

Assessing the Impact of Environmental Education on Sustainable Practices: A Semi-Systematic Literature Review

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ABSTRACT : Environmental education is a powerful tool for cultivating the attitudes, knowledge, and skills necessary to address environmental challenges, yet it also reveals areas of both empowerment and vulnerability in sustainability efforts. This study examines how environmental education influences institutional practices aimed at addressing specific environmental issues and promoting sustainable development. Employing a semi-systematic literature review, the research synthesizes themes from various studies to evaluate both strengths and limitations of environmental education in institutional settings. Findings indicate that environmental education empowers institutions to adopt long-term sustainable practices, enhancing environmental awareness, integrating indigenous knowledge, and encouraging academic and community participation in global environment initiatives. While these themes cover various issues, key gaps persist. Evidence on the long-term impact of environmental education in fostering sustainable behaviors across institutions is limited, as is research on local policy implementation and its effects on communities. Although climate change and pollution are well-researched, integrated approaches connecting education, policy, and conservation remain lacking. Addressing these gaps, this study explores specific ways to optimize environmental education in supporting sustainable development at multiple levels. These insights underscore the need to harness the full potential of environmental education while addressing its limitations, promoting a balanced approach that builds resilience and fosters a deeper relationship between communities and the environment. The findings provide a foundation for strengthening environmental education's role in sustainable development, advancing knowledge, and fostering innovative solutions to environmental challenges.

KEYWORDS - Environmental Education, Sustainable Development, Institutional Practices, Indigenous Knowledge, Semi-Systematic Literature Review

I. INTRODUCTION

Rising environmental problems and concerns from the 1950s to the 1990s has resulted in the emergence of sustainability which focuses on three concepts: the economy, ecology and equity. Institutions serve as an important tool in achieving sustainable development, as they need to utilize their resources to create practices, policies and to conduct action not only for environmental development but also the economic development for all classes of society and for next generations [1]. Institutions must lead the emergence of sustainability by enhancing environmental education because it is crucial to use their resources and power to maintain and support environmental practices that have been applied over the years to solve environmental problems. The integration of the concepts of sustainability will make the institutions economically stable, increasing the environmental knowledge of people and it will make institutional and societal collaboration towards mitigating environmental

concerns. Environmental practices need to be assessed before they are implemented and modified throughout the years by the institution to ensure that these environmental practices were really suited to solve the specific environmental problems that was face by the community. The widespread use of these environmental practices will be the key to increasing people's environmental awareness and strengthening their desire to make changes and to improve the quality of the environment through these practices. The power of the people is stronger than that of the people in power, and it shows the importance of voluntary and collective efforts between institutions and the community. Conversely, when there is a harmonious action between development and environment, it supports the idea of having a long-term development that is sustainable. As highlighted in Corpuz [2], implementing a comprehensive sustainability strategy using the TBL (Triple Bottom Line) framework can aid in building systems that are socially, ecologically, and economically sustainable, thereby making a substantial contribution to long-term adaptation and resilience.

The UN Secretary-General Guterres stated that “our world as we know it and the future we want are at risk. Despite considerable efforts these past four years, we are not on track to achieve the Sustainable Development Goals by 2030” [3]. It is really concerning as these details came from the Global Sustainable Development Report, a publication by the United Nations that provide scientific and evidence-based insights that informed the policymakers and public regarding the challenges and progress towards sustainable development. The development strategies pursued have caused a decline in people's quality of life, as it focuses on exploiting the environment to increase economic growth while neglecting environmental issues and confronting the environmental defenders. The institutions must change in setting their development objectives in achieving sustainable development by implementing a policy that can adapt to address global issues and fosters collaboration that will enhance the effectiveness of their policies which will lead to a better outcome for the environment and people. It is also important to concentrate on implementing environmental practices for a cleaner environment and focus on solving domestic problems which hinder sustainable development. In line with this, Licy et al. [4], note the importance of protecting the environment, as it attained the highest global significance in this generation. It highlights that a healthy environment meets the needs of the people and ensures that the environment was still usable in the future generations. However, people frequently need to pay more attention to environmental practices such as proper waste disposal. The lower level toward implementing environmental policies contributed to elevating the level of challenges despite having enough awareness and knowledge of people regarding the adverse consequences of improper waste disposal. It is important to address and to stop neglecting the environment as it will be considered as one of the threats to human life and global ecosystems.

In the 18th century, two influential scholars provided information about environmental education. Jean-Jacques Rousseau emphasized the significance of learning and training in enhancing the environment. After several years, Louis Agassiz, the origin of environmental education started to develop as this scholar supported Rousseau's philosophy by encouraging his students to study the environment instead of books [5]. These two influential scholars helped to create a foundation for an environmental education program called *Nature Study*. It resulted in a better environmental awareness among students as it portrayed a direct interaction with nature and provided a deeper understanding of the natural world.

Despite significant research on environmental awareness, there may be a need for more cooperation between local and worldwide institutions in promoting environmental education. For example, although much research has stated that environmental education is effective and makes people environmentally aware, according to Carangan [6], there is a need to increase environmental education awareness in coastal schools, particularly about limited challenges. It says that some schools need more knowledge and understanding, and some need more discipline when it comes to environmental education contribution. On the other hand, according to Sarinas et al. [7], the national government's promotion of countryside tourism has led to sustainable and conservation tourism. The local government units (LGUs) of Rizal and Laguna have acknowledged the potential of ecotourism and designated it as a promising initiative to facilitate economic growth where people will be involved. A significant gap is community involvement because it requires attention and effort from the LGU to encourage individuals and promote the importance of volunteerism. Environmental, economic, and social factors must be integrated to comprehensively improve the quality of life, including environmental protection, economic stability, and social equity. Furthermore, according to Tristao & Tristao [8], an NGO must address its growing challenges, establish

partnerships, and reshape its traditional functions. NGOs must balance the objectives of environmental consideration and economic growth. It should also focus on improving internal organizational processes, ensuring legal compliance, and enhancing training for its human resources to enhance human capabilities in protecting the environment. After all, active participation and integration between the institutions and the community was essential to promote environmental education to achieve development in social and economic sectors and foster environmental conservation.

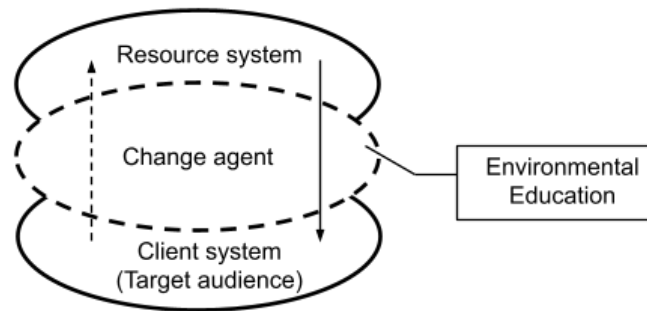
Therefore, the role of LGUs, NGOs, and Academic Institutions in raising environmental awareness through environmental education is relevant to the field of International Studies as this covers International Environmental Relations where it fosters collaboration between countries and institutions where they shared expertise, knowledge and resources in mitigating environmental problems, which are essential for driving meaningful environmental action to achieve a development that is sustainable. The 15th Sustainable Development Goal: Life on Land (SDG 15) will serve as a foundation for protecting and restoring the environment. By working together, these entities can more effectively promote and implement practices through environmental management that will provide enough resources to improve the quality of the environment. In light of these insights into both the empowering potential and the limitations of environmental education fostering sustainable practices, this study seeks to address the following research questions to deepen our understanding and provide actionable guidance. These questions, presented in the next section, serve as a foundation for exploring environmental education's impact on sustainability.

II. RESEARCH QUESTIONS

This study examines key themes in environmental education research, addressing the following questions: (1) To what extent does environmental education enhance sustainable practices within institutions? (2) How does environmental education influence the longevity of institutional environmental practices? (3) What role does environmental education play in defining the scope of sustainability efforts undertaken by institutions? (4) What are the causes and effects of these environmental practices on the community? (5) What recommendations can strengthen environmental education to support sustainable practices?

III. THEORETICAL FRAMEWORK

This paper's framework was created by identifying the elements that contribute to the methods used to promote a sustainable environment. This qualitative literature review was anchored by three conceptual lenses: institutional theory (IT), change agent theory (CAT), and PSIR indicator theory. The institutional theory by Scott [9] aids in the understanding of the impact of institutions on the decision-making process by providing indications of what is acceptable or unacceptable, as well as determining the community's practices in promoting environmental sustainability. Institutions establish the rules of the game and define the available modes of operation by discouraging, constraining, or encouraging specific behavioral patterns. Institutional theory emphasizes the normative impact of the environment on organizational activity. NGOs, local governments, and academic institutions operate in an institutional setting where external stakeholders influence organizational behavior and practices. It shows how institutions through their programs, practices and their implementation of sustainability affect people's action, behavior and decision-making towards the environment. The second lens, the change agent theory, examines how the institution demonstrates its grasp in promoting environmental education through environmental practices to its subject. There are two types of systems in the change agent theory, which will be represented as the resource system and the client system. The "resource system" consists of information, knowledge, discussion, materials, and other environmental education resources. The "client system" includes environmental education's target audiences, which could include institutions (including NGOs, LGUs, and Academic Institutions) as well as people from outside the area who want to learn about the local environment. The change agent theory provides insights into the institution's influence in changing sets of practices; a change agent is someone who promotes and facilitates change within any group or organization [10][11][12].



Source: Modified from Rogers
 1983, 314

Figure 1. A Change Agent Model for Environmental Education (Sharma et al., 2023 [10]; Chao, 2020 [11]; Rogers, 1983 [12]).

Finally, the PSIR indicator theory explains how these pressure points (P) of human activities (waste management, environmental seminars, etc.) within a given state of bio-physical conditions (S) will result in specific impacts (I) and to which responses (R) can be identified. This will serve as the foundation for the awareness, methods or practices of the participants. The application of this theory establishes the significance of the four dimensions of a sustainable development decision-making system. These four points (4Ps)/dimensions: policy (P1), place (P2), problem-solving (P3), and practice (P4) adhere to the more generic P-S-I-R indicators and form an interconnected system at both the local and national levels. The 4-P framework has proven to be effective in identifying shared indicators among various institutions and arriving at a long-term direction for a community [13][14].

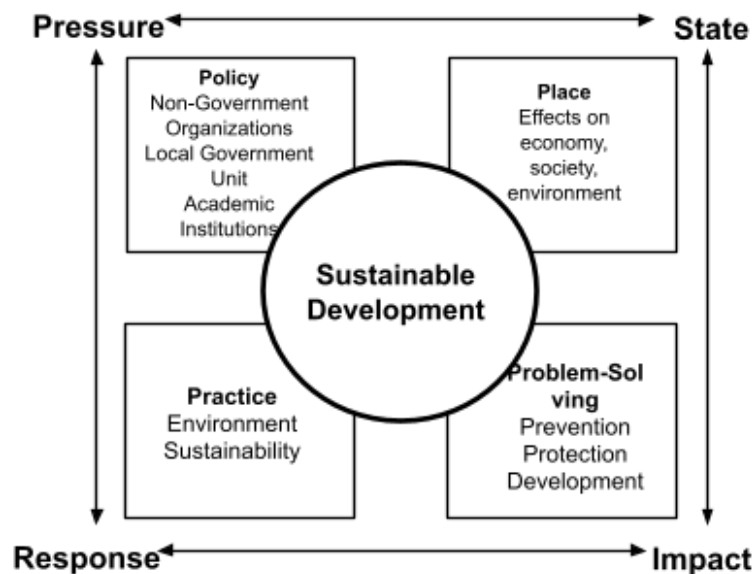


Figure 2. Dimensions of Sustainable Development based Decision-making System (Elazegui, 2006 [13]; Brown, 1999 [14])

Together, these theories inform the study’s approach to examining environmental education’s empowering potential, limitations, and influence on sustainable practices. By integrating these perspectives, the study aims to deepen understanding and provide actionable guidance for advancing environmental education’s role in fostering a sustainable future.

