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A Geographic Perspective in the Context of Political Ecology for Understanding Strategic Environmental Assessment in Indonesia

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ABSTRACT
This research aims to explore the concept of political ecology in the context of the relationship between humans and the environment. Through a qualitative approach, literature analysis, case studies, and interviews were conducted to understand the implementation of the concept of political ecology. The results of the analysis show the complexity of socio-environmental interactions and the scale of political ecology. The findings provide a deeper understanding of the political and cultural dynamics in the representation of "nature". Thus, this research makes an important contribution to understanding political ecology from a geographical perspective. In conclusion, the political ecology approach provides a comprehensive picture and effective solutions in dealing with increasingly complex environmental problems.

Keywords: *Cultural Dynamics, Environmental Interactions, Political Ecology*

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INTRODUCTION

The Political Ecology approach emerged as a response to increasingly complex environmental problems in Indonesia, such as waste, flooding, river pollution, marine ecosystem damage, global warming, air pollution, clean water crisis, deforestation, abrasion, and soil pollution (Salakory & Rakuasa, 2022; Abdurrahim et al., 2023). The solutions offered so far tend to be technical-instrumental and lack consideration of socio-political aspects. The limited access of forest communities to utilize and manage forest resources has led to marginalization and exclusion due to the interests of regional and global actors or agencies (Toumbourou et al., 2020). These interests are inserted into international agreements, then become national policies and manifest in licensing and governance regimes (Rakuasa et al., 2024).

Geographical approaches in political ecology focus on both socio-environmental interactions and the scale of political ecology (Çıdık et al., 2024). This contrasts with the "environmental politics" or "politicized environment" approach that dominates current political ecology texts (Çıdık et al., 2024). There is a perspective on the environment as a stage or arena for direct struggles over access and control of resources. Rather, it is more about the dynamics between humans and nature that are shaped by the presence of nature or biophysical processes within it (Wulandari et al., 2023). Existing approaches are used to examine biogeophysical factors and processes. Biogeophysics is used to explain human-environment interactions and ultimately brings understanding to politics and culture in the representation of "nature" and narratives so as to shape and provide clearer meaning in understanding political ecology in a geographical perspective (Abdurrahim et al., 2023).

A further contrast is the centrality of geographical scale in political ecology. The political scale is closely related to the focus of nature and society (Zhou et al., 2024). Environmental processes interact with social processes and create different reciprocal relationships and indirectly create different political ecology perspectives by applying Piers Blaikie's understanding such as the Chain Model for example in rural-urban, local-regional, and national-international levels that form horizontal and vertical patterns (Arnauld de Sartre et al., 2012).

The geographical approach in political ecology is well suited to discussing environmental problems caused by globalization processes (Gautier & Hautdidier, 2015). Globalization is mostly caused by climate and vegetation with global economic, political and cultural changes. Globalization is the basis for understanding the environment and the world itself. To be closer to political ecology, it uses the perspective of ecological modernization based on awareness of legal, institutional, and eco-industrial and techno managerial reforms (Collins, 2024). Although ecological modernization is centered in Northern Europe. However, when it comes to national environmental issues, biodiversity conservation and protected areas can be used because these issues have expanded to the south and north of the world (Llavero-Pasquina et al., 2024).

The Political Ecology approach seeks to dissect these problems by analyzing the political context behind the formation of disaster risk and environmental damage (Aguiar et al., 2024). This approach views humans as an integral part of the environment, so human development cannot be separated from existing environmental factors. By considering social, cultural, economic, and political aspects in relation to the environment, the Political Ecology Approach is expected to provide a more comprehensive picture and more effective solutions in dealing with environmental problems. Based on the description above, this research aims to explore the concept of political ecology in the context of the relationship between humans and the environment.

RESEARCH METHODOLOGY

This research uses a qualitative approach to explore the concepts and practices of political ecology in the context of the relationship between humans and the environment.

The research methods used include literature analysis, case studies, and interviews with political ecologists and related practitioners.

