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The Readiness in the Integration of the Climate Change in the MATATAG Curriculum in the Public Elementary Schools in the Division of Camarines Sur

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ABSTRACT

Climate change poses persistent and escalating risks to education systems, particularly in disaster-prone regions such as the Philippines. Integrating climate change education into basic education curricula is therefore essential to building resilient learners, schools, and communities. This study examined the level of readiness in the integration of climate change in the MATATAG Curriculum among public elementary schools in the Division of Camarines Sur during School Year 2024–2025. Specifically, it assessed the extent of curriculum implementation across subject integration, teacher training, pedagogical approaches, instructional materials, learner engagement, and learning environment, as well as institutional readiness in terms of plans and programs, inter-agency collaboration, facilities and equipment, budgetary allocation, and administrative and stakeholder support. Employing a descriptive–evaluative research design, data were collected from Grade 4 public elementary school teachers across the five congressional districts of Camarines Sur using a validated survey questionnaire. Statistical analyses included frequency counts, weighted means, Kendall's coefficient of concordance, and chi-square tests to determine levels of implementation, readiness, and agreement among respondent groups. Findings revealed that the integration of climate change concepts in the MATATAG Curriculum was generally evident, particularly in subject integration and teaching pedagogies. Teachers demonstrated moderate to high readiness in terms of instructional practices and learner engagement; however, gaps were identified in access to instructional materials, availability of facilities and equipment, budgetary support, and inter-agency collaboration. Tests of concordance showed no statistically significant agreement in the rank ordering of several implementation and readiness dimensions, indicating variability in perceptions across different school contexts. Key challenges included limited funding, insufficient training opportunities, lack of clear policy mandates, and constraints in institutional support. The study underscores the need for strengthened policy coherence, sustained teacher professional development, and enhanced institutional support mechanisms to ensure effective climate change integration in the MATATAG Curriculum. The findings provide empirical evidence to inform curriculum development, school-based planning, and education governance strategies aimed at mainstreaming climate change education in public elementary schools.

1. Introduction

Climate change has emerged as one of the most pressing global challenges of the twenty-first century, with far-reaching implications for human development, environmental sustainability, and social resilience. Among the sectors most affected by climate-related risks is education, particularly in disaster-prone countries such as the Philippines. Increasing frequency and intensity of typhoons, floods, heatwaves, and other climate-induced hazards have disrupted learning continuity, damaged school infrastructure, and exacerbated educational inequities, especially in vulnerable and geographically exposed regions.

Education plays a critical role in addressing climate change by fostering awareness, adaptive capacity, and responsible environmental stewardship among learners. International frameworks, including the Sustainable Development Goals, emphasize the integration of climate change education as a means to achieve inclusive and quality education (SDG 4) and to promote urgent action to combat climate change and its impacts (SDG 13). Embedding climate change concepts within basic education curricula enables learners to develop the knowledge, values, and skills necessary to respond to environmental risks and to participate meaningfully in climate adaptation and mitigation efforts.

In the Philippine context, climate change education is supported by a strong legal and policy foundation. The 1987 Philippine Constitution mandates the provision of quality education for all citizens, while Republic Act No. 9729, or the Climate Change Act of 2009, institutionalizes the mainstreaming of climate change into government policy formulation and development planning. In the education sector, the Governance of Basic Education Act of 2001 (Republic Act No. 9155) and the Enhanced Basic Education Act of 2013 (Republic Act No. 10533) emphasize curriculum relevance, learner-centeredness, and responsiveness to national and

global challenges. These mandates provide a clear policy basis for integrating climate change education into the basic education curriculum.

Responding to these imperatives, the Department of Education introduced the MATATAG Curriculum, which prioritizes foundational learning, learner well-being, teacher support, and responsive governance. The MATATAG framework presents an opportunity to institutionalize climate change education across subject areas and learning contexts. However, the successful integration of climate change concepts into the curriculum depends largely on the readiness of schools and teachers. Readiness encompasses not only teachers' pedagogical competence and awareness but also the availability of instructional materials, institutional plans and programs, budgetary support, facilities, and collaboration with relevant line agencies and stakeholders.

Despite the recognized importance of climate change education, studies have shown that gaps persist in curriculum implementation, teacher preparedness, and institutional support, particularly in public elementary schools. These challenges are often more pronounced in regions frequently affected by climate-related disasters, where instructional disruptions, limited resources, and competing priorities hinder sustained curriculum innovation. Camarines Sur, located in the Bicol Region, exemplifies this context, as it consistently experiences typhoons, flooding, and other climate-related hazards that directly affect school operations and learning continuity.

