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Environmental Education Practices for Ecological Conservation in the Schools Division of Bulacan

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Abstract

This convergent parallel mixed methods study examined the implementation of Department of Education policies on environmental education, the contributions of school-community stakeholders, and the conditions and challenges affecting environmental activities in the Schools Division of Bulacan, Philippines. During the School Year 2022–2023, 42 public junior high schools were selected through stratified random sampling. The quantitative sample comprised 384 learners, 384 parents, 261 junior high school science teachers, 42 school heads, and 264 barangay officials ($N = 1,335$). The qualitative component included 20 purposefully selected participants from each stakeholder group ($n = 100$). Validated survey questionnaires, challenge-ranking items, and open-ended guide questions were analyzed through descriptive statistics and thematic analysis, then compared and merged by research objective. Perceived policy implementation was very high among school heads and high among teachers, learners, parents, and barangay officials. Perceived stakeholder contribution was highest among school heads and lowest among parents. In the separate challenge ranking, lack of resources ranked first, followed by insufficient school-community support, weak monitoring and evaluation, and limited training. Qualitative themes described policy-practice integration, youth and community engagement, stewardship education, sustainable activities, educational and environmental management, community responsibility, infrastructure and resilience, shared problems, and unique contextual challenges. Integrated findings showed widely reported implementation and sustained motivation alongside material and organizational constraints. Resource provision, monitoring, training, and shared school-community responsibility are priority areas for strengthening environmental education in the Division.

Keywords: environmental education; policy implementation; stakeholder participation; school-community partnerships; public junior high schools; mixed methods research

Introduction

Environmental education develops awareness, knowledge, attitudes, problem-solving skills, and participation in actions that improve the environment. Environmental literacy is the intended learner outcome reflected in informed judgment and responsible action. Keeping these terms distinct is important: environmental education refers to the educational process and program, whereas environmental literacy refers to the capacities that the process seeks to develop (U.S. Environmental Protection Agency, 2026).

This distinction is relevant in the Philippines, where development and resource use have placed continuing pressure on ecological systems. Material-flow evidence has shown the need to reduce the link between economic growth and environmental pressure in the country (Martinico-Perez et al., 2018). Schools therefore have a direct role in helping learners understand local environmental conditions and connect classroom knowledge with conservation practices.

Republic Act No. 9512 (2008), or the National Environmental Awareness and Education Act of 2008, requires the integration of environmental education across school curricula and programs. The Department of Education reinforced this policy through the establishment of the Youth for Environment in Schools Organization (YES-O) under DepEd Order No. 72, s. 2003 and subsequent environmental education and YES Program directives (Department of Education, 2003, 2011a, Environmental Education Practices for Ecological Conservation in the Schools Division of Bulacan. DOI: 10.65223/HUKG9736



2011b). DepEd Order No. 34, s. 2022 governed the School Year 2022-2023 calendar and the resumption of co-curricular activities (Department of Education, 2022).

Within the Schools Division of Bulacan, earlier assessment results showed gaps in learner performance on ecosystem concepts and environmental problem solving, while the Division Education Development Plan identified Makakalikasan and learning recovery as continuing priorities (Schools Division of Bulacan, 2021, 2023). The province includes urban, agricultural, upland, and coastal communities, making local context important in environmental education (Provincial Government of Bulacan, n.d.).

This study drew on social ecology theory and place-based education. A social-ecological perspective connects environmental issues with relationships among schools, families, communities, and institutions, while place-based education emphasizes learning grounded in local issues and school-community relationships (Suškevičs et al., 2018; Yemini et al., 2025). These perspectives guided the interpretation and program relevance; neither was measured as a separate study variable.

Recent studies continue to emphasize that environmental education is strongest when curriculum, action, and community participation are connected. Classroom integration can strengthen environmental ethics and responsibility among secondary learners (Olawumi & Mavuso, 2023; Mahat et al., 2022), while studies of sustainability education and local environmental learning report gains in knowledge, attitudes, and action competence when learners encounter meaningful opportunities to participate (Olsson et al., 2022; Ramírez Suárez et al., 2023; Rice et al., 2024). Bibliometric evidence also shows that empirical environmental education research remains concentrated in particular settings, supporting the value of locally grounded evidence (Yanniris et al., 2018). However, implementation can remain uneven when schools lack resources, monitoring systems, or coordinated support.