1) Literature Analysis: Conducted to collect information and theories related to political ecology, geospatial technology, and environmental history. Sources used include journal articles, books, and other related documents.
2) Case Study: Conducted to understand the implementation of political ecology concepts in a real context. Case studies are selected based on relevance to the research topic and may include analysis of environmental change, resource conflicts, or environmental policies.
3) Interviews: Conducted with political ecologists, environmental practitioners, and relevant stakeholders to gain first-hand insights into the issues addressed in the research. Interviews are used to support data analysis and enrich understanding of political ecology.

The data collected through the above methods will be thematically analyzed to identify patterns, trends, and implications in the context of political ecology. A qualitative approach was chosen as it allows for an in-depth understanding of the complex relationship between humans and the environment and allows for rich interpretation of the data obtained.

RESULT AND DISCUSSION

1. Protected Areas and Conservation

Excessive resource control is found in protected areas in many political ecology studies. Efforts have been made to address this by demarcating conservation areas and limiting the use of shared resources. For example, prohibiting local communities from using protected resources is known as the "participatory local management" approach (Muin & Rakuasa, 2023). This approach has been successful in some protected areas such as Nepal and Central America where local participation in natural resource conservation is mediated by community interactions with non-local actors such as national governments, transnational corporations and non-governmental organizations (NGOs) (Schumacher, 2023). The use of shared resources in the form of ecotourism also indirectly has consequences for the sustainability of animals in their habitat such as whale watching along the Pacific of Baja Mexico. This action clearly shows that there is a shift in shared access to political-economic interests to become more centralized and dominated by large foreign companies in the guise of tourism. In the case of the state-supported Maya Biosphere Reserve on Guatemala's Pete Peninsula, it is NGO conservation. Weaker groups are indirectly excluded due to the incompatibility of essentialist and environmental discourses because they do not possess the cultural ecological traits that lead to not being granted access to NGO-sponsored programs. The result is that various groups resort to changing land use practices to appear more "indigenous" in order to gain access to project resources. The scale of political ecology is evident in some of the above cases from biosphere, protected forest area to community-based scales.

2. Urban and Industrial Environments

Urban and industrial environments are also inseparable from political ecology as a central concern of contemporary environmentalism, environmental change and conservation (Arnauld de Sartre et al., 2012). There are differences in understanding urban and industrial landscapes and rural locales. In the case of flooding in the capital city of Georgetown in the coastal lowlands, which is otherwise a flood-prone area in Guyana (Pelling, 1997). Flooding accompanied by storms and higher sea levels in the city are implications of global warming and climate change. This case in the capital city of Georgetown has been followed up from the political economy perspective of urban and regional planning to examine the socio-environmental dimensions of urban and industrial development (Keil et al., 1998: Gustavo & Rakuasa, 2023).

The results show that the resulting environmental risks continue to grow and become undesirable impacts (Gustavo & Rakuasa, 2023). This is also the same in relation to geography and other disciplines (Gustavo & Rakuasa, 2023). The Spanish case is also closely related to the socio-political aspects of water resources management. The case is examined textually from hydrological and environmental planning as well as cultural and historical sources such as literary documents and national politics. There are dynamics of environmental change that are closely related to elements of state control and the cultural politics of modern water resources (Emel & Roberts, 1995; Latue & Rakuasa, 2023). The urban setting as a shaper of the water landscape is quite a demonstration of the socio-biogeophysical aspects associated with political ecology analysis. The results show that the nature of water, including flow, management and measurement corresponds to the geographical approach in political ecology.

3. Ecological Analysis and Theory in Resource Management and Conservation

Ecological concepts are often used to understand resource management and conservation inadvertently in some cases. The political economy impacts of globalization such as land privatization, decentralization and land use are impacts in the form of access, control and management practices of forests and wildlife in the global South that are inseparable from the consequences of afforestation and forest destruction or degradation (Eddy et al., 2021). Multi-methods between political-ecological processes and socio-environmental changes are needed to get a picture of vegetation changes with political ecological changes in the form of utilization of non-timber forest products (Collins, 2024). This multi-method analysis can be further linked to the impact on wildlife populations, as well as the effect on the expansion of agricultural areas that indirectly suppress the growth of wildlife populations. Multi-methods were applied to address this complex issue by combining agroecological sampling (field elevation transects), household surveys, key informant analysis and cartography (Almazán & Prádanos, 2024).

