

Ecological Crisis and Human Security: A Legal Analysis of the Exploitation of the Sei Ular River

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ABSTRACT

River empowerment for tourism and sustainable agriculture has a positive impact on environmental sustainability and community welfare. However, these positive benefits have not been fully felt by the community in Sei Ular River, North Sumatra. Increasingly rampant illegal mining activities have deprived the community of their social rights, especially for a good and healthy environment. Government policies and existing legal instruments have not been optimal in solving the problem due to inconsistencies in law enforcement, lack of coordination between authorities, and low public awareness to protect river ecosystems. The research conducted is normative juridical, namely analyzing written law, jurisprudence, and norms that live in society. The descriptive-analytical approach aims to retrieve data systematically, factually, and accurately on a problem based on applicable laws and legal norms. The results of this study indicate that regulations and legal protection for the community due to illegal mining in Sei Ular River have been regulated starting from laws, government regulations, to regional regulations, but these legal instruments have not been effective enough in protecting the community from the impact of illegal mining activities, as a result, there have been violations of fundamental rights that affect community welfare. Empowerment of the Sei Ular River for tourism and sustainable agriculture and its concrete benefits, namely, involving the community in the management of tourist destinations in the river area, building dams and irrigation channels for farmers, socialization, strict action (sanctions) against illegal mining actors, actively collaborating with various parties in conducting surveillance to protect the Sei Ular River ecosystem. In addition, the government also requires illegal mining actors who pollute the Sei Ular River to compensate affected communities and restore the environmental damage caused.

Keywords: River, Sustainable Development, Legal Policy, Community Welfare.

ABSTRAK

Pemberdayaan sungai untuk pariwisata dan pertanian berkelanjutan memiliki dampak positif bagi kelestarian lingkungan dan kesejahteraan masyarakat. Namun, manfaat positif tersebut belum sepenuhnya dirasakan oleh masyarakat di Sungai Sei Ular, Sumatera Utara. Aktivitas pertambangan ilegal yang semakin marak, telah merampas hak-hak sosial masyarakat, terutama akan lingkungan yang baik dan sehat. Kebijakan pemerintah dan instrumen hukum yang ada saat ini belum maksimal dalam menyelesaikan masalah karena adanya inkonsistensi penegakan hukum, minimnya koordinasi antar pihak berwenang, serta rendahnya kesadaran masyarakat untuk menjaga ekosistem sungai. Penelitian yang dilakukan bersifat yuridis normatif yaitu menganalisis hukum tertulis, yurisprudensi, dan norma-norma yang hidup dalam masyarakat. Pendekatan deskriptif-analitis bertujuan untuk mengambil data secara sistematis, faktual, dan akurat terhadap suatu permasalahan berdasarkan hukum dan norma hukum yang berlaku. Hasil penelitian ini menunjukkan bahwa regulasi dan perlindungan hukum bagi masyarakat akibat tambang ilegal di Sungai Sei Ular telah diatur mulai dari undang-undang, peraturan pemerintah, hingga peraturan daerah, namun instrumen hukum ini belum cukup efektif dalam melindungi masyarakat dari dampak aktivitas pertambangan ilegal, akibatnya terjadi pelanggaran hak-hak fundamental yang mempengaruhi kesejahteraan masyarakat. Pemberdayaan Sungai Sei Ular untuk pariwisata dan pertanian berkelanjutan serta manfaat konkretnya yaitu, melibatkan masyarakat dalam pengelolaan destinasi wisata di area sungai, membangun bendungan dan saluran irigasi bagi petani, sosialisasi, tindakan tegas (sanksi)

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terhadap pelaku penambangan ilegal, berperan aktif menjalin kolaborasi dengan berbagai pihak dalam melakukan pengawasan melindungi ekosistem Sei Sungai Ular. Selain itu, pemerintah juga mewajibkan pelaku tambang ilegal yang mencemari Sei Sungai Ular untuk memberi kompensasi kepada masyarakat terdampak dan memulihkan kerusakan lingkungan yang ditimbulkan.

Kata Kunci: Sungai, Pembangunan Berkelanjutan, Kebijakan Hukum, Kesejahteraan Masyarakat.