Earlier work in Bulacan evaluated a greener curriculum and youth empowerment through environmental programs (Perez, 2019a, 2019b). The present study extended this local work by examining environmental education as practiced across stakeholder groups in the Schools Division of Bulacan. It focused on what stakeholders reported about policy implementation, their contributions, and the challenges encountered in carrying out environmental activities. The results were intended to guide practical improvements in environmental education and support the development of environmental literacy.

Research Objectives

1. Determine how DepEd policies on environmental education, particularly those related to ecological conservation and the YES Program, are implemented and practiced in the Schools Division of Bulacan.
2. Describe how learners, parents, science teachers, school heads, and barangay officials contribute to the realization of environmental education policies.
3. Identify the conditions and challenges experienced in carrying out environmental education activities and integrate quantitative and qualitative evidence to determine priority areas for improvement.



Methodology

Research Design

This study used a convergent parallel mixed methods design (Creswell, 2014). Quantitative survey data and qualitative responses to open-ended guide questions were collected during the same study period, analyzed separately, and merged during interpretation. The quantitative component described stakeholder perceptions and challenge rankings. The qualitative component explained how environmental education was practiced, supported, and constrained in local settings.

Study Setting and Data-Collection Period

This study was conducted in 42 public junior high schools across the six educational districts of the Schools Division of Bulacan, Philippines. The schools represented the municipalities covered by the Division and their varied community contexts. Survey administration commenced following written approval from the Schools Division of Bulacan on June 20, 2023. Responses from learners, parents, science teachers, and barangay officials were accepted until July 10, 2023, the end of the School Year 2022-2023. The school-head survey remained open during the school vacation until approximately August 15, 2023.

Participants and Sampling

Two junior high schools per municipality were selected through stratified random sampling. When a municipality had more than two eligible schools, the fishbowl method was used. Sample allocations for learners, parents, and science teachers were proportional to the populations of the selected schools. School heads assisted in the random selection of teachers, learners, and parents, while Punong Barangays selected the barangay officials. Quantitative learners were 13–16 years old, enrolled in a selected school, taking junior high school science, and members of YES-O; the parent group corresponded to participating learners. The adult groups comprised junior high school science teachers, heads of the selected schools who led environmental education implementation, and Sangguniang Barangay members serving communities where the schools were located.

Table 1

Planned and Final Quantitative Sample

Group	Reported population basis	Calculated sample	Analyzed n
Learners	149,083	384	384
Parents	149,083	384	384
JHS science teachers	807	261	261
School heads	42 selected schools	42	42
Barangay officials	840	264	264
Total	—	1,335	1,335

Note. Minimum sample sizes for learners, parents, science teachers, and barangay officials were calculated using Raosoft. All 42 school heads were included through total enumeration. The final analyzed sample was 1,335.

Purposeful sampling was used for the qualitative component. A fixed quota of 20 participants from each stakeholder group produced a total qualitative sample of 100 and provided balanced representation for cross-group thematic comparison. Learners were enrolled in a selected school, took subjects that integrated environmental education, and were YES-O officers or members for three consecutive school years. Teachers were junior high school science teachers who served as YES-O advisers within the previous five school years. School heads managed selected schools, held School Principal III or IV positions, and had led environmental activities. Parents had a child enrolled in a selected school and were parents of a qualifying YES-O learner. Barangay participants were chairpersons or representatives from the Sangguniang Barangay where a selected school was located. Willingness to participate was required in every group.

Research Instruments

The self-developed instruments contained four parts: participant information; five-point agreement items on policy implementation, stakeholder contribution, and conditions relevant to addressing challenges; a challenge-ranking task; and seven open-ended guide questions. The name field was optional, and the parent/barangay form also contained an address field. The instruments were prepared in English, with Filipino translations for learners, parents, and barangay officials.



Five experts in science education, environmental policy, educational planning and research, and YES-O implementation assessed content relevance. Four language reviewers checked the English-Filipino translations. Pilot testing was conducted in the Hagonoy West District, outside the final study sample, with the permission of the district and school authorities. Complete instrument versions are provided in the accompanying Supplementary Research Instruments file.

