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Transforming Local Wisdom: Qualitative Exploration of Purun Straw Adoption in an Effort to Reduce Plastic Emissions

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Abstrak

Penelitian ini mengkaji proses transformasi kearifan lokal dengan menggunakan sedotan purun sebagai alternatif ramah lingkungan pengganti sedotan plastik dalam upaya mitigasi emisi karbon. Melalui pendekatan kualitatif dengan wawancara mendalam, observasi partisipatif, dan analisis dokumen, studi ini mengeksplorasi bagaimana masyarakat lokal mengadaptasi pengetahuan tradisional tentang pemanfaatan tanaman purun menjadi solusi kontemporer untuk masalah lingkungan global. Temuan menunjukkan bahwa adopsi sedotan purun tidak hanya berhasil mengurangi limbah plastik tetapi juga memberdayakan ekonomi lokal, melestarikan praktik budaya, dan menciptakan kesadaran lingkungan yang berkelanjutan. Faktor-faktor pendukung keberhasilan mencakup keterlibatan komunitas, dukungan kebijakan pemerintah daerah, dan integrasi pengetahuan tradisional dengan teknologi modern. Tantangan utama meliputi standardisasi produksi, perluasan skala, dan kompetisi harga dengan produk plastik. Hasil penelitian menyoroti pentingnya pendekatan berbasis kearifan lokal dalam mengatasi permasalahan lingkungan global, memberikan model yang berpotensi diterapkan pada konteks dan komunitas lain dengan adaptasi yang sesuai.

Kata Kunci: Kearifan Lokal, Plastic Waste Reduction, dan Sedotan Purun

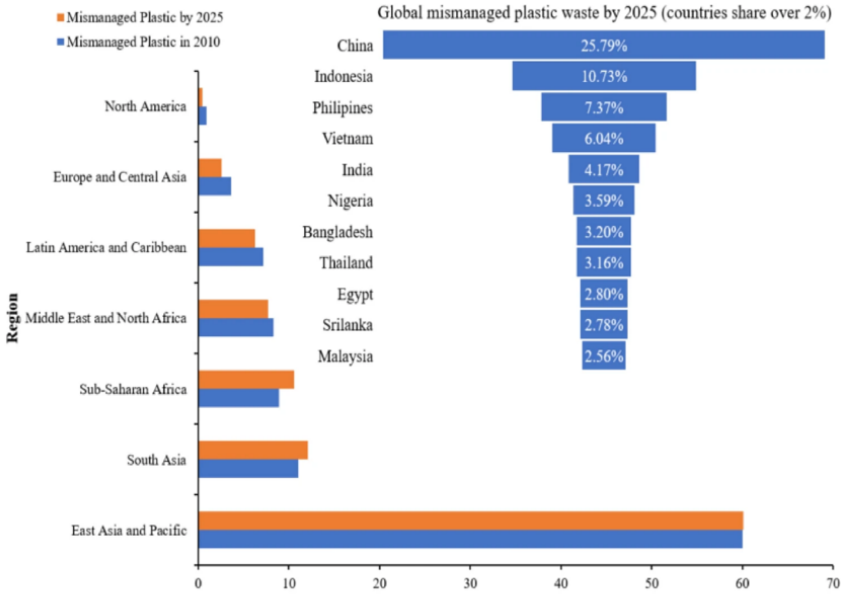
Abstract

This study examines the process of transforming local wisdom by using purun straws as an environmentally friendly alternative to plastic straws in an effort to mitigate carbon emissions. Through a qualitative approach with in-depth interviews, participatory observations, and document analysis, this study explores how local communities are adapting traditional knowledge about the utilization of purun plants into contemporary solutions to global environmental problems. The findings show that the adoption of purun straws has not only succeeded in reducing plastic waste but also empowering local economies, preserving cultural practices, and creating sustainable environmental awareness. Factors supporting success include community involvement, local government policy support, and the integration of traditional knowledge with modern technology. Key challenges include standardizing production, scaling up, and price competition with plastic products. The results highlight the importance of a local wisdom-based approach in addressing global environmental problems, providing a model that has the potential to be applied to other contexts and communities with appropriate adaptations.
Keywords: Local Wisdom, Plastic Waste Reduction, and Purun Straws

