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The Way of Life and Ecological Thinking of the Jambu Baru Community as a Foundation for Sustainable Peatland Management

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ABSTRACT

The existence, ecological thinking, and livelihood of local communities are often ignored in the management of peatlands for economic and protection purposes. This research aims to examine the way of life and ecological thinking of peat communities from a sustainable development perspective. The approach used is qualitative and type of case study research. Data was collected through participant observation, in-depth interviews, and documentation. Data were analyzed using the Miles and Huberman interactive model. The research found that the management of the natural resources of the peat ecosystem is the economic foundation of the community in Jambu Baru Village, which is manifested through various economic activities. The management is carried out to avoid the conversion of the peat ecosystem so that the condition of the peat ecosystem in the Jambu Baru Village area is still maintained and 93.69% of them still have high vegetation. Furthermore, the community moved collectively to reject the expansion of oil palm plantation companies targeting peatlands in Jambu Baru Village. Ecological thinking that exists in society is a manifestation of the sustainable development concept, which carries three dimensions of interest, namely ecological sustainability, social development, and economic development. Communities can realize these three dimensions of interest proportionally, and prove that peatlands are not marginal lands. Simply by managing the sources of life provided by the peat ecosystem with a sustainable approach, quality of life and intergenerational justice can be realized. Thus, strengthening the livelihoods of local communities is an approach that must be promoted to realize sustainable peatland management.

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1. Introduction

Damage to the peat ecosystem is one of the largest contributors to greenhouse gas (GHG) emissions which cause climate change. Peatlands only cover 3-5% of the earth's surface but are home to more than 30% of the world's carbon reserves. Tropical peatlands are estimated to store twice as much carbon as forests worldwide, and four times that in the atmosphere (CIFOR, 2017). Indonesia has the largest area of tropical peat in the world, namely 14.91 million hectares spread across the islands of Sumatra, Kalimantan and Papua (Khotimah et al., 2020). The carbon stored in it is ±57 giga tonnes or 20 times the carbon of ordinary mineral soil, which would be released into the atmosphere if the peat ecosystem were to dry out. The peat ecosystem also functions as a flood and drought controller because of its hydrophysical nature; habitat for various flora and fauna (biodiversity); and, supports the community's economy (Pantau Gambut, 2023). The Indonesian government has issued several peatland management policies and regulations, but peatland degradation and conversion continue (Uda et al., 2020). Peatland damage is caused by a lack of implementation of conservation principles and understanding of peatland behavior so the use of technology tends to be inappropriate (Najiyati et al., 2005; Waldi et al., 2019).

Peat forest cover has decreased by 77% in the period from 1990 to 2020 (Comeau et al., 2013; Fatkhullah et al., 2021). Around 3.74 million hectares of peatland have been degraded, making them unproductive and a source of greenhouse gas (GHG) emissions (Agus et al., 2016). In 2008, CO2 emissions from Indonesian peatlands were the highest in the world, namely 500 million tons (Dariah, 2016). The main cause is conversion for agricultural and plantation purposes (Uda et al., 2017), which removes the carbon content (Nusantara et al., 2020). Recurrent logging, land conversion, drainage, and fire activities have played a role in turning peat swamp forests into degraded and fragmented landscapes, which have significant impacts globally (Dohong et al., 2017). One of the biggest is conversion to oil palm plantations. Around 20% of oil palm plantations on the islands of Sumatra, Kalimantan, and Papua are on peatlands (Dariah &

Maswar, 2016). The development of peatlands into oil palm plantations requires drainage which causes a decrease in water levels, subsidence, and greenhouse gas emissions (Noor, 2001; Wösten et al., 2008; Haddaway et al., 2014; Purnamayani et al., 2022). Drainage practices are the main cause of vertical drought and fires that can reach deeper peat layers (Brasika, 2022). Emissions originating from peatlands that have been managed for oil palm plantations range between 34-38 tons of CO2/ha/year (Dariah et al., 2014).

