# COMMUNITY ECOLOGICAL KNOWLEDGE ON FOREST CONSERVATION: IMPLICATIONS FOR EDUCATIONAL ADMINISTRATION AND SUSTAINABLE ENVIRONMENTAL GOVERNANCE

**Roberto S. Eyo II**
Zamboanga Peninsula Polytechnic State University, Philippines
Contact number: +639171420260 email: eyorobertoii@gmail.com

***ABSTRACT**: This study examined community ecological knowledge (CEK) on forest conservation and its implications for educational administration and sustainable environmental governance. Using a qualitative descriptive design, ten community residents participated in semi-structured interviews exploring their understanding of forests' ecological functions. Thematic analysis revealed five dominant knowledge domains: (1) disaster mitigation, recognizing forests as buffers against floods, landslides, and typhoons; (2) climate regulation, highlighting forests' roles in microclimate stabilization, carbon sequestration, and agricultural support; (3) livelihood support, emphasizing timber and non-timber resources critical for daily subsistence; (4) watershed sustainability and biodiversity, reflecting awareness of forests' importance in water quality, soil conservation, and habitat protection; and (5) integration of formal and experiential knowledge, demonstrating that ecological understanding is reinforced through both classroom learning and lived experience. Participants' narratives indicate that CEK is contextual, actionable, and informed by both education and community observation. Findings suggest that CEK can inform curriculum planning, institutional sustainability initiatives, and environmental policy development, positioning educational institutions as active agents in promoting sustainable forest governance and environmental stewardship.*

**Keywords:** Community Ecological Knowledge, Forest Conservation, Disaster Mitigation, Climate Regulation, Environmental Education, Sustainable Governance

## 1. INTRODUCTION.

Environmental conservation has become a pressing global concern due to escalating deforestation, biodiversity loss, and climate change. Forest ecosystems provide critical services, including regulation of water cycles, prevention of soil erosion, disaster mitigation, and support for biodiversity [1]. In local communities, residents' knowledge and attitudes toward forests influence conservation behaviors and the sustainable use of natural resources. Understanding community ecological knowledge (CEK) is therefore essential, as it shapes collective responsibility, environmental engagement, and local stewardship practices [2].

Research in environmental education emphasizes the role of formal instruction and community-based learning in enhancing ecological literacy and promoting pro-environmental behavior [3, 4]. Environmentally-focused language programs have also been shown to foster awareness of sustainability issues and reinforce social norms for responsible environmental practices [5, 6]. Within this framework, residents' perceptions of collective responsibility, urgency for environmental protection, and willingness to engage in conservation activities are shaped by both personal values and community expectations, consistent with the Theory of Planned Behavior, which posits that attitudes, subjective norms, and perceived behavioral control predict intentions and behaviors [7].

Despite growing literature on CEK, there is limited research on how such knowledge can inform educational administration, curriculum development, and institutional sustainability initiatives. Linking CEK with formal education and governance structures is crucial for designing programs that cultivate environmental stewardship, enhance disaster resilience, and support sustainable forest management.

### Research Questions

This study is guided by the following research questions:

1. What community ecological knowledge (CEK) do residents possess regarding forest conservation, specifically in disaster mitigation, climate regulation, livelihood support, and watershed sustainability?
2. How can CEK inform educational administration and sustainable environmental governance?
3. What strategies can be proposed to integrate CEK into curriculum planning, policy formulation, and institutional sustainability initiatives?

By examining these questions, the study aims to provide empirical evidence for educational administrators and policymakers on the integration of CEK into institutional strategies, thereby contributing to sustainable environmental management, curriculum development, and community-based conservation efforts.

## 2. METHODOLOGY

This study employed a qualitative descriptive design to explore community ecological knowledge (CEK) regarding forest conservation and its implications for educational administration and sustainable environmental governance. Qualitative description was chosen to provide a straightforward and comprehensive understanding of participants' knowledge, perceptions, and experiences, without imposing theoretical interpretations beyond the participants' own perspectives.

### Participants

Ten residents from local barangays adjacent to forested areas participated in the study. Participants were selected using purposive sampling to ensure representation of individuals with direct interaction with forest ecosystems and engagement in environmental activities. The sample included a mix of ages, occupations, and educational backgrounds, reflecting the diversity of experiences and knowledge within the community. All participants voluntarily agreed to take part and provided informed consent prior to data collection.