On ranches and pastures in the semi-arid environment of Mali, Sudano-Sahelian Africa there is an irregularity of the rainy season that simultaneously increases the level of fire and overgrazing. Similar to the case of the Andes Mountains but in this case also combining with soil and plant nutrient analysis and the history of market shifts due to the

influence of small rainfall intensity. According to Turner, (1998), this case in Mali is called the nonequilibrium concept in ecology and human-environment science in geography which is seen from the spatial-temporal distribution of livestock on pastures. The degradation of the region arises from the dominance of the global economy when it enters the countryside and institutions that eliminate and change the views of livestock owners in managing and utilizing natural resources due to prolonged drought. The analysis of a concept such as ecology has indirectly represented and examined various problems within the scope of resources influenced by anthropogenic and physical factors.

4. Geospatial Technology and Knowledge

Geospatial technologies are an increasingly common element in the methodological toolkit of political ecologists interested in understanding the multi-scale dynamics of nature and society relationships such as the use of satellite imagery, aerial photography, geographic positioning system (GPS) devices, and GIS mapping and data analysis software. Most often used to examine regional-scale changes in land use and land cover with the aim of linking these processes to broader-scale environmental changes such as global warming (Rakuasa & Pakniany, 2022; Latue & Rakuasa, 2023). Geospatial technologies become useful in (1) providing empirical data on land use patterns, environmental history, and biophysical patterns (fire scars, key resources, landscape fragmentation); and (2) linking detailed local studies to broader scales, although the latter is fraught with methodological and epistemological difficulties. Political ecology contributes to the integration of geospatial technologies into the social sciences, through an exploration of the relationship between geospatial technologies, knowledge and landscape representation (Goldman et al., 2018).

Fort & Paul, (2002), in their study used participatory classification methods to compare land cover interpretations by forester and agropastoralist on the presence of invasive Prosopis juliflora. According to forester/foresters, its presence is widely recognized as a sign of forest while agropastoralists classify it as degraded grassland. Robbins' focus on the interpretive struggle between foresters and agropastoralists over land cover and its quality highlights the highly subjective nature of image processing and mapmaking. Results suggest afforestation is occurring as juliflora growth is encouraged due to its reflectance values.

McCusker, (2004), shows how satellite imagery tends to "naturalize" landscapes by erasing historical traces of apartheid policies on South African land. Their political ecology approach to geospatial technology takes them beyond positivist imagery of land change to inquire about the social processes that produce landscapes, i.e., the power relations of landscapes. Participatory GIS is done by incorporating local knowledge into the interpretation of satellite imagery. This fusion of geospatial technology and political ecology investigation through participatory GIS results in the production of land cover maps that sometimes differ from those created by the authors in the spatial analysis laboratory. Understanding these differences leads to the uncovering of a "hidden political

ecology" where the imagery information reveals the political economy strategies of land users who fabricate land use histories to validate their land claims.

5. North-South Environmental History

Political ecology research is characterized through its use of a historical perspective; typically, it accounts for the recent past framed on the scale of decades and, when prompted, usually incorporates the time scale of colonial precedents. Because of this emphasis, much geography-centered political ecology engages fruitfully with the field of environmental history. The core of this topic centers on three areas proposed as touchstones of environmental history: cultural-mental, political-social-economic, ecological-biogeophysical.

Sluyter, (1994), explains the political and ecological origins of the "pure myths" widely thought to have characterized the present-day Latin American New World prior to European contact. Sluyter shows how this influential myth, which has powerfully shaped modern environmentalism, emerged in the context of Latin America's early colonial period from a combination of environmental changes, such as forest regeneration, the demographic decline of Native Americans, and colonial ideology. Americans, and Spanish colonial ideologies that erased Native American land rights and landscape presence. Sluyter's study helped bring international geographical analysis from pure myth into a sustained and focused dialog with environmental history. The latter field has pointed to the formative influence of colonial and frontier experiences in the United States and Canada but has paid less attention to international legacies. By emphasizing the formation of colonial and postcolonial notions of pristine nature through conceptual transformations, Sluyter (1994) also built on an earlier series of pioneering studies in geographical cultural ecology that had highlighted the pre-European impact of Native Americans.