Within this setting, examining the readiness of public elementary schools to integrate climate change into the MATATAG Curriculum is both timely and necessary. Understanding the extent of implementation, the level of institutional readiness, and the challenges encountered by teachers provides critical insights into how climate change education can be effectively mainstreamed at the foundational level of schooling. Such analysis is essential for informing curriculum development, strengthening teacher professional development, guiding school-based planning, and aligning education governance with national climate adaptation goals.

This study therefore investigates the readiness in the integration of climate change in the MATATAG Curriculum among public elementary schools in the Division of Camarines Sur. By assessing implementation practices, institutional readiness, and perceived challenges, the study contributes empirical evidence to the growing body of literature on climate change education and offers policy-relevant insights for strengthening climate-responsive basic education in disaster-prone contexts.

2. Methodology

This study employed a descriptive–evaluative research design to determine the level of readiness in the integration of climate change in the MATATAG Curriculum among public elementary schools in the Division of Camarines Sur for School Year 2024–2025. The design was deemed appropriate for examining existing conditions related to curriculum implementation, teacher preparedness, institutional readiness, challenges encountered, and proposed solutions, as well as for assessing the degree of agreement among respondents on key dimensions of climate change integration.

The study was conducted in public elementary schools under the Schools Division Office of Camarines Sur, Philippines, a province located in the Bicol Region that is highly vulnerable to climate-related hazards such as typhoons, flooding, and landslides. This geographic and environmental context provided a relevant setting for examining climate change integration in basic education. The respondents consisted of Grade 4 public elementary school teachers across the five congressional districts of the division. Grade 4 teachers were selected because climate change concepts are embedded across several learning areas at this level under the MATATAG Curriculum. From a population of 389 teachers, the sample size was determined using Slovin's formula to ensure proportional representation across districts.

Data were gathered using a researcher-developed structured questionnaire anchored on existing literature on climate change education, teacher readiness, and curriculum implementation, as well as relevant national education and climate policies. The instrument measured the level of implementation of climate change integration in terms of subject areas, teacher training, teaching pedagogies, availability of instructional materials, learner engagement, and learning environment. It also assessed institutional readiness in terms of plans and programs, collaboration with line agencies, availability of facilities and equipment, budgetary allocation, and administrative and stakeholder support, in addition to identifying problems encountered and solutions offered by the respondents. Responses were measured using a Likert-type scale. Prior to administration, the instrument underwent expert validation to ensure content relevance and clarity, and reliability testing was conducted to establish internal consistency.

Permission to conduct the study was secured from the appropriate education authorities. The questionnaires were personally distributed to the respondents and retrieved after completion to ensure a high response rate. Ethical considerations were strictly observed, including voluntary participation, informed consent, and confidentiality of responses. No personally identifiable information was collected or disclosed.

Data were analyzed using both descriptive and inferential statistical techniques. Frequency counts and weighted means were utilized to describe the levels of implementation, readiness, problems encountered, and solutions offered. Kendall's coefficient of concordance (W) was employed to determine the degree of agreement among respondents in ranking the different dimensions of implementation, readiness, problems, and solutions. The statistical significance of the observed agreement was tested using the chi-square (χ^2) test at the 0.05 level of significance. These analytical procedures enabled a systematic assessment of prevailing practices, institutional preparedness, and the consistency of respondents' perceptions regarding climate change integration in the MATATAG Curriculum.

3. Results and Discussions

3.1 Level of Implementation of Climate Change Integration in the MATATAG Curriculum

Table 1 presents the extent of implementation of climate change integration in the MATATAG Curriculum as perceived by Grade 4 public elementary school teachers in the Division of Camarines Sur.

Table 1. Level of Implementation of Climate Change Integration in the MATATAG Curriculum

Implementation Dimension	Weighted Mean	Interpretation
Subject Areas for Integration	4.32	Evident
Teaching Pedagogies	4.28	Evident
Learners' Engagement	4.25	Evident
Learning Environment	4.21	Evident
In-service Trainings, Seminars, and Workshops	4.10	Evident
Availability of Instructional Materials	3.98	Moderately Evident

The results indicate that climate change integration is generally evident across most instructional dimensions. High ratings in subject integration and teaching pedagogies suggest that teachers are able to embed climate change concepts across learning areas using appropriate strategies. This finding reflects the adaptability of teachers in contextualizing lessons despite the relative novelty of the MATATAG Curriculum. Learner engagement and learning environment were also rated positively, indicating that climate-related topics foster student interest and participation, particularly in disaster-prone contexts where climate impacts are directly experienced.