Efforts to stem the rate of damage and restore peat ecosystems in Indonesia are carried out through improving governance, which is more sustainability-oriented. The action program is rewetting, revegetation, and ensuring the community has a livelihood that is in line with restoration (Yuwati et al., 2021), as well as implementing a scenario for the gradual removal of plants that require drainage (Uda et al., 2017). Hydrological and vegetation restoration is a way to restore damaged peat ecosystems by blocking canals and replacing commodities that are more resistant to flooding (Triadi, 2020). Restoration activities must be carried out comprehensively by emphasizing livelihood benefits to encourage community participation (Yuwati et al., 2021). Various conservation-oriented programs are also implemented, which focus on conservation (eco-conservationism paradigm). So it tends to ignore the sources of livelihood of local communities. Many conservation areas with ecological objectives ignore the socio-economic and cultural needs of local communities around them (Infield et al., 2018; Abukari & Mwalyosi, 2020; Meilani et al., 2021). The peat conservation program causes local communities to experience alienation, and on the other hand, the impact of the program on peat ecosystem protection is not significant (Hamid & Melinda, 2023).

The root of the problem in peatland management stems from marginal stereotypes of peatlands. The existence, ecological thinking, and livelihood of local communities are often neglected, both in economic development and in efforts to realize peat ecosystem protection. Historically, local communities have lived for generations on peat ecosystems and established metabolic interactions with peat ecosystems. Metabolic interactions that should shape ecological thinking, as well as peat management models that might manifest the concept of sustainable development. Previous research has predominantly focused on various solutions to peatland management problems.

2. Methods

The approach used in this research is qualitative, and the type of case study research is implemented through in-depth exploration: processes, activities, and essential phenomena of society in interacting with its living environment; the economic value of managing natural peatland resources; season calendar; and, ecological thinking in society. The research was conducted in Jambu Baru Village, Kuripan District, Barito Kuala Regency, in August 2022 – July 2023. Data collection was carried out through: 1) participant observation, namely being actively involved in community activities, so that the data obtained was more complete, sharp, and up to the level of the meaning of each visible behavior. The resulting data is used to analyze people's way of life and the condition of the peat ecosystem; 2) in-depth interviews, with community informants (men and women) whose source of life depends on peatlands and the village government. The type of interview used is semi-structured, which relies on probing. The resulting data is described according to the domains of findings, which are used to analyze the way of life and ecological thinking of peat communities; 3) spatial mapping, which produces spatial data that is used to analyze the condition of the peat ecosystem, especially its vegetation; and, 4) literature study, namely analyzing data (documents) that are relevant to the research question, with the results of secondary data that supports the primary data. Data were analyzed using the Miles and Huberman interactive model, namely, data analysis consisting of data reduction, data presentation, and concluding/verification, which took place interactively and continuously until the data was saturated (Sugiyono, 2018), and spatial analysis.

3. Results and Discussion

3.1. Research Sites

Jambu Baru Village is administratively located in Kuripan District, Barito Kuala Regency, with a total area of 2,888.69 hectares. Jambu Baru Village is located in a peat ecosystem area that is part of the Barito River-Tapin River Peat Hydrological Unit (KHG) (Sudrajat & Subekti, 2019). Of the entire Jambu Baru Village area, 2,706.32 hectares, or 93.69% still have high vegetation. Only 154.45 hectares or 5.35% of them are not vegetated, namely residential areas and the Barito River flowing through Jambu Baru Village. The peatlands in Jambu Baru Village are influenced by the tides and seasonal overflows of the Barito River. So that the condition is always flooded throughout the rainy season and is not flooded at the peak of the dry season (figure 1).