Table 2
Pilot Reliability of the Survey Instruments

Instrument group	Pilot n	Part	Cronbach's alpha	Interpretation
School heads	13	Agreement scale	0.987	Excellent
School heads	13	Ranking items	0.683	Acceptable
Teachers	20	Agreement scale	0.965	Excellent
Teachers	20	Ranking items	0.879	Good
Learners	20	Agreement scale	0.817	Good
Learners	20	Ranking items	0.739	Good/acceptable
Parents/barangay officials	12	Agreement scale	0.929	Excellent
Parents/barangay officials	12	Ranking items	0.824	Good

Data-Collection Procedure

After ethical and administrative permissions were secured, the researcher coordinated with the selected school heads and Punong Barangays. Participants received the study information and consent materials before answering. Survey questionnaires and open-ended guide questions were administered in person, with Microsoft Forms available as an alternative. The seven guide questions covered knowledge and experience of DepEd environmental policies, stakeholder cooperation and activities, locally encountered problems, whether those problems were shared or unique to a community, and possible solutions. Filipino versions were available for learners, parents, and barangay officials; Filipino quotations presented in this article are accompanied by English translations.

Data Analysis

Quantitative results were analyzed using frequencies, means, and standard deviations. The agreement scale used 5 = Strongly Agree, 4 = Agree, 3 = Moderately Agree, 2 = Disagree, and 1 = Strongly Disagree. Mean ranges were interpreted as Very High (4.50-5.00), High (3.50-4.49), Moderate (2.50-3.49), Low (1.50-2.49), and Very Low (1.00-1.49). For the conditions reported in Table 5, higher agreement denotes stronger perceived cooperation, motivation, clarity, support, or resource sufficiency; it does not denote greater challenge severity. The separate ranking task used 5 = most difficult to address and 1 = easiest to address. Mean ranking scores were ordered from highest to lowest; fixed numerical cutoff ranges were not applied to these rank scores. Because no inferential tests were conducted, group comparisons in this article are descriptive.

Qualitative responses were analyzed through a hybrid thematic approach guided by Creswell (2013) and Nowell et al. (2017). The responses were first organized in three Excel matrices by research objective, guide question, and stakeholder group. The research objectives and guide-question domains provided the deductive organizing frame, while the researcher conducted the initial review and assigned descriptive codes to recurring ideas in the responses. Related codes were clustered directly into emerging themes, and each theme was defined and linked to illustrative response excerpts in the retained matrices. Patterns were reviewed across the five stakeholder groups and examined alongside the quantitative findings. The coding process was reviewed by a qualified coder who also served as the dissertation adviser; the coder's identity and qualifications are documented in the signed coder's certification. The review focused on the alignment of the descriptive codes, emerging themes, theme definitions, and supporting excerpts with the original responses. Because the review did not involve independent parallel coding, no separate set of coding decisions required reconciliation, and no inter-coder agreement coefficient was calculated. The Excel matrices documented the progression from participants' responses to descriptive codes and emerging themes. Trustworthiness was supported through the preservation of response-to-code and code-to-theme linkages, comparison of patterns across stakeholder groups, integration of the qualitative and quantitative findings, qualified-coder review, and the use of representative quotations. Participant quotations are identified using anonymous stakeholder codes: SH = school head, T = teacher, L = learner, P = parent, and BO = barangay official; the numerals correspond to the response numbers in the matrices.



Mixed Methods Integration

The two datasets were integrated by research objective after their separate analyses. Group means and item-level patterns were compared with themes and representative quotations in a side-by-side procedure. Convergent findings were reported when both datasets pointed to the same condition; qualitative findings were used to elaborate quantitative patterns; and disagreements were retained and explained. In particular, high agreement with positive implementation and motivation indicators was interpreted alongside the ranking and qualitative evidence of resource, support, monitoring, training, and infrastructure constraints. The latter evidence qualified, rather than invalidated, the positive ratings.

Ethical Considerations

The Bulacan State University Ethics Review Committee reviewed and approved the study protocol on June 6, 2023, and the informed-consent materials on June 8, 2023. The Ethics Review Committee did not assign a protocol or reference number to the approval; therefore, the approval dates are reported instead. The Schools Division of Bulacan granted written permission on June 20, 2023. Adult participants provided informed consent. Parents or guardians provided consent for minor learners, and the learners provided assent. Participation was voluntary, and participants could withdraw without penalty.

