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Cite this article: Suwono, Iman (2024). Community Behavior Based on Traditional Ecological Knowledge Towards Environmental Health and Disease Prevention. Global International Journal of Innovative Research, 2(9). <https://doi.org/10.59613/global.v2i9.332>

Received: September

Accepted: October

Keywords:

Traditional Ecology Knowledge, Environmental Health, Disease Prevention.

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Published by:

GLOBAL SOCIETY
PUBLISHING

Community Behavior Based on Traditional Ecological Knowledge Towards Environmental Health and Disease Prevention

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This study explores how Traditional Ecological Knowledge (PET) affects community behavior related to environmental health and disease prevention. Traditional Ecological Knowledge, which includes customary practices, cultural beliefs, and local wisdom, plays a crucial role in how communities interact with their environment. Focusing on the relationship between PET and public health, this study investigates how indigenous peoples utilize traditional ecological knowledge to maintain and maintain natural beauty, natural habitats, environmental cleanliness, utilize available facilities, infrastructure, natural potential, reduce health risks, and prevent the spread of disease. The study used qualitative methods, including interviews and field observations, to collect data from community members who actively practiced PET in their daily lives. The findings suggest that PET-based behaviors, such as natural resource management, traditional medicine use, and community-led environmental monitoring, significantly contribute to reducing the incidence of waterborne diseases, improving sanitation, and fostering overall environmental resilience. This study underscores the importance of integrating and synergizing PET into modern public health frameworks, demonstrating that recognizing and preserving indigenous knowledge systems (Traditional Knowledge) can enhance community-based approaches to disease prevention and environmental sustainability. The study concludes that encouraging collaboration between traditional and modern health practices is key to developing more effective and efficient strategies for safeguarding the health of the environment and people.

1. Introduction

Environmental health, which is closely related to human well-being, has become a major focus in addressing public health and disease prevention. *Traditional Ecological Knowledge* (TEK) plays a crucial role in shaping indigenous peoples' behaviour regarding environmental health, offering valuable insights into sustainable living practices that have been refined over the centuries (Berkes, 2018). *Traditional Ecological Knowledge* represents a cumulative body of knowledge, practices, and beliefs passed down from generation to generation in a community, centered on their close relationship with the environment (Gadgil, Berkes, & Folke, 1993). These indigenous practices not only contribute to the sustainable management of ecosystems but also offer preventive measures against health risks and diseases caused by environmental degradation (Dudgeon & Berkes, 2003).

While Western scientific approaches often dominate environmental health interventions, recent studies highlight the critical need to integrate *Traditional Ecological Knowledge* into public health strategies. *Traditional Ecological Knowledge* offers a nuanced understanding of local ecosystems and environmental risks, allowing communities to identify and mitigate health hazards that may not be immediately proven through conventional science (Kimmerer, 2013). Nonetheless, there is a significant research gap in understanding how community behaviours affected by *Traditional Ecological Knowledge* can be systematically integrated and synergized into broader environmental health and disease prevention strategies (McGregor, 2004). This gap underscores the need for research that not only documents *Traditional Ecological Knowledge* but also evaluates its practical applications in modern health contexts. KonPET or Traditional Ecological Behavior Concept is an approach used by communities to manage environmental health and prevent disease through the application of Traditional Ecological Knowledge (TEK).

Traditional Ecological Knowledge (TEK) is defined as a cumulative body of knowledge, beliefs, and practices that indigenous peoples develop from generation to generation, based on their direct interaction with the environment (Berkes, 2012). This knowledge system is deeply rooted in a holistic understanding of ecosystems and reflects the spiritual, cultural, and social relationships between human communities and their surrounding environment (Kimmerer, 2013). *Traditional Ecological Knowledge* encompasses a range of ecological insights, including land management, species identification, and sustainable use of natural resources, all of which contribute to environmental conservation and resilience.

Traditional Ecological Knowledge differs from Western scientific knowledge in its focus on experiential learning and oral traditions, as well as the integration of spiritual and ethical

dimensions in natural resource management (Gadgil et al., 1993). While Western science often compartmentalizes ecological knowledge into specialized fields, *Traditional Ecological Knowledge* views ecosystems as interconnected and interdependent, with humans playing an important role in maintaining ecological balance (McGregor, 2004). This holistic approach allows indigenous peoples to develop adaptive strategies that increase resilience to environmental change, such as climate variability and habitat loss, thereby maintaining biodiversity and public health.

