JOURNAL OF SOCIAL SUSTAINABILITY IMPACT

e-ISSN 3025-2016 Vol. 1, No. 1, 2023

Research Article

Exploring the Intersection of Ecology and Social Sciences: Opportunities for Collaboration and Impact

Mustaqim*

Department of Sociology, Institut Pertanian Bogor, West Java, Indonesia.

***Corresponding author, E-mail address:** mustaqim_23@apps.ipb.ac.id

Abstract

Research in the field of ecology examines social phenomena through the lens of how people interact with the natural, economic, and political worlds. The emergence of new ecological approaches provides a new lens to examine the interplay of societal, economic, and environmental dynamics. This article presents a "track" perspective on social science as the basis for new environmental thinking, emphasizing "non-balance," dynamic, spatial dimensions, temporal variation, and complexity. It highlights deviations from the original "natural equilibrium" concept and establishes resource conservation as the bedrock of economic and political conflicts. The political ecology perspective is invaluable for comprehensively understanding environmental challenges and potential solutions. The anthropology of human ecology explains how human use of natural resources affects and is influenced by institutional, social, and cultural norms. It emphasizes a political agenda that questions the breakdown of human behavior. Throughout environmental history, three themes—structure, institutions, scale, complexity, and uncertainty—have been discussed, each presenting challenges and opportunities for greater collaboration between the natural and social sciences. Future reviews in this crucial area, we hope, will focus extensively on the interaction between the new ecology and the social sciences.

Keywords: environmental issues; human ecology; social interaction and ecology; political ecology.

1. INTRODUCTION

This paper aims to briefly review the ecological approach and "integration prospects" in the future. Ecological studies always look at social phenomena from the perspective of human interaction with nature, economics (production, consumption, distribution), and politics (dominance) (Becker, 2013). In the last few decades, studies in the environmental field, especially ecological and societal issues, have been increasingly in demand. Studying the natural and social sciences relationship contributes to science's conceptual and methodological new interdisciplinary relationship. The emergence of new ecological approaches (Zimmerer, 1994) provides a new understanding of the relationship between social, economic, and ecological processes. Previous studies have placed the social sciences in the debate over the understanding of "equilibria" as an ecological system with regard to natural equilibrium (Zimmerer, 2000). However, this paper tries to give a "track" view of social science as a foundation of new ecological thinking, focusing on "non-balance," dynamic, dimensionality of space (space of power), variation of time/time, and complexity. A summary of the emergence of a new ecology highlights the differences with the initial concept of the "natural equilibrium" perspective and places the issue of resource conservation as the foundation of political and economic struggles. The analysis of politicization becomes characteristic in ecology, especially to find out how nature is represented in the context of anthropological ecology, ecological politics, environment, economic and cultural ecology (customary). This paper provides three areas of dynamic perspective and a foundation of ecological thinking. A concept that can practically be used in planning, policymaking, and management that integrates with political, political-economic, and development studies.

The main focus is the dimension of space and the dynamics of development as an analysis, mainly historical analysis as a foundation explaining environmental changes related to time, landscape, and social landscapes. Second, Understanding the environment, patterns of interaction relationships, and structural analysis of the environment as an agent of environmental change from a structural approach. Third is the complexity and uncertainty of socio-ecological economic and market systems as the leading causes of the resource environmental crisis.

2. POLITICAL ECOLOGY APPROACH

The flow of development and the issue of political ecology is increasingly discussed, but the term political ecology was first proposed by (Cockburn & Ridgeway, 1979; Russett, 1967). The political ecology approach is fundamental in understanding the complexity of environmental issues as a basis for formulating environmental policies. The study of political ecology deals with "power (economic and political). Political ecology provides a premise that environmental change is not a technical-neutral process but rather a political economy. Thus, political position becomes a fundamental issue that deals with power structure and dominance over environmental resources. Some experts understand political ecology as a relationship of social, political, and environmental processes (Blaikie & Brookfield, 2015; Bryant & Bailey, 1997; Walker, 2005). Recent formulations have picked up this theme more than political ecology, which tries to move beyond a structuralist perspective (Peet & Watts, 2004; Rocheleau, 2008). This means that the political ecology theory can well explain the use of natural resources. The following are some explanations and practices of political ecology approaches.