Confidentiality and data protection followed Republic Act No. 10173 (2012), the Data Privacy Act of 2012. The consent materials stated that responses would not be linked to participants' identities and that survey responses would be stored separately with access limited to authorized persons. Participant codes or pseudonyms were used in the analysis and reporting, and audio recording or photo documentation was undertaken only with permission. The collected data were destroyed after the completion of the study in accordance with the approved procedure.

Results and Discussion

The results and discussion section presents the findings of the study in relation to the research questions or objectives and interprets their meaning. It reports the results using appropriate statistical values, tables, figures, or qualitative themes, followed by an explanation of what the findings indicate. The discussion integrates the results with relevant literature, highlighting similarities, differences, and new insights. This section also explains the implications of the findings for theory, practice, or policy and may acknowledge limitations that affect the interpretation of the results.

The results are presented in three sections corresponding to the research objectives. Quantitative findings are reported first, followed by qualitative evidence and an integrated interpretation. All comparisons among stakeholder groups are descriptive.

Implementation and Practice of DepEd Environmental Education Policies

Quantitative Findings

All five groups reported high or very high agreement with the implementation indicators. School heads had the highest overall mean ($M = 4.84$), followed by science teachers ($M = 4.43$), barangay officials ($M = 4.11$), learners ($M = 4.09$), and parents ($M = 3.96$). The item-level results show where implementation was strongest and where participation was less consistent.

Table 3
Group Scores and Item-Level Patterns for Policy Implementation

Group	M	SD	Highest-rated indicator (M)	Lowest-rated indicator (M)
School heads	4.84	0.41	YES Program requirement; school direction; learner activities (4.86)	Learner participation in community initiatives (4.79)
Science teachers	4.43	0.87	YES Program requirement (4.51)	Learner participation in community initiatives (4.32)
Learners	4.09	1.01	Teachers integrate environmental concepts (4.48)	Empowered to implement YES Program (3.79)
Parents	3.96	0.96	Environmental activities conducted in community (4.13)	Opportunity to provide resources (3.75)
Barangay officials	4.11	0.71	Informed of ways to conserve environment (4.19)	Opportunity to provide resources (3.92)

Note. Mean interpretation: 4.50-5.00 = Very High; 3.50-4.49 = High; 2.50-3.49 = Moderate; 1.50-2.49 = Low; 1.00-1.49 = Very Low.



Qualitative Findings

The analysis identified three themes. Each theme is defined below before the supporting participant statement is presented. Figure 1 presents the conceptual relationship among the three themes concerning policy implementation and practice.

Policy and Practice Integration. This theme refers to the translation of environmental education policies into school planning, curriculum integration, campaigns, and programs.

“Yes, we are tasked to prepare Action Plan and Program of Activities for proper implementation in the school.” — SH01

Community and Youth Engagement. This theme captures the active involvement of learners and other school-community members in environmental initiatives, particularly through YES-O and related activities.

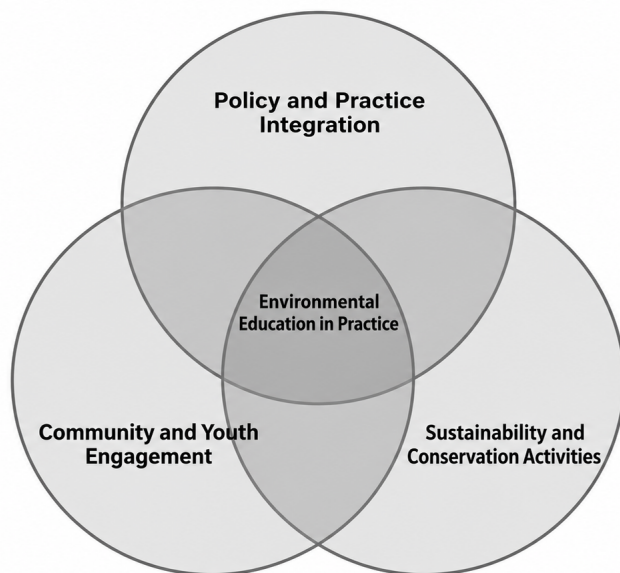
“As School Head, I closely monitor the activities of the clubs which advocate Environmental Conservation like YES-O, Eco-Savers Club, Science Club, and SSG and suggested activities and projects which promote environmental conservation.” — SH06

Sustainability and Conservation Activities. This theme covers hands-on activities through which environmental education becomes visible in practice, including tree planting, waste management, and other eco-friendly projects.