IV. METHODOLOGY

Qualitative semi-systematic review is a type of literature review that can be used to synthesize and analyze the information from different research studies, and it can be done through a number of methods [15]. In addition, it serves as a foundation in the selection of keywords, summarizing research titles, forming a theme and theoretical perspectives. These methods often have similarities to approaches used in qualitative research in general such as thematic analysis which is useful in providing an overview and track the development about environmental education.

Furthermore, this qualitative literature review used a systematic approach. According to Templier and Pare [16], there are six (6) steps associated with reviewing literature.

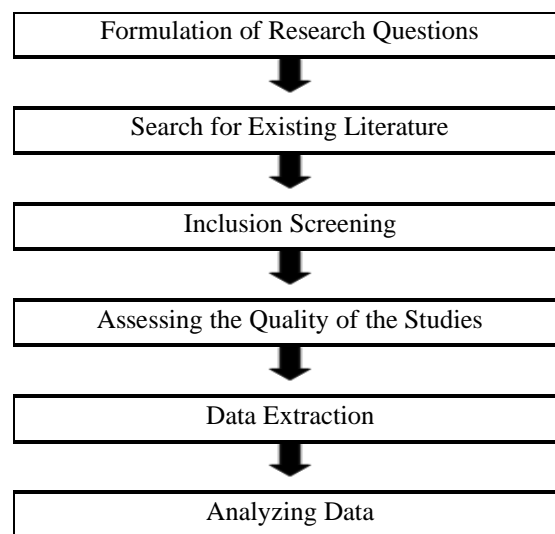


Figure 3. Templier and Pare Systematic Approach [16]

In this study, researchers gathered related studies and literature regarding Environmental Education. Using the main topic, which is environmental education, researchers are able to formulate research questions served as a guide in searching for the literature. The next step was searching for relevant studies and references, in this regard, all related studies about environmental education were taken and collected from various sources, including journals and articles from ERIC (files.eric.ed.gov), ResearchGate (www.researchgate.net), IMF eLIBRARY (www.elibrary.imf.org), Munich Personal RePEc Archive (mpra.ub.uni-muenchen.de), Aquademia (www.aquademia-journal.com), KOAJ (www.kci.go.kr), ScienceDirect (www.sciencedirect.com) and Scopus Index Journals (www.scopus.com) and put into list with their respective authors. Screening for inclusion is taken into account, since not all studies listed are associated with the other thus searching the databases using keywords such as "environmental education," "environment," and "sustainable development" and 50 studies were considered for analysis. In addition, assessing its quality is a must in a literature review. Researchers have chosen literature and studies that are found in peer-reviewed journals and full-text, since it is more reliable and accessible. Extracting data involves the title of the study, evaluation of the research and its synthesis. And as a final step, the researchers compiled, organized, analyzed and synthesized the articles gathered used for literature review [17].

Table 1 gives an overview of 50 studies and literature on environmental education, showing which countries conducted the research, their methods, and the tools for collecting data. Reviewing these studies provided a strong foundation for analyzing and allowed the researchers to capture various perspectives and findings from the different studies. This also ensured that the conclusion of this study would be well-informed and reflective. Using the context of other countries helped the researchers understand the different approaches used in various regions to study environmental issues. In addition, it provided a variety of gaps that emphasize studies that need to be researched and refined.

According to Table 1, most of the studies reviewed were from Asia (32), Europe (8), North America (6), Africa (3), and Oceania (1). This variety indicates that environmental issues and educational methods are diverse and can vary widely depending on the region and development level.

These studies used mostly qualitative data collection tools, namely, semi-structured interviews, document analysis, case studies, and possibly focus groups. This suggests that the research focused on understanding and documenting the details of environmental education. Some studies also used mixed-methods and quantitative approaches to evaluate the effectiveness and impact of environmental education programs.

Table 1. Authors, Countries, Research Designs, and Data Collection Tools

Author(s)	Countries	Research Design	Data Collection Tools
Abainza (2018) [18]	Philippines	Descriptive-Qualitative Quantitative Design	Surveys Participant Feedback
Ampatzidis & Ergazaki (2017) [19]	Greece	Experimental Design	Pre- and Post-Questionnaires Classroom Observations Follow-Up Interviews
Ardoin et al. (2020) [20]	United States	Systematic Review with a Mixed-Methods Approach	Literature Review Analysis
Balanac & Punzalan (2020) [21]	Philippines	Mixed-Methods	Surveys/Questionnaires Interviews
Bruyere et al. (2011) [22]	United States	Qualitative Case Study	Focus Group Interviews Evaluations
Camacho et al. (2015) [23]	Philippines	Qualitative Research Design	Focus Group Discussions
Carangan (2023) [6]	Philippines	Descriptive	Questionnaire
Chen et al. (2023) [24]	Netherlands	Literature Review	Systematic Literature Review
Coracero (2022) [25]	Philippines	Descriptive Research Design	Surveys
Craven et al. (2018) [26]	Germany	Descriptive Survey Research Design	Survey Questionnaires Structured Interviews Participation Records
Dal et al. (2015) [27]	Turkey	Quasi-Experimental Design	Awareness to Climate Change Questionnaire (ACCQ)
De Guzman et al. (2014) [28]	Philippines	Qualitative Research Design	Unstructured Interviews Focus Group Discussions
De Los Santos-Nolo & Lee (2021) [29]	Korea	Descriptive Exploratory	Structured Questionnaire Interviews Document Analysis
Ekene & Oluoch-Suleh (2015) [30]	Kenya	Qualitative Approach Case Study Design	In-depth Interviews Document Analysis
Erhabor & Don (2016) [31]	Nigeria	Survey Research Design	Questionnaire (Survey)
Esguerra et al. (2018) [32]	Philippines	Developmental-Descriptive-Evaluative	Pre- and Post-tests Interviews Focus Groups
Eslit (2023) [33]	Philippines	Qualitative Study	In-Depth Interviews
Gawad (2021) [34]	Philippines	Qualitative with a Case Study Approach	Surveys/Questionnaire Focus Groups Document Review
Hoffmann & Muttarak (2020) [35]	Philippines	Quantitative Research Design	Surveys
Ilovan et al. (2017) [36]	Romania	Descriptive Survey	Questionnaire
Khan (2013) [37]	India	Descriptive Qualitative	Literature Review Interviews
Kilag et al. (2023) [38]	Philippines	Qualitative	Document Analysis
Lagasca-Hiloma (2021) [39]	Philippines	Quasi-Experimental Approach with Correlational Component	Pre-tests and Post-tests
Lamanauskas & Makarskaite (2023) [40]	Lithuania	Qualitative	Semi-Structured Interviews
Marable (2015) [41]	United States	Mixed-Methods Research Design	eSurvey (Quantitative Analysis)

Table 1. continued...

Author(s)	Countries	Research Design	Data Collection Tools
Maryono et al. (2015) [42]	Indonesia	Descriptive Qualitative	In-Depth Interviews
Muduli et al. (2013) [43]	India	Descriptive Case Study Quantitative	Structured Questionnaire/Survey
Omoogun et al. (2016) [44]	Nigeria	Critical Review Theoretical Analysis	Literature Review Curriculum Analysis Case Studies
Oteyza et al. (2023) [45]	Philippines	Descriptive Research Design	Structured Survey Questionnaire
Pardo (2012) [46]	Philippines	Descriptive Survey-Correlational	Structured Questionnaire
Pojani & Stead (2015) [47]	Australia	Descriptive Systematic Review	Systematic Literature Review Document Analysis
Premakumara et al. (2013) [48]	Philippines	Descriptive	Structured Questionnaire/Survey Interviews Focus Groups
Puna (2023) [49]	Philippines	Descriptive	Online and Paper Surveys
Rajovic & Bulatović (2014) [50]	Montenegro	Survey Research Design	Structured Questionnaires
Raut (2014) [51]	India	Qualitative	Semi-Structured Interviews Document Analysis and Case Studies
Rogayan & Nebrida (2019) [52]	Philippines	Descriptive-Correlational	Structured Questionnaire
Sharma & Bhat (2022) [53]	India	Quantitative Research	Survey Questionnaire
Shutavela et al. (2020) [54]	Russia	Document Analysis, Qualitative	Document Review Content Analysis
Silva et al. (2013) [55]	Portugal	Theoretical Computational Design	Mathematical and Computational Tools Literature Review Secondary Data for Model Parameters
Sinan et al. (2022) [56]	United States	Systematic Review Qualitative Analysis	Database Search (ERIC) Data Extraction Form/Table Thematic Analysis
Singh & Rahman (2012) [57]	Malaysia	Mixed-Methods Research Design	Surveys Questionnaires
Spencer (2021) [58]	United States	Qualitative Grounded Theory Methods	In-depth Interviews Document Analysis
Tolentino & Landicho (2011) [59]	Philippines	Descriptive Historical Review Case Study	Literature Review Interviews Focus Groups Surveys
Tristao & Tristao (2016) [8]	Philippines	Qualitative	Delphi Method (Multiple Rounds of Structured Questionnaires)
Tsai (2011) [60]	United States	Experimental Research Design	Controlled Experiments Statistical Hypothesis Tests
Van Der Ploeg et al. (2011) [61]	Philippines	Counterfactual Comparison Design	Survey Questionnaires Interviews Focus Groups Pre- and Post-Campaign
Yang et al. (2012) [62]	Turkey	Empirical Experimental	Pre- And Post-tests Surveys/Questionnaire Focus Groups/Interviews Observations
Yecla et al. (2022) [63]	Philippines	Mixed-Methods	Structured Questionnaire Face-to-face Interviews
Yusof & Ariffin (2021) [64]	Malaysia	Descriptive Comparative Analysis	Survey Questionnaires Focus Groups Document Analysis Mapping Tools
Zhu (2023) [65]	China	Comparative Study	Document Analysis Interviews with Key Informants

Table 2 summarizes the titles and keywords in the studies reviewed. It helps show the main topics and ideas, showing how different research approaches various parts of environmental education. You can see what the research focuses on and find common themes, by looking at the titles and keywords.