INTRODUCTION

The existence of rivers has had a huge influence on the development of human civilization from the past until now (Nurlidiawati, 2014). Rivers are not only a provider of clean water to fulfill basic needs but also provide greater benefits to the ecosystem of a region (Barreto et al., 2014). In simple terms, modern society currently empowers rivers as flood barriers, agricultural irrigation, means of transport, and tourist destinations (Muchlashin, 2019). Therefore, rivers must be preserved and protected from various forms of destruction and pollution (Nabhi, 2023). Massive development activities, population growth, land clearing, and industry are the main causes of pollution in watershed areas in Indonesia. Good and sustainable river flow management is very important to maintain the sustainability of human life and environmental sustainability (Roos et al., 2023). River conservation analysis can be done with land use change and its effect on local water and air quality. This is important in fulfilling water needs and handling pollution, especially the concept of greening for life (Brontowiyono et al., 2010).

Based on data from the Ministry of Environment and Forestry of the Republic of Indonesia (KLHK), from monitoring 564 river points in Indonesia, there are 59% experienced heavy pollution, 26.6% experienced moderate pollution and 8.9% others were lightly polluted. Meanwhile, data from the Central Statistics Agency (BPS) of the Republic of Indonesia in 2021, 10,683 villages experienced water pollution. Central Java is the region with the most water pollution with 1,310 affected villages, followed by West Java with 1,217 villages, and East Java with 1,152 villages. Meanwhile, in West Kalimantan Province, there are 715 villages/sub-districts, North Sumatra 673 villages/sub-districts, Central Kalimantan 610, South Sumatra 440, and South Kalimantan 396 villages/sub-districts affected by water pollution. The biggest causes of water pollution come from household waste, factory waste, and other sources of pollution. (databoks, 2022).

Excessive excavation activities (without post-mining reclamation) will adversely affect the sustainability of the river ecosystem, including: causing erosion, decreasing water discharge, water pollution, sedimentation, and damaging infrastructure around the river. Meanwhile, quarrying activities also have social impacts on the community such as health and safety risks (due to pollution from mining activities), damage to agricultural land on the riverbank which results in decreased productivity of farmers and reduced income, and the worst is triggering social conflicts between the community, government and mining entrepreneurs (Potkonjak, 2024).

Various existing regulatory provisions such as Law Number 32 the Year 2009 on Environmental Protection and Management, Law No. 7 the Year 2004 on Water Resources, Law No. 3 of 2020 concerning Mineral and Coal Mining, Government Regulation No. 37/2012 on Watershed Management, Government Regulation No. 38 of 2011 on Rivers, are not optimal enough and have not run well, because in addition to the problem of inconsistency in law enforcement, the performance of the government at the central and regional levels has not been maximized. The lack of public awareness about the importance of maintaining river ecosystems also has a direct impact.

The obligation to reclaim the former excavation C land as referred to in Article 96 of Law No. 3 of 2020 concerning Mineral and Coal Mining in its implementation cannot be implemented optimally. This is due to the lack of supervision by the relevant ministries and law enforcement officials of mining entrepreneurs, especially C excavation. If entrepreneurs do not carry out reclamation after mining activities, law enforcement officials cannot take direct action before there is a report and losses to the state (both material and immaterial losses) (Mariane et al., 2024). Therefore, in the future, special regulatory arrangements are needed, for example in the form of government regulations or relevant ministerial regulations, which can be a solution to this legal loophole.

As one of the efforts to overcome this problem, the national strategy for sustainable development was formulated in Agenda 21 which is grouped into four three namely: community services, waste management, and natural resource management (Waluyo Jati et al., 2023). Water resources management (natural resources management), is divided into four sub-areas: water resources management, land resources stewardship, agriculture, and rural development, and forest management (Nwankwo et al., 2023). The implementation of natural resource management must be carried out in an integrated manner, including spatial planning, forests, land, watersheds, and so on (Yildirim et al., 2021).

This policy is in line with the objectives of sustainable development, namely: Firstly, the essential needs of the poor must be prioritized (Sumaryanto et al., 2022). Second, as a foresight that emphasizes the precautionary principle against potential serious threats or something that cannot be prevented, to overcome environmental degradation (Scheel et al., 2020). Third, it integrates the complex relationship between environmental, economic, and social aspects of society, which are the main pillars of sustainable development (Ngoya, 2015).

The activities of the excavation of Urug Land on Jalan Kenanga Pagar Merbau, Pagar Merbau District, Deli Serdang Regency, North Sumatra Province (Sei Ular) received serious attention from the surrounding community. After the excavation of C soil on the banks of the Sei Ular River made residents excited and surprised, until now there has been no action from law enforcement to arrest this excavation. Observations in the field, the C excavation project has been operating for several years. Trucks carrying sand, stone, and river sediment continue to operate illegally and so far there has been no firm action from the local government or law enforcement officials.