“Ang akin pong alam na patakaran isinasagawa sa aming paaralan ay ang waste segregation management. [English translation: The policy I know is being implemented in our school is waste-segregation management.]” — L01

Figure 1.

Conceptual Relationships among Themes in the Implementation and Practice of Environmental Education





Integrated Interpretation

The qualitative evidence converged with the high survey ratings by showing that environmental education was visible in classroom integration, YES-O activities, waste management, and other school-based actions. The item-level results also qualified the overall ratings: learner empowerment ($M = 3.79$) and opportunities for parents and barangay officials to provide resources ($M = 3.75$ and $M = 3.92$) were lower than the strongest items in their respective groups. This suggests that implementation was established but participation was not equally experienced across stakeholder groups.

The pattern is consistent with recent evidence that school environmental education benefits from clear institutional support and opportunities for learners to participate in locally meaningful action (Ramírez Suárez et al., 2023; Rice et al., 2024). The findings support stronger links among policy, classroom instruction, co-curricular activity, and community participation. They are not evidence that place-based education itself caused the reported ratings, because that approach was not directly measured.

Stakeholder Contribution to Environmental Education Policies

Quantitative Findings

Perceived contributions were very high among school heads and high among the other groups. School heads reported the strongest contribution ($M = 4.74$), while parents reported the lowest overall mean ($M = 3.70$). The most distinct item-level gap was parent leadership of environmental initiatives, which was rated moderate ($M = 3.38$). Learner leadership was also lower than learner participation ($M = 3.63$ versus $M = 4.07$).

Table 4

Group Scores and Item-Level Patterns for Stakeholder Contribution

Group	M	SD	Highest-rated indicator (M)	Lowest-rated indicator (M)
School heads	4.74	0.51	Lesson integration/resource support (4.81)	Participation in community-led initiatives (4.55)
Science teachers	4.18	0.87	Promote practices through lessons (4.37)	Lead/facilitate activities (3.97)
Learners	3.92	1.02	Participate in community-led initiatives (4.07)	Lead environmental initiatives (3.63)
Parents	3.70	1.02	Promote conservation at home (4.09)	Lead environmental initiatives (3.38)
Barangay officials	4.10	0.88	Participate in community-led initiatives (4.30)	Provide resources (3.81)

Note. The same five-point agreement scale and mean ranges shown under Table 3 were used.

Qualitative Findings

Four themes explained how stakeholders contributed. Concise definitions from the thematic analysis are followed by statements that illustrate each theme. Figure 2 presents the conceptual relationship among the four themes of stakeholder contribution.

Environmental Stewardship Education. This theme concerns the importance of environmental education in schools, advocacy for environmental awareness, and the use of different platforms to share environmental information.

“The activities that may contribute in the promotion of environmental education is through values integration manifested in the daily lesson plan of the teachers.” — T03

Integration of Environmental Policies. This theme refers to the alignment of school and community activities with government programs, environmental ordinances, and wider policy initiatives.

“Pagsasagawa o [pakikiisa] sa Manila Bay Weekly Clean Up Drive. Pagpapatupad ng ordinansa at resolusyon. [English translation: Participating in the Manila Bay Weekly Clean-Up Drive and implementing ordinances and resolutions.]” — BO05



Sustainable Practices and Initiatives. This theme covers concrete conservation practices such as waste management, school or urban gardening, clean-up drives, and related sustainability projects.

*“Mahalaga ito upang maturuan ng mga matatanda ang mga bata ukol sa tamang pagtatapon ng basura sa tamang tapunan.
[English translation: This is important so that adults can teach children to dispose of waste in the proper place.]” — BO18*

Community Engagement and Partnership. This theme describes cooperation and shared responsibility among school and community members in planning and carrying out environmental work.

“Collaboration and support of the community is important to make the activity successful.” — SH19

Figure 2.

Conceptual Relationships among Themes in Stakeholder Contribution



Integrated Interpretation

The qualitative themes elaborated the quantitative results by showing that contribution took different forms: school heads and teachers emphasized curriculum and program leadership, learners described participation, parents emphasized practices at home, and barangay officials described community action. The lower leadership scores among learners and parents indicate that participation did not always extend to shared decision-making or project leadership. This is a practical area for improvement rather than evidence of a statistically significant group difference.