Preliminary

The plastic problem has become an urgent global polemic, as is the case in Indonesia. Indonesia is one of the countries with a population of approximately 270 people who are facing the challenge of managing plastic waste. According to data on the National Waste Management Information System (SIPSN), it is noted that in 2023 the large waste pile is around 38.6 million tons (Kementerian Lingkungan Hidup dan Kehutanaan, 2023).This number is increasing as time goes by, so that Indonesia becomes a plastic waste emergency. Indonesia occupies the second position in global plastic waste management (Kibria et al., 2023).

Figure 1. The Scenario of Global Mismanaged Plastic Waste



Source: Kibria et al., 2023

Plastic has a domain throughout human life with its versatile properties such as lightweight, high durability, flexibility, and low production costs (Nayanathara Thathsarani Pilapitiya & Ratnayake, 2024). Despite all its benefits, plastics cause severe environmental and public health problems. Basically, plastics can be degraded to micro to nano sizes, and those fine particles are more easily dispersed in air, water, and soil. Therefore, both land and water animals experience various negative impacts such as being swallowed and entangled. Plastic is useful in daily life in different communities, post-use it can change the parameters of different worlds if not managed properly (Evode et al., 2021). Some of these effects can be harmful to the environment, including humans. Before plastic waste management, it is important to outline some of the harmful effects that poor plastic management can have after utilization. Non-biodegradability and poor waste management can lead to a series of environmental hazards to safety and choking on waterways in urban cities and other production areas. The plastic population is a threat to all parts of the world affecting almost every ecosystem, both marine,

freshwater, and globally. In response, tiered mitigation strategies are being adopted to break down plastic emissions (Borrelle et al., 2020).

Reducing plastic emissions has been launched since a few years ago through several government programs and Non-Governmental Organizations (NGOs) in the environmental sector. The 3R principle (Reduce, Reuse, and Recycle) is always predicted to be the main effort and play a role in the process of reducing plastic emissions (Apriyani et al., 2020). In early 2025, the Ministry of Environment and Forestry launched the "Waste-Free Indonesia 2025" program, as an effort to use single-use plastic bags. The program consists of support for the development of the plastic recycling industry, education and public awareness programs, collaboration with the private sector and NGOs to prevent the increasing use of plastic (Supriatna, 2017). One of these programs is the prohibition on the use of single-use plastics. The program is one of the efforts in big cities, such as Semarang, Denpasar, Balikpapan, Bandung, and Banjarmasin to reduce plastic emissions.

The city of Banjarmasin, as the capital of South Kalimantan Province, faces serious challenges related to increasingly complex waste management, so efforts to reduce plastic emissions are increasingly encouraged. As a river city with various canals and tributaries that divide its territory, Banjarmasin has a special vulnerability to waste problems. The volume of waste produced by the people of Banjarmasin City continues to increase in line with population growth and economic activity. According to data from the Banjarmasin City Environment Agency, daily waste production reaches more than 600 tons, but the transportation capacity is only about 80% of the total waste pile (Maulidah et al., 2024). Socio-economically, the image of Banjarmasin City as a river city and tourist destination has the potential to be negatively affected by the waste problem. Floating markets and riverside tours that are the mainstay of local tourism face the threat of degradation of the quality of visitor experience due to the sight of garbage floating on the surface of the river. Efforts to handle the waste problem in Banjarmasin require a comprehensive and integrated approach, either through government and NGO programs or utilizing existing local wisdom (Najeri Al Syahrin, 2021).