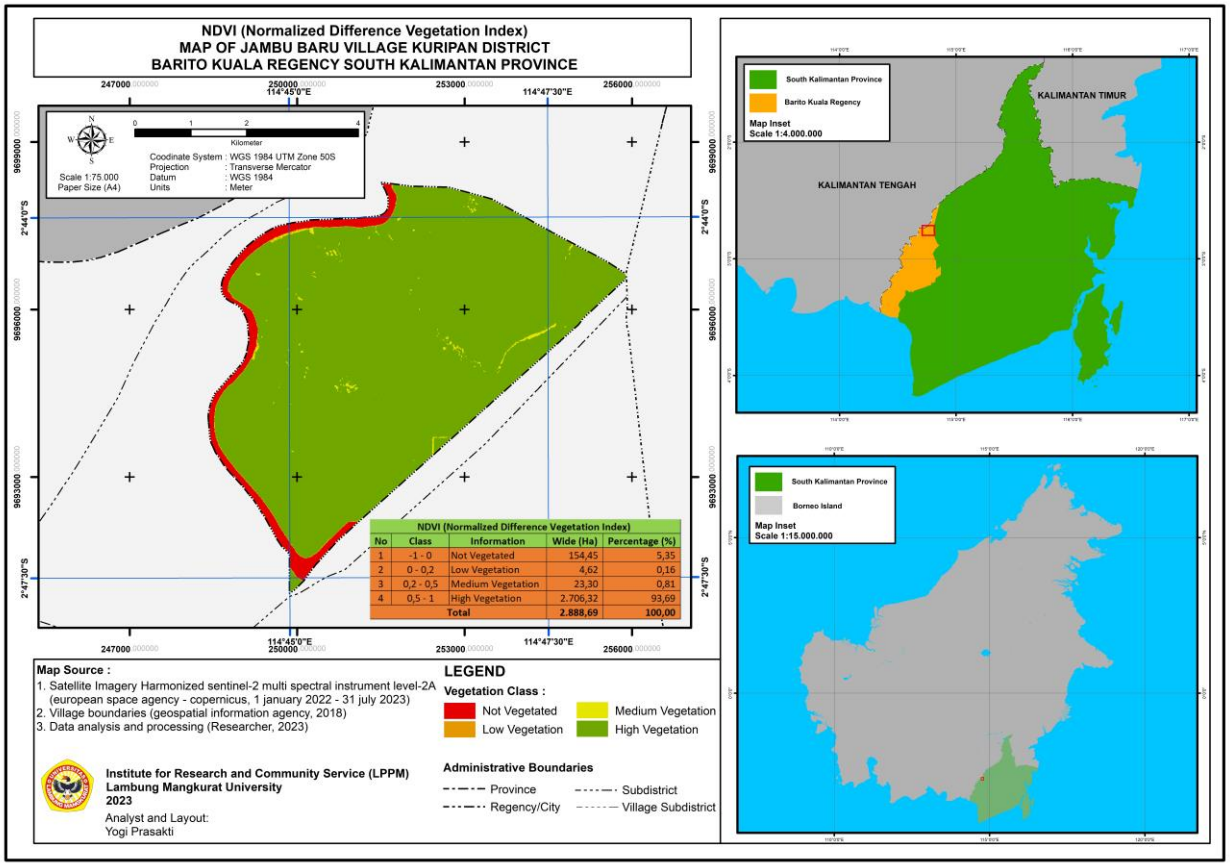

Figure 1. NDVI map of Jambu Baru Village
Source: Data processing results, 2023

3.2. Community Livelihood

The people of Jambu Baru Village have lived in the peat ecosystem for generations, depending on the sources of life from the peat ecosystem. Padang is the term the people of Jambu Baru Village refer to for peatlands, especially those whose natural properties and functions have not undergone much change. The people of Jambu Baru Village do not consider peat land as marginal land.

> *"...Jika dibilang lahan tidur (marginal) itu karena mereka belum pernah masuk ke dalamnya. Seandainya masuk (ke dalam padang) mereka bisa melihat bagaimana pekerjaan kami. Masyarakat sejak dulu sudah memanfaatkan padang..."(Informan Sunardi, 2023).*

> *"...If they say it's an idle (marginal) land, it's because they've never been inside it. If they come (into the field) they can see how we work. People have been using the fields for a long time..."(Informant Sunardi, 2023).*

People carry out various economic activities on peatlands (padang) to meet family needs. Every day people go in and out of the fields carrying out various economic activities. The community places the sources of life (livelihood) from the peat ecosystem as the foundation of the economy. The existence of the people of Jambu Baru Village shows a contradictory side to the view that peat land is marginal land. A view that makes peatlands the target of economic development programs. (Surahman et al., 2018; Barchia et al. 2022) suggest that increasing the productivity of marginal land such as peatlands is chosen for agricultural development to ensure Indonesia's food security.

Specifically, economic activities from the management of natural peatland resources that many people are still involved in today are as follows:

3.2.1 *Menggalam*

Menggalam is the term in the Dayak Bakumpai language for the economic activity of looking for *galam* wood. Galam wood is an endemic swamp plant that grows in peat forests (Anggarini & Muzaidi, 2021), It is

strong and durable so it is widely used as a support for building and bridge construction (Laksono et al., 2019), especially in peat swamp areas. So *galam* wood provides many benefits for people's lives, both for domestic and economic purposes. Galam wood is a commodity with high economic value because market demand is quite high. The economic activity of the *galam* is quite influenced by the season, where the productivity of the *galam* increases during the rainy season because the water in the peat ecosystem rises so boat transportation routes to find and transport galam wood are easier.