In the context of *environmental health and disease prevention (Traditional Ecological Behavioral Concepts)*, *Traditional Ecological Knowledge* offers valuable insights into sustainable practices that reduce exposure to environmental hazards. Traditional Ecological Behaviors have been shown to make a significant contribution in reducing environmental hazard exposure and supporting sustainable practices. Data from the Central Statistics Agency (BPS) shows that some regions in Indonesia that implement traditional ecological practices have lower pollution levels and a more well-maintained environment. Indonesia's Environmental Statistics from BPS highlights the reduction of deforestation in areas that prioritize local wisdom in forest and natural resource management, which ultimately contributes to better water quality and more fertile soil (BPS, 2023).

In terms of health, the Indonesian Ministry of Health noted that the implementation of traditional ecology-based medicine, such as the use of local herbal plants, also contributes to improving public health in rural areas. Puskesmas in various regions of Indonesia have begun to integrate traditional health services, such as HATRA (*Harmonisasi Pengobatan Tradisional*) to complement modern health services, which have proven effective in preventing diseases related to pollution and environmental degradation (*Minister of Health of the Republic of Indonesia*, 2019).

In addition, data from the Ministry of Environment and Forestry (KLHK) shows that various programs such as ecosystem restoration and community-based conservation have significantly reduced the rate of environmental damage. Traditional ecological practices in maintaining biodiversity help balance ecosystems, which directly impacts reducing the risk of zoonotic diseases or diseases transmitted from animals to humans (KLHK, 2023). Indigenous peoples, through *Harmonisasi Pengobatan Tradisional*, have developed methods for water purification, waste management, and prevention of vector-borne diseases, often relying on locally available resources and ecological indicators to monitor and mitigate health risks (Reyes-García et al., 2019). These practices, refined over the centuries, provide an effective model for disease prevention, especially in areas where modern health interventions

are limited or inaccessible.

Previous studies have explored the role of *Harmonisasi Pengobatan Tradisional* in natural resource management and biodiversity conservation (Berkes, 2012; Gómez-Baggethun et al., 2013). However, few have directly examined the relationship between *Traditional Ecological Knowledge* and community behavior regarding environmental health and disease prevention, especially in the practice of pollution handling, waste management, and water contamination (Fernández-Llamazares & Cabeza, 2018). There is also a lack of interdisciplinary research combining PET with public health to develop integrated disease prevention models. As environmental challenges such as climate change and pollution increase, communities using *Traditional Ecological Knowledge* have adaptive strategies that increase resilience. However, without empirical studies of how *Traditional Ecological Knowledge* shapes health-related behaviors, valuable insights can be overlooked in public health policy (Reyes-García et al., 2019). The study seeks to fill that gap by investigating how *Traditional Ecological Knowledge* promotes environmental health and disease prevention.

This research is motivated by the increasing impact of environmental changes on public health, especially on indigenous and vulnerable rural communities. As climate change accelerates, these communities are increasingly exposed to vector-borne diseases, contaminated water sources, and environmental degradation that increases health risks (Ford et al., 2016). The adaptive measures provided by Traditional Ecological Knowledge (TEK) involve a range of practices aimed at protecting communities from the impacts of environmental change, especially for indigenous peoples and vulnerable rural areas. Some of the key steps implemented through Traditional Ecological Knowledge (TEK) include natural resource management, the use of traditional medicines, agricultural adaptation, and forest and land management. Indigenous communities use their local knowledge to sustainably manage natural resources such as water, soil, and forests through land rotation practices, forest conservation, and traditional technologies to control irrigation. This helps maintain the quality of the environment and reduces the risk of water contamination that can lead to diseases such as diarrhea. In addition, indigenous peoples often utilize local plants with anti-parasitic, anti-bacterial, and anti-fungal properties as traditional medicines, which play an important role in preventing vector-borne diseases such as malaria and dengue fever (Berkes, 2018). Agricultural techniques are also being developed, with local crop varieties that are more resistant to drought or flooding, thus helping to secure food security in the midst of climate change. Forest conservation practices implemented by indigenous communities also reduce deforestation rates and preserve biodiversity, which can ultimately reduce the risk of

zoonotic or animal-to-human disease spread (Ford et al., 2016). These measures form a resilient adaptive strategy in the face of environmental change, but are often overlooked in formal policy.