The revitalization of traditional practices based on local wisdom can contribute to reducing dependence on plastic, as is the case in the city of Banjarmasin. The people of Banjarmasin, often known as Urang Banjar, have skills in utilizing local resources in the form of purun plants. Purun plants are used as various utensils such as mats, bags, hats, and straws (Mardiana et al., 2021). In addition to being a local livelihood, the use of purun plants can be an alternative to reducing contemporary problems related to plastic emissions. The revitalization of traditional practices based on local wisdom can make a significant contribution

to reducing dependence on plastic. The manufacture of purun crafts can maintain the preservation of the physical and social environment for the management of natural resources without emissions (Mattiro et al., 2023). This approach is not only beneficial from the environmental aspect, but also supports the local economy through strengthening the creative industry based on traditional crafts. The presence of initiatives in utilizing purun plants in daily life will affect public overconsumption which is strongly related to the high use of single-use plastics. On the other hand, purun has an important role in maintaining the balance of the ecosystem with its ability to absorb heavy metals and pollutants, stabilize the soil, and provide habitat for various aquatic organisms (Syahza et al., 2020). Some of these things show that the use of purun can be re-explored to describe the ecological wisdom of the community that has sustainability values as an effort to reduce plastic emissions.

Method

This study uses a descriptive qualitative research method. The method was chosen because of the nature and characteristics of the research object being studied based on the real conditions and realities in society. As qualitative research begins with assumptions and interpretive frameworks that form the study of research problems related to the meaning imposed by individuals or groups on social problems (Creswell, 2020). The descriptive approach aims to describe the facts or characteristics of a particular population systematically, factually, and accurately. This research was carried out in Kampung Purun as a place for the production of handicrafts from purun plants. In addition, this research was also conducted at Cafe Sakabaswara and Curiak Conservation Island which used straws from purun plants as a form of using environmentally friendly materials. Meanwhile, data collection is carried out by observation, interviews, and documentation. Technical data analysis starts from data collection, data reduction, presentation, and decision-making or verification (Miles, 1999). These four processes are carried out by the researcher to obtain a complete analysis of the results in accordance with the focus of the research.

Results and Discussion

Transformation of Local Wisdom through Purun Straws as a Form of Zero Waste

The abundance of plastic waste has become a global challenge that threatens the balance of ecosystems and human health. Plastics that do not decompose naturally can last for hundreds of years, contaminating soil, water, and air. In Indonesia, as an archipelagic country with high biodiversity, this problem is increasingly urgent due to the threat to the rich marine ecosystem. Conventional approaches to plastic waste management often fail because they do not take into

account the local context and the involvement of local communities. As a community around swamps and wetlands, efforts to preserve the environment, especially rivers and seas, are important to be carried out through local wisdom. Local wisdom is a form of knowledge, belief, understanding, or insight that guides human behaviour in life in its ecological community . In addition, local wisdom can be in the form of local resources that can be used for various uses, as is the case with local wisdom by utilizing local plants to increase awareness of the environment (Ari Silvianingsih et al., 2022).

The integration of local wisdom in the prevention of plastic problems can be done through several approaches (Putri et al., 2022). First, the revitalization of traditional practices in the use of natural materials as a substitute for plastic. Second, the adaptation of the community-based waste management system that already exists in traditional communities. Third, the development of technological innovations inspired by local wisdom, such as the manufacture of bioplastics from local natural materials. Fourth, environmental education that integrates local wisdom values to strengthen community awareness and responsibility for the environment. The local wisdom approach to preventing plastic problems also provides a double benefit (Khoiri et al., 2021). In addition to reducing environmental impact, this approach also strengthens cultural identity, supports local economies, and improves community social cohesion. In the context of the global plastic waste crisis, the use of purun as an ecological straw represents a solution sourced from local wisdom to overcome contemporary environmental problems. Purun plant (Eleocharis dulcis) has long been known as a raw material for traditional crafts in various swamp areas of Southeast Asia, especially Banjarmasin, South Kalimantan. The characteristics of purun stems that have natural cavities and a fairly strong structure make them ideal candidates to be developed as an alternative to plastic straws. The use of purun occurs because the disposal of plastic straws is difficult and has an impact (Syarif, 2023).