Table 2. Summary of Titles and Keywords from Reviewed Studies on Environmental Education and Related Studies

Title of the Studies	Keywords
A digital game-based learning system for energy education: An energy conservation pet [62]	Energy Education Energy Conservation ECOPEP System Digital Game-based Learning
Analysis of Pollution Prevention Business Case Analyses [58]	Pollution Chemical Reporting Chemical Testing Regulation
An Analysis of the Teachers' Climate Change Awareness [27]	Climate Change Teacher
An Approach for Environmental Education by Non-Governmental Organizations (NGOs) in Biodiversity Conservation [57]	Biodiversity Conservation Behavior Modification NGOs
Assessing Recent Climate Policy Initiatives in the Netherlands: NETHERLANDS [24]	Adaptation Climate Change Mitigation
Assessing the Effectiveness of Environmental Education: Mobilizing Public Support for Philippine Crocodile Conservation [61]	Crocodile Conservation Environmental Education Outreach Programs
Assessing the Stakeholders' Level of Awareness in Environmental Education in Coastal Schools: Basis for an Action Plan [6]	Environmental Awareness COVID-19
Barriers to green supply chain management in Indian mining industries: a graph theoretic approach [43]	Mining Industries GCSM Hazards
Can the Idea of 'Balance of Nature' be Effectively Challenged within a Model-Based Learning Environment? [19]	Model-based Learning Collaborative Learning Ecosystems Teaching Ecological Reasoning Nature's Resilience Teaching
Citizens' Assessment of the Environmental Management Programs Delivered by the Local Government Unit of Lezo, Aklan [63]	Environmental Management Local Government Unit New Growth Theory
Economic and Environmental Effects under Resource Scarcity and Substitution between Renewable and Non-Renewable Resources [55]	Economic Development Economic Growth Disaster
Effectiveness of the Environmental Education Program in Enhancing Preparedness of the Vulnerable Populations in Coastal Communities of Manito, Albay [18]	In-school-youth Out-of-school-youth Practice
Empowering Change at the Grassroots: Community-Led Initiatives for Local Environmental Protection [33]	Community-Led Initiatives Local Environmental Protection
Enhancing Preparedness of Vulnerable Populations in Palawan, Philippines through Environmental Education Programs [32]	Environmental Education Vulnerable Populations Coastal Communities Environmental Awareness
Environmental Awareness and Practices of Science Students: Input for Ecological Management Plan [52]	Environmental Education Environmental Awareness Environmental Practices Ecological Management Plan
Environmental Awareness, Practices, and Attitudes of Selected UNP Students [46]	Environmental Awareness Practices Environmental Laws
Environmental Conservation Practices in Baybay City Leyte [49]	Environmental Conservation Practices Level of Awareness Level of Implementation
Environmental Education and Education for Sustainable Development in Romania. Teachers Perceptions and Recommendations [36]	Geography Active Learning Activity in Nature Field Trips
Environmental Education for Sustainable Development in Russia [54]	Environmental Education Sustainability Education for Sustainable Development

Table 2. continued...

Title of the Studies	Keywords
Environmental Education in Primary School: Meaning, Themes and Vision [40]	Environmental Education Primary School Pre-service Teachers
Environmental Education Outcomes for Conservation: A Systematic Review [20]	Environmental Education Systematic Review Public Engagement
Environmental Governance Practices of Local Government Units on Waste Policy Implementation [29]	Conservation Social Sciences Environmental Governance Waste Policy Implementation
Environmental Problems and Education in Last Five Years [56]	Local Government Unit Environmental Pollution Environmental Education COVID-19
Environmentally Sustainable Practices in the Selected Higher Education Institutions in Calapan City [34]	Environmental Sustainability Environmental Sustainable Programs Institutional Assessment
Exploring Effective Environmental Education Practices to Enhance Environmental Awareness and Education: A Navigational Study [38]	Environmental Education Environmental Awareness Vertical Hanging Gardens Cleaning of Seashores Proper Segregation
Fostering Sustainable Development and Environmental Education Programmes: Role of Teacher Training Institutions and Colleges of Teacher Education [37]	Environmental Education Teachers Training Prospective Teachers Sustainable Development Pedagogic Strategies Ethics
From Environmental Awareness to Environmental Responsibility: Towards a Stewardship Curriculum [44]	Environmental Education Environmental Awareness Environmental Responsibility Environmental Ethics
Greening through Schooling: Understanding the Link between Education and pro-environmental behavior in the Philippines [35]	Developing Country Pro-environmental Behavior Education
Green Schools -- The Implementation and Practices of Environmental Education in LEED and USED Green Ribbon Public Schools in Virginia [41]	Environmental Education Public Schools Conservation (Environment) Educational Practices
How International Organizations Influence State Behaviour: A Comparative Study of Environmental Governance [65]	International Organizations Environmental Governance Sustainable Development World Bank
Impact of Environmental Education on the Knowledge and Attitude of Students Towards the Environment [31]	Environmental Education Attitude Environmental Knowledge
Incorporating Environmental Education into an Urban After-School Program in New York City [22]	Informal Education Urban Environmental Education Environmental Education Nature
Indigenous Knowledge and Practices for the Sustainable Management of Ifugao Forests in Cordillera, Philippines [23]	Indigenous Practices Sustainable Management Biodiversity Education
Knowledge and Perspective of Students Towards Biodiversity and its Conservation and Protection [25]	Biodiversity Conservation Biodiversity Protection Biodiversity Stability
Multiple facets of biodiversity drive the diversity and stability relationship [26]	Stability Solid Waste Management Implementation
Planning and Implementation of Integrated Solid Waste Management Strategies at the Local Level: The Case of Cebu City [48]	Environment Policies Natural Resources Management Forest Conservation
Promoting Sustainable Development Through Agroforestry Education: Lessons and Experiences from the Philippines [59]	Environmental Issues Environmental Conservation Higher Education Sustainability
Role of Higher Education Institutions in Environmental Conservation and Sustainable Development: A case study of Shivaji University, Maharashtra, India [51]	Environmental Conservation Higher Education Sustainability Institutions of Higher Education
Role of Institutions of Higher Learning in Enhancing Sustainable Development in Kenya [30]	Sustainable Development Population
State of Environmental Awareness in Northeastern Montenegro: A Review [50]	

Table 2. continued...

Title of the Studies	Keywords
Students' Participation in Tree Planting Activity: Promoting the 21st Century Environmental Education [21]	Tree Planting Environment Global Warming
Sustainable Agricultural Production Systems for Food Security in a Changing Climate in Batanes, Philippines [28]	Indigenous Farming Practices Sustainable Agriculture
Sustainable Tourism Practices of Local Tourism Establishment of Nueva Vizcaya [45]	Water Consumption Energy Consumption Tourism Development Conservation
Sustainable Urban Transport in the Developing World: Beyond Megacities [47]	Sustainable Transport Environmental Problems Megacities
The Contribution of NGO in Environmental Education [8]	Environmental Education Non-governmental Organizations
The Effectiveness of WWF-Philippines' Manual on Waste Management in Promoting Positive Environmental Behaviors Among Filipino 5th and 6th Graders [39]	Environmental Education Waste Management
The Impacts of Water Conservation Strategies on Water Use: Four Case Studies [60]	Water Conservation Water Demand Management Water Resource Planning Nonparametric Statistics
The Implementation of the Environmental Education at "Adiwiyata" Schools in Pacitan Regency [42]	Implementation Policy Education Environment Grindler
The Role of Community Involvement in Sustainable Tourism Strategies: A Social and Environmental Innovation Perspective [53]	Community Involvement Environmental Innovation Social Innovation Sustainable Tourism Development
Youth Engagement in the Implementation of The Sustainable Development Goals (SDGs) in Asean Countries [64]	Sustainable Development Goals (SDGs) Youth Engagement

In analyzing themes, the researchers based each theme on three (3) approaches. First would be the Education for Sustainable Development (ESD), which integrates education and sustainability, emphasizing the collaboration of environmental, economic, and social goals. This approach assists in how environmental programs, specifically for awareness and practices, could be fostered sustainably. It also emphasizes governance involvement, which is the one responsible for laying out these programs. According to UNESCO [66], ESD provides its learners with global knowledge and skills regarding environmental challenges, it empowers them to have precise information on how their decisions would vary, whether they will be one of the reasons for environmental degradation or they will be able to help in lessening ecological problems. The second approach would be the Sustainable Development Goals (SDG), which focuses on how educational institutions and governments contribute to disseminating sustainability efforts. According to the UNDP [67], SDG or also known as Global Goals, is a universal call for action to specifically promote sustainable development, and one of its goals is to protect the planet. These goals are integrated, and if one goal is not being maintained, it will affect the other. This is where different institutions play a crucial role in maintaining the balance of each goal to achieve sustainable development. The last approach would be Community-Based Environmental Education (CBEE), which allows for the understanding of local participation in environmental and sustainable development. Each study the researchers had collected had a participant's or community involvement, these individuals will determine the practices and programs that will be made specifically for the locals involved in the study. This last approach gives each individual a sense of responsibility for environmental stewardship. Using these approaches, the researchers generated themes from the synthesized and analyzed studies and literature they collected.

V. RESULTS AND DISCUSSION

Research Question 1. To what extent does environmental education enhance sustainable practices within institutions?

In recent years, research studies have proved that environmental education is progressing in enhancing the environmental practices of different institutions towards sustainability. This shows that they are on the right track in progressing these stages, as it will help institutions enhance their environmental practices effectively, which is a good foundation for contributing to broader sustainable development.

Environmental Education provides insights and knowledge about the environment, which will serve as a foundation for implementing policies and environmental practices aimed at protecting the environment. It is the kind of learning that increases awareness of society in the climate to counter environmental problems and improves their commitment and motivations in implementing environmental practices. Raut [51] examines the roles and actions of these institutions in promoting sustainable development, where environmental education serves as a foundation. It is proven that environmental education was at a transition stage in preparing people to be mentally, physically, and socially aware and knowledgeable regarding solving the current problems, which brings social prosperity and improvement to the status of the environment. In line with this, the findings by Hoffmann and Muttarak [35] reveal that an additional year of schooling raises the likelihood of engaging in environmentally friendly actions by 3.3%. This positive impact is consistent with studies from both high-income and developing countries, as it influences and shapes the behavior of individuals to become environmentally aware and concerned. In addition, environmental education helps individuals better understand the causes and risks of climate change as they become involved in environmental activities such as tree planting, recycling, and waste management, where they are encouraged and shaped to become environmentally friendly. Following this, Puna [49] stated that Baybay City has introduced ordinances to manage environmental concerns, including Anti-Littering, Solid Waste Management, and plastic bag regulations. While Baybay City has made progress with the environmental laws, the effectiveness of their implementation varies. The Solid Waste Management ordinance is well enforced, but more work is needed on the plastic bag and Anti-Littering ordinances. Marable [41] discusses and examines the implementation of environmental education in Green Schools, defined as those with LEED certification or USED Green Ribbon recognition. The findings showed that while many schools successfully integrate environmental education, there needs to be more variability in how LEED and Green Ribbon criteria are applied. Some schools effectively use building features like monitoring systems, while others focus on more straightforward practices like recycling programs and community outreach.

A recent study showed that participants are highly aware when it comes to environmental ideas and are practicing good habits related to environmental issues. According to Pardo [46], the participants opposed harmful activities such as deforestation, quarrying, and industrialization. The role of environmental education was utilized as this study also found a link between the awareness and the behavior of the participants about the environment. It is important that in the curriculum of the academic institutions, environmental education should be included to ensure that the students and teachers are willing to participate and committed to protecting the environment.