Research on place-based and sustainability education likewise emphasizes participation across classroom and community settings (Gonzalez, 2023; Yemini et al., 2025). The present results indicate that schools can build on existing support by assigning clearer roles to learners, parents, and barangay partners and by creating regular opportunities for them to plan, implement, and review environmental activities.



Conditions and Challenges in Carrying Out Environmental Education Activities

Perceived Conditions Supporting Environmental Activities

Table 5 reports agreement with four conditions common to all stakeholder instruments: cooperation, motivation, clarity and sustainability of plans, and community support. The school-head and teacher instrument also assessed resource sufficiency. Higher means therefore indicate stronger perceived capacity to address difficulties, not greater difficulty. Motivation and cooperation received the strongest ratings, whereas resource sufficiency or community support received the lowest ratings within the groups.

Table 5
Perceived Conditions Supporting Environmental Education Activities

Group	M	SD	Highest-rated condition (M)	Lowest-rated condition (M)
School heads	4.58	0.63	Motivation despite challenges (4.79)	School resources are sufficient (4.26)
Science teachers	4.09	0.83	Motivation despite challenges (4.28)	School resources are sufficient (3.87)
Learners	4.29	0.87	Cooperation addresses challenges (4.42)	Activities receive community support (4.15)
Parents	4.07	1.12	Cooperation addresses challenges (4.24)	Activities receive community support (3.89)
Barangay officials	4.16	0.85	Cooperation addresses challenges (4.29)	Activities receive community support (3.87)

Note. Higher means indicate stronger agreement that the supportive condition was present. They do not indicate a more severe challenge.

Ranking of Challenges

The separate ranking task directly measured perceived difficulty. Lack of resources for environmental projects was ranked first by every stakeholder group: school heads (M = 3.28), teachers (M = 3.38), learners (M = 3.15), parents (M = 2.70), and barangay officials (M = 3.08). The overall ranking is shown in Table 6.

Table 6
Overall and Group-Specific Ranking of Environmental Education Challenges

Challenge	Overall mean score	Overall rank	Group ranks: SH / T / L / P / B
Lack of resources for environmental projects (funds, space/venue, materials)	3.12	1	1 / 1 / 1 / 1 / 1
Lack of support from school-community members	2.88	2	2 / 2 / 2 / 2 / 3
Weak monitoring and evaluation of environmental projects	2.75	3	3 / 4 / 3 / 3* / 2
Lack of training for teachers, student leaders, and community members	2.67	4	4 / 3 / 4 / 3* / 4
Low-to-moderate integration of environmental concepts in class discussion and activities	2.56	5	5 / 5 / 5 / — / —

*Note. Ranking scale: 5 = most difficult to address; 1 = easiest to address. Higher mean scores received higher priority ranks. SH = school heads; T = teachers; L = learners; P = parents; B = barangay officials. * Parent ranks for monitoring and training were tied. The fifth item did not appear in the parent/barangay instrument.*

Qualitative Findings

Six themes described how the challenges appeared in practice. Each theme is defined below before the supporting participant statement is presented. Figure 3 presents the conceptual relationship among the six themes describing challenges in environmental education.

Environmental Management Challenges. This theme covers operational environmental concerns in schools and communities, including waste, energy, and water use, indoor air quality, biodiversity and green spaces, transportation, chemical use, and environmental education itself.

“Waste management, energy consumption, water usage, indoor air quality, biodiversity and green spaces, transportation, chemical usage, environmental education.” — SH05

Educational Challenges and Practices. This theme concerns curriculum integration, teaching practice, training and capacity building, learner interest and attention, and the difficulty of translating environmental knowledge into action.

“Lack of interest of the learners in conserving the environment and their short attention span.” — T13



Community Engagement and Responsibility. This theme refers to community participation, initiative, accountability, and environmental practices that connect school activities with conditions outside the classroom.

“Some elected people are not engaging anything to promote in [their] community. They lack initiatives.” — P08

Infrastructure and Environmental Resilience. This theme describes physical and structural conditions, particularly drainage and flooding, that can support or hinder environmental activities and community access.