The widespread use of plastic straws with a relatively short use will show that they are not able to be recycled optimally, especially with the material that plastic will be difficult to biodegrade. So it requires environmental awareness of the surrounding community to reduce the use of plastic straws (Maciej Serda et al., 2022). Although it is known that plastic straws are only a small part of environmental damage, if all people use them, it will hoard environmental problems in the long term. From an environmental perspective, purun straws offer significant advantages over plastic alternatives. Purun straws are biodegradable and can decompose completely in a relatively short time (3-6 months) without leaving microplastic residues (Ari Silvianingsih et al., 2022). In addition, purun cultivation has the potential to

support the stability of swamp ecosystems, which serve as natural carbon stores. Sustainable purun economic development can create incentives for communities to maintain natural wetlands, which in turn contributes to climate change mitigation. The use of purun as an ecological straw also opens up opportunities for economic empowerment for rural communities. Purun straw industry development programs can integrate traditional knowledge with modern business practices, creating sustainable employment in rural areas. Several preliminary studies show that the development of purun value chains can increase farmers' income by up to 40% compared to selling raw materials without added value. This reflects how nature-based solutions can answer environmental challenges while improving people's welfare (Ari Silvianingsih et al., 2022).

Figure 2. Bonding of Purun Stems and Purun Straws

Source: 1) Ari Silvianingsih et al., 2022; 2) Go Purun's Instagram Post, 2024

The manufacture of purun straws involves traditional techniques that have been passed down from generation to generation. Purun stems are selected, cleaned, dried, and then woven or shaped into straws with high hand skill. This process does not require electric-powered machines or chemicals, so the resulting carbon footprint is minimal. The ecological value of purun straws lies not only in the biodegradable final product, but also in the entire production process that leaves almost no negative impact on the environment. The manufacture of purun straws is carried out during harvest, followed by cutting, cleaning, and drying. Purun cleaning uses a standard food-grade cleaner to remove impurities using organic materials (Rakhmawati et al., 2023). In the context of the local economy, the use of purun as a raw material for ecological straws provides a source of income for rural communities. Local wisdom not only includes environmental aspects but also social welfare. When these purun-based products get higher economic value, there is an incentive for the community to preserve the purun habitat and maintain its sustainability. This creates a positive cycle in which environmental

preservation and economic well-being support each other. The phenomenon of using purun straws also shows how local wisdom can adapt to contemporary and modern needs. Although the use of purun has been going on for centuries for various purposes such as mats and baskets, its adaptation to ecological straws is a creative response to the modern environmental crisis. This proves that local wisdom is not a static concept but a dynamic knowledge that can contribute to the solution of global problems.

Ecological Values Contained in Purun Straws

The use of purun straws in daily life is part of green behavior in harmonizing between human needs and nature conservation. The use of environmentally friendly straws offers various ecological values in the midst of the global plastic crisis (Acharya et al., 2024). An ecologically oriented society will believe that it is part of the morality to achieve sustainability. So that future generations do not get the impact (Stone & Barlow, 2012). The ecological value seen in the utilization of purun straws is biodegradability. Unlike plastic straws that can last up to hundreds of years in the environment, purun straws decompose naturally within a few weeks to months. This decomposition process does not leave any microplastic residues that are harmful to aquatic ecosystems and marine organisms. Thus, the use of purun straws directly contributes to the reduction of plastic pollution that threatens life on earth. Purun plant cultivation also has a positive impact on the balance of swamp and wetland ecosystems. As a semi-aquatic plant, purun plays a role in maintaining water quality by absorbing excess nutrients and pollutants. The roots of these plants help bind the soil, prevent erosion, and provide habitat for a variety of small organisms. The development of purun cultivation for straw production encourages the preservation of wetlands that are often threatened with conversion to agricultural land or settlements.

When viewed from the perspective of production, purun straws have an environmentally friendly process. The production process does not require significant fossil energy as is the case with the manufacture of plastics. Purun plants absorb carbon dioxide during their growth, contributing to climate change mitigation. Additionally, purun straw supply chains tend to be shorter and local, reducing emissions associated with long-distance transportation. Another ecological value lies in simpler waste management. The purun straws that have been used can be composted alongside other organic waste, resulting in a natural fertilizer that returns nutrients to the soil. This creates a closed nutrient cycle that is aligned with the principles of the circular economy, in contrast to plastic straws that require a special recycling infrastructure that is not always available. The use of purun straws also reflects local wisdom in utilizing natural resources in a sustainable manner. The traditional practice of

making purun straws has been developed over generations with environmental carrying capacity in mind. Sustainability is an important ecological value in the era of mass consumption that often ignores the impact in the long term.