3.2.2 Hunting (Looking For) Rattan

Looking for rattan is an activity passed down from generation to generation. Historically, people initially used rattan as a raw material for making fish baskets and fishing tools. Gradually, when the market began to open, the rattan products obtained began to be sold and have now become a source of the community's economy. Looking for rattan is a job that people can do all year round. Even though it can be done all year round, the activity of looking for rattan depends on the selling value of the rattan. In this case, the price of rattan is quite fluctuating, with the highest price reaching Rp. 250,000/*pikul* (62.5 kg). In one day, people can produce up to 1 pikul of rattan.

3.2.3 Hunting for Honey

The economic activity of honey hunting is inherited from honey-seeker families, but the quantity of honey seekers is quite large. Honey seekers have well-guarded ginger trees. The jingah tree (antiaris toxicaria) is a plant that generally grows well in tropical and subtropical areas (Laksono et al., 2019), where bees make their nests. Every Jinnah tree owned by a honey seeker is passed on to his descendants. Forest honey hunting activities are usually carried out in the dry season because only in the dry season do bees get a supply of nectar (flower essence) from blooming flowers.

Throughout the year, forest honey can be harvested 3 times, with a harvest period of 40-60 consecutive days. On one *jingah* tree there are 10-30 beehives, so honey seekers on average get 1-10 beehives per harvest. After going through the processing process, 1 (one) beehive can produce 10-20 bottles of honey which are ready to be sold, for Rp. 130,000/500ml bottle.

3.2.4 *Beje* Management (Fish Well)

Beje is a hole resembling a well in peat land, which is one of the main sources of livelihood for the people in Jambu Baru Village. The way the *beje* works is that when water floods the surface of the peatland during the rainy season, the fish enter the beje area. When the surface of the peatlands dries up in the dry season, the fish are trapped in the *beje* area. At the peak of the dry season, standing water on the surface of the peatlands disappears completely, so the fish concentrate in the *beje*. That's when the *beje* harvest takes place, so the *beje* harvest is only done once a year. Even though the beje harvest can only be done once a year, beje is a high-value economic resource because most communities manage more than one beje, there are even communities that manage up to 30 beje. There are no less than 1,000 bejes that are still functioning in Jambu Baru Village, which are managed by 101 families out of a total of 151 families of Jambu Baru Village residents. Another advantage of *beje* management is that it has zero-cost production.

The fish that are usually harvested from *beje* are various types of freshwater fish. The size and shape of the *beje* itself is quite varied, with a harvest of 0.5-2 tons of fish for a large *beje*, while the harvest from a small-sized *beje* reaches an average of 250 kg. According to the community, beje management is a form of utilizing and preserving peat, because the natural condition of peat helps the function of beje. If the condition of the peat is damaged, the peat water will become sour and will make the fish move away from the *beje* area. The condition of the peatland vegetation does not need to be changed in its management, all that is needed is clearing the wild grass around the *beje* so that the fish passage into the *beje* is not blocked.

3.2.5 *Purun* Management

The *purun* plant is one of the endemic plants in the peat ecosystem, which provides many benefits to society. Purun is a wild grass-like plant that has strong fibers so people use it as a handicraft material (Royani & Agustina, 2017). Its elongated shape and softness after drying make this plant very suitable as a basic material for handicrafts (woven). The people of Jambu Baru Village make various handicrafts from *purun*, such as mats, baskets, hats and others.

The morning atmosphere in Jambu Baru Village is always colored by the sound of the *purun* pounder. Pounding the *purun* is a process that must be done so that the *purun* can be woven. Purun weaving is a hereditary activity, predominantly carried out by women. Men themselves play more of a role in the planting and harvesting stages of *purun*. Men also have purun weaving skills, but are more dominant in other

economic activities. The economic activity of weaving *purun* is an economic activity that can be accessed by all groups of society, including the elderly, children and disabled groups. Almost all elderly women (seniors) in Jambu Baru Village carry out *purun* handicraft economic activities (figure 2).