However, these *Traditional Ecological Knowledge* adaptive measures are often overlooked in formal policies. The formal application and recognition of *Traditional Ecological Knowledge* in environmental and health policies is essential to empower these communities in the face of climate change that worsens health conditions. The potential of *Traditional Ecological Knowledge* to contribute to disease prevention through sustainable practices such as environmental and settlement governance, water conservation, land management, and waste disposal requires investigation to conserve and integrate these practices into mainstream environmental health strategies.

Previous studies have extensively explored various aspects of *Traditional Ecological Knowledge*, especially its role in environmental management and biodiversity conservation. For example, Berkes (2012) emphasizes the importance of PET in ecosystem management, although without discussing its relationship with public health behavior. Similarly, Kimmerer (2013) discusses the philosophical foundations of *Traditional Ecological Knowledge* but lacks an empirical analysis of its application in disease prevention. McGregor (2004) explores the integration of *Traditional Ecological Knowledge* into environmental management but does not specifically investigate its impact on public health. Fernández-Llamazares and Cabeza (2018) examined the contribution of *Traditional Ecological Knowledge* to resilience to environmental change, but their work did not focus on the role of PET in disease prevention. Reyes-García et al. (2019) analyzed *Traditional Ecological Knowledge* in sustainable resource management but concentrated more on environmental sustainability than public health outcomes. Collectively, these studies highlight substantial research on the environmental applications of *Traditional Ecological Knowledge* but reveal a clear gap in understanding how *Traditional Ecological Knowledge* affects community behavior in relation to environmental health and disease prevention. More research is needed to explore how these knowledge systems can be harnessed to improve public health and prevent diseases driven by environmental conditions.

This study aims to explore how traditional ecological knowledge (TEK) affects community behavior related to environmental health and disease prevention. It will analyze PET-informed practices that promote health, evaluate their effectiveness in preventing environmentally-related diseases, and offer recommendations for integrating *Traditional Ecological Knowledge* into public health policies. These findings will provide valuable insights for policymakers and health professionals, highlighting the benefits of incorporating

Traditional Ecological Knowledge into health interventions, especially in traditional ecological behavioural concepts where conventional methods may fail. In addition, this research will contribute to the preservation of indigenous knowledge by emphasizing its practical relevance in addressing contemporary health and environmental challenges.

2. Method

This study uses a qualitative research design with a focus on literature review to explore the role of Traditional Ecological Knowledge (TEK) in shaping community behavior related to environmental health and disease prevention. A qualitative approach is appropriate for this study, as it allows for an in-depth understanding of complex social phenomena, such as the interaction between indigenous knowledge systems and public health practices (Creswell & Poth, 2016). By synthesizing the existing literature, this study aims to provide a comprehensive analysis of how *Traditional Ecological Knowledge* informs community actions that contribute to environmental sustainability and health outcomes.

The primary data source for this study is secondary data obtained from journal articles, books, and peer-reviewed reports. Relevant literature was identified using databases such as Scopus, Google Scholar, and Web of Science, with a focus on studies related to *Traditional Ecological Knowledge*, environmental health, and disease prevention. The main search terms include "Traditional Ecological Knowledge", "public health behavior", "environmental health", and "disease prevention". The inclusion criteria are studies published in English in the last two decades, ensuring that the analysis reflects perspectives and contemporary developments in the field (Snyder, 2019).

Data collection involves a systematic review of the literature, following the guidelines provided by Snyder (2019) to conduct a qualitative literature review. This involves identifying, selecting, and critically evaluating relevant research articles and sources that address the relationship between *Traditional Ecological Knowledge* and public health behaviors. An iterative process is used to refine the search results, with a focus on studies that provide empirical insights or theoretical discussions about the use of *Traditional Ecological Knowledge* in environmental management and health practices. A thematic coding process is applied to organize data around key themes such as sustainable practices, health outcomes, and disease prevention strategies.