With the active role, supervision, and effective legal action from related parties, efforts to maintain the sustainability of the Sei Ular River ecosystem can run optimally, thus providing certainty of legal protection not only for the community but also for the environment itself (Iwan Juwana, Rizka Maria, 2023). To empower and reduce the level of river pollution, the Sei Ular Watershed and Protected Forest Management Centre (BPDAS) of North Sumatra, manages the potential of river resources, for sustainable tourism and agricultural activities. Conservation and empowerment of river areas are expected to maintain environmental sustainability while opening up the potential for the tourism and agriculture sectors with various productive programs that can improve community welfare (Januar et al., 2023).

This research carries the Theory of Sustainable Legal Protection, namely that every mining activity must be carried out sustainably by prioritizing environmental aspects and social welfare (Pratama et al., 2016). Mining business actors, especially in Sungai Ular, are obliged to carry out post-mining reclamation, in addition, local governments must play an active role in supervising and conserving river areas that are critical due to mining exploration. The government must conserve (either reforestation, reclamation, or other forms) river land whose ecosystem is threatened (Jaelani et al., 2024). Meanwhile, law enforcement officials can take firm action against business actors who do not carry out post-mining reclamation obligations in Sungai Ular, following the provisions of Law Number: 32 of 2009 concerning Environmental

Protection and Management, and Law Number: 3 of 2020 concerning Mineral and Coal Mining (Demartoto et al., 2024).

RESEARCH METHOD

The research conducted is normative juridical or research that analyzes written law, jurisprudence, and norms that live in society. The descriptive-analytical approach aims to take systematic, factual, and accurate data on an issue based on applicable laws and legal norms. The data collection technique is carried out through literature research, namely obtaining data by examining library materials or secondary data which include primary legal materials, secondary legal materials that can be in the form of laws and regulations, books and works, or other scientific journals or university legal materials in the form of dictionaries, magazines, newspapers, articles (Agustina et al., 2023). Qualitative data is collected in the form of primary data and secondary data. Primary data was obtained directly from the source, namely community groups who care about rivers, people who live in the river, the Ministry of Environment, the North Sumatra Environmental Conservation Institute BPDAS Wampu Sei Ular, stakeholders, and other relevant sources. Secondary data comes from previous research, books, journals, and scientific papers. Primary data collection was carried out using observation techniques, in-depth interviews, and Focus Group Discussions (FGDs), while secondary data collection was carried out using document or literature study techniques (Zunariyah, 2018).

RESULTS AND DISCUSSION

Regulatory Analysis and Legal Protection for Communities Due to Illegal Mining in Sei Ular River

Sei Ular River is located in North Sumatra Province, Indonesia, and flows from Mount Simbolon in Simalungun Regency. The river divides two regencies, namely the Serdang Bedagai Regency and the Deli Serdang Regency. (Thach et al., 2021). Excavation C activities in the Sei Ular Watershed, particularly around Sei Ular, have become a significant issue. Excavation C refers to the mining activities of materials such as sand, stone, and clay that are often carried out along the riverbanks. Excavation C activities, especially unplanned exploitation, cause a variety of negative impacts, including environmental damage, sedimentation, deterioration of water quality, and threatening the ecosystem and social order of the community around the river (Fauzi, 2020).

Article 28H paragraph (1) of the 1945 Constitution of the Republic of Indonesia, states that every person has the right to live in physical and mental prosperity, to have a place to live, and to have a good and healthy environment. This article guarantees that every color of the Indonesian state to get a good and healthy environment, free from pollution and exploration that can endanger the sustainability of the environment. In addition, Indonesia is also one of the countries of the 1971 Ramsar Convention (Convention on Wetlands of International Importance especially as Waterfowl Habitat) which was ratified by the Government of Indonesia in 1991 by forming the National Committee for Wetland Ecosystem Management and various regulations related to river ecosystem management (Maltby, 2022).