In Asia such as the Philippines, experienced an environmental degradation which led to the collaborative actions of institutions to implement environmental education programs practiced which was helpful to address environmental concerns [38]. The current environmental education practices and programs that were implemented worldwide were helpful to show concern about the environment and to inspire others to implement programs despite coming from different institutions.

The involvement of people and partnership between different institutions make the implemented environmental practices successful, as they work collaboratively and use technology, hands-on learning and innovation to increase the awareness of students and promote sustainability in the community which will make our planet more livable for ourselves and to the future generations [38].

On the other hand, Abainza [18] recognizes the environmental problems that are existing in their community. Environmental education was on a progressive stage as their materials that were easy and simple to understand were requested to be available to the communities. Ekene and Oluoch-Suleh [30] stated that education is vital for sustainable development and improving individual and societal outcomes. Institutions of higher learning have a significant role in promoting sustainability through updated curricula and fostering innovative thinking. To better support sustainable development, higher education institutions should focus on integrating sustainability under the concept of environmental education into their curricula as this program was on a developmental stage. It is important that they should also work to shift students' perceptions from viewing education as merely a path to employment to seeing it to drive innovation and contribute to societal progress.

As Kilag et al. [38] noted, environmental education is still considered a good foundation to lessen the threat caused by human activities because many institutions implemented environmental measures to include environmental education in their academic agenda and activities. In this study, PAU Excellencia Global Academy Foundation Inc. (PEGAFI) implemented and enhanced environmental practices such as vertical hanging gardens, coastal cleanup drives, and proper waste segregation. It is an institution that was active and continually mitigated environmental issues through environmental education, which led to positive outcomes, as it increases the students' awareness and significantly impacts the community. The accomplishment of these activities can be linked to factors including long-term funding, influential leadership, integration of environmental education into the academic framework, and collaboration with the Department of Education, local government, private sector, and the community. In addition, the programs of this institution have contributed to the community's development of awareness, especially among teachers and students. The institution will serve as a role model for other institutions and communities to adopt these kinds of foundations and environmental practices towards a sustainable environment for our good and future generations.

As the world has been adapting to a more technologically advanced system, education has also been technologically adapted. Shutavela et al. [54] study highlights that Sustainable Development 2030 stresses the importance of raising environmental awareness to help the planet's environment not burn out its limit. The evolution of environmental education requires continuous learning at all levels, which is achieved by integrating technologies. As the Covid-19 came across all parts of the world, cities, and other countries tried to enhance the understanding of the economic, environmental, and social issues, resulting in innovative teaching methods of all institutions. One of the innovations is energy education, which is highly efficient for preserving the environment since it reduces energy consumption and promotes environmental well-being [62]. However, learners rarely apply the knowledge they received to use, and they only have limited ideas on how to lessen energy consumption. This is where teachers have a major role in addressing environmental awareness to boost students' participation in mitigating environmental problems.

The results stated the importance of environmental education as one of the foundations of school curriculum and institutional frameworks. By utilizing resources efficiently, institutions can serve as tools to mitigate environmental problems and promote sustainability, as it is possible to engage with local stakeholders and implement collaborative environmental programs.

Research Question 2. How does environmental education influence the longevity of institutional environmental practices?

The stage of environmental education identifies the longevity of environmental practices implemented by various institutions by emphasizing the roles of institutions and community engagement. Institutions play a crucial role in implementing environmental programs, but without citizens' engagement, environmental programs would only last for a short period. The study by Yecla et al. [63] shows how citizens' involvement raises the satisfaction and demand of LGU in managing environmental programs. Asking the citizens' feedback and input has aided the LGUs in refining and having a better approach to implementing certain programs, thus permanently making the program last.

Long-term environmental goals are highly not achievable since there are many hindrances when it comes to prolonging certain programs and practices. However, certain programs are likely to have an effect in implementing environmental education in the long term. Thus, including community involvement through environmental programs, like raising awareness and promoting environmental sustainability through community initiatives would likely increase the prevention of environmental degradation. As demonstrated by the sustainable tourism practices by Oteyza et al. [45], including practices such as water and energy consumption into the industry's standards ensures the sustainable practices will be helpful. This shows how environmental education can be beneficial not only to institutions but also to the industry. Community-led initiatives and partnerships further support sustainability, where sustainable behavior has greatly emerged because of their grassroots initiatives; this also has empowered the local communities for their sense of ownership [33]. Similarly, as discussed by Tristao & Tristao [8], NGOs' role in environmental education shows how partnership and collaboration can impact community-driven efforts. This stage highlights how sustainability strengthens through the cooperation between institutions and citizens.

The current stage of environmental education ensures the longevity of environmental practices through the steadily advancing help of various institutions. As proposed by Omoogun et al. [44], academic institutions can help achieve sustainable development by integrating environmental education into the school's curriculum. It emphasizes the concept of "environmental ethics." Stating that the people must protect our environment, which

is very important in fostering long-term sustainability. Similarly, Indonesia has an example of how it integrated environmental education into its curriculum, and that is through a program entitled “*Adiwayata*,” which highlights the importance of behaviors when it comes to environmental responsibility [42]. This stage is the first step toward achieving sustainability. Environmental education plays various roles in fostering the longevity of sustainable practices across different institutions. Building public awareness is one of the major elements that have a lasting impact. The research conducted by Maryono et al. [42] states that school-based environmental programs are very important because they equip youth with necessary skills and behavior positive towards the environment. These types of programs can be an effective way to lay the foundation for having a more environmentally aware community. These programs also serve as a foundation for long-term sustainability since these skills and behaviors can persist into adulthood. Academic Institutions are likely to have an essential role in providing their behavior and practical skills, encouraging them to be active participants in environmental initiatives such as the National Service Training Program conducted in one of the Asian countries.

The roles of each institution are very crucial in attaining long-term sustainability. As stated by Raut [51], each institution can provide different resources and knowledge to address environmental challenges effectively. Collaborative efforts between these institutions show impressive results in amplifying great-impact sustainability initiatives [34]. There are several studies that guarantee that environmental education is associated with sustainability. One example would be a study conducted by Rogayan and Nebrida [52], highlighting the importance of continual practice and raising awareness within the institutions to promote sustainability. There are also setbacks in achieving these initiatives, such as the Anti-Littering ordinances of Puna [49], which it struggled to attain in the long term. A successful example is the *myong* system by the Ifugao, which they still use, integrating indigenous knowledge with modern practice to promote environmental sustainability [23]. Moreover, the implementation of conservation practices, such as agroforestry, came into practice as a solution for the negative happening in the environment; as such, environmental education must develop addressing not only the behavior and the practical application but also the economic system ensuring that these environmental practices are implemented to be sustainable and effective for the long run. However, the inconsistent implementation of environmental practices across different institutions made these practices extend over time. It is also important to address the differences between each place because not all practices are applicable in another; this also limits the effectiveness of practices since there are places where these environmental activities can be implemented and places that cannot.

In assessing the stages of environmental education, establishing the longevity of environmental practices is evident through the help of various institutions. Globally, legislative support is essential in achieving long-term sustainability, as seen in Montenegro’s environmental laws [50], while broader perspectives on environmental education emphasize the indispensable role of policies [56]. With these initiatives, it helps strengthen institutions’ participation and community involvement to ensure long-term success. Furthermore, the practical impact on environmental education is demonstrated through a study by Erhabor and Don [32], which discovered that students possess significant knowledge and a positive attitude toward the environment. This shows that an early opportunity to gain knowledge regarding the environment can be of help in sustaining environmental practices. Similar to that is also evident in the study of Balanac & Punzalan [21], where students have fostered more vital ecological awareness through tree planting activities because of the hands-on experience. Activities like this have instilled immediate environmental values and an opportunity for institutions to make much more sustainable and recurring programs. Finally, the efforts of institutions, collaborations, and community endeavors to achieve this should be supported through environmental education by raising consciousness and taking practical actions about their environment. There are broad ways; these all help sustain the length of institutions’ environmental efforts with some study which strengthens it; they can create environmentally friendly effects with strong support while continuing these initiatives.

Research Question 3. What role does environmental education play in defining the scope of sustainability efforts undertaken by institutions?

The layer of environmental education refers to its aspects and influence in guiding diverse institutions in implementing specific environmental practices that can address the issues that they are experiencing environmentally. It serves as a foundation to improve the quality of life of the people, as they will become environmentally knowledgeable and volunteerism will be part of their lives, and a voice of the environment.

In recent years, environmental education has gained significant attention in Europe including Lithuania as it shapes influence and knowledge that shapes people’s behavior regarding the treatment of the environment [40]. It has been a good development as in the space of just a few decades, urban areas worldwide, in both

developed and developing countries, have become increasingly automobile-dominated and less sustainable [47]. Introducing children to environmental issues early on helps them become more engaged and responsible toward nature. The study found that future researchers recognize the importance of environmental education in developing students' knowledge and skills [40]. It emphasizes the importance of challenging the students' belief in the "balance of nature", where the individuals, especially the youth, will become a significant instrument towards sustainability where they will adopt volunteerism, performing various environmental practices [19].

Youth involvement will increase the possibility of achieving those goals, as volunteerism will improve and be fostered. It is essential to consider that they have a crucial role in achieving the sustainable development goals (SDGs). It is also necessary that these SDGs be implemented from the local to the national level to find the roots that serve as hindrances to achieving the SDGs by 2030 [64]. It implies the importance of having a country's national development plans and staying committed to achieving the SDGs that involve the presence of the community resources and policies that every stakeholder and institution has. As one of the younger generations, youth should be able to benefit from the SDG initiatives to contribute to the country's growth. The World Bank (WB) and United Nation Environment Programme (UNEP) were built to improve people's lives while protecting the environment. They have a solid influence on better environmental governance, which will improve the environmental status and policies of developing countries.

Environmental practices such as Green Supply Change Management (GCSM) highlight the aspects that mitigate carbon emissions and sustainability. It is essential to adopt GCSM as it is one of the best practices that mainly focuses on reducing the unfavorable impacts of supply chain activities and minimizing the energy and the use of materials. In addition, it combines environmental management principles with supply chain practices to mitigate further ecosystem degradation. Locally, Cebu Philippines of Asia introduced strict enforcement in implementing the National Solid Waste Management Law (RA 9003). The approach of the city to SLCPs shows a commitment to eliminating health risks to communities and promoting innovative and ecofriendly solid waste management.

Yecla et al. [63] research study benefited their LGUs and their citizens by allowing them to know what to do or their solutions to their communities' environmental issues. It is when the citizens utilize their power to speak for what's right and will serve as a guide to the LGUs to know what solutions must be implemented to the specific environmental issues communities are experiencing. In line with this, Puna [49] stated that it is essential that there are collaborative efforts between the barangay officials and LGUs to increase the number of people who will voluntarily exercise their practices towards environmental conservation. It is also essential to use their funds to upgrade their facilities and utilize their resources to motivate the residents to join this practice. Gawad [34] evaluated the environmental sustainability practices in higher education institutions to create a sustainable environment that would help the government achieve its goals. The proposed program significantly helps higher education enhance its implementation of environmental awareness programs and activities. NGOs should also focus on improving internal organizational processes, ensuring legal compliance, and enhancing training for their human resources to enhance human capabilities in protecting the environment [8].