(R. M. Harvey, 1975) The idea of resources being socially and politically constructed has been central to the discussion. It has produced important work on how perspectives on environmental change should be measured from the point of view of different actors (Blaikie, 1995) models of cause-and-effect chains, emerging various case studies that show how, for example, as a whole about soil conservation (Blaikie, 2016), This work has sought precisely to connect micro-understandings, ecological anthropology, with broader political processes and structural ideologies (Hecht & Cockburn, 2011) land use in Amazonia is influenced by the interaction of political and ecological processes.

However, although the understanding of knowledge, power, and politics concerning the environment has continued, this discussion has not yet been taken on understanding the new ecology, an increasingly noticeable tension (Ali, 2019; Zimmerer, 1996). Political ecology is a dialectical approach to analyzing the political context of the relationship between man and nature. The issue of social justice and conflicts over natural resources is another focus of concern in the analysis of political ecology (Escobar, 2011; Peet & Watts, 2004). Political ecology is closely related to other areas of cultural ecology. Human ecology. Ecological anthropology, ecological economics. The geography of radical development and the history of the environment.

3. ANTHROPOLOGY-ECOLOGY APPROACH

Ecological issues have been "exciting" in ecological anthropology, cultural ecology, and human ecology, with the main question that arises is how (especially) society lives with nature. The natural environment has a homeostatic regularity with the surrounding community (Scoones, 1999). Some early literature provides interesting variations of group ideas drawing on the concepts of rational actors and natural selection to describe patterns of human behavior about environmental resources. Various approaches are used in ecological anthropology, such as the (B. S. Orlove, 1980) Processual approaches. Darwin used an evolutionary approach, transactional analysis (Barth 1966), and a new actor-based approach (Vayda, 1983). The systems approach in ecological analysis was developed by (Rambo, 1981). The functionalist position of cultural ecology has long been rejected; elements have persisted in perspectives related to the concept of evolutionary adaptation (Bhalerao & Metkar, 2020; Diener et al., 1980). Demographic interactions, household structures, and technological change (Bennett, 2017; Hardesty, 1977; Lees & Bates, 1990). Meanwhile, it concentrates on decision-making models of individual behavior (Dyson-Hudson & Smith, 1978).

Beneficial interactions between ecology, economics, and social scientists. For example, research that attempts to develop dynamic theories of economic, social system, and ecological interdependence, including paying attention to issues such as resilience, scale and hierarchy, complex dynamics, and dependence (Berkes et al., 1998; Darhamsyah, 2019). In anthropology, a socio-cultural or cultural system is meant as a whole integration. In the overall ecology, the integration is an ecosystem (Foster & Treherne, 1986). (Hardesty, 1977) is an interaction between a group of plants and animals with their non-living environment. Such non-living environments or habitats may differ in size. Its complexity and duration range from a drop of pond water with its micro-organisms to the entire life of plants and animals (Geertz 963: 3). (Vayda et al., 1968) together in Ecology, Cultural. and Non-Ecology; Introduction to Cultural Anthropology. Which explains the relationship between the development of the population. There are two main approaches in ecological anthropology, namely the ecological functionalism approach (including the adoption of the cultural ecology approach, the ecosystem approach. and the systems approach) and the environmentalism approach (popularly known as the action-oriented approach) (Little, 1999). Ecological anthropology as the study of how the use of natural resources by humans affects and is influenced by organizational, social and cultural values (Bennett, 2017).

4. NEW ECOLOGICAL APPROACH

Ecology, a term first coined by Haekel in 1866 (Goodland, 1975), is not surprising that concepts such as the structure and function of nature are used as ecological explanations. Ecological studies have been built on the idea of balance. Several studies in ecology have predominated (Worster, 1988). The challenge to balance first emerged from Elton, who stated that natural balance does not occur and has never even existed. It is interesting to analyze the phrase "natural balance does not exist and may never have existed" (Elton, 1930). Fifty years later, (Connell & Sousa, 1983) concluded: "If a natural balance exists, it has been proven very hard to show. This balance never existed. The shift from ecosystems to new ecologies touches on conceptual issues: methodology and policy implications. The root of the emergence of a new ecological school is the individual approach developed by (Gunathilaka & Wijeratne, 2022; B. Orlove, 1977). (Vayda & Walters, 1999) even positioned this approach as a new school of thought in ecological anthropology. There are two main approaches in ecological anthropology, namely the ecological functionalism approach (including the eco-cultural approach, the ecosystem approach, and the systems approach) and the environmentalist approach (popularly known as the action-oriented approach) (Little, 1999). The functionalist-ecological approach refers to (Vayda et al., 1968). While action-oriented (developed by (Bennett, 2017; Vayda et al., 1968; Vayda & Walters, 1999).