**Data Collection**

Data were gathered through semi-structured interviews, allowing participants to describe their knowledge and experiences related to forest conservation in their own words. Interview questions focused on four key areas: (1) awareness of forests' role in disaster mitigation, (2) understanding of forests in climate regulation, (3) recognition of forests' contribution to livelihood support, and (4) knowledge of forests' importance for watershed sustainability and biodiversity. Interviews were audio-recorded with permission and supplemented by field notes capturing contextual observations.

**Data Analysis**

The recorded interviews were transcribed verbatim and analyzed using thematic analysis, following Braun and Clarke's six-step approach. This included: (1) familiarization with the data through repeated reading, (2) initial coding of meaningful units, (3) identification of patterns across participants, (4) clustering codes into themes corresponding to domains of CEK, (5) reviewing and refining themes to ensure they reflected the data accurately, and (6) defining and naming final themes. The analysis emphasized participants' own utterances, linking them to each knowledge domain while highlighting implications for education and environmental governance.

**Ethical Considerations**

Ethical approval was obtained from the relevant institutional review board. Participants were assured of confidentiality, and identifying information was anonymized in transcripts and reporting. They were informed of their right to withdraw from the study at any point without penalty. To ensure trustworthiness and credibility, the study employed member checking, where participants reviewed their transcripts for accuracy, and peer debriefing, where emerging themes were discussed with research colleagues. Rich descriptive quotes were used to support interpretations and enhance transparency.

## 3. RESULT AND DISCUSSION

Thematic analysis of interviews with ten participants revealed five interrelated domains of community ecological knowledge (CEK) on forest conservation: disaster mitigation, climate regulation, livelihood support, watershed sustainability and biodiversity, and integration of formal and experiential knowledge. These themes capture both participants' understanding of forest functions and the sources of their ecological knowledge, providing a foundation for educational and governance strategies.

**1. Disaster Mitigation**

Participants consistently emphasized that forests act as natural shields against environmental hazards. P1 stated, *"After the trees were cut near the river, our area flooded. Forests act like a shield for us,"* while P4 observed, *"The slope became unstable when the forest was cleared. During heavy rains, small landslides happen frequently."* P5 added the role of formal learning: *"In our environmental class, we learned that forests absorb rainwater and prevent flooding. Seeing it happen in our community made the lesson real."*

These narratives demonstrate that participants recognize forests' regulatory functions in stabilizing soil, reducing runoff, and mitigating floods, landslides, and typhoons. The knowledge reflects both experiential learning from direct observation and formal environmental education, aligning with empirical evidence on ecosystem-based disaster risk reduction strategies. For educational administration, this domain highlights opportunities to integrate CEK into disaster preparedness programs, curriculum modules, and school-community risk reduction initiatives.

**2. Climate Regulation**

Participants also demonstrated awareness of forests' role in climate stabilization and agricultural support. P6 described, *"Trees help regulate the climate and support crops. They are not just scenery; they are part of our daily survival,"* while P9 noted, *"The forest cools our area and stores carbon. If it disappears, the climate changes and crops fail."*

This knowledge underscores forests' contributions to microclimate regulation, carbon sequestration, and resilience of agricultural systems, reinforcing the ecological literacy of participants. Integrating this domain into environmental education curricula can enhance learners' understanding of climate change, ecosystem services, and sustainable practices. From a governance perspective, such knowledge can inform local policy-making, climate adaptation strategies, and community forest management plans.

**3. Livelihood Support**

CEK also included recognition of forests as sources of essential materials and income. P2 remarked, *"We rely on the forest for firewood, wild fruits, and materials for farming. Without it, life becomes difficult."*

Participants' understanding highlights forests as life-supporting systems, providing both timber and non-timber products that sustain livelihoods. This knowledge domain emphasizes the practical and economic importance of forests, which can be leveraged in educational programs to illustrate the direct relevance of ecological literacy to everyday life. Administratively, recognizing the livelihood value of forests can guide sustainability policies, community engagement strategies, and resource management education.