In their study, Esguerra et al. [32] showed notable differences between the respondents' awareness and understanding of environmental education concepts before and after implementing these programs. It focused on the respondents' knowledge and awareness regarding the influence of environmental education programs. It shows that awareness and preparedness can be significantly improved, which is helpful to mitigate the negative impacts of these environmental hazards. The other results showed an improvement in the scores of both sectors after implementing the environmental education program. The environmental education programs demonstrate an important contribution to the young Badjao's environmental knowledge, where their desire to practice these programs will increase, which help mitigate environmental problems while shaping their behavior into environmentally friendly. This study provides knowledge that community practices, especially those in vulnerable communities, must be implemented and have a continual process as they have been proven effective in promoting the importance of taking care of the environment by enhancing their traditional practices. Future research should explore how to adapt environmental education programs to different communities while considering their unique values, beliefs, and lifestyles.

The influence of environmental education and human activities is one of the most influential factors in bringing changes to the environment. These changes can positively or negatively impact the environment and people's knowledge and perception of environmental issues and practices [25]. Youth participation is important in developing Sustainable Development Goals (SDGs), while international organizations utilize their power and resources to support sustainable and effective environmental governance. The collaborative efforts of local governments and citizens are instrumental in tackling environmental problems. It is because it protects the

environment by making long-term environmental policies and starting a program that conducts environmental activities. Additionally, higher education institutions play a vital role in fostering environmental awareness and education for a sustainable future.

Research Question 4. What are the causes and effects of these environmental practices on the community?

The fast-growing global challenges such as climate change, pollutants, and other things pose a major threat to the environment, affecting the community's health and well-being. All environmental practices, cause, and effect are interconnected, which can guide effective action and policies. Programs such as educational awareness play a crucial role in schools and communities. In line with the environmental education, they also aim to raise awareness among the students and the community. For example, in the study of Carangan [6], the schools in coastal areas implemented programs like Clean and Green, the 3 Rs (Reduce, Reuse, Recycle), and Solid Waste Management, which helped build the foundation for collaborative responsibility. The sense of environmental responsibility among the community helps them become more aware of the importance of sustainability, leading to a much firmer commitment to protecting the environment.

It is also crucial to implement policy and enforce regulations regarding environmental actions. Republic Act (RA) No 9003 in the Philippines orders LGUs to manage solid waste and encourages communities to adopt and follow the said practices. An example is Cebu City's "no segregation, no collection" policy [48]. It enables people to segregate their trash since their local laws mandate it. In addition to that, there has been a reduction in environmental degradation as policies regulating the use of chemicals and their proper disposal have been made. Furthermore, communities with stricter implementation of waste management practices are bound to enjoy a cleaner and reduced health risk community [58]. As Sinan et al. [56] stated, developing and applying environmental education is essential to help the environment and those living in it achieve sustainability. In Russia, as stated by Shutavela et al. [54], developing a solid environmental education system aided their communities in combating environmental challenges. One of the most effective ways to fight these issues is by planting trees [54]. Another example is the initiatives that the WWF has made, which showed a positive outcome on the environmental behaviors among students, giving emphasis on the importance of the connection between the individual and nature [39]. Moreover, community-led conservation efforts led citizens to get involved in environmental initiatives, which can be seen in the Van der Ploeg et al. [61] study of how campaigns, murals, comics, and cultural shows received support from the public. The use of these initiatives gives encouragement to the community to get involved in raising awareness about environmental challenges. Given, for instance, what happened in the Philippines, communities have been responsible for their water and energy consumption, which aims to promote sustainable practices. Such practices show how these minimal actions can help lessen environmental degradation.

Implementing conservation practices can also help lessen and prevent environmental degradation. One example is the water conservation strategies in the study conducted by Tsai [60], which has shown positive effects on water usage and management of the communities. Additionally, the conservation of indigenous knowledge proves that sustainability is achievable. Communities like Ivatans in Batanes of the Philippines have utilized and preserved their traditional knowledge in sustaining food security by adapting to climate change. These practices help promote sustainable food production and resilience against natural disasters without using many resources [28]. Furthermore, an innovative approach to preventing environmental degradation is seen in the study of Yang et al. [62], in which they developed a game-based learning system for energy education. Students can enhance their knowledge and increase their awareness regarding energy consumption.

Environmental education programs are important in enhancing awareness and understanding, particularly in vulnerable communities that do not have much opportunity to gain this knowledge about the environment. The programs under environmental education aim to equip individuals with information about environmental issues and how to prevent them, which can also lead to increased understanding and stewardship towards the environment [32]. However, environmental education also faces criticism because there are some environmental issues that they too cannot give solutions, thus emphasizing that it also needs individual stewardship and responsibility to solve environmental degradation [44]. Each institution must work together to improve environmental education to ensure a sustainable future. It will help spread awareness, give practical skills to people, and reduce environmental risks. Additionally, by combining efforts from each institution, environmental degradation will be prevented, and sustainable goals will be achieved.

Research Question 5. What recommendations can strengthen environmental education to support sustainable practices?

Institutions around the world play a crucial role in giving recommendations for promoting environmental education and adapting implemented environmental practices. It aims to increase awareness regarding environmental problems and will enhance environmental knowledge to help mitigate these problems that threaten the Earth's environment. Firstly, Chen et al. [24] reported that the Netherlands is among the best examples regarding the adaptation strategy against climate, considering that irrigation and clean-up water resources have played a very influential role in supporting the local agricultural sector. It has something in common with the research study of Camacho et al. [23], the roles of Ifugao Local Government Units (LGUs) in the Philippines are important in preserving and promoting the *muyong* system. It is essential that this institution systematically integrate the indigenous knowledge of the Ifugao people and the environmental practices that they were using in managing their forest. In addition to this, there is a suggestion by Tolentino and Landicho [59] to intensify education programs on agroforestry. This would benefit the enhancement of sustainable development in resource-rich regions but under economic stress. Agroforestry education should thus be promoted toward ecological and economic goals of integration that would provide an avenue for improved livelihoods while sustaining the environment. Institutions should address the elimination of barriers to adopting climate strategies and actively involve the public in environmental activities. This approach can be followed by Local Government Units as outlined by De Los Santos-Nolo and Lee [29], which is effective leadership and participative governance. Participative leadership models in LGUs must involve stakeholders and focus on environmental stewardship that will encourage community participation in waste management programs.

Environmental education must be orchestrated to create different practices for sustainability. According to Singh & Rahman [57], a well-structured education program for environmental issues must have clear goals and objectives that would help raise the awareness, knowledge, and abilities of citizens in problem-solving while actively participating. They emphasize how social marketing can influence behavior, remove barriers, and create easy access to public environmental involvement. However, they face financial, human assets, and political support challenges. According to Ardoin et al. [20], the ultimate goal of environmental education must be more than mere provision of information; it also needs to bring up positive environmental attitudes, values, and action-orienting skills that enable communities to act collaboratively in the service of conservation. Their systematic review shows the effectiveness of conservation results from programs that are locally focused, supported by scientists and community groups, and have action integrated into them. According to Ilovan et al. [36], drawing from their research in Romania about the view of the teachers, activities within the field, involvement from families, and schools with actions increase EE and ESD.

The complex relationship between biodiversity and ecosystem stability is expounded by Craven et al. [26], an important aspect that can be introduced in education to inform learners about the importance of biodiversity in sustainability. Furthermore, there's also a study with a common goal of solving environmental challenges, and it is the research study by Raut [51]. Academic institutions, like Higher Education Institutions may be critical actors in responding to specific environmental challenges. The study discusses the role of education in providing solutions to environmental problems like pollution through the proper use of their facilities and expertise to achieve long-term growth for sustainable development. However, a mainly theoretical approach, minimal time resources, and minimal state support are the major barriers. The study by Bruyere et al. [22] of an after-school program in New York City yields similar insights: the EE added to the confidence and support of educators and parents of the participants, who appreciated the programs because they resulted in students' increased participation and interest in nature. Sharma & Bhat [53] also depict the community engagement importance in light of social and environmental innovations in sustainable tourism in Jammu and Kashmir. The outcomes of the study are affirmative in terms of the connection between community engagement and sustainable development. By doing so, they stress that social and environmental innovation can go well with sustainability more generally. According to Khan [37], teachers and prospective teachers play a key role in raising awareness and fostering a harmonious relationship between humans and nature. The teachers should share their environmental knowledge with the community, especially with the students. It is because spreading that information is important to foster environmentally aware and knowledgeable people to practice environmental programs, which helps achieve sustainable development. In addition, they can also influence and inspire their students to serve the environment for a sustainable future. They also emphasize the importance of fostering partnerships within the institutions with environmental education to achieve economic, social, and equity in sustainability. Further international cooperation, for example, between the World Bank and UNEP, as analyzed by Zhu [65], will provide resources and technical assistance in support of a country's capacity to build effective

environmental governance. Such knowledge will enrich educational frameworks and produce a culture of sustainability and resilience within communities.

The research studies highlight that those institutions utilized environmental education, resulting in a shared conclusion regarding addressing the environmental problems that the world is currently facing. It highlights the importance of having a long-term environmental goal, utilizing resources efficiently, integrating hands-on learning, involving the community, developing students' leaderships, strengthening partnerships, increasing the environmental knowledge of educators, evaluating and adopting programs. In line with this, environmental education enhances attitudes, values, and environmental knowledge of individuals and communities preparing parts of them for collaborative action towards sustainable development. It shows that institutions and research studies concentrate on achieving sustainable development towards a greener by implementing those environmental practices and increasing the environmental awareness of the people living in the community. Environmental education and institutions must serve as a driving force to encourage community and institutions to establish an environmental program to achieve sustainable development and make the world and the communities more livable and greener.

VI. SUMMARY OF THEMATIC ANALYSIS AND GROUPINGS OF REVIEWED LITERATURE

A thematic analysis is an analytic method mostly used in qualitative research. It is by the use of themes to fully understand the sets of gathered literature [68]. The themes that arose from this study depict a clear relationship between environmental education and sustainable practices. In addition, environmental education and sustainable development are themes that are connected to this study since they discuss the importance of integrating environmental education in each institution to help people understand environmental issues for long-term goal. Furthermore, the other themes stated that environmental management became effective through partnership between sectors and collaborative efforts which resulted in the implementation of policies. They emphasized the involvement of the government and community. Combining these elements is a practical approach to promoting environmental stewardship and achieving sustainable development.

Raising environmental consciousness is essential for building a society that values ecological stewardship, and education plays a vital role in this transformation. Various studies showcase how different approaches to teaching and learning have shaped environmental understanding and promoted responsible behavior. The comprehensive approach towards sustainable practices highlights the importance of environmental care. It is an effort that needs to be implemented to ensure that the environment is still good and functional to fully satisfy the demands of today without affecting posterity. Leadership, governance, and community involvement will serve as keys to implementing these practices and improving the lives of the people and the environment where they live. It will help to mitigate the environmental problems we're currently facing, such as pollution and climate change. Collaborative action between institutions and communities needs to be activated to find solutions and mitigate environmental issues.

Table 3 summarizes the keywords used in the literature review, organized into thematic groups. This grouping helps to identify and categorize the main themes that emerged from the reviewed studies, providing a clearer understanding of the central topics and trends within the field.