The ecological functionalism approach is interdisciplinary and seeks to understand and manage ecosystems by focusing on their functional relationships and processes. Several related approaches fall under this umbrella term, including the eco-cultural, ecosystem, and systems approaches. The eco-cultural approach emphasizes the interconnectedness between human cultures and the natural environment. It recognizes the critical role that human societies play in shaping and being shaped by their environment. This approach promotes sustainable development by incorporating cultural values and practices into environmental management strategies. The ecosystem approach is a scientific framework for ecosystem management that aims to conserve and manage natural resources by considering the ecological, social, and economic factors that influence ecosystem function. It recognizes that ecosystems are complex and dynamic systems and that their health and resilience are essential for human well-being. The systems approach is a holistic approach that views ecosystems as integrated systems of interacting components rather than collections of isolated parts. It seeks to understand the complex relationships between different components of an ecosystem and to identify the feedback loops and interdependencies within the system. This approach helps develop models and predict the impacts of environmental changes on ecosystem function. Overall, the ecological functionalism approach seeks to promote a deeper understanding of the complex relationships between humans and the natural environment and develop strategies for managing sustainable and resilient ecosystems.

The environmentalist approach, or action-oriented, is a philosophy and movement emphasizing direct action to protect the environment and promote environmental sustainability. This approach seeks to raise awareness of environmental issues and to mobilize individuals and communities to take action to address them. Environmentalists often advocate for policies and practices that reduce the human impact on the environment, such as reducing greenhouse gas emissions, protecting endangered species, and promoting sustainable resource use. They may engage in protests, boycotts, and

lobbying to effect change locally, nationally, and internationally. The environmentalist approach is rooted in the belief that humans are responsible for protecting the environment and that human activities cause environmental problems. Proponents of this approach argue that environmental protection is essential for the long-term health and well-being of humans and the natural world. While the environmentalist approach can be highly effective in raising awareness and promoting change, it can also be controversial and sometimes lead to conflict with other stakeholders. Some critics argue that environmentalists are overly confrontational and ignore environmental policies' economic and social impacts. The environmentalist approach is essential, emphasizing the need for direct action and activism to address environmental problems and promote sustainability.

5. ENVIRONMENTAL, ECOLOGICAL AND NATURAL-CULTURAL CONCEPTS

Ecological issues are stimulated in ecological anthropology, cultural ecology, and human ecology around how people (especially) (non-Western) live with nature. For ecological economists, a systems approach is adopted in which economic and ecological systems are seen to appear together (Abdeljalil et al., 2022; Gowdy, 2013; Kallis & Norgaard, 2010). Finally, a significant concern for institutional economics has been the collective action of issuing central management of shared natural resources (Bromley, 1992; Ostrom, 1990). The main focus is limits and carrying capacity (Arrow et al., 1995; Krishnan et al., 2013). In environmental economics, natural resource issues have been discussed mainly regarding market failures arising from externalities and the rational allocation of scarce resources (Markandya & Richardson, 1992; Suarlin & Ali, 2020). Despite the more nuanced reflections on ecological dynamics mentioned above, most social science thought continues to employ balance, regulation, and harmony metaphors in framing the discussion. The idea of "harmony with nature is not as a human desire, but as a need" (D. Harvey, 1993).