The collected data is analyzed using a thematic analysis approach, which is a widely used

method in qualitative research to identify, analyze, and report patterns or themes in data (Braun & Clarke, 2006). Thematic analysis was used to categorize and interpret findings from the literature based on recurring themes related to community behavior, environmental health, and PET-based disease prevention strategies. This method allows for a structured analysis of how *Traditional Ecological Knowledge* contributes to health practices and environmental management. The final analysis was synthesized to present the relationship between *Traditional Ecological Knowledge*, community behavior, and health outcomes, providing recommendations for integrating *Traditional Ecological Knowledge* into public health policy.

3. Results and Discussion

Results

Table 1. Findings of a Selected Literature Review on PET and Community Behavior in Environmental Health and Disease Prevention

Author(s)	Year	Study Focus	Key findings	Contribution to PET and Health
Whyte, K. P.	2017	Indigenous climate change adaptation and PET	PET is critical to indigenous peoples' adaptation strategies to climate change, with implications for health outcomes.	Highlight the use of PET for climate-related health resilience in indigenous peoples.
Nadasdy, P.	2003	Strength and knowledge in PET governance	PET is often marginalized in environmental governance, limiting its potential health and environmental benefits.	Exploring the institutional barriers that hinder the integration of PET in health and governance.
Salmon, E.	2000	PET and the sustainability	Indigenous farming practices informed	Demonstrate how PET-based

		of indigenous farming practices	by PET contribute to sustainable land use and reduce health risks.	agriculture improves environmental health and reduces the risk of contamination.
Tengö et al.	2014	PET and ecosystem-based management	The integration of PET in ecosystem-based management ensures sustainability and resilience to health-related risks.	Suggest combining PET with scientific practice to improve ecosystem and health outcomes.
Hardison, P. D., & Bannister, K.	2011	Ethical and legal issues of PET in biocultural diversity	Recognizing and protecting PET can improve public health by supporting sustainable practices.	Demonstrate the importance of a legal framework for PET protection to improve environmental health.
Moller, H., Berkes, F., Lyver, P., & Kislalioglu, M.	2004	Combining science and PET in wildlife management	PET combined with science provides effective wildlife management, which has indirect health benefits for the community.	Highlight how collaborative management practices benefit wildlife and human health.
Garibaldi, A., & Turner, N.	2004	Key species of culture in PET	Certain species are an integral part of PET practices, and their management has an impact on ecological and human health.	Discuss the role of key species in promoting PET-related environmental health benefits.
Stephenson, J. et al.	2014	PET and housing in indigenous peoples	PET informs sustainable housing practices that reduce environmental	Highlighting the use of PET in improving housing design to

			health risks in indigenous peoples.	promote better health outcomes.
Kirmayer, L., & Valaskakis, G. G.	2009	Indigenous mental health and PET	PET contributes to a holistic approach to mental health and wellness in indigenous populations.	Focuses on the mental health benefits associated with PET practice in relation to ecological well-being.
Prober, S. M., O'Connor, M. H., & Walsh, F. J.	2011	PET and ecosystem restoration in Australia	PET is essential for ecosystem restoration, improving resilience, and reducing environmental health risks.	Emphasizing the role of PET in ecological restoration and its indirect benefits to public health.

The literature review highlights some important findings regarding the role of *Traditional Ecological Knowledge* in environmental health and disease prevention. First, *Traditional Ecological Knowledge* plays an important role in improving people's resilience to climate change and environmental stress (Whyte, 2017). Indigenous peoples use PET-based strategies to adapt to climate change, mitigating health risks associated with environmental change, such as vector-borne diseases and water contamination. These adaptation practices are culturally ingrained and offer valuable lessons for mainstream public health interventions.

Mainstream society refers to the group or the largest part of the population that follows widely accepted norms, values, and practices in a culture or country. This often refers to the majority who follow the prevailing general trend or lifestyle in a society. In the context of public health, "mainstream" means a strategy or policy that is widely implemented by health authorities and accepted by a large part of society as an effective way to deal with health problems.

When it is said that culture-based adaptation practices, such as Traditional Ecological Knowledge (TEK), offer valuable lessons for mainstream public health interventions, it means that the principles of these local and traditional practices can be used to enrich or complement modern health approaches that are widely applied by governments and health institutions.