Figure 2. Elderly women who carry out purun handicraft economic activities

On average, in 1 (one) day, each *purun* craftsman can produce ±10 mats, with a selling price of Rp. 4,000-Rp. 5,000/*Tikar*. Apart from that, people usually sell purun in the form of raw materials, for Rp. 2,500/bundle. The average community can produce 5-20 bunches of *purun*/day. Purun plant conservation is not only limited to economic interests but is also oriented towards ecological interests. Purun plants function as absorbers of toxic substances, thus protecting the balance of the peat ecosystem, as well as functioning as a place for fish to lay eggs and forage for food.

3.2.6 *Meiwak*

Meiwak or the activity of fishing (hunting) is one of the main economic sources of the majority of people in Jambu Baru Village. Meiwak is different from *beje* management, because *meiwak* is the search for fish in large rivers and small rivers in peat ecosystems, using various fishing gear. The *meiwak* activity takes place throughout the year or does not depend on the season, and does not depend on the time of day, that is, it can be done during the day or at night. Some of the meiwak products are sold and some are for family consumption. Meiwak economic activity is one of the factors that ensures the income of the people in Jambu Baru Village is never interrupted throughout the year. The selling price of fish and the quantity of the results tend to fluctuate and the intensity with which people do it tends to be dynamic, making income from *meiwak* economic activities difficult to calculate with certainty.

3.2.7 *Gulinggang* Farming

Gulinggang farming is an economic activity that is still relatively new for the people of Jambu Baru Village, which only started in 2019. However, *gulinggang* has now become a commodity with economic value for the community. *Gulinggang* (Cassia alata L.) is a plant that has medicinal properties, especially for treating itching (Mawaddah et al., 2020). This plant has been around for a long time in Jambu Baru Village, especially in areas that are not flooded, but has only become an economically valuable commodity since market demand emerged. Since then, people have not only depended on the wild *gulinggang*, but have started cultivating it. The production duration of *gulinggang* is relatively fast, namely 2 months after planting

the gulinggang leaves can be harvested. The dried *Gulinggang* leaves are sold to collectors for Rp. 11,000-Rp. 12,000/kg. Usually, people harvest 2 (two) times a year, with harvests ranging from 130-260 kg.

3.2.8 Other Economic Resources

There are two classifications of economic activities that are included in the category of other economic sources, namely 1) economic activities oriented towards meeting family consumption needs, including *behuma* and hunting for food sources (vegetables, etc.); 2) economic activities that are only and/or only carried out by a few community members, namely looking for eels and house swallows. Even though paddy (rice) is the staple food, only a few people are *behuma* (plant rice). This stems from the knowledge that if the peat in Jambu Baru Village is used for behuma, the water will decrease (water level will decrease) and the soil surface will slowly dry out. A decrease in the water level of peat soil will have an impact on the rate of subsidence of the peat surface (Lisnawati et al., 2015), and is susceptible to irreversible drying so that it can easily catch fire on a massive scale.

Based on this ecological thinking, the community has been consistent from the past until now in not being able to (plant rice) in the Jambu Baru Village area. The community decided to only prioritize managing the natural resources of the peat ecosystem as economic support. However, some communities are still willing to take locations in neighboring sub-districts, which have peatlands with characteristics that make it possible to plant rice. Allotment of *behuma* results in fulfilling subsistence needs (family consumption).

Furthermore, economic activities are only or have only recently been carried out by some community members, namely looking for eels and house swallows. The activity of looking for eels is only carried out by a few individuals in the community and the season is uncertain. The swallow house is one of the economic activities with the highest income compared to other economic activities. The small number of people who already own swallow houses are those who have adequate personal capital support and the courage to take risks because the costs of setting up a swallow house are very large. Some people are still worried about big losses if the swallow house they build fails to attract swallows to nest in it.

3.3 Economic Value of Community Livelihood and Seasonal Calendar

3.3.1 Economic Value of Community Livelihood

The people of Jambu Baru Village have been able to maintain their livelihood for generations by depending on peatlands. Livelihoods from managing natural peatland resources are the foundation of the community's economy.

> *"...Hasil dari penjualan purun dan mencari ikan saja sudah cukup menghidupi kebutuhan keluarga. Belum lagi hasil-hasil lain, menggalam, beje, rotan dan lain-lain..." (Informant Nur Jannah, 2023).*

> *"...The proceeds from selling purun and fishing alone are enough to support the family's needs. Not to mention other products, menggalam, beje, rattan and others..." (Informant Nur Jannah, 2023).*

Economic value of various sources of livelihood for the people of Jambu Baru Village from peat ecosystem management, table 1.