The concept of environment, ecology, and culture provides an understanding that the environment is a common property. In Ostrom's perspective, he sees that resources are shared property. "If you take resources in one place, it will reduce the opportunity for other people to get resources." The concept of institutional economics as a significant concern for the collective action of society in the management of shared natural resources (Bromley, 1992; Ostrom, 1990) attempts to develop a theory of the dynamic nature of the interdependence of economies, social systems, and ecology, including paying attention to issues such as resilience, complex dynamics, and dependencies (Berkes et al., 1998; Harshana & Gunathilaka, 2023). Recognizing the typology of rights in relation to shared property resources, there are five rights: the right of access or passage, the right to use (withdrawal tight), and the right to prohibit other people from crossing and utilizing the resource (exclusion right). The anthropological debate has recently been a critique of the nature-culture divide. how trait-cultural differences are untenable in various contexts (Woodgate & Redclift, 1998) argue (in various ways) for an appreciation of multiple traits, socially constructed and assigned various meanings and interpretations. McNaghten & Urry concludes that "the main task for the social sciences is to decipher the social implications of what has always been, that is, an intricately entangled and fundamentally bound realm of social practices and their characteristic models of cultural representation" (Macnaghten & Urry, 1992).

Environmental concepts refer to the physical and biological components of the natural world and how they interact. This includes understanding the cycles of matter, energy flow, and other physical and chemical processes that occur in the environment. Environmental concepts are also concerned with the impacts of human activities on the environment, such as pollution, resource depletion, and climate change. We can develop strategies to mitigate these impacts and sustainably manage resources by understanding these concepts. Ecological concepts focus on the relationships between living organisms and their environment. This includes understanding the complex interactions between different species and how they interact with their physical surroundings. Ecological concepts also encompass larger-scale processes, such as nutrient cycling and ecosystem dynamics. By studying ecological concepts, we can better understand how ecosystems function and how human activities impact them. This knowledge can help us develop more effective conservation and restoration strategies. Natural cultural concepts emphasize how human societies interact with the environment. This includes understanding the cultural practices and beliefs that shape how people use and manage natural resources and the impacts of human activities on the environment. Natural-cultural concepts also encompass traditional ecological knowledge, which is the accumulated knowledge of local communities about the natural world and how to manage it

sustainably. By considering natural-cultural concepts, we can develop more effective strategies for managing resources that consider local values and knowledge.

Understanding environmental, ecological, and natural-cultural concepts is critical for developing effective strategies to address environmental challenges and promote sustainability. By taking a holistic approach that integrates these concepts, we can better understand the complex interactions between humans and the environment, and develop more effective strategies for managing resources sustainably.

6. STRUCTURE, AGENTS AND ENVIRONMENTAL CHANGE

The new ecological view shows the direct relationship between society and the environment in the process of environmental change. The environment is dynamically and recursively created in a non-unidirectional, non-deterministic manner. Social, political, economic, and ecological processes interact dynamically. Therefore, analysis requires sensitivity to the interaction of human structures and agencies from local to global scales. Such a perspective requires analysis to move beyond the functionalist, adaptationist, and deterministic models that have dominated ecological anthropology and similar approaches used in the social sciences in the past.

Analysis has highlighted the importance of the dialectical relationship between the natural environment and people's actions (Collins, 1992). Change is seen as an "internal imperative" (D. Harvey, 1974). Studies of the processes that local practices—agriculture, land management, tree cutting, wetland management, fires, grazing, hunting, and so on—influence the environment over time reveal how the intentional and unintentional combinations of actions of different social actors may lead to change: environmental significance and ecological dynamics. Similar concerns are shared by anthropogenic environmental historians focusing more on ethnography and ecological analysis of local knowledge and practices. Here again, the anthropological perspective offers important insights. Institutions, seen as products of contested social practices that are culturally and historically embedded, often with symbolic associations and attached meanings, are shown differently in institutional analysis (Agrawal et al., 2000; Leach et al., 1999; Schroeder et al., 1997) show how different institutional arrangements associated with different networks of local and non-local actors lead to different “landscape” changes and ecological dynamics. The forms of patterns of authority that are inscribed in “landscape areas” and reflected in patterns of ecology and spatial physical and biophysical processes of “component features and access” become socialized and institutionalized over time and are produced (Appadurai, 1997) through institutional and political interconnections that cut across space and time. So that ecological patterns and processes that are embedded in social and institutional aspects become a part that is continuously studied.