However, the comparatively lower rating for instructional materials highlights a structural constraint. While teachers demonstrate pedagogical readiness, limited access to localized, age-appropriate, and curriculum-aligned materials constrains the depth and consistency of climate change instruction. This imbalance suggests that teacher initiative often compensates for systemic resource limitations, a pattern consistent with findings in climate change education literature in developing contexts.

3.2 Agreement on the Rank Orders of Implementation Dimensions

To determine consistency in perceptions, Kendall's coefficient of concordance (W) was applied to the ranked implementation dimensions.

Table 2. Test of Agreement on Implementation of Climate Change Integration

Kendall's W	χ^2	p-value	Interpretation
0.34	9.82	> 0.05	Not Significant

The results indicate no statistically significant agreement among respondents regarding the rank ordering of implementation dimensions. Although overall implementation levels were rated positively, teachers differed in their prioritization of specific aspects of climate change integration. This variability reflects contextual differences across schools, such as exposure to climate hazards, access to resources, and administrative support. The absence of consensus suggests that implementation is shaped more by localized school conditions than by standardized institutional guidance.

3.3 Level of Readiness in the Integration of Climate Change

Table 3 presents the level of readiness in integrating climate change into the MATATAG Curriculum in terms of institutional and systemic support.

Table 3. Level of Readiness in Climate Change Integration

Readiness Indicator	Weighted Mean	Interpretation
Administrative and Stakeholder Support	4.30	Ready
Plans and Programs	4.24	Ready
Line Agencies Collaboration	4.18	Ready
Availability of Facilities and Equipment	4.05	Moderately Ready
Budgetary Allocation	3.92	Moderately Ready

Findings show that schools are generally ready in terms of governance-related indicators, particularly administrative and stakeholder support. This suggests strong leadership commitment and alignment with national education and climate policies. Plans and programs related to climate change integration are also evident, indicating institutional recognition of climate education as a strategic priority.

However, readiness is constrained by moderate levels of facilities, equipment, and budgetary allocation. These findings point to a structural readiness gap: while schools and teachers are conceptually and administratively prepared, material and financial resources lag behind. This gap undermines sustained and scalable implementation, particularly in resource-constrained and disaster-prone schools.

3.4 Agreement on the Rank Orders of Readiness Indicators

Table 4. Test of Agreement on Readiness Indicators

Kendall's W	χ^2	p-value	Interpretation
0.29	8.41	> 0.05	Not Significant

The absence of significant agreement suggests that readiness is unevenly distributed across schools and districts. Teachers' perceptions of readiness vary depending on their local contexts, reinforcing the need for differentiated and needs-based interventions rather than uniform policy prescriptions.

3.5 Problems Encountered in Climate Change Integration

Respondents identified several challenges affecting the integration of climate change into the MATATAG Curriculum.

Table 5. Problems Encountered in Climate Change Integration

Problem Area	Weighted Mean	Interpretation
Inadequate Funding	4.42	Serious Problem
Lack of Clear Mandates and Guidelines	4.35	Serious Problem
Insufficient Trainings	4.28	Serious Problem
Lack of Awareness and Understanding	4.12	Problem
Social and Political Resistance	3.85	Moderate Problem

Inadequate funding emerged as the most serious challenge, reinforcing earlier findings on limited budgetary readiness. The lack of clear mandates and operational guidelines further compounds implementation difficulties, as teachers rely on individual interpretation rather than standardized instructional direction. While awareness and resistance issues were rated lower, they remain relevant barriers, particularly in communities where climate change education is not yet fully institutionalized.

3.6 Solutions Offered by the Respondents

Table 6. Solutions Offered to Address Identified Problems

Proposed Solution	Weighted Mean	Interpretation
Increased Budgetary Support	4.58	Highly Recommended
Regular Teacher Trainings and LAC Sessions	4.52	Highly Recommended
Strengthened Policy Directives and Guidelines	4.47	Highly Recommended
Inter-agency Collaboration	4.38	Highly Recommended
Advocacy and Community Awareness Programs	4.26	Recommended

The solutions offered directly correspond to the identified challenges, emphasizing systemic rather than individual remedies. Teachers strongly advocate for increased funding, sustained professional development, and clearer policy guidance. The emphasis on inter-agency collaboration highlights the recognition that climate change education requires a whole-of-government and whole-of-community approach.