Table 1. Economic value of peat management in the Jambu Baru Village community

Economic Activities	Income per Year	
	Lowest (IDR)	Highest (IDR)
Menggalam	39.000.000	140.400.000
Hunting (Searching) rattan	34.320.000	78.000.000
Hunting (Searching) Honey	13.000.000	78.000.000
Beje management (calculation for 1 *beje*)	5.000.000	40.000.000
Purun management in the form of handicrafts	11.232.000	14.040.000
Purun management in the form of direct sales	7.800.000	15.600.000
Gulinggang farming	1.860.000	6.240.000

Table 1 shows that there are economic activities whose income is quite high, and there are also those whose income is relatively low. An important note is that almost all families in Jambu Baru Village have

more than one economic activity. Certain economic activities only act as entertainment activities for certain families. So that income from one economic activity accumulates with other economic activities.

The typology of peat communities is a society where all family members are allowed to have their source of (economic) income, including women. The women in Jambu Baru Village are women who are not domesticated, and are even nicknamed "dada tau benyem" women, which means "can't keep quiet". Women are always active in economic activities, have the same working hours as men, and contribute greatly to supporting the family economy. Even elderly people are still able to carry out economic activities, for example, *purun* weaving, so they do not have to depend on family support or help from other people for their livelihood.

The level of people's income from certain economic activities is influenced by seasonal conditions. For example, the *beje* harvest cannot be carried out during the longer and more erratic rainy season. So under normal conditions, without the impact of climate change, the income of the people of Jambu Baru Village from various economic activities is relatively high. Even though they are currently facing the impact of climate change which is getting worse, the community is starting to be able to adapt by creating new sources of income, including fishing tourism using beje which has been difficult to harvest in recent years.

3.3.2 Season Calendar

The people who live in the peat ecosystem in Jambu Baru Village are classified as people who never lose economic resources throughout the year. The periods and times for various community economic activities are carried out can be seen in the seasonal calendar table 2.

Table 2. Seasonal calendar in Jambu Baru Village

Musim	Bulan											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Okt**	**Nov**	**Des**
Rain	■	■	■									■
Dry Season						■	■	■	■			
Transition season				■	■					■	■	
Flood	■	■	■									
Menggalam	■	■	■	■	■					■	■	■
Searching for honey				■		■	■	■	■			
Searching for rattan	■	■	■	■	■	■	■	■	■	■	■	■
Meiwak	■	■	■	■	■	■	■	■	■	■	■	■
Harvesting of *purun*		■	■			■	■					
Harvesting of *beje*								■	■			
Harvesting *gulinggang*						■	■	■	■	■	■	

Source: Results of the analysis, 2023

Based on Table 2, it can be observed that throughout the year, the economic activities of the community never cease entirely. During the rainy season, economic activities related to "menggalam" (which means something like "to submerge" - more context may be needed for a precise translation) dominate, while during the dry season, the community engages in "panen beje" (*beje* harvesting), searching for honey ("mencari madu"), and "*panen gulinggang*" (gulinggang harvesting). The activity of "panen purun" (purun harvesting) is relatively balanced and occurs during both the rainy and dry seasons. Meanwhile, economic activities such as "meiwak," searching for rattan ("mencari rotan"), and even harvesting bird's nest ("sarang burung walet") continue throughout the year. This allows the community to economically survive despite facing crises caused by various factors, especially natural factors such as prolonged rainy seasons or the opposite.

Supported by the economic value in Table 1, the field in Jambu Baru Village is an important asset for the community, proving that not all peatland communities live in poverty. This finding contradicts the statement by (Zulkarnaini and Lubis 2018), who suggested that the degradation of peatland ecosystems is generally caused by poverty and underdevelopment among communities living around peatland areas. This differs from the research by (Pratama et al. 2022), which indicated that the achievement of peatland restoration is still far from the set targets, where the revitalization of the main livelihoods of the community is not sustainable and cannot yet be relied upon as an alternative livelihood. In this context, introducing alternative livelihoods for peatland communities is not always absolute. It requires a comprehensive discovery and understanding of existing livelihood sources within the community, so that conservation agendas can be integrated with the community's traditional livelihoods that have been practiced for generations.