“In our school community the main problem is the flood from other brgy [barangays]. When it rains a little, the streets are not passable already; it is because of the poor drainage [drainage] system.” — T11

Shared Environmental Challenges. This theme recognizes that some environmental problems recur across nearby schools, communities, or districts and therefore may require coordinated responses.

“Most of the issues are same with other nearby communities.” — T04

Unique Contextual Challenges. This theme refers to problems that take a distinct form because of local geography, infrastructure, or community practices.

“Bad smell coming from dumpsite outside the school.” — T03

Integrated Interpretation

The two datasets show both convergence and divergence. They converged on the value of cooperation and the need for resources, support, monitoring, and training. They diverged in tone: the agreement scale reflected strong motivation and positive perceptions of existing conditions, while the ranking and open-ended responses identified concrete barriers. This divergence was retained in the interpretation. It indicates that stakeholder commitment can be high even when the material and organizational conditions for sustained action are incomplete.

The themes also show that challenges vary by local context, including drainage, flooding, waste, and nearby dumpsites. Social-ecological research emphasizes that learning and environmental action depend on relationships among institutions, communities, and local resource conditions (Suškevičs et al., 2018). Updated guidance likewise calls for action-oriented environmental learning supported by adequate teacher preparation and whole-school systems (UNESCO, 2024). The present results therefore support targeted rather than uniform responses across the Division.

Figure 3.

Themes Describing Challenges in Environmental Education



Conclusion

For the first objective, participants rated the implementation of DepEd environmental education policies as high or very high and described curriculum integration, YES-O activities, waste management, and other conservation practices. Item-level results nevertheless showed less consistent learner empowerment and fewer opportunities for parents and barangay officials to contribute resources.



For the second objective, all stakeholder groups reported their contributions in different ways. School heads and teachers reported strong roles in program leadership and lesson integration, while learners, parents, and barangay officials contributed mainly through participation, household practices, and community initiatives. Learner and parent leadership were the clearest areas for strengthening.

For the third objective, high agreement on cooperation and motivation coexisted with practical constraints. These supportive conditions should be read together with the separate difficulty ranking. Lack of resources was the leading ranked challenge, followed by insufficient school-community support, weak monitoring and evaluation, limited training, and uneven classroom integration. Qualitative findings added environmental management, infrastructure and resilience, shared environmental problems, and unique contextual concerns. Taken together, the findings support environmental education that is adequately resourced, monitored, locally responsive, and shared across the school community.

Limitations and Directions for Future Research

The findings are based on self-reported, cross-sectional data and descriptive statistics. Social-desirability bias may have increased agreement with favorable self-report statements. The 42-school sample and the purposive qualitative sample were localized to the Schools Division of Bulacan; therefore, transfer to other divisions should consider differences in geography, resources, and school-community arrangements. The fixed qualitative quota provided balanced stakeholder representation but was not determined through a documented saturation procedure. Future studies may use multi-division samples, inferential analyses, independent observations or document-based indicators, and longitudinal designs to examine how implementation and environmental literacy outcomes change over time.

Recommendations

1. Schools and the Division Office should prepare a resource inventory and annual priority list for environmental projects, and then use documented partnerships with local government units, nongovernment organizations, and private groups to address specific shortages in funds, materials, venues, and equipment.
2. School heads and barangay officials should establish a communication and participation plan that assigns clear roles to learners, parents, teachers, and community partners from planning through evaluation. Learner and parent representatives should be given feasible leadership responsibilities rather than participation-only roles.
3. The Division should use a common monitoring and evaluation framework for environmental education, with a small set of indicators, responsible persons, reporting schedules, and feedback meetings. Monitoring should cover curriculum integration, participation, resource use, project continuity, and locally relevant outcomes.
4. Professional development should respond to the ranked training gap. Science teachers, YES-O advisers, student leaders, and community partners should receive role-specific training on environmental content, project management, learner engagement, and the use of local issues as contexts for instruction.
5. Schools should connect classroom learning with manageable conservation activities and address context-specific concerns identified by their communities. Infrastructure issues such as drainage, waste collection, and proximity to dumpsites should be referred to the responsible school or local-government offices and incorporated into coordinated action plans where appropriate.
6. Future research should track implementation over more than one school year and include direct measures of learner environmental literacy, project outputs, and environmental practices. Comparative studies across divisions may test whether the patterns found in Bulacan persist in other ecological and administrative contexts.



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