Glaesel, (1999), describes the political, geographical and cultural dimensions of North-South relations in the establishment of Serengeti National Park, Africa's world-famous protected area. Serengeti was the first national park in Africa. Neumann explains how the park came into being through the interaction of Northern colonialism and Southern environmental management for the purpose of nature protection. According to Neumann, the British Empire's culturally shaped vision of Africa as an ancient wilderness and its political economy assumptions about private property translated into strictly demarcated and uninhabited areas for wildlife protection in East Africa. Neumann's (1998) analysis shows that European policies in East Africa created contrasting landscapes of protected areas that coexisted with primary economic production lands that were sometimes severely degraded by agriculture, livestock and forestry.

Neumann's working concept is put into practice in the Yellowstone model as a nature conservation area. The Yellowstone model is based on the creation of a restricted national park and the exclusion of people who previously frequented these same areas (Llavero-Pasquina et al., 2024). Instead of demonstrating a socially progressive stance, the establishment of nature reserves under strict protection has been a disaster for many local populations whose livelihoods and human rights have been undermined as a result of

reduced access to resources. In many cases, contemporary protected area administrators continue to ignore local claims to resources and territories as well as indigenous environmental knowledge, thus "forcing conservation" (Peluso, 1993). One application of this model in Indonesia is in the Mentawai Islands region, where the 190,500 Ha Siberut National Park was established. Supported by Law 5/1999 which describes the National Park as a nature conservation area with indigenous ecosystems, this has led to access restrictions for indigenous communities already in the area (Tay et al., 2018). The work of Neumann and others has highlighted how conservation and environmental management often raise human rights issues. Human rights concerns often arise through violations, although, at least in some cases, human rights may be proactively protected.

Carney, (1996), offers a provocative analysis of the role of African-American slaves in America's international environmental history. Focusing on the introduced agricultural landscape of African rice (Oryza glaberrima), which extended from the southeastern United States (especially the Carolinas), through the Caribbean, and into Brazil and other coastal regions of South America. Carney establishes that it was the technical expertise, cultural traditions, and social strategies of African-American slaves that successfully transplanted the rice landscape to the moist or irrigated lowlands of much of the Americas. Carney opens up a vast and exciting new vista of the environmental history of North-South relations involving groups of people such as slaves who were subordinates in larger societies. Carney's study creates a historical vision that includes the integration of political-social relations of power and the dynamics of ecological-biogeophysical processes (i.e., organisms, technologies, and landscapes of rice cultivation and processing).

CONCLUSION

Various interdisciplinary and transdisciplinary approaches to political ecology are developing within and between other disciplines, especially sociology, anthropology and planning science. At the same time, geographic approaches make a particular contribution to understanding environmental change, with a core focus on human-environment interactions and the scale of political ecology. These two focuses define our geographical approach to political ecology - an approach that tends to be subsumed or made secondary by the different emphases of approaches rooted in other disciplines or interdisciplinary fields. These twin themes contribute to the role of political ecology as a key "hub area" in human-environment studies and one that focuses on environment-development relations in particular. Integration of scales, spatial as well as temporal, is at the core of linking and integrating social and environmental analysis. This allows the perspectives of the social sciences and biogeophysics to be woven together.

REFERENCES

Abdurrahim, A. Y., Dharmawan, A. H., Adiwibowo, S., Yogaswara, H., & van Noordwijk, M. (2023). Relational and instrumental values of tropical peat landscapes: morality and political ecology in Indonesia. *Current Opinion in*

Environmental Sustainability, *64*, 101318. https://doi.org/10.1016/j.cosust.2023.101318

Aguiar, R., Keil, R., & Wiktorowicz, M. (2024). The urban political ecology of antimicrobial resistance: A critical lens on integrative governance. *Social Science & Medicine*, *348*, 116689. https://doi.org/10.1016/j.socscimed.2024.116689

Almazán, A., & Prádanos, L. I. (2024). The political ecology of technology: A non-neutrality approach. *Environmental Values*, *33*(1), 3–9. https://doi.org/10.1177/09632719231209745

Arnauld de Sartre, X., Berdoulay, V., & Lopes, R. da S. (2012). Eco-Frontier and Place-Making: The Unexpected Transformation of a Sustainable Settlement Project in the Amazon. *Geopolitics*, *17*(3), 578–606. https://doi.org/10.1080/14650045.2011.631199

Carney, J. (1996). Landscapes of technology transfer: Rice cultivation and African continuities. *Technology and Culture*, *37*(1), 5–35.