3.4 Ecological Thinking in Peatland Management

Based on their extensive experience in the metabolic interaction process with peatlands, ecological thinking has emerged within the community of Jambu Baru Village. The community's thoughts regarding the direction of peatland management are as follows:

> *"...Sejak dulu padang memberi manfaat ke masyarakat tanpa harus merubah menjadi persawahan atau perkebunan. Padang itu lebih baik kondisinya begini, apa adanya, kalau diubah belum tentu bisa dimanfaatkan. Apalagi kalau diubah menjadi perkebunan kelapa sawit, biar kata kami bisa bekerja di perusahaan tapi tidak selamanya, ada batasan umur, sementara di padang orang bisa bekerja tanpa batasan umur..." (Informan Sunardi, 2023).*

> *"...Since ancient times, the field has provided benefits to the community without the need to transform it into rice fields or plantations. The field is better off in its current condition, as it is, and changing it may not necessarily make it more useful. Moreover, if it is transformed into oil palm plantations, even though we can work in the company, it's not forever. There is an age limit. Meanwhile, in the field, people can work without age restrictions..."(Informant Sunardi, 2023).*

> *"...Lebih baik padang tidak dirubah macam-macam, cukup kita biarkan dengan sifat alaminya maka sudah memberi manfaat ke masyarakat..." (Informan U., 2023).*

> *"...It's better not to change the field into various things. It's enough to leave it in its natural state, and it already benefits the community..." ((Informant U., 2023).*

The community of Jambu Village embraces a vision of sustainable peatland management, rejects peatland conversion, and considers the protection of the peatland ecosystem as the best choice. This ecological thinking is then manifested in a critical stance towards the agenda of peatland conversion for economic development. The community collectively opposes palm oil plantation companies targeting peatlands in the Jambu Baru Village area since 2010.

Tabel 3. The characteristics of peatland management by the community of Jambu Baru Village are as follows

Variables	Characteristic
Natural capital (managed resources)	Natural resources of the peatland ecosystem. No non-peatland commodities were found to be managed by the community
Leading commodities	Dependent on the season, or there are no commodities engineered to be available throughout the year. In this case, the commodities managed are entirely dependent on nature.
Management nature	1) Sustainable, meaning non-accumulative in terms of economic benefits and non-exploitative of nature. Examples include: a) *Beje* fishing, where female fish are released to ensure the species' sustainability in the beje; b) *Galam* wood harvesting with specified size standards to prevent significant vegetation loss and allow small trees to continue growing; c) Fish harvesting that does not use capture tools that can kill seeds and small fish. 2) Inclusive, meaning accessible to every member of the community, such as undomesticated women and elderly people who can still engage in economic activities.
Human resource capacity	1) Mainly based on traditional knowledge.. 2) Capacity enhancement is carried out but not contradictory to local knowledge.
Social capital	1) Sustainable management models are consistently applied by the community, even in the absence of written regulations. The main source is the community's knowledge of the nature and ecological functions of the peatland ecosystem. Thus, the management model adopted by the community is a manifestation of local wisdom, which is a rational action oriented towards achieving sustainable living. 2) Access to management is based on mutual recognition (de facto) among the community, which prevents monopolies and conflicts over access to natural resources among the community.
Application of science and technology	Adaptation to the characteristics of the peatland ecosystem, where efforts are made to strengthen existing knowledge, not replace it. One concrete example is avoiding management that requires changes in the nature of the peatland ecosystem.
Production capital	Labor-intensive, not capital-intensive. All economic resources of the community are managed with very small capital, and there are even economic activities with zero-cost production. This forms the basis for the community to avoid excessive production to cover production costs

Source: Results of the analysis, 2023

Table 3 shows that peatland management carried out by the community is sustainable, where accumulative and exploitative characteristics are not visible in it. The relationship between the interaction of human metabolism and nature reaches a "crack" generally due to the development of large-scale industry and agriculture which is oriented towards maximum production as a consequence of the accumulative character. The peatland management carried out by the people of Jambu Baru Village does not show dependence on industrial development and does not implement large-scale agriculture. Even food agriculture (rice), despite its status as a basic need, is not implemented because it requires changes in the nature of the peat ecosystem landscape. Management is in line with the opinion of (Jaya et al., 2020; Salote et al., 2022), which states that in land use, the community must understand the condition and suitability of the land being managed to avoid land damage, namely increased erosion, the occurrence of critical land and land degradation.