Article 1 Paragraph (7) of Law Number: 7 Year 2004 on Water Resources states that water resources management is an effort to plan, implement, monitor, and evaluate the implementation of water resources conservation, water resources utilisation, and control of water destructive power. Law No. 5 of 1990 on the Conservation of Living Natural Resources and Ecosystems explains that conservation is

organized based on three main principles, namely: protection of life support systems, preservation of the diversity of plant and animal species and their ecosystems, and sustainable utilization of biological natural resources and their ecosystems (Santana et al., 2023).

Water resources are one of the pillars supporting development capital. Water resources as raw materials have contributed as much as 24.8% of gross domestic product (GDP) and 48% to national employment. Therefore, without effective handling, water resources will face various complicated problems that can affect development programs and national food security (Gaafar et al., 2021). As an effort to save and maintain the beauty of the river, the North Sumatra Environmental Conservation Institute (LKLH) and BPDAS Sei Ular carry out conservation and rescue efforts for the Deli watershed whose conditions are increasingly alarming, by planting trees on the riverbanks (LKLH Sumut, 2022). Tree planting efforts are carried out appropriately in planning, species selection, nursery, planting time, maintenance, and harvesting. Tree planting in the Deli watershed can prevent floods and landslides and maintain the beauty of the ecosystem (Ottinger, 2010). In addition to the riverbank reforestation program, in early 2023, the Deli River will also be cleared of debris from Jalan KL Yos Sudarso Km. 17 to Simpang Kantor Bridge in Medan. The sweeping succeeded in clearing 11,250 m³ of rubbish and removing 2,025 m³ of sediment from the river.

The North Sumatra Watershed Forum together with the Indonesian Green Aren Foundation (YAHF) launched the One Million Superior Aren Trees Assistance Programme, marked by the first planting at the Kota Cina Site Complex and Lake Siombak Bank, Lingkungan VII Paya Pasir Village, Medan Marelan District, Medan City. In addition to reforestation, BPDAS Wampu Sei Ular also reclaimed former excavation C mining land in the Sei Kukam Hulu-Sub Watershed Sei Bingei Area, water conservation and watershed management of North Sumatra Province (Fordas Sumut) and the Sei Ular Watershed Forum Action Program for 2023-2024 (socialization of fords, the establishment of ford posts, training in making eco-enzyme fertilizer) (Etedali et al., 2025).

Within the national and regional scope there are several regulations governing the empowerment and protection of rivers, especially the Wampu Sei Ular River, including the surrounding ecosystem, namely:

1. Article 28H paragraph (1) of the 1945 Constitution of the Republic of Indonesia
Every person has the right to live in physical and mental prosperity, to have a place to live, and to have a good and healthy environment.
2. Law Number 32 Year 2009 on Environmental Protection and Management
Regulates legal protection and criminal sanctions for perpetrators of water pollution and destruction of river ecosystems with a maximum imprisonment of 15 years and a maximum fine of Rp. 15,000,000,000 (fifteen billion rupiah);
3. Law No. 7 the Year 2004 on Water Resources
This law regulates the management and conservation of water resources based on the principles of sustainability, balance, public benefit, integration and harmony, justice, and legal certainty;
4. Law No. 3 of 2020 concerning Mineral and Coal Mining
Article 96 states that every business actor is required to carry out land reclamation after mining activities. Reclamation is an activity carried out throughout the stages of the Mining Business to organize, restore, and improve the quality of the environment and ecosystem so that it can function again according to its designation. Government Regulation No. 37/2012 on Watershed Management. Regulates watershed management, including water resources management, flood control, and environmental management in watershed areas;

5. Government Regulation No. 38 of 2011 on Rivers
This regulation regulates river management, including river space management, licensing, information systems, community empowerment, protection, authority and responsibility for river development;
6. Regulation of the Minister of Home Affairs No. 22/2009 on Technical Guidelines or Methods of Regional Cooperation
This regulation provides technical guidelines or ways of cooperation between regions (provinces and districts/cities) in the context of managing water resources, including rivers;
7. Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.10/Menlhk/Setjen/OTL.0/1/2016 on the Organisation and Work Procedure of the Watershed and Protected Forest Management Centre
Becomes the regulatory basis for the Wampu Sei Ular Watershed Management Centre (BPDAS) to manage and empower water resources (including rivers and forests) in North Sumatra;
8. Minister of Environment and Forestry Instruction INS.1/Menlhk/Pdashl/DAS.1/8/2017
Requires people to plant and maintain at least 25 trees during their lifetime that are planted in the surrounding environment (including rivers). The 25 trees come from 5 trees at elementary school, 5 trees at junior high school, 5 trees at high school, 5 trees at university, and 5 trees at marriage.
9. North Sumatra Provincial Government Regulation No. 11 of 2023 on the Regional Spatial Plan of North Sumatra Province 2023-2043
This regulation is a regional spatial plan for North Sumatra Province that includes the management of water resources and rivers.