7. COMPLEXITY AND UNCERTAINTY: IMPLICATIONS FOR PERCEPTION, POLICY, AND PRACTICE

The new ecology provides essential insights into the complexity and non-linearity of ecological systems. Several significant consequences for the environment of perception, policy, and practice. Uncertainty and continuity in central ecological dynamics (Hilborn & Ludwig, 1993; Ludwig et al., 1993). The issues of risk, uncertainty, and uncertainty have been of concern to sociologists exploring the epistemological issues surrounding the scientific process of public and policy responses to environmental issues (Wynne, 1994). Highlights some essential vital concepts on which alternative perspectives on questions of complexity challenge understanding of environmental perceptions, policies, and practices. An understanding of the interaction process of various kinds of knowledge about environmental issues in conditions of scientific uncertainty. Understanding scientific negotiation requires insight into the foundations and constructions of environmental knowledge and the emerging discourse models (Apthorpe, 1996; Gasper & Apthorpe, 1996; Grillo & Stirrat, 1997). Classical anthropological approaches are effectively applied locally for farmers and other resource managers, who can benefit from extending a more comprehensive range of actors and interactions (Cussins, 1996; Sivaramakrishnan, 1996).

The new ecology provides essential insights into the complexity and non-linearity of ecological systems, which have significant consequences for environmental perception, policy, and practice. Here are some of the critical implications:

- Perception: The new ecology challenges traditional views of ecological systems as linear and predictable. It highlights that ecological systems are highly complex and often exhibit non-linear dynamics, making it difficult to predict the outcomes of environmental interventions. This means that our perception of environmental problems needs to be more nuanced and informed by a systems perspective.
- Policy: The new ecology has important implications for environmental policy, as it emphasizes the need for a holistic approach that considers the complex interactions between different components of the environment. This requires policies integrated across sectors, such as agriculture, energy, and transportation, prioritizing long-term sustainability over short-term gains.
- Practice: The new ecology also has implications for environmental practice, emphasizing the importance of adaptive management and resilience. Ecological systems are constantly changing, and environmental interventions must be flexible and adaptable to be effective. Environmental practitioners must be skilled in real-time monitoring and responding to environmental changes.

The new ecology represents a paradigm shift in our understanding of ecological systems and has important implications for how we perceive, policy, and practice environmental management. By recognizing the complexity and non-linearity of ecological systems, we can develop more effective strategies for promoting sustainability and resilience in the face of environmental change.

8. CONCLUSION

The political ecology approach is fundamental in understanding the complexity of environmental issues as a basis for environmental policy formulation. Ecological development depends on a new approach emphasizing a political agenda that questions the breakdown of human behavior. So, examining ecology will be inherently symptomatic. Political. Discussions of ecology were discussed with Clements in 1916. This biological vegetation expert is interested in the process of succession. The anthropology of human ecology explains how humans' use of natural resources affects and is influenced by organizational, social, and cultural values. Three themes discussed in history over the environment, structure, institution, scale, complexity, and uncertainty present real challenges and potential to move toward broader engagement between the natural and social sciences. The focus in the social sciences debate is on environmental issues, offering the potential for more varied insights into social interaction and ecology, which go beyond the limiting balance of natural views that have dominated academic and policy discussions in the past.

ACKNOWLEDGMENTS

The authors would like to sincerely thank the Institut Pertanian Bogor (IPB) for their invaluable support throughout this research. IPB's commitment to excellence in education and research has been a cornerstone for the success of this study.

REFERENCES

Abdeljalil, A., Nabil, S., & Rachid, M. (2022). The Environmental Aspect & Impacts for Industrial Sites: Methodological Framework and Evaluation. International Journal of Environment, Engineering and Education, 4(1), 5–10.

Agrawal, A., Sivaramakrishnan, K., & Sivaramakrishnan, K. (2000). Agrarian environments: resources, representations, and rule in India. Duke University Press.

Ali, M. I. (2019). The Consequences of Illegal Mining in the Environment: Perspective of Behavior, Knowledge, and Attitude. International Journal of Environment, Engineering & Education, 1(1), 25–33.

Appadurai, A. (1997). Discussion: Fieldwork in the era of globalization. Anthropology and Humanism, 22(1), 115–118.

Apthorpe, R. (1996). Reading development policy and policy analysis: on framing, naming, numbering and coding. The European Journal of Development Research, 8(1), 16–35.

Arrow, K., Bolin, B., Costanza, R., Dasgupta, P., Folke, C., Holling, C. S., Jansson, B.-O., Levin, S., Mäler, K.-G., & Perrings, C. (1995). Economic growth, carrying capacity, and the environment. Ecological Economics, 15(2), 91–95.