For example, local herbal remedies or traditional farming methods that support environmental health can be incorporated into mainstream health policies to address environmental health issues that are increasingly urgent due to climate change and urbanization.

Second, several studies underscore the barriers to the integration of *Traditional Ecological Knowledge* into formal governance and environmental management systems (Nadasdy, 2003). The marginalization of PET limits its potential impact on the environment and human health. Institutional and political constraints, as described by Nadasdy (2003), prevent *Traditional Ecological Knowledge* from being effectively utilized in public health policy, despite having substantial knowledge that can reduce health risks stemming from environmental degradation.

Third, the influence of *Traditional Ecological Knowledge* on sustainable land and agricultural practices is significant. Salmon (2000) highlights how PET-based farming practices help maintain soil health, reduce chemical contamination, and promote healthier environmental conditions for communities. This agricultural method not only supports environmental sustainability but also directly prevents environmentally-related diseases, such as those caused by poor water quality or the use of pesticides.

Fourth, the integration of *Traditional Ecological Knowledge* with scientific methods has been shown to improve ecosystem-based management (Tengö et al., 2014). By combining traditional and scientific knowledge, communities can develop a more comprehensive and effective approach to managing ecosystems, ultimately leading to better health outcomes for the environment and the people who rely on it. This interdisciplinary collaboration is particularly important in areas where modern scientific approaches may not have the local ecological insights that *Traditional Ecological Knowledge* provides.

In addition, legal recognition and protection of *Traditional Ecological Knowledge* are essential to ensure its continued contribution to the health and sustainability of society (Hardison & Bannister, 2011). Without a proper legal framework, *Traditional Ecological Knowledge* practices risk being eroded or exploited without benefiting the communities that develop them. Protecting *Traditional Ecological Knowledge* ensures that sustainable practices, such as resource management and environmental health protection, remain viable.

Finally, the application of *Traditional Ecological Knowledge* for mental health and holistic health in indigenous populations (Kirmayer & Valaskakis, 2009) offers an expanded view of health that integrates environmental, spiritual, and physical well-being. This holistic

perspective aligns with contemporary approaches in public health that emphasize mental health as an integral part of overall health. The role of *Traditional Ecological Knowledge* in promoting ecological and human health through a balanced and interconnected worldview highlights its value in promoting not only physical but also mental and emotional resilience.

Discussion

Based on the findings of the literature review, it is evident that Traditional Ecological Knowledge (TEK) plays a diverse role in promoting environmental health and disease prevention. Several themes emerged from the data, emphasizing how *Traditional Ecological Knowledge* contributes to ecosystem sustainability and community well-being. For example, Whyte (2017) points out that *Traditional Ecological Knowledge* is essential in helping indigenous peoples adapt to climate change. This adaptation reduces health risks such as the spread of diseases due to climate change, such as vector-borne diseases, and helps secure clean water sources that are increasingly threatened by environmental degradation. In the current climate crisis, the insights provided by *Traditional Ecological Knowledge* are increasingly valuable as people around the world face similar health risks associated with climate instability.

In addition, the marginalization of *Traditional Ecological Knowledge* in governance structures, as highlighted by Nadasdy (2003), reflects a broader problem of unequal power dynamics in environmental management. *Traditional Ecological Knowledge* is often dismissed or deemed less legitimate compared to scientific knowledge, limiting its application in formal public health policy. However, as environmental health issues become more complex and require local solutions, integrating *Traditional Ecological Knowledge* into mainstream health and environmental policies can provide more effective strategies for disease prevention and environmental management. The exclusion of *Traditional Ecological Knowledge* from decision-making processes not only undermines indigenous peoples' knowledge but also limits the potential to develop comprehensive health policies that take into account local ecological realities.

In addition, sustainable farming practices based on *Traditional Ecological Knowledge*, such as those discussed by Salmon (2000), present practical solutions to some of today's most pressing environmental health problems. As industrial agriculture continues to contribute to environmental degradation, soil depletion, and water pollution, PET-informed farming

practices offer a sustainable alternative. This method improves soil health, reduces the use of harmful chemicals, and helps prevent diseases related to environmental pollution. This is especially relevant in a global food system that is increasingly under *Traditional Ecological Behavior* to produce more with fewer resources while reducing environmental damage.