Çıdık, M. S., Garfias Royo, M., Mulligan, J., K'oyoo, A. O., & Parikh, P. (2024). Political ecology perspective for a new way of understanding stakeholders and value in infrastructure projects. *International Journal of Project Management*, *42*(2), 102565. https://doi.org/10.1016/j.ijproman.2024.102565

Collins, Y. A. (2024). A political ecology of atmospheres: A voluminous case study of the Guiana Shield. *Political Geography*, *109*, 103048. https://doi.org/10.1016/j.polgeo.2023.103048

Eddy, T. D., Lam, V. W. Y., Reygondeau, G., Cisneros-Montemayor, A. M., Greer, K., Palomares, M. L. D., Bruno, J. F., Ota, Y., & Cheung, W. W. L. (2021). Global decline in capacity of coral reefs to provide ecosystem services. *One Earth*, *4*(9), 1278–1285. https://doi.org/10.1016/j.oneear.2021.08.016

Emel, J., & Roberts, R. (1995). Institutional Form and Its Effect on Environmental Change: The Case of Groundwater in the Southern High Plains. *Annals of the Association of American Geographers*, *85*(4), 664–683. https://doi.org/10.1111/j.1467-8306.1995.tb01819.x

Fort, D. J., & Paul, R. R. (2002). Enhancing the predictive validity of Frog Embryo Teratogenesis Assay— Xenopus (FETAX). *Journal of Applied Toxicology*, *22*(3), 185–191. https://doi.org/10.1002/jat.848

Gautier, D., & Hautdidier, B. (2015). Connecting political ecology and French geography: on tropicality and radical thought. In *The International Handbook of Political Ecology*. Edward Elgar Publishing. https://doi.org/10.4337/9780857936172.00012

Glaesel, H. (1999). Roderick P. Neumann. Imposing Wilderness: Struggles over Livelihood and Nature Preservation in Africa. Berkeley: University of California Press, 1998. xii + 256 pp. Maps. Photographs. Tables. Notes. Bibliography. Index. $35.00 Cloth. - Terence O. Ranger. Voices from the Rocks: Nature, Culture and History in the Matopos Hills of Zimbabwe. Bloomington: University of Indiana Press, 1999. viii + 305 pp. Maps. Photographs. Notes. Bibliography. Index. $19.95 Paper. $49.95. Cloth. *African Studies Review*, *42*(3), 120–122. https://doi.org/10.2307/525232

Goldman, M. J., Turner, M. D., & Daly, M. (2018). A critical political ecology of human dimensions of climate change: Epistemology, ontology, and ethics. *WIREs Climate Change*, *9*(4). https://doi.org/10.1002/wcc.526

Gustavo, G. J. P., & Rakuasa, H. (2023). Disaster Education and the Role of Geographers: A Step Toward a Disaster Resilient Ambon City: A Review. *Journal of Education*

Method and Learning Strategy, *1*(03), 183–192. https://doi.org/10.59653/jemls.v1i03.238

Heinrich Rakuasa, Dzaka A Faris, Philia Christi Latue, Y. P. (2024). Analysis of Indonesia's Foreign Policy in the Face of Climate Change: A Review from an International Relations Perspective. *Journal of International Multidisciplinary Research*, *2*(4), 41–48. https://doi.org/https://doi.org/10.62504/bx9g2j06

Keil, M., Cule, P. E., Lyytinen, K., & Schmidt, R. C. (1998). A framework for identifying software project risks. *Communications of the ACM*, *41*(11), 76–83. https://doi.org/10.1145/287831.287843

Latue, P. C., & Rakuasa, H. (2023). Spatial Analysis of Landscape Suitability of Ambon City for Settlement Using Geographic Information System. *Jurnal Riset Multidisiplin Dan Inovasi Teknologi*, *1*(02), 59–69. https://doi.org/10.59653/jimat.v1i02.218