Becker, G. S. (2013). The Economic Approach to Human Behavior (Vol. 803). University of Chicago press.

Bennett, J. W. (2017). The ecological transition: cultural anthropology and human adaptation. Routledge.

Berkes, F., Kislalioglu, M., Folke, C., & Gadgil, M. (1998). Minireviews: exploring the basic ecological unit: ecosystem-like concepts in traditional societies. Ecosystems, 1, 409–415.

Bhalerao, N., & Metkar, S. (2020). The Renewable Energy: Environmentally Friendly Algae Biofuel. International Journal of Environment, Engineering & Education, 2(3), 13–21. https://doi.org/10.5281/zenodo.4309022

Blaikie, P. (1995). Changing environments or changing views? A political ecology for developing countries. Geography, 203–214.

Blaikie, P. (2016). The political economy of soil erosion in developing countries. Routledge.

Blaikie, P., & Brookfield, H. (2015). Land degradation and society. Routledge.

Bromley, D. W. (1992). The commons, common property, and environmental policy. Environmental and Resource Economics, 2, 1–17.

Bryant, R. L., & Bailey, S. (1997). Third world political ecology. Psychology Press.

Cockburn, A., & Ridgeway, J. (1979). Political Ecology: An Activist's Reader on Energy, Land. Food, Technology, Health, and the Economics and Politics of Social Change.

Collins, P. H. (1992). Transforming the inner circle: Dorothy Smith's challenge to sociological theory. Sociological Theory, 10(1), 73–80.

Connell, J. H., & Sousa, W. P. (1983). On the evidence needed to judge ecological stability or persistence. The American Naturalist, 121(6), 789–824.

Cussins, C. (1996). Ontological choreography: Agency through objectification in infertility clinics. Social Studies of Science, 26(3), 575–610.

Darhamsyah, D. (2019). Environmental Governance Urban: Public Participation and Sustainable Development. International Journal of Environment, Engineering and Education, 1(1), 17–24.

Diener, P., Nonini, D., & Robkin, E. E. (1980). Ecology and evolution in cultural anthropology. Man, 1–31.

Dyson-Hudson, R., & Smith, E. A. (1978). Human territoriality: an ecological reassessment. American Anthropologist, 80(1), 21–41.

Elton, C. S. (1930). Animal ecology and evolution.

Escobar, A. (2011). Sustainability: Design for the pluriverse. Development, 54, 137–140.

Foster, W. A., & Treherne, J. E. (1986). The ecology and behaviour of a marine insect, Halobates fijiensis (Hemiptera: Gerridae). Zoological Journal of the Linnean Society, 86(4), 391–412.

Gasper, D., & Apthorpe, R. (1996). Introduction: Discourse analysis and policy discourse.

Goodland, R. (1975). History of" Ecology". Science, 188(4186), 313.

Gowdy, J. (2013). Coevolutionary economics: the economy, society and the environment (Vol. 5). Springer Science & Business Media.

Grillo, R. D., & Stirrat, R. L. (1997). Discourse of Development: Perspectives. Oxford: Berg Publishers.

Gunathilaka, M., & Wijeratne, V. (2022). Pro-Environmental Communication and Behavior in Sustainable Use of Environmental Resources: A Study in Kalpitiya Fisheries Inspector Division, Sri Lanka. International Journal of Environment, Engineering and Education, 4(2), 55–59.

Hardesty, D. L. (1977). Ecological Anthropology.

Harshana, W. T. S., & Gunathilaka, M. D. K. L. (2023). The Implementation of the Mangrove Quality Index: A Way to Overcome Overestimation and Classification Concerns in Detecting Mangrove Forest Cover. International Journal of Environment, Engineering and Education, 5(1), 1–8.

Harvey, D. (1974). Class-monopoly rent, finance capital and the urban revolution. Regional Studies, 8(3–4), 239–255.

Harvey, D. (1993). The nature of environment: dialectics of social and environmental change. Socialist Register, 29.

Harvey, R. M. (1975). Environmental factors in glue ear. The Journal of Laryngology & Otology, 89(1), 73–77.

Hecht, S. B., & Cockburn, A. (2011). The fate of the forest: developers, destroyers, and defenders of the Amazon. University of Chicago Press.

Hilborn, R., & Ludwig, D. (1993). The limits of applied ecological research. Ecological Applications, 550–552.