Interdisciplinary collaborations between *Traditional Ecological Knowledge* and scientific approaches, as explored by Tengö et al. (2014), provide a promising model for future environmental and public health initiatives. Combining the empirical rigor of science with conceptual and experience-based knowledge, *Traditional Ecological Knowledge* creates a stronger framework for addressing environmental health issues. In particular, ecosystem-based management approaches incorporating *Traditional Ecological Knowledge* have been shown to improve the sustainability of natural resources, directly impacting public health by ensuring a cleaner environment and more resilient ecosystems. This collaboration is a step towards more inclusive and effective environmental health governance.

In addition, legal recognition of *Traditional Ecological Knowledge* is essential to protect its contribution to the environment and human health (Hardison & Bannister, 2011). Without proper legal protection, there is a risk that *Traditional Ecological Knowledge* could be exploited or ignored, especially as the industry seeks to exploit natural resources managed by indigenous peoples. A legal framework that respects and protects PET ensures that sustainable practices are maintained, which is critical for long-term public health outcomes. In regions where *Traditional Ecological Knowledge* has been legally protected, there is evidence of better environmental management and, as a result, improved health outcomes related to cleaner air, water, and land.

Finally, the influence of *Traditional Ecological Knowledge* on mental health and holistic health, as discussed by Kirmayer & Valaskakis (2009), emphasizes a broader definition of health that combines environmental, spiritual, and community well-being. This is in line with the perspective of modern public health which recognizes the importance of mental and emotional health in overall health. PET's holistic approach can offer valuable insights into how mental health can be supported through environmental stewardship and a balanced relationship with nature. In a world where mental health issues are becoming increasingly common, especially in communities affected by environmental degradation and climate change, PET's emphasis on interconnectedness offers a refreshing and necessary perspective.

Modern society is a social group that lives in an environment dominated by advanced technology, industrialization, and urbanization. Their lives are influenced by the advancement

of science, with technology playing a huge role in many aspects of life, including communication, economics, and health. Values in modern society place more emphasis on individualism and rationality, where decisions are often made based on logic and efficiency rather than tradition. In addition, modern society lives in urban areas and is globally connected through trade, technology, and media. Their economy is based on a capitalist system with the free market as the main driver of the production and distribution of goods. Institutions such as government, education, and health are also more structured and formal in modern society, creating a more organized and complex social system.

Traditional Ecological Knowledge provides a wealth of knowledge and practices that can significantly increase people's resilience to environmental challenges and improve public health. However, the marginalization of *Traditional Ecological Knowledge* in the policymaking process limits its potential impact. To address the contemporary environmental and health crises, there must be a concerted effort to integrate PET into public health and environmental strategies, recognizing its value in promoting sustainable practices, protecting biodiversity, and preventing disease. Through interdisciplinary collaboration, legal protection, and inclusive governance, *Traditional Ecological Knowledge* can be an important component in building healthier and more resilient communities.

4. Conclusion

These findings show that Traditional Ecological Knowledge (TEK) plays an important role in shaping people's behavior towards environmental health and disease prevention. *Traditional Ecological Knowledge* contributes to sustainability, ecosystem resilience, and public health by encouraging practices that reduce environmental risks, adapt to climate change, and support mental and physical well-being. Despite its significant potential, *Traditional Ecological Knowledge* remains underutilized in formal public health and environmental policies due to institutional barriers and marginalization of indigenous knowledge. Integrating *Traditional Ecological Knowledge* with modern scientific approaches presents a valuable opportunity to improve public health outcomes, especially in vulnerable communities facing environmental challenges.

Policymakers must integrate Traditional Ecological Knowledge (TEK) into public health strategies, recognizing its role in promoting sustainability and preventing disease. Collaboration between governments, scientists, and indigenous peoples is essential to combine traditional and modern approaches for better ecosystem management and health. A stronger legal framework is needed to protect PETs from exploitation and ensure indigenous

peoples' control over their practices. In addition, more empirical research should focus on linking *Traditional Ecological Knowledge* to measurable health outcomes, especially in areas facing environmental degradation and health risks.

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