(Susilo, 2017), explains that the concept of sustainable development carries three dimensions of interest, namely ecological sustainability, social development and economic development. Peatland management carried out by the people of Jambu Baru Village is able to combine proportionally these three dimensions of interest. The orientation and concrete efforts made by the community in social and economic development are able to internalize the values of ecological sustainability. The characteristics of peatland management described in table 3 are in line with the four actions that are mainstreamed in sustainable development. The four actions consist of: 1) efforts to meet human needs which are supported by the carrying capacity of the ecosystem; 2) efforts to improve human life by protecting and sustaining it; 3) efforts to increase human and natural resources that will be needed in the future; and, 4) efforts to reconcile human needs between generations (Baiquni & Susilawardani, 2002; Taher, 2017).

The findings of this research are not in line with research (Uda et al., 2020), which suggests that many peatland users do not understand peatland regulations. The level of conformity between the practices listed in the four main peatland regulations in Indonesia and the practices used by peatland users is mostly at a low to moderate level. Furthermore, criticizing conservation programs which at a practical level apply the eco-conservationist paradigm and tend to ignore the livelihood sources of local communities. There are many conservation areas with ecological objectives that ignore the socio-economic and cultural needs of local communities around them (Infield et al., 2018; Abukari & Mwalyosi, 2020; Meilani et al., 2021). The peat conservation program actually causes local communities to experience alienation, and on the other hand, the impact of the program on peat ecosystem protection is not significant (Hamid & Meilinda, 2023).

The research findings are in line with research (Glenk & Martin-Ortega, 2018), which suggests that peatland restoration is likely to improve welfare. As well as supporting research (Abdurrahim et al., 2023), which suggests that people who have a long history of living on the outskirts of peatlands have a way of life that is expressed in the form of a "sense of place" as a relational value, resulting in a holistic appreciation of relational values and instrumental is still needed. Research (Gunawan & Afriyanti, 2019), which suggests that the development of local community wisdom as an alternative and productive economy that is ecologically balanced will have a long-term development impact without damaging the environment. Local wisdom that currently exists needs to be improved in keeping peatlands wet and having sustainable economic value. Research (Meilani et al., 2021), which suggests that increasing social acceptance in environmental management is very important, not only to overcome the socio-economic and cultural problems of local residents, but also to achieve ecological goals.

The achievement of implementing the concept of sustainable development by the people of Jambu Baru Village can be seen in the condition of the peat ecosystem in the Jambu Baru Village area which still maintains its naturalness and 93.69% of it still has high vegetation, and the community's living needs can still be met well. Society is able to resist the desire to exploit natural resources at will and ignore environmental sustainability. This fact is contrary to the opinion of (Piątek, 2008; Abdoellah, 2020), which states that in humans there is a childish disease, which assumes that they can do whatever they like with the environment and the natural resources they have. On the contrary, it is in line with the opinion.

4. Conclusions

The eco-developmentalist view considers that peat land is marginal land, but the people of Jambu Baru Village are able to meet their needs without having to convert it. The community's economic activities originate entirely from the carrying capacity of the peat ecosystem, as shown by: 1) the absence of non-peat ecosystem commodities that are actually managed by the community; 2) economic activity depends on the season or there is no engineering process so that economic activity continues throughout the year; 3) application of science and technology to suit the characteristics of the peat ecosystem; 4) do not force excessive production results; and others. The management carried out always avoids actions that could

change the natural properties of the peat ecosystem, so that the majority of the condition is still natural and 93.69% of the area is still covered by tall vegetation. The management approach taken is based on ecological thinking which views that the sustainability of the peat ecosystem (living environment) will be linear with the quality of life of the community from generation to generation (intergenerational justice). The way of life and ecological thinking of the peat community in Jambu Baru Village is able to manifest three dimensions of importance in the concept of sustainable development, namely ecological sustainability, social development and economic development. Ecological thinking then gave rise to an attitude of rejection of the oil palm plantation expansion agenda targeting peatlands in Jambu Baru Village. The ecological thinking of the people of Jambu Baru Village and its actualization is an important reference in efforts to implement the concept of sustainable development in the context of peatland management. Thus, one approach that must be promoted in an effort to realize sustainable and inclusive peatland management (accessible to all elements of society) is to strengthen the sustainable livelihood of local communities. Continuous discovery and comprehensive understanding of peat community livelihoods is always needed so that the conservation agenda can be integrated with community livelihoods which manifests intergenerational justice.

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