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With the various river protection regulations mentioned above, it turns out that they have not been fully able to fully protect the river ecosystem as a whole. There are still various shortcomings in several resolutions, such as Law on Environmental Management and Protection and Law Number 7 of 2004 concerning Water Resources, there are several critical analyses including:

1. Privatization of Water Resources: One of the main weaknesses of this law is that it has the potential to pave the way for the privatization of water resources. Although these laws cover

environmental aspects, the practice often benefits the private sector more than the public, leading to limited and expensive access to clean water (Lakshmisha, 2023).

2. **Lack of Law Enforcement:** Law enforcement related to water resource management is still weak, due to the lack of law enforcement officials and incompleteness of regulations. This results in difficulties in dealing with violations and conflicts related to water management.
3. **Centralization of Management:** these regulations tend to be centralistic, which often conflicts with local authorities. This hinders coordination between various agencies and reduces the effectiveness of overall water resource management (Ahmadianfar et al., 2025).
4. **Less Involving Local Wisdom:** This law does not sufficiently consider local wisdom and traditional knowledge of the community in water resource management. The top-down approach applied often ignores the sustainable practices that already exist in society (Puspasari et al., 2024).

Meanwhile, Government Regulation No. 37/2012 on Watershed Management, and Government Regulation No. 38 of 2011 on Rivers are still ineffective in efforts to protect and empower the Wampu River, among others:

1. This regulation has not comprehensively regulated technical provisions on watershed management and empowerment, so the use of less planned river flows, especially for commercial activities, often results in erosion, sedimentation, and land degradation around rivers (Amanzhol Kuferin, 2019).
2. There are no legal sanctions that have a deterrent effect. Sanctions for violations such as illegal logging or siltation of rivers are still too light, so they do not have a deterrent effect on perpetrators.
3. There is still a lack of community participation in the importance of watershed management, especially in the upstream river area. Community involvement in maintaining the river ecosystem has not been built properly.
4. Synchronization between regulations has not been maximized, so there is an overlap of policies between the central and regional governments (Usman, 2020).

Sustainable utilization of resources and ecosystems is part of conservation activities (Anisa Eka Ariyani et al., 2018). In general, the empowerment of conservation areas aims to protect biodiversity and ecosystems so that humans can still utilize them. More specifically, conservation aims to (Chan et al., 2023). First, provide protection, restriction, and maintenance to an area or environment of value to avoid damage or extinction to the components that form the environment that can trigger an ecosystem imbalance. Second, reuse buildings or places that are no longer in use by renewing or restoring their original function so that they can be used again, to prevent new land expansion such as converting forest functions into non-forest functions. Third, maintaining the quality of the aquatic and terrestrial environment by ensuring the availability of clean water and air (Theodurrus, 2021).

The existing legal instruments have not been maximized in providing certainty and protection, and are exacerbated by weak law enforcement against illegal C excavation activities, resulting in violations of community rights, among others:

1. Heavy vehicle activity causes damage to road infrastructure and generates dust that disrupts public health activities;
2. Competition with migrant workers as laborers in the C-excavation mine;
3. Triggering social conflicts, because illegal excavation C causes land disputes, river damage, and environmental pollution;

4. Residents have difficulty getting access to water for agricultural irrigation and fishing (especially for local anglers and fishermen);
5. Causing economic losses for the community because they cannot empower the potential of local resources in their area, thus triggering social inequality;
6. Depriving the community of their basic right to a clean and healthy environment.

The government and law enforcement officials must take firm action to curb illegal C excavation mines in Sei Ular that have harmed the rights of the surrounding community. The state is obliged to maintain a good and healthy environment as mandated by Article 28 H of the 1945 Constitution of the Republic of Indonesia in conjunction with Article 9 Paragraph 3 of Law of the Republic of Indonesia Number 39 of 1999 concerning Human Rights (Anif et al., 2017).