Table 3. Overview of Keywords and Thematic Grouping

THEME 1. Environmental Education and Awareness
Keywords: Environmental Education, Environmental Awareness, Outreach Programs, Teachers Training, Prospective Teachers, Public Schools, Primary School, Pre-service Teachers, Vertical Hanging Gardens, Environmental Responsibility, Attitudes, Teacher, Awareness.
THEME 2. Sustainability and Conservation Practices
Keywords: Sustainable Development, Environmental Sustainability, Sustainability, Sustainable Agriculture, Tree Planting, Forest Conservation, Biodiversity Conservation, Biodiversity Protection, Ecological Management Plan, Solid Waste Management, Water Conservation, Water Resource Planning, Water Demand Management, Waste Management, Conservation, Natural Resources.

Table 3. continued...

THEME 3. Policy, Governance, and Community Involvement

Keywords: Environmental Governance, Waste Policy, Local Government Unit, Institutional Assessment, World Bank, International Organizations, Policy, Grindle, Local Environmental Protection, Environmental Laws, Environmental Conservation Practices, Indigenous Practices, Implementation, Regulation, Environmental Management, ECOPET System.

THEME 4. Climate Change, Pollution, and Global Challenges

Keywords: Climate Change, Mitigation, Adaptation, Pollution, Global Warming, Chemical Testing, Chemical Reporting, Environmental Pollution, Megacities, Environmental Problems, Hazards, COVID-19, Crocodile Conservation, Energy Conservation, Biodiversity, Stability, Ecological Reasoning, Energy Education.

The identified themes for the studies include Environmental Education and Awareness, Sustainability and Conservation Practices, Policy, Governance, and Community Involvement, and Climate Change, Pollution, and Global Challenges. These themes were selected because they encompass diverse aspects of environmental and sustainability issues, each offering unique perspectives, objectives, and approaches to prevention and policy.

THEME 1. Environmental Education and Awareness

Environmental education enhances individuals' and communities' attitudes, values, and knowledge about the environment, preparing them for collaborative action towards sustainable development. It was part of the primary and secondary curriculum as the Department of Education integrated it to foster environmental awareness, skills and knowledge of environmental problems in today's world. It also increases the motivation of the people to practice different environmental activities and fuels the commitment of the institutions to implement effective environmental practices. However, academic institutions faced hurdles in implementing environmental education in their curriculum: more teacher training, a lack of resources, and more tracking and assessment [69].

In recent years, integrating environmental education into primary and secondary curricula has been crucial for equipping a generation with students to help lessen ecological problems. In the study of ESCAP in the Asia-Pacific region, it is given that each country has its unique initiatives in integrating its primary and secondary curricula to tackle environmental issues. For example, in Maldives, with its environmental action plan of 1989, education programs focus more on marine conservation. In Nepal, its national education aims to give importance to the protection and sustainability of using natural resources and reinforcing the relationship between people and nature. Similarly, in the 1900s, the Republic of Korea introduced environmental science courses in middle schools to tackle pollution, and to showcase best practices by providing these schools with resources and educational materials. In 1992, in China, a regulation formalized environmental education across all school levels with subjects like biology, chemistry, geography and physics integrating environmental concepts and allowing teachers to use local and relatable examples to deepen students' understanding. Additionally, some small islands in the South Pacific, such Papua New Guinea and Solomon Islands, have been incorporating environmental education into their curricula. These programs demonstrate the region's dedication to environmental awareness in youth education, equipping the next generation to prioritize and preserve their environment [70].

Across Asia, institutions have faced many challenges in making progress in environmental education, especially in creating materials that strongly match the local context and meet the specific needs of each country. Many educational resources need to be aligned with the local language, and their impact is limited because the issues are irrelevant to that particular country. In response, different organizations have developed specific solutions to fill these gaps. One example would be in Malaysia, where the Academy of Writers produced a storybook that is specifically designed to teach environmental values to primary students. Using narratives and characters, these books' environmental lessons are much more understandable, accessible and culturally relevant because they engage young readers more effectively.

Another challenge is the standardization of environmental content in educational materials since having inconsistent textbook information can prevent students from learning and gaining knowledge and understanding of environmental issues. To address this issue, some countries have taken the initiative to intensively review each educational resource and revise its content to ensure that they are accurate. With this action, it will bring materials up to date and showcase the commitment to achieving a high quality of education in environmental sustainability.

In the classroom, practical and active engagement fosters a deeper understanding of environmental practices. In Indonesia, the Ministries of Environment and Education tackled the need for a place where everyone can learn environmental practices, then established Environmental Study Centers (PSLs) in public universities across all provinces. These centers allow students to experience hands-on training and research opportunities. This approach brought environmental learning into real-world settings, strengthening their ecological knowledge through these practical applications.

Similarly, Thailand's Department of Environmental Quality Promotion (DEQP) recognizes that educators need more resources and skills to address environmental issues locally and effectively. In 1995, DEQP supported the formation of the Provincial Environmental Education Centers (PEECs) in selected schools. These centers have developed materials specific to each province's environmental challenges, empowering teachers and building a community-centered approach to environmental education. Altogether, these initiatives give a strong and creative institution for overcoming ecological challenges [70].

Environmental awareness strengthens society's connection to the environment where there is a collaborative action between people and institutions to protect the environment and mitigate environmental problems. Research studies illustrate different institutions' approaches to environmental issues by enhancing education and increasing public awareness. It must be the foundation of connecting society and the environment to address the risks posed by environmental problems.

The Role of Academic Institutions.

The role of Academic Institutions is to prepare and encourage students to contribute to global efforts to protect the environment. It allows students to join and organize environmental activities to preserve the environment. Rogayan Jr. and Nebrida's [52] research study disclosed that the students where they had conducted their study were very much aware of environmental ideas, issues, and problems. They frequently take action to find a solution, work out environmental issues, and exercise the need to take control of an environmental commitment. This study found a connection between the student's awareness regarding environmental issues and their practices in giving solutions to problems. Still, it must address the factors influencing them to practice environmental activities.

Academic Institutions make connections and apply the learning from inside the school to the real world by integrating environmental education into the curriculum. This is also about environmental studies stating that future primary school teachers have background knowledge about problems that environmental education encounters. In this study, environmental education was still one helpful tool to develop the knowledge and understanding of students, which will increase their environmental awareness and shape their behavior regarding how they will treat the environment. It helps educators and learners to be prepared when bringing the concept of nature inside and outside the schools to provide an excellent background for interdisciplinary learning and a better environment. All in all, a commitment to continuous and consistent conduct of orientation on environmental education should be evident in every institution. While this does not guarantee immediate widespread excellence in environmental education across all schools, it does provide a framework for more profound engagement through the implementation of this initiative.

Academic institutions have improved students' knowledge and understanding of environmental issues and programs. Numerous peer-reviewed studies have shown that education positively impacts academic subjects like biology, chemistry, ecology, and mathematics. Furthermore, the engaging nature of environmental education activities increases the motivation and participation of the students. Environmental education has developed student's academic and critical skills, particularly critical thinking and decision-making skills. According to the report, 90% of the participants have increased their skills, 86% have obtained a positive change, and 83% have improved their environmentally related behaviors. As a result, academic institutions are essential in promoting environmental sustainability to the community [71]. In addition, it also plays a vital role in developing a student's knowledge and understanding of environmental concerns, specifically sustainable education. According to a report from the NASEM (2020), there has been a significant increase in U.S. undergraduate and graduate programs focusing on sustainability. The report also emphasizes that education about sustainability should integrate educational experiences through formats such as courses, majors, minors and research degrees. It also highlights the importance of interdisciplinary approaches to a sustainable environment. Another important component is experiential learning, which allows students to use their knowledge into practical applications. Engaging in businesses, government and NGOs encourages the student to enhance their skills and readiness for a sustainable future. Moreover, the report also emphasizes being diverse, equal and inclusive in sustainability education, advocating for programs that attract students from other backgrounds and support their success. Federal agencies

are motivated to provide support for these programs, especially those in the minority. By these actions, it will help increase sustainability education [72].

Future researchers should study how essential it is to redesign teacher training programs to enhance conceptual knowledge and practical experience where future teachers will be exposed to a range of strategies and encouraged to participate in environmental activities.

Workshops for the Development of Teachers.

According to Dal et al. [27], workshops like "Awareness and Adaptation to Climate Change" help teachers to be updated with knowledge and teaching strategies. While this study highlights the positive impact of these workshops on awareness, future research should also focus on improving teachers' content knowledge for more effective environmental education. Furthermore, innovative teaching will help students explore how protection of ecosystems is reinforced through environmental practices.

The study's professional development workshop effectively increased the teacher's awareness regarding climate change. At first, the pre-test showed a low level of understanding of various topics related to climate initiatives. However, the result of the post-test indicates a measurable improvement in awareness, showcasing a positive impact on the said workshop. Given that the climate change content was integrated on the social studies and science curricula, the workshop helped eliminate the gaps in the understanding of the teachers in line with the research result that underscores the importance of professional development in improving the educators' knowledge of the environmental topic.

Successful Environmental Programs.

Kilag et al. [38] revealed that successful programs and initiatives in the Philippines by The PAU Excellencia Global Academy Foundation implemented various programs such as vertical hanging gardens, cleaning of seashores, and proper segregation, to promote environmental education. This highlights the importance of collaborative efforts and progressive learning. In contrast, Birkmann and von Teichman [73] discussed that each country experienced different causes of climate change, where monitoring and evaluating environmental education needs to improve to analyze its effectiveness in implementing environmental practices and determine the aspects that needed improvement. UNESCO's Growing up in Cities program, in partnership with Cornell University, public schools and community organizations in low-income districts of the city of New York, developed a joint initiative of summer programs for young adolescents. This program involves the students in neighborhood walking tours, photography, and interviews. Chawla and Cushing [74] study revealed that these activities enable the youth to explore and evaluate their local environment, engage in meaningful discussions, and collectively determine strategies for enhancing their communities.

Public Awareness Campaigns.

Public awareness campaigns such as Communication, Education, and Public Awareness (CEPA) have played a crucial role in promoting environmental sustainability. Its campaign highlights designing informative posters, distributed to the locals; it is highly effective as it was used in a recent study of Van der Ploeg et al. [61], stating that those campaigns have deliberately reduced the killings of the crocodile and have improved the city's conservation practices. Given that campaigns are vital in spreading awareness, institutions should use better campaigns to promote before having a program.

Environmental Programs and Community Engagement.

Ardoin et al. [20] study highlights the crucial role of environmental education in empowering communities to address conservation challenges effectively. Out of 105 environmental education studies, 41 reported that an environmental education program enhanced communities' ability to tackle conservation issues. These programs achieved this by promoting collaboration and communication among stakeholders, such as local communities, government agencies, and conservation organizations. Additionally, these programs encouraged increased community participation in conservation projects, leading to greater ownership and commitment to the cause. Establishing local environmental groups further strengthened community-led conservation efforts, providing a platform for collective action and a sense of shared responsibility. Carangan [6] has found that environmental programs such as 3R's (Reduce, Reuse, and Recycle), Clean and Green, Solid Waste Management, Tree Planting, and YES-O have been proven effective in raising and promoting environmental awareness in the communities. These practices must be implemented in schools and other institutions like NGOs and LGUs; by expanding these programs, institutions can promote environmental awareness to lessen environmental problems further. Ampatzidis and Ergazaki [19] study shows that students believe in the "balance of nature", which suggests that the ecosystem remains stable after disturbances. However, the world is currently facing environmental

degradation, which is contrary to the study.