In addition, the use of purun dominates green behavior indicators. These indicators are to determine actions that are already green behavior in daily life. The following are indicators of environmentally friendly behavior.

Table 1. Indicators of Environmental Behavior

Key Principles	**Action**
Respect for The Earth	Dispose of garbage in its place
	Sorting organic and inorganic waste
	Planting and maintaining trees
	Turning off power in unused spaces
Care for Life	Choosing organic foods
	Wearing a mask when traveling
	Reprimanding a friend who commits an act that is not environmentally friendly
	Avoid food products that contain preservatives
Addopt Patern of Production, Consumption, and Reproduction	Avoid or reduce the use of plastic bags
	Consuming eco-friendly goods
	Using a refillable drinking bottle
	Recycling paper

Source: (Supriatna, 2017)

Based on the table, the utilization of purun straws can be associated with when the indicator. The first indicator is respecting the earth, namely the use of purun as the use of natural resources without emissions so that it does not have a bad impact on the environment. Indirectly, the use of purun straws shows a public awareness to appreciate the earth. Second, caring for life is closely related to reducing plastic emissions. The use of purun as a straw can reduce the amount of plastic emissions. Purun straws are organic and their waste can be recycled into fertilizer. The third is an indicator that adopts production, consumption, and distribution. The distribution process of purun straws has begun to be encouraged with various trends in the community so that it can be produced in larger quantities. As an environmentally friendly measure, the use of purun straws can be a lifestyle that creates an ecosystem balance so that nature and living things in it can live prosperously. Of course, this is not something that can be created without real efforts.

Obstacles that occur in Purun Straw Exploration

Purun straw exploration faces several obstacles in its development and preservation efforts (Herianto et al., 2024). Purun plants, which are the main raw materials for environmentally friendly straws, are increasingly limited in availability due to the conversion of swamp and peat land. Areas that used to be the natural habitat of purun are now widely converted into agricultural land, plantations, or settlements, thereby significantly reducing the growth area of purun. Unfortunately, in Kampung Purun Banjarmasin only produces woven purun such as hats and bags. Purun straw production is in South Amuntai District, North Hulu Sungai Regency. So that in Banjarmasin only the distribution process is only. Marketing challenges are the next obstacle in the development of purun straws. Despite having high ecological value, this product often loses competition to other mass-produced eco-friendly straw alternatives at a lower price. Consumer awareness of the benefits of purun straws is still limited, and the distribution network is not optimal, making it difficult for this product to reach a wider market.

Aspects of standardization and quality control are also important constraints. Variations in the quality of raw materials and manual production processes lead to inconsistencies in the final product. Some consumers report the non-uniform durability of purun straws, and the challenge of ensuring that each straw meets food safety standards needs to be taken seriously to build consumer confidence. In addition, the regeneration of purun straw craftsmen has experienced serious obstacles. The younger generation is generally less interested in continuing this tradition because it is considered economically disadvantageous and requires a high level of patience. Without adequate regeneration, traditional knowledge and skills in purun straw manufacturing risk being lost over time.

Conclusion

The use of purun plants for straws shows the potential in reducing single-use plastic waste. The use of local raw materials not only reduces the carbon footprint of material transportation, but also revitalizes the traditional knowledge of local communities in processing natural resources. The purun straw adoption process involves a collaboration between traditional knowledge and modern approaches in the production and marketing process. This creates a sustainable business model that supports the local economy while providing solutions to global environmental problems. Despite challenges in terms of production consistency and building consumer awareness, this study finds that the approach of education and community

involvement is able to accelerate the process of adopting this local wisdom-based innovation. The transformation of local wisdom through purun straws offers a replicable model to face a variety of other environmental challenges, by placing traditional knowledge as the foundation of sustainable innovation that is aligned with today's needs.

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