Implementation of Sei Ular River Empowerment for Sustainable Tourism and Agriculture and Real Benefits for the Community

Empowering rivers for tourism and sustainable agriculture has a positive impact on environmental sustainability and improving community welfare. In the tourism sector, tourism management of conservation areas has a huge economic effect on the business world and the community (Roos et al., 2023). In 2022, tourist visits to conservation areas reached 5 million people consisting of 4.9 million domestic tourists and 195 thousand foreign tourists with a value of Non-Tax State Revenue from Entrance Tickets to Natural Tourism Objects (PNBP-PMOWA) of Rp. 96,737,120,500. This number increased compared to visits in 2021, namely: 2.9 million domestic tourists and 12 thousand foreign tourists with a contribution value of PNBP-PMOWA of IDR 34,219,489,000 (ppid.menlhk.go.id).

In terms of employment, 97 Business Permits for the Provision of Nature Tourism Facilities employ as many as 1900 people, and 81 Business Permits for the Exploitation of Nature Tourism Services have involved at least 2,068 workers and casual workers. In addition, nature tourism activities in conservation areas have also provided jobs for local communities as accommodation, food and beverage service providers, tour guides, and souvenir businesses (Chen et al., 2021).

Table I. Contribution of Conservation Areas to Tourism Sector Revenue

Income sources	2021	2022
Domestic and international tourist arrivals	2.9 million visits	5.1 million visits
Nature tourism entrance ticket	Rp. 34,219,489,000	Rp. 96,737,120,500
Levy on the results of the business of provision-Natural Tourism Facilities	Rp 6,483,300,000	Rp. 9,607,400,000
Business License Fee for natural provision-Tourism Services	Rp. 500,000	Rp. 3.000.000

Source: Ministry of Environment of the Republic of Indonesia.

Sei Ular has tourism potential that can be developed optimally. The tourist destinations and agendas that have been implemented include

1. Waterfront City Sei Ular Sergai Regency, starting from the cross Sumatra road bridge to the Estuary along 15 km. This arrangement uses the concept of integrated and sustainable river areas with the aim of surface water conservation, water tourism areas, culinary tourism, and aquaculture areas;
2. Bathing in Sei Ular River, Dolok Tinggi Raja. In this tourist destination, visitors can enjoy the freshness and warmth of the Sei Ular water in the Dolok Tinggi Raja Nature Reserve/ Tourism Park area in Dolok Merawan Village, Simalungun Regency;

3. Floating Tourism Objects on the banks of the Sei Wampu, Binjai Bakung Village, Pantai Labu District, Deli Serdang Regency;
4. River Flow Tourism Object, Melati Gang Delima Village, Perbaungan Subdistrict, Serdang Bedagai Regency;
5. Wampu River Rafting Tour, Marike Village - Bahorok Bridge, Langkat Regency;
6. Rafting Tourism Pagar Manik-Sungai Buaya (Serdang Bedagai-Deli Serdang);
7. Sibolangit Nature Park (TWA), Sibolangit Village, Sibolangit District, Deli Serdang Regency, North Sumatra Province.

Only a few tourist destinations in Sei Ular are managed independently by the surrounding community such as Dolok Tinggi Raja, Perbaungan, and Rafting in Sergai Regency. Large tourist attractions in Sungai Ular are managed by corporations and local governments such as Sibolangit Nature Park (TWA), and Wampu River Rafting Tour Bahorok. The government should provide assistance, training, and capital to local communities to manage tourist destinations more optimally. (Lin et al., 2021). In addition, Sungai Ular tourist destination, which is managed independently by the community, has many difficulties such as limited supporting facilities, poor infrastructure, cleanliness, and the rampant practice of unofficial retribution. (Satoto et al., 2025)

The existence of tourist destinations has a direct effect on improving the welfare of the local community and driving the economy (Zhai et al., 2020). Besides the tourism sector, the Sei Ular River also plays an important role in agriculture as an agricultural concept using sustainable natural resources, and utilizing renewable energy to produce quality agricultural products (von Jeetze et al., 2023).

Agroecology-based sustainable agriculture is supported by the community based on four pillars, namely: Firstly, it is economically feasible to establish a long-term production system. Second, the use of technologically appropriate technology. Third, it is environmentally sound and sustainable. Fourth, socially and culturally acceptable and applicable (Beltrán-Véliz et al., 2023). The empowerment of the Sei Ular River for sustainable agriculture in its domain:

1. The Sei Ular River can function as a flood control by building the right infrastructure, such as dams and waterways, flooding can be controlled and agricultural land can be protected from damage or crop failure due to flooding;
2. Source of irrigation water, being a source of irrigation that is needed by farmers to meet the needs of water in rice fields, fields, and gardens;
3. Being a source of livelihood for the community around the river, especially for fishermen. In this river there are various types of fish with high economic value such as Dong-dong fish, Baung, Selais, Tapah, and Jurung fish;
4. The Sei Ular River can be utilized as a source of renewable energy, such as hydroelectric power plants. Utilizing renewable energy sources can reduce dependence on fossil fuels and reduce negative impacts on the environment.