Enhancing environmental awareness is fundamental to enriching community engagement by promoting sustainable efforts and effectively implementing environmental practices and policies. It was spread throughout the community as academic institutions fostered awareness and empowered students to participate and be active in activities that protected the environment. The programs the PAU Excellencia Global Academy Foundation implemented were successful as they featured the good impact of innovative practices and collaborative efforts. Furthermore, CEPA is one of the public awareness campaigns that highlights the importance of education in sustainably shaping people's behavior while protecting the environment and wildlife.

THEME 2. Sustainability and Conservation Practices.

Sustainability and conservation practices have been widely connected to other studies, especially regarding environmental awareness, practices, and sustainable developments; integrating these practices, mitigating environmental concerns, and environmental education have been the main approaches in fostering sustainable development. However, maintaining long-term sustainability will depend on the resources of each institution and access to a quality education.

Integration of Character Education in Active Participation.

According to Omoogun et al. [44], there was a need for environmental education to be integrated into the school curricula entitled "environmental ethics," emphasizing that humans must protect nature, and each should be the main topic of this education. Only through action can we accomplish sustainability if those people have the heart to offer their time and duty to help mitigate environmental problems. Environmental education must address this problem by teaching students practical and sustainable behaviors, encouraging reasonable consumption and respect for nature.

The concept of self-efficacy and its role in behavior change argues that our belief in our ability to carry out a specific action successfully is the key driver of whether we engage in that action. According to Ajzen & Fishbein [75], this perception is directly connected to an empowering educational environment because it encourages students and educators to feel confident and capable in their roles [57]. When students believe in their ability to learn, they are more likely to engage actively and persist through challenges, leading to tremendous academic success. Educators benefit from high efficacy and are more likely to be involved and innovative, creating a positive learning environment for all. Self-efficacy is a foundational principle for creating an empowered educational environment. Future researchers should foster self-efficacy in students and educators to create an environment where everyone feels capable, confident, and motivated to reach their full potential.

Maryono et al.'s [42] study shows the importance of character education in integrating environmental education; this program was entitled "Adiwiyata." Integrating character into the environment is believed to achieve a more sustainable environment. This shows how active participation will help achieve sustainable development goals. Their study also emphasizes that institutions such as schools are crucial in setting an example and creating learning environments. It also stated in Kilag et al. [38] that the current environmental education programs have effectively promoted, which has led to various people giving their time to lessen human consumption. These programs have shown how collective action helps promote environmental sustainability. Future researchers should strengthen individuals' characters to have the heart to participate in environmental drives.

Institutions' Involvement in a Sustainable Future.

Higher education also plays an important role in addressing environmental challenges. As higher education is much more advanced when it comes to learning, these institutions can effectively utilize their knowledge and resources to attain long-term sustainable development. In addition, collaborative efforts with other institutions will help increase the number of those who implement sustainable education toward a sustainable future [51]. Another perspective Gawad [34] gives is that academic institutions have played countless roles in reshaping societies through environmental education. These could be instrumental in enhancing environmentally sustainable programs, as these institutions have a wide range of activities or programs that help make environmental practices sustainable. One example would be the course or program NSTP (National Service Training Program), which engages students in performing societal activities that can benefit the environment.

Local Government Unites (LGUs) play a crucial role in promoting environmental practices for sustainable development. This institution encounters challenges not only in the effectiveness of environmental programs but also in the initiatives of the communities they have. One of the challenges in promoting sustainable

development is balancing growth towards environmental responsibilities [49]. In Baybay, Leyte, a study shows successes and limitations regarding local ordinances. According to the results of the research, solid waste management is the most effective program that has been implemented, and it is a long-term program. While the Anti-Littering Ordinance receives the lowest rating for a long-term program. This shows that each person has environmental responsibilities that are much more important in achieving a sustainable future. De Los Sanots-Nolo and Lee [29] found that implementing waste reduction strategies, education, and resource conservation helps ensure that municipalities remain self-sufficient and well-managed. However, these can only be achieved when an LGU adopts participative leadership by the result of the study. This type of leadership emphasizes a collaborative environment that allows everyone to participate in mitigating environmental sustainability. It also emphasizes environmental stewardship, where individuals take responsibility for environmental protection, leading to long-term sustainable programs.

Each LGU is responsible for promoting environmental sustainability; one example would be the Ifugao LGUs in the study of Camacho et al. [23], which states that these LGUs are responsible for developing plans and policies. The *muyong* system is an enhanced Indigenous system that integrates Indigenous knowledge into environmental practices. Even though there are many new environmental programs and practices, Ifugao still has its systems, knowledge, practices, and sustainability regarding forests or environments intact. The help of the Bagong Pag-asa Foundation Inc. enhances the *muyong* system to increase people's environmental awareness in preserving animals, safeguarding watersheds, and utilizing resources properly. This demonstrates that conservation practices can help achieve a sustainable future.

Sustainable Development Approach.

According to Mhatre et al. [76], the European Union (EU) enhances the concept of Circular Economy (CE), which is a paradigm and economics system that prioritizes the betterment of the environment as it focuses on redesigning things through manufacturing processes that aim at eliminating ways and enhances that continual use of resources. It is a sustainable concept that contrasts the linear economy model of take, make, and dispose as it utilizes and follows the principles of redesign, reduce, reuse, and recycle. Adopting CE principles and improving a country's economic status, as it will produce a sustainable product that can be useful and demanded by other places. Generating a net financial benefit also significantly changes the environment and society, creating a sustainable future where both people and nature can flourish.

Globally, the Philippines is known to be rich in natural resources but struggles to mitigate environmental problems. According to Tolentino and Landicho [59], it is one of the countries that faced issues mitigating these environmental problems, they have shifted in an approach to managing forest and land resources. While sustainable development is important, one can only achieve it if conservation practices are given importance. As stated in the study, one practical application of conservation practice is through agroforestry, which helps improve soil fertility, leading to more balanced environmental protection. Their study also argues that agroforestry offers a promising solution for sustainable development in this country, integrating trees, crops, and livestock will help achieve economic and ecological goals. As Silva et al. [55] discuss, human desires and unlimited wants increase a society's productivity and economic growth, enhancing knowledge and innovation; this economic concept is called the new growth theory. This theory states that a country's economic development relies on people's wants and needs, and a person's increased ambition and consumption directly results in economic growth and will make a society sustainable. However, there is also an increase in the pollution a person can make.

In each study, scholars and inventors collaborated their knowledge and expertise to create ideas to solve environmental pollution; with the help of environmental institutions, environmental practices, and programs will run for an extended period when appropriately implemented. It is also essential to have suitable conservation practices in each place since not all practices can be used in each locality. Each study also integrates innovation and technological advancement when addressing environmental problems, creating practices and programs that are sustainable enough to last for many years.

THEME 3. Policy, Governance, and Community Involvement

Environmental management is a system and practice that organizes people and enhances collaboration to come up with effective environmental practices to address the specific environmental problems that the community is facing to ensure the safety of the environment and achieve sustainable development.

Youth Participation and Sustainable Development Goals (SDGs).

The ASEAN Youth Development Index (YDI) emphasizes the importance of youth participation and

their development, education, engagement, health, opportunities, and well-being [64]. In addition, the youth could play a crucial role in giving information and spreading awareness to the future generation that their engagement can be a significant step in achieving sustainable goals in different countries. In contrast, the study analyzes that in various countries, the uses of their best practices can be provided to other countries to help each other in helping their own country and the youth engage and achieve sustainable development in each country. Stakeholder involvement and youth engagement will foster significant stakeholder collaboration to develop a long-term policy at multiple levels.

The Role of International Organizations in Environmental Governance.

In line with this study, the involvement of international organizations such as UNEP and the World Bank is essential in environmental governance [65]. The World Bank (WB) has the capacity and enough resources to be considered an effective source for developing countries committed to implementing environmental programs and ecological projects. It creates environmental management in those developing countries, as this international organization provides policy advice and financial support. On the other hand, through international cooperation and policy advocacy, the UNEP has advanced the implementation and development of the global environmental agenda. However, it faced limitation as it focused only on the roles of UNEP and the World Bank, limiting other progressive international organization's connections and important influence. It will make it harder to understand how these groups utilized their power and resources to mitigate environmental problems.

Green Supply Chain Management (GCSM) and Solid Waste Management in Industries.

Recently, to focus on addressing environmental issues, manufacturing industries have begun applying GCSM [43]. One example of a manufacturing industry is the Indian manufacturing industry, which has made valuable contributions to the country's economic growth. However, due to being considered a contributor to polluting the environment, it has acquired an extremely poor public image. Cebu City in the Philippines has been contributing waste disposal and transportation to its municipal budget at the annual cost of PHP 47 million (US\$ 1 million). However, Premakumara et al. [48] found that the city has funding to solve this issue and relies on collecting public services fees. It is to make their communities exercise Solid Waste Management practices. As Cebu City is one of the most urbanized cities in the Philippines, they set goals for solid waste management until 2028. They are producing environmental practices to reduce Short-Lived Climate Pollutants (SLCPs) from municipal solid waste management (MSWM).

Local Governance and Engagement of the Citizens.

Local governance develops the interactions between humans in the environment to create balanced conditions in which humans and nature coexist, which leads to safeguarding the environment and an environmentally aware society. The Citizen Satisfaction Index System (CSIS) serves as a tool to measure the level of effectiveness of the Local Government Unit (LGU) of Lezo, Aklan regarding the execution of environmental management programs through the four major ideas such as awareness, availability, need for action, and satisfaction [63]. Similarly, according to De Los Santos-Nolo and Lee [29], the LGUs are also considered political agencies given authority by the law to implement waste policies and waste management programs. They are there to monitor and evaluate the importance of these policies and programs to be approved, where they will grant the authority to the schools and barangay officials to conduct an environmental practice called waste disposal every month to mitigate the waste and to a better condition of the environment. The LGU has introduced ordinances to manage environmental concerns. Those ordinances are implemented to ensure proper environmental conservation, and they are called anti-littering, solid waste management, and plastic bag regulations. Among these, the Solid Waste Management Ordinance is the most effectively implemented. However, the plastic bag ordinance is the least enforced [49].

Relations of Environmental Education and Institutions.

Higher Education Institutions play countless roles and responsibilities in transforming and developing societies by educating decision-makers, academics, entrepreneurs, and leaders. It will provide enough information about the environment through environmental education and serve as their basis for creating and implementing environmental practices, programs, and activities. Locally, Calapan City in the Philippines supports local green activities that teach environmental practices. The City of Calapan established collaboration for mangrove forests, solid waste segregation, river rehabilitation, tree planting, and urban backyard gardening. This project would only succeed with community support, especially from schools [34]. Similarly, according to Tristao and Tristao [8], Non-Governmental Organization (NGOs) must address their growing challenges, establish partnerships, and reshape their traditional functions. NGOs must balance the objectives of environmental consideration and economic growth.

Environmental Education and the Preparedness of Community.