Llavero-Pasquina, M., Navas, G., Cantoni, R., & Martínez-Alier, J. (2024). The political ecology of oil and gas corporations: TotalEnergies and post-colonial exploitation to concentrate energy in industrial economies. *Energy Research & Social Science*, *109*, 103434. https://doi.org/10.1016/j.erss.2024.103434

McCusker, B. (2004). Land Use and Cover Change as an Indicator of Transformation on Recently Redistributed Farms in Limpopo Province, South Africa. *Human Ecology*, *32*(1), 49–75. https://doi.org/10.1023/B:HUEC.0000015220.22795.27

Muin, A., & Rakuasa, H. (2023). Sasi Laut as a Culture of Natural Resources Conservation to Overcome the Tragedy of the Commons in Maluku Province. *International Journal of Multidisciplinary Approach Research and Science*, *1*(03), 277–287. https://doi.org/10.59653/ijmars.v1i03.139

Pelling, M. (1997). What determines vulnerability to floods; a case study in Georgetown, Guyana. *Environment and Urbanization*, *9*(1), 203–226. https://doi.org/10.1177/095624789700900116

Peluso, N. L. (1993). Coercing conservation? *Global Environmental Change*, *3*(2), 199–217. https://doi.org/10.1016/0959-3780(93)90006-7

Philia Christi Latue, H. R. (2023). Analisis Perubahan Suhu Permukaan Daratan di Kecamatan Ternate Tengah Menggunakan Google Earth Engine Berbasis Cloud Computing. *E- JOINT (Electronica and Electrical Journal of Innovation Technology)*, *4*(1), 16–20. https://doi.org/https://doi.org/10.35970/e-joint.v4i1.1901

Rakuasa, H., & Pakniany, Y. (2022). Spatial Dynamics of Land Cover Change in Ternate Tengah District, Ternate City, Indonesia. *Forum Geografi*, *36*(2), 126–135. https://doi.org/DOI: 10.23917/forgeo.v36i2.19978

Salakory, M., Rakuasa, H. (2022). Modeling of Cellular Automata Markov Chain for predicting the carrying capacity of Ambon City. *Jurnal Pengelolaan Sumberdaya Alam Dan Lingkungan (JPSL)*, *12*(2), 372–387. https://doi.org/https://doi.org/10.29244/jpsl.12.2.372-387

Schumacher, J. M. (2023). Framing REDD+: political ecology, actor–network theory (ANT), and the making of forest carbon markets. *Geographica Helvetica*, *78*(2), 255–265. https://doi.org/10.5194/gh-78-255-2023

Sluyter, A. (1994). Intensive Wetland Agriculture in Mesoamerica: Space, Time, and Form. *Annals of the Association of American Geographers*, *84*(4), 557–584. https://doi.org/10.1111/j.1467-8306.1994.tb01877.x

Tay, K.-C., Supangkat, S. H., Cornelius, G., & Arman, A. A. (2018). The SMART Initiative and the Garuda Smart City Framework for the Development of Smart Cities. *2018 International Conference on ICT for Smart Society (ICISS)*, 1–10.

https://doi.org/10.1109/ICTSS.2018.8549961

Toumbourou, T., Muhdar, M., Werner, T., & Bebbington, A. (2020). Political ecologies of the post-mining landscape: Activism, resistance, and legal struggles over Kalimantan's coal mines. *Energy Research & Social Science*, *65*, 101476. https://doi.org/10.1016/j.erss.2020.101476

Turner, B. (1998). Mali. In B. Turner (Ed.), *The Statesman's Yearbook: The Essential Political and Economic Guide to All the Countries of the World 1998--1999* (pp. 944–947). Palgrave Macmillan UK. https://doi.org/10.1057/9780230271272_161

Wulandari, A. A., Pertuak, A. C., & Rakuasa, H. (2023). Climate Change and its Impact on Human Health: A Medical Geography Perspective. *Journal of Health Science and Medical Therapy*, *1*(02), 80–90. https://doi.org/10.59653/jhsmt.v1i02.279

Zhou, Y., Huang, Q., He, C., Chen, P., Yin, D., Zhou, Y., & Bai, Y. (2024). A bibliographic review of the relationship between ecosystem services and human well-being. *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-024-04791-3