Robert Malthus stated the theory of natural resource management as a way to balance population growth and food needs by increasing agricultural productivity (von Jeetze et al., 2023). If this is not implemented, there will be environmental degradation in the form of pollution and damage due to excessive exploitation of natural resources without considering their sustainability (Kachena et al., 2023)

The increase in population causes the ability to provide food and water to become increasingly limited. In addition, the increase in population has also resulted in increased conversion of forest and agricultural land for settlement or industry (Shiferaw et al., 2023). This condition causes agricultural

productivity to decline, due to the shrinking of rice fields, as well as the destruction of forest areas and irrigation networks (Vihervaara et al., 2012). The water resources sector will face critical issues including:

1. Water allocations to various sectors are experiencing localized scarcity due to growing non-irrigation water demand (Ball et al., 2023);
2. Inadequate access to clean water supply as urban water supply facilities are unable to serve growing demand (Zhou et al., 2023);
3. Water pollution due to the discharge of urban wastewater, industrial waste, and business waste is detrimental and can reduce the availability of clean water (Booth et al., 2018);
4. Limited provision of operation and maintenance (O&P) funds for existing facilities and infrastructure, as well as investment to add new facilities in anticipation of increased water demand;

The North Sumatra Watershed Forum together with the Agriculture, Fisheries and Forestry Extension Commission of Deli Serdang Regency and Pondok Pesantren Al-Hidayah Sei Mencirim Village, Kutalimbaru District, Deli Serdang Regency developed Beneng taro cultivation, marked by the first planting of taro seeds on the Al-Hidayah Islamic Boarding School Campus. This agricultural product is expected to be accepted by the community as well as a learning material for Santri in the context of applying agricultural science (Hegde et al., 2023). The North Sumatra Wampu Watershed Forum, in collaboration with the community of Stabat Lama Village, Stabat District, Langkat Regency, planted 3000 seeds of Sempur, Asam Gelugur, and Aren plants in the community. These three types of plants were deliberately chosen because they function as riverbank reinforcements, and the fruit can be processed into sweets which are typical culinary specialties of the local community (Malay Langkat) with economic value (Takai et al., 2024).

In addition, Sei Wampu Dam has also been built in an area of 10,991 hectares in four sub-districts, namely, Stabat, Hinai, Secanggan, and Wampu Sub-district. Sei Wampu Dam is a development of rain-fed rice fields and rice fields with semi-technical irrigation to optimize water utilization for agriculture, especially during the dry season. Fulfillment of water needs for irrigation areas sourced from the Martebing River is carried out by diverting water from the Sibaro River with a discharge of 12.30 M3/det (Belawan Ular Padang River Basin). Fulfillment of water needs from the Batugingging River is carried out by diversion from the Ular River with a discharge of 5 M3/det.

In maintaining the existence and sustainability of the Wampu Sei Ular River ecosystem, concrete steps are needed in both juridical and non-juridical approaches, including:

1. Strengthen law enforcement related to environmental violations, including river pollution and forest destruction around watersheds. This is important to create a deterrent effect for violators and ensure that environmental policies are strictly followed.
2. Implementing policies that protect water resources based on Law Number 7 of 2004 concerning Water Resources. This policy should include the protection of catchment areas and sustainable management to prevent pollution and deterioration of water quality.
3. Implementing watershed management based on community empowerment, as done by PT. Tirta Sibayakindo together with BPDAS Wampu Sei Ular, can help involve the community in the conservation and management of water resources.
4. Holding education and socialization programs about the importance of river sustainability to local communities. Awareness of the negative impacts of human activities on rivers can encourage active participation in conservation efforts.