Esguerra et al. [32] presents the results of their research study regarding the effectiveness of environmental education programs in improving the preparedness of the Badjao Community regarding environmental hazards. On the other hand, this study also aims to compare the program's impact on in-school and out-of-school children in vulnerable coastal areas, focusing on increasing environmental awareness and understanding. Environmental education highlights how the programs conducted for vulnerable communities influence the knowledge and perception of these sectors despite the differences in the educational setting of young Badjao. The study's limitations include the potential need for long-term analysis and goals regarding the effectiveness of environmental education in the Badjao Community. In addition, the findings don't fully capture the problems faced by both sectors in vulnerable coastal communities, which limits the overall results across various factors

Overall, effective environmental management, which resulted in active participation and integration between the institutions and the community, was essential to promote environmental education to achieve and encourage socio-economic development and to foster environmental conservation. It develops the interactions of humans in the environment to create balanced conditions in which humans and nature coexist, which leads to safeguarding the environment and environmentally aware societies.

THEME 4. Climate Change, Pollution, and Global Challenges.

Global challenges are obstacles where people and the Earth experience sudden changes, significant trends, and developments that can cause harm. Climate change and Pollution are some of the global challenges that the world is facing right now that it is important to address immediately. Additionally, with the need for more resources or unequal distribution of resources to mitigate these issues, global challenges are getting harder to combat.

Addressing Global Environmental Challenges.

According to Sinan et al. [56], environmental pollution is the intense mixing of harmful substances with soil, air, and water; it is considered one of the most prominent environmental problems that need to be treated, as it has undesirable consequences that will harm the environment and effects on how people will live, especially on their health. In this matter, the effectiveness of environmental education must be utilized to increase individuals' awareness and improve their sustainable living skills. Internationally, the environmental education system in Russia is still developing. This educational approach must be tested in global challenges like climate change to achieve Sustainable Development in Russia [54]. The good news is that there are effective environmental practices that will help address these global challenges. Balanac and Punzalan [21] note that tree planting is known as one of the best practices to counteract and mitigate the effects of global warming and deforestation. This study shows the importance of this activity, as it influences the learners to volunteer to plant trees, which will increase their motivation to do these kinds of activities and engage others to participate as well; it is where environmental consciousness and community awareness will increase. Furthermore, Oteyza et al. [45] has started to find a way to take care of its tourist destination for long-term sustainability. It is through implementing water and energy consumption and conservation, which is described as using water and energy to practice a more efficient way of reducing unnecessary water and energy usage. It shows that the goal was to focus on tourism development and avoid water pollution. They started practicing proper water and energy use to make their tourist spot functional. To mitigate environmental challenges, environmental education should be integrated not only into other institutions that have a role in implementing environmental practices and programs.

Addressing Environmental Impact.

In just a few decades, urban areas worldwide, both in developed and developing countries, have become increasingly conquered by automobiles and less sustainable [47]. Urban sustainability must be prioritized for megacities and all cities to address traffic, the impact of climate change, and air pollution. This study increases the awareness of institutions, legislators, and urban planners that they should improve transportation networks in cities that are good for the environment. Muduli et al. [43] highlights the importance of implementing GCSM to reduce the risks of hazards and to improve ecological efficiency. In addition, this environmental practice will make the mining industry in India more environmentally friendly as they will prioritize the importance of the environment they use in their mining operations. Future researchers should conduct public awareness campaigns to educate people and further develop their knowledge regarding the environment.

Promoting Environmental Protection.

Environmental protection is one of the most important things an institution should promote; one example is biodiversity conservation. According to Craven et al. [26], there is a comprehensive analysis of how various aspects of biodiversity impact diversity-stability relationships. Challenges such as understanding each of these influences on the stability of the community are a lot more work to be given a solution. The study by Spencer Jr. [58] states that not only are these conservation practices hard to understand, but the chemicals that have a negative impact on the environment are the main cause of environmental degradation. The study states that to help regulate the importation, production, and disposal of these chemicals, the Toxic Substance Control Act (TCSA) was created to protect the health of humans and the environment by authorizing Environmental Protection Agency (EPA). Chemicals have a lot more effects on increasing environmental problems; this has also led to the most talked about environmental issue, which is climate change. For example, the Netherlands experienced severe drought and precipitation in 2018 and 2019, which affected the country's agricultural sector and industry [24]. It is important to address these problems to meet the people's demands, such as farm products. Furthermore, this country is known as sustainable and environmentally friendly, and it does not often experience the consequences of climate change, such as severe flooding, and that's why it is important to mitigate precipitation. The institutions in this country must support the farmers in providing water irrigation in farms. It is also important that they focus on exercising a clean-up drive from the water resources in the country and build some infrastructure where water will flow. It is essential to remove obstacles to adapting climate strategies [77]. This will allow institutions to freely adopt policies that can mitigate drought and precipitation. In addition, the institutions can easily exercise environmental strategies to solve environmental issues and engage the public in those environmental activities.

The commitment of the European Union (EU) to the circular economy is important in utilizing its strategies to increase people's environmental awareness while promoting sustainability. The EU addresses environmental challenges by implementing comprehensive environmental policies, starting to engage within local communities, and fostering environmental education. It is a domino effect as it cultivates a sustainable society and culture among its citizens. The EU serves as one of the intergovernmental organizations that foster an environmental global movement toward a sustainable future as it aligns its policies and programs with a compelling concept and principles of a circular economy that makes an important factor to this study, to the people and environment [76].

Enhancing of Environmental Conservation.

Communication, education, and public awareness (CEPA) campaigns are important in biodiversity conservation. The cost-effectiveness of these CEPA outcomes, measured as the cost per person per day, influenced the efforts and requested the respondents to prioritize the outputs [61]. Investing in CEPA campaigns is effective as it encourages people to consider conserving the crocodile in different informative ways, leading to substantial gains. Global implementation of carefully assessed CEPA programs will bring significant benefits to mitigate the effects of global challenges such as the mass killing of animals, as it focuses on saving the species in the wild and is used in monitoring the number of species such as Philippine Crocodiles.

Addressing environmental problems such as climate change, pollution, chemical usage, and other problems that cause loss of biodiversity, flooding, and other natural calamities that are fueled by these environmental problems requires a complicated and mixed approach by the different institutions. Institutions should integrate policy improvements, effective practices, educational initiatives, practical action, and community engagement. Coordinating these efforts is crucial to achieving a sustainable environment.

While the themes identified cover a range of issues, critical gaps remain. There is limited evidence on the long-term effectiveness of environmental education in fostering sustainable behaviors across institutions, as well as on the local implementation of policies and their impact on communities. Although climate change and pollution are well-studied, there is a need for integrated approaches that link education, policy, and conservation. These gaps highlight the necessity for further studies that not only evaluate the sustainability of environmental practices within institutions and examine the interconnected roles of education, policy, and community action in fostering resilient and adaptive systems. This study seeks to address these gaps by exploring how environmental education can be optimized to support sustainable development across multiple levels.

The findings of the research are based on the underlying theoretical frameworks. The Institutional Theory emphasizes how organizations influence community norms and sustainability-related behaviors via planned programs and environmental education regulations. This is shown by the execution of cooperative environmental programs and regulations, which maintain the institutions' normative impact in academic waste management and environmental practices. Additionally, the Change Agent Theory shows how organizations and educators work as knowledge and resource bridges, encouraging revolutionary shifts in environmental practices among people and

communities. The community-driven projects and the inclusion of environmental education in the curriculum to promote awareness and sustainable practices are clear examples of this dynamic. Lastly, the PSIR Indicator Theory emphasizes how environmental pressures, states, effects, and responses are interrelated, primarily via waste management, climate education, and sustainability initiatives programs. Combined, these theoretical perspectives provide a strong foundation for understanding how environmental education empowers people to confront environmental issues and encourage sustainable long-term habits

VII. CONCLUSION

Institutions have a crucial role in promoting environmental education, raising awareness, and implementing sustainable practices in a world facing escalating environmental challenges. Particularly in developing countries, institutions can drive economic growth but address pressing issues related to environmental sustainability.

Around the globe, institutions contribute significantly to raising awareness of environmental problems by promoting practices that enhance environmental knowledge and creativity, ultimately helping mitigate threats to our planet. The research reveals a common theme: institutions are committed to sustainable development and a greener future by implementing environmental practices and engaging communities in environmental awareness initiatives. Theoretical models and frameworks used by these institutions have proven effective, offering robust foundations for this study and supporting sustainable environmental solutions.

This study finds that effective solutions to environmental issues often depend on how institutions utilize environmental education. Furthermore, the research highlights the need for collaborative efforts among institutions to enhance public environmental awareness through joint environmental practices. Such cooperation is possible through international environmental relations, which facilitates the sharing of expertise and resources to address these global issues. By educating communities- young and old alike- institutions can help build environmentally conscious societies that align with sustainability goals, ensuring that people understand both their needs and the practices required to maintain a healthy environment.

This study's findings reaffirm the relevance of the three theoretical frameworks-Institutional Theory, Change Agent Theory, and PSIR Indicator Theory-in understanding the pivotal role of institutions in environmental education and sustainability. The Institutional Theory explains how institutions establish norms and influence behaviors, as evidenced by their structured implementation of environmental practices and community engagement initiatives. The Change Agent Theory highlights the transformative role of institutions as intermediaries that provide resources and knowledge, enabling individuals and communities to adopt sustainable practices effectively. Similarly, the PSIR Indicator Theory underpins study's emphasis on addressing environmental pressures, evaluating impacts, and formulating targeted responses through collaborative efforts. By anchoring this research in these theoretical frameworks, the study not only validates their applicability but also underscores the importance of institutional collaboration and education in fostering sustainable environmental solutions and raising public awareness. Together, these insights point to the vital role of institutions in driving sustainable development and creating environmentally conscious societies.

VIII. RECOMMENDATION

To address pressing environmental challenges, particularly in developing countries, institutions must take a leading role in promoting environmental education, raising awareness, and implementing sustainable practices. The following recommendations highlight actions for institutions to maximize their impact:

1. Enhance Environmental Education: Institutions should prioritize environmental education at all levels to foster a deeper understanding of sustainability. This involves integrating environmental topics into curricula, encouraging hands-on conservation efforts, and emphasizing the importance of sustainable practices.

2. Strengthen Community Engagement: Increasing public awareness and involvement in environmental initiatives is essential. Institutions can achieve this by partnering with local communities to promote sustainable practices and by leveraging traditional and indigenous knowledge to address environmental issues.

3. Optimize Resource Allocation: Institutions should use their resources more effectively to support environmental initiatives. This includes funding and supporting programs that promote sustainable development

and adopting eco-friendly policies within institutional operations.

4. Foster International Collaboration: Given the global nature of environmental challenges, institutions should engage in international environmental networks to share expertise, resources, and strategies. Collaborative efforts can enhance local practices and contribute to global sustainability goals.

5. Encourage Further Research: Additional studies are needed to understand environmental education's long-term impact and refine strategies that increase public engagement and sustainability outcomes. Institutions should support and invest in research to develop innovative solutions for environmental challenges.

By implementing these recommendations, institutions can contribute to creating environmentally conscious communities aligned with sustainability goals, ultimately supporting a greener, more resilient future in an increasingly interconnected world.

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