Kallis, G., & Norgaard, R. B. (2010). Coevolutionary ecological economics. Ecological Economics, 69(4), 690–699.

Krishnan, R., Harris, J., & Goodwin, N. R. (2013). A survey of ecological economics (Vol. 1). Island Press.

Leach, M., Mearns, R., & Scoones, I. (1999). Environmental entitlements: dynamics and institutions in community-based natural resource management. World Development, 27(2), 225–247.
Lees, S. H., & Bates, D. G. (1990). The ecology of cumulative change (Vol. 1). University of Michigan Press Ann Arbor.
Little, P. E. (1999). Political ecology as ethnography: the case of Ecuador's Aguarico River Basin (Issue 258). Departamento de Antropologia, Universidade de Brasília.
Ludwig, D., Hilborn, R., & Walters, C. (1993). Uncertainty, resource exploitation, and conservation: lessons from history. Science, 260(5104), 17–36.
Macnaghten, P., & Urry, J. (1992). Constructing the countryside and the passive body. Constructing the Countryside and the Passive Body.
Markandya, A., & Richardson, J. (1992). Environmental Economics: A Reader. Martin's Press.
Orlove, B. (1977). Inequality among peasants: The forms and uses of reciprocal exchange in Andean Peru. Peasant Livelihood: Studies in Economic Anthropology and Cultural Ecology, 201–226.
Orlove, B. S. (1980). Ecological anthropology. Annual Review of Anthropology, 9(1), 235–273.
Ostrom, E. (1990). Governing the commons: The evolution of institutions for collective action. Cambridge university press.
Peet, R., & Watts, M. (2004). Liberation ecologies: environment, development, social movements. Psychology Press.
Rambo, A. T. (1981). Rain-Forest Collectors and Traders: A Study of Resource Utilization in Modern and Ancient Malaya. Monographs of the Malaysian Branch, Royal Asiatic Society, No. 5. JSTOR.
Rocheleau, D. E. (2008). Political ecology in the key of policy: From chains of explanation to webs of relation. Geoforum, 39(2), 716–727.
Russett, B. M. (1967). The ecology of future international politics. International Studies Quarterly, 11(1), 12–31.
Schroeder, P., Brown, S., Mo, J., Birdsey, R., & Cieszewski, C. (1997). Biomass estimation for temperate broadleaf forests of the United States using inventory data. Forest Science, 43(3), 424–434.
Scoones, I. (1999). New ecology and the social sciences: what prospects for a fruitful engagement? Annual Review of Anthropology, 28(1), 479–507.
Sivaramakrishnan, K. (1996). The politics of fire and forest regeneration in colonial Bengal. Environment and History, 2(2), 145–194.
Suarlin, S., & Ali, M. I. (2020). The Effect of Environmental Education Learning on Students at University. International Journal of Environment, Engineering & Education, 2(3), 49–56.
Vayda, A. P. (1983). Progressive contextualization: methods for research in human ecology. Human Ecology, 11, 265–281.
Vayda, A. P., Rappaport, R. A., & Clifton, J. (1968). Ecology, cultural and non-cultural.
Vayda, A. P., & Walters, B. B. (1999). Against political ecology. Human Ecology, 27(1), 167–179.
Walker, P. A. (2005). Political ecology: where is the ecology? Progress in Human Geography, 29(1), 73–82.
Woodgate, G., & Redclift, M. (1998). From a 'sociology of nature'to environmental sociology: beyond social construction. Environmental Values, 7(1), 3–24.
Worster, D. (1988). The ends of the earth: Perspectives on modern environmental history. Cambridge University Press.
Wynne, R. D. (1994). The emperor's new eco-logos?: a critical review of the Scientific Certification Systems environmental report card and the Green Seal certification mark programs. Virginia Environmental Law Journal, 51–149.
Zimmerer, K. S. (1994). Human geography and the "new ecology": The prospect and promise of integration. Annals of the Association of American Geographers, 84(1), 108–125.
Zimmerer, K. S. (1996). Discourses on soil loss in Bolivia. Sustainability and the search for socioenvironmental" middle ground". Liberation Ecologies: Environment, Development, Social Movements., 110–124.
Zimmerer, K. S. (2000). The reworking of conservation geographies: nonequilibrium landscapes and nature-society hybrids.