Legal Certainty and Protection for the Sungai Ular Community

Article 28 H of the 1945 Constitution of the Republic of Indonesia in conjunction with Article 9 Paragraph 3 of Law of the Republic of Indonesia Number 39 of 1999 concerning Human Rights, is the juridical basis for the fulfilment of the right for everyone to get protection and guarantee of a good and healthy environment. (Rifqi Anugrah Tama, 2023). The exploitation of the Ular River, both for tourism and mining activities, has directly had a significant social impact on the local community (Angriani et al., 2018). To guarantee the fulfillment of community rights and ensure they benefit from river empowerment, the government must create a legal policy framework as an operational basis, including:

1. Law Number 10 of 2009 concerning Tourism and Government Regulation Number 50 of 2011 concerning the Master Plan for National Tourism Development
This regulatory instrument emphasizes the importance of community participation, including the formation of tourism awareness groups (Pokdarwis) and the use of local wisdom to support sustainable tourism development. Pokdarwis are formed in each region (Regency/City), which aims to involve the community in tourism management)
2. Regulation of the Minister of Environment and Forestry Number P.17/MENLHK/PER/2014 concerning Community Empowerment in Watershed Management
3. It is aimed at increasing community participation and capacity in watershed management, including in the preparation of watershed management plans, the implementation of water and soil conservation activities, and sustainable water use.
4. Regulation of the Governor of North Sumatra Province Number 36 of 2018 concerning Duties, Functions, Description of Duties, and Work Procedures of the Community and Village Empowerment Office of North Sumatra Province
5. It is a theoretical framework for achieving the Regional Action Plan to achieve the Sustainable Development Goals (SDGs), by involving community empowerment, especially productive sectors, including the management of Ular River tourism.
5. There is an unwritten custom or regulation in North Sumatra that urges companies with legal entities to hire local people as permanent employees. This is aimed at increasing the productivity of the local community, reducing unemployment, and helping to improve welfare.

Meanwhile, against the excessive management and exploration of the Ular River which has the potential to cause environmental damage, the government and law enforcement officials have not been able to take maximum action. For example, illegal exploration in the Sungai Ular watershed, Pagar Merbau District, Deli Serdang Regency. The illegal mine is still operating to this day, this is due to the existence of individuals in law enforcement and government institutions who protect these illegal activities. The lack of concrete action from the government and law enforcement officials against this illegal activity not only has a bad impact on the social order of the community but also the environment as explained in the analysis section above (S Sugiarti, Yuniyanto, 2021).

To provide certainty to the community around the Sei Ular River, the government must provide guarantees and legal protection in the form of:

1. Immediately put order to all forms of illegal mining activities;
2. Enforce criminal sanctions against perpetrators of river environmental pollution following the provisions of applicable laws;
3. Revoking the operational permits of mining companies that pollute the river environment;
4. Creating a complaint post for the public to report illegal C mining activities that have the potential to damage the environment;

5. Playing an active role in increasing supervision of the management and empowerment of the Ular River;
6. Require mining companies that pollute the environment to compensate communities and rehabilitate the environment (Sanz et al., 2021).

CONCLUSION

The conservation of the Sei Ular River has been regulated in various regulations, ranging from Article 28 H Paragraph 1 of the 1945 Constitution, Law No. 32 of 2009 concerning Environmental Protection and Management, Law No. 7 of 2004 concerning Water Resources, Law No. 3 of 2020 concerning Mineral and Coal Mining, Government Regulation No. 37 of 2012 concerning Watershed Management, Government Regulation No. 38 of 2011 concerning Rivers, Regulation of the Minister of Environment, and Governor's Regulation. This instrument has not been effective enough in protecting the community from the impact of illegal excavation of the Ular River caused by: the objectivity of law enforcement, the lack of maximum legal sanctions given, the lack of synchronization between regulations, and weak supervision. Legal protection for the impact of illegal mining on the community as a fulfillment of human rights includes: regulating illegal mining, enforcing criminal sanctions and revoking mining permits that pollute rivers, playing an active role in supervising river areas, and requiring companies that commit pollution to compensate the affected communities and recover environmental damage.

The empowerment of the Ular River for the tourism and agriculture sectors has benefited the community such as the opening of tourist attractions that are managed independently by individuals and corporations, dams and irrigation of the Sei Ular River for agricultural activities, and the cultivation of various types of fish. These positive benefits must be further optimized through programs and policies such as increasing community empowerment in the management of Ular River tourist attractions, reforestation to maintain environmental sustainability, implementing protective policies for river resources, collaboration with various parties to carry out conservation and routine tourism agendas, education and socialization about the importance of river sustainability to encourage environmental awareness and active participation in conservation.

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