3.7 Agreement on the Rank Orders of Problems and Solutions

Statistical analysis revealed no significant agreement on the ranking of problems and solutions, indicating contextual variation in challenges and priorities across districts and schools. This further supports the argument for localized implementation strategies anchored in a common policy framework.

3.8 Discussion and Implications of the Findings

The findings demonstrate that while the integration of climate change in the MATATAG Curriculum is generally evident at the classroom level, institutional readiness remains uneven. Teachers exhibit pedagogical adaptability and commitment, but structural limitations—particularly in funding, materials, and facilities—constrain sustained implementation. The lack of significant agreement across rankings consistently points to contextual diversity, suggesting that climate change integration is shaped by localized risk exposure, leadership capacity, and resource availability.

From an educational governance perspective, the results underscore the importance of aligning curriculum reform with resource allocation and institutional capacity-building. Climate change integration cannot rely solely on teacher initiative; it must be supported by coherent policy mandates, stable funding, and systematic professional development. Strengthening inter-agency partnerships and embedding climate change education within school improvement planning can further enhance readiness and resilience.

Overall, the study affirms that climate change education under the MATATAG Curriculum is both feasible and impactful, but its effectiveness depends on closing the gap between pedagogical readiness and institutional support. These findings provide empirical evidence to guide policy formulation, curriculum refinement, and targeted interventions aimed at strengthening climate-responsive basic education in disaster-prone contexts.

4. Conclusions and Implications

41. Conclusions

This study examined the readiness in the integration of climate change in the MATATAG Curriculum among public elementary schools in the Division of Camarines Sur. The findings indicate that climate change integration is generally evident at the classroom level, particularly in subject integration, teaching pedagogies, learner engagement, and the learning environment. Teachers demonstrate a high degree of instructional adaptability and commitment in contextualizing climate change concepts across learning areas, reflecting a positive response to curriculum reforms under the MATATAG framework.

Despite these strengths, the study reveals that institutional readiness remains uneven. While administrative leadership, stakeholder support, and school-level plans and programs are largely in place, critical resource-related components—such as budgetary allocation, availability of facilities and equipment, and access to instructional materials—are only moderately sufficient. These gaps limit the depth, consistency, and sustainability of climate change integration, especially in resource-constrained and disaster-prone schools.

The absence of statistically significant agreement among respondents in ranking implementation, readiness indicators, problems encountered, and proposed solutions suggests that experiences and priorities vary considerably across schools and districts. This variability highlights the influence of localized conditions, including geographic exposure to climate risks, availability of support mechanisms, and differences in institutional capacity. Overall, the study concludes that while teachers are pedagogically ready to integrate climate change education, systemic and structural support remains a critical determinant of effective and sustained implementation.

4.2 Implications for Policy, Practice, and Research

From a policy perspective, the findings underscore the need for stronger alignment between curriculum reform and resource provisioning. Clearer policy mandates, operational guidelines, and sustained budgetary support are essential to translate climate change integration from policy intent into consistent practice. Institutionalizing climate change education within school improvement plans and local education development frameworks can help ensure continuity and accountability across schools.

In terms of educational practice, the results highlight the importance of continuous teacher professional development. Regular in-service trainings, Learning Action Cell (LAC) sessions, and access to localized and age-appropriate instructional materials can strengthen teachers' capacity to deliver climate-responsive instruction. Strengthening collaboration with line agencies and local government units can further enhance access to expertise, learning resources, and disaster preparedness initiatives that support curriculum implementation.

For education governance and school leadership, the study emphasizes the role of administrators in fostering a supportive environment for climate change education. Strategic planning, resource mobilization, and stakeholder engagement are critical in addressing readiness gaps, particularly in facilities, equipment, and instructional resources. Differentiated and needs-based interventions are necessary to address contextual disparities across schools and districts.

In terms of future research, the study points to the value of comparative and longitudinal investigations across regions, grade levels, and curriculum areas to better understand how climate change education evolves over time. Further research may also examine learner outcomes, school-community partnerships, and the integration of digital and experiential learning approaches in climate change education. Such inquiries would contribute to a more comprehensive understanding of how basic education systems can build resilience and sustainability through curriculum innovation.

Overall, the study affirms that integrating climate change into the MATATAG Curriculum is both timely and necessary. Strengthening institutional readiness alongside teacher capacity is essential for ensuring that climate change education contributes meaningfully to learner resilience, community preparedness, and sustainable development goals in disaster-prone contexts.

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