**4. Watershed Sustainability and Biodiversity**

Participants articulated the role of forests in maintaining water quality and biodiversity. P4 stated, *"The stream water is cleaner where trees grow. When the forest is gone, the water becomes muddy and unusable,"* P8 added, *"We learned that cutting too many trees affects water and animals. Knowing this makes me careful about what I do in the forest,"* and P9 highlighted, *"Many animals depend on the forest. If we lose it, birds, insects, and other creatures disappear too."*

These insights demonstrate a deep understanding of forests' ecological functions, including hydrological regulation, soil protection, and habitat provision for biodiversity. For education, this domain supports hands-on conservation projects, environmental monitoring exercises, and biodiversity awareness programs. In governance, it underscores the need for watershed management policies, habitat protection initiatives, and sustainable forestry practices.

**5. Integration of Formal and Experiential Knowledge**

Across all domains, participants emphasized that CEK is reinforced when formal education is complemented by

experiential learning and local narratives. P5 shared, *"We learned in class, but seeing it in our community made me realize why forests matter,"* while P7 observed, *"Stories from elders and lessons from school help me protect the forest; knowledge guides our behavior."* P8 noted, *"Using local stories and examples about the forest in school made me care more and share knowledge with friends. It's not just about learning; it's about doing something."*

This integration demonstrates that CEK is contextual, culturally relevant, and actionable, combining scientific knowledge with lived experience. For educational administration, this theme suggests strategies for curriculum design, sustainability initiatives, and community-based learning programs, ensuring that knowledge translates into responsible environmental behavior and policy support.

**Synthesis**

The findings illustrate that CEK encompasses a rich understanding of forests' ecological, social, and economic functions, derived from both formal education and lived experience. Participants' knowledge highlights the interconnection between environmental awareness and practical application. Leveraging CEK in curriculum planning, institutional sustainability programs, and policy formulation can strengthen the role of educational institutions in promoting environmental stewardship, collective responsibility, and sustainable forest governance.

## 4. CONCLUSION, RECOMMENDATION & IMPLICATIONS

**Conclusion**

This study demonstrates that community ecological knowledge (CEK) on forest conservation is both rich and actionable, encompassing five interrelated domains: disaster mitigation, climate regulation, livelihood support, watershed sustainability and biodiversity, and integration of formal and experiential knowledge. Participants consistently highlighted forests' critical ecological functions, including soil stabilization, flood and landslide prevention, climate moderation, provision of essential resources, maintenance of water quality, and support for biodiversity. CEK is derived from a combination of lived experiences, observations, local narratives, and formal environmental education, reflecting both practical and scientific understanding.

Findings indicate that CEK aligns closely with contemporary ecosystem service science and sustainability governance principles, yet remains underutilized in formal educational administration and policy development. The study underscores that integrating CEK into school curricula, institutional sustainability initiatives, and community programs can strengthen environmental stewardship and collective responsibility for forest conservation.

**Recommendations**

Based on the findings, the following recommendations are proposed:

1. **Curriculum Integration:** Educational institutions should embed CEK into science, environmental education, and language programs. This includes lessons on disaster mitigation, climate regulation, livelihoods, and watershed protection, using local examples and experiential activities.
2. **Teacher and Administrative Training**: School leaders and educators should receive training on leveraging community knowledge in instructional planning and policy development, ensuring CEK informs teaching practices and school sustainability initiatives.
3. **Community-School Partnerships:** Schools should collaborate with local communities to facilitate participatory conservation programs, such as tree planting, watershed monitoring, and biodiversity protection activities, which reinforce CEK while promoting civic engagement.
4. **Policy Development**: Local and educational policymakers should incorporate CEK into institutional sustainability strategies, aligning school-based programs with broader environmental governance frameworks and Sustainable Development Goals (SDG 13: Climate Action; SDG 15: Life on Land).

**Implications**

The study highlights several implications for practice and research:

- Educational Administration: CEK can serve as a governance resource, guiding curriculum design, disaster risk reduction education, and institutional sustainability planning.
- Sustainable Environmental Governance: By integrating CEK into local and institutional policies, communities can enhance collective responsibility, climate resilience, and biodiversity conservation.
- Research and Knowledge Transfer: Future studies can explore mechanisms for systematically capturing CEK and translating it into actionable strategies, including technology-based environmental learning platforms and participatory curriculum design.

In conclusion, leveraging community ecological knowledge as an educational and governance resource can foster sustainable environmental stewardship, enhance ecological literacy, and strengthen the role of schools as active agents in promoting conservation and climate resilience.

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