

Heads of Schools' Coordination of Co-Curricular Activities Strategy in Promoting Climate Change Mitigation Practices in Public Secondary Schools in Kilimanjaro Region, Tanzania.

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Abstract

This study examined the heads of schools' coordination of co-curricular activities strategy in promoting climate change mitigation practices in public secondary schools in Kilimanjaro Region, Tanzania. Guided by Stapp's (1969) Environmental Education Theory, the study adopted a convergent mixed-methods design. The target population comprised 105,450 students across 249 public secondary schools. A sample of 400 students from 25 schools was selected using proportionate stratified random sampling. Data were collected through questionnaires, a document analysis guide, and an observation guide. Four experts established instrument validity, while the students' questionnaire achieved a Cronbach's alpha coefficient of 0.837. Peer debriefing, an audit trail, and triangulation enhanced trustworthiness. Quantitative data were analysed descriptively, while qualitative data were analysed thematically. The study followed ethical principles, including obtaining research permits, informed consent, and acknowledgement of sources. The findings revealed that heads of school's coordination promoted climate change mitigation practices by supporting environmental clubs' activities, such as connecting students with environmental organisations and providing opportunities for practical environmental engagement. However, some schools had inactive environmental clubs, fragmented documentation, and inconsistent activities, limiting students' sustained participation in mitigation practices. The study concludes that effective coordination of co-curricular activities can strengthen students' engagement in climate change mitigation. However, consistent implementation, systematic documentation, and sustained institutional support are necessary to translate participation opportunities into lasting environmental practices.

Keywords: Climate Change Mitigation Practices, Co-Curricular Activities, Environmental Education

1.0 Introduction

Climate change is no longer a distant environmental concern; it is an immediate global challenge that increasingly affects individuals, communities, and institutions. Schools are part of this reality. Beyond imparting academic knowledge, schools provide settings where young people develop attitudes, habits,

and everyday practices that can either support environmental sustainability or undermine it. The scientific evidence on anthropogenic climate change underscores the urgency of this responsibility. The most recent annual assessment of global climate indicators reports that human activities contributed to a 1.37°C global warming in 2025, while atmospheric concentrations reached 425.6 parts per million for carbon dioxide, 1,936.3 parts per billion for methane, and 339.4 parts per billion for nitrous oxide, with all three gases increasing steadily since 2019 (Forster et al., 2026). These trends make education more consequential to climate action. Schools are not simply places where climate change is discussed; they are spaces where students can learn, model, and reinforce practical responses. In this context, coordinating co-curricular activities matters, as these activities can give students opportunities to translate environmental knowledge into everyday practices that support climate change mitigation.

The extent to which schools take on this role, however, varies across education systems. In the United States, climate change education has developed unevenly, partly because of the country's decentralised governance structure. Recent scholarship characterizes the challenge as fundamentally structural rather than curricular: examining climate change education through a meso-level lens, researchers argue that the extent to which K-12 schools actually teach climate science depends heavily on the administrative support of principals and superintendents and on the cultural and political pressures exerted by local school boards, factors that vary widely across the country's decentralized education system (Long et al., 2026). This suggests that even where scientific consensus is well established, institutional leadership at the secondary school level functions as a critical, and often overlooked, gatekeeper for climate education implementation.

The importance of school-level coordination is also evident in Europe, although the policy and institutional context differs from that of the United States. Case-study research examining four secondary schools in England found that effective climate change and sustainability education depended on schools adopting a genuinely whole-school approach, one spanning curriculum, campus operations, community partnerships, and institutional culture, and that the leadership practices of school staff were decisive in determining whether such an approach took root or remained confined to isolated classroom initiatives (Rushton et al., 2025). This finding reinforces a pattern already visible in the American context: policy frameworks alone are insufficient without deliberate institutional coordination.

In Asia, the picture is complicated further by tensions between national development priorities and the aims of climate literacy. A qualitative study of environmental educators in India found that prevailing framings of climate change education were shaped primarily by a national emphasis on economic growth, with persistent socioeconomic inequality creating both specific obstacles and unexpected openings for more comprehensive integration of climate content into Indian schools (Krishna & King, 2025). The study's call for pragmatic, context-sensitive implementation strategies echoes a broader concern within Global South scholarship: that climate education frameworks designed for high-income contexts often translate poorly into public secondary school settings defined by resource constraints and competing school development priorities.

This concern is especially acute across Sub-Saharan Africa, where nations face disproportionate climate exposure despite negligible historical contributions to global emissions. A recent review of climate change education across the continent argues that its integration into schooling must be understood through an Education for Sustainable Development lens, one that treats climate literacy not as an isolated content area but as a transformative learning process capable of reshaping how African youth perceive their agency in addressing sustainability challenges (Tshabalala et al., 2025). The review also finds that implementation

across African education systems remains constrained by uneven institutional capacity and inconsistent leadership commitment, a finding that resonates with American and European evidence on the centrality of school-level coordination.

East Africa provides a more focused context for examining how institutional support shapes the implementation of climate change education. A comparative case study of Makerere University in Uganda and the University of Dar es Salaam in Tanzania found that institutional support, meaning the deliberate allocation of resources, administrative backing, and coordinated programming, was the decisive factor distinguishing effective climate change education interventions from symbolic or poorly sustained ones, even though the two universities operated under broadly similar regional and policy conditions (Ssekamatte, 2023). Although this study examined higher education, its core finding that institutional leadership determines whether climate education interventions translate into sustained practice applies with equal force to the public secondary school context central to this study.

Tanzania sits at the empirical heart of this East African pattern, and Kilimanjaro Region within it. Comparative survey research involving students drawn from across Tanzania's regions found that perceived climate change scores were significantly higher among students from the Kilimanjaro region than among their counterparts from Morogoro, Mtwara, Mwanza, and Tabora, a disparity the researchers linked to the region's marked exposure to crop failure and shifting agro-climatic conditions (Mramba & Mapunda, 2024). This heightened local awareness of climate risk, combined with Kilimanjaro's established position within Tanzania's education system, positions its public secondary schools as a particularly consequential site for examining how climate mitigation practices are, or are not, embedded in day-to-day school life.

Within this convergence of exposure and institutional readiness, the head of school coordinating role becomes analytically central. Empirical research on environmental education leadership among school principals shows that how principals conceive of and enact their leadership role, whether as passive administrators or active architects of a sustainability-oriented school culture, directly shapes the depth and durability of environmental programming within their institutions (Gan, 2021). Read alongside the meso-level and institutional-support findings from the United States, Europe, and East Africa discussed above, this body of work converges on a single proposition: climate education outcomes are not determined by policy or curriculum alone, but by the coordinating practices of school leaders who translate policy into sustained institutional action.

Despite this accumulating international evidence, remarkably little empirical attention has been directed specifically at how heads of school in Tanzania's public secondary schools coordinate co-curricular activities, as distinct from formal curriculum, in the service of climate change mitigation, and Kilimanjaro Region's distinctive combination of climate exposure and institutional maturity makes this gap particularly consequential. This study therefore examines the Head of School's coordination of co-curricular activities as a strategy for promoting climate change mitigation practices in public secondary schools in Kilimanjaro Region, Tanzania, situating this inquiry within the broader international literature on school leadership and climate education implementation reviewed above.

2.0 Statement of the Problem

Weak coordination of co-curricular activities by heads of schools contributes to inadequate climate change (CC) mitigation practices among students in public secondary schools in the Kilimanjaro Region, Tanzania. Evidence from Kilimanjaro indicates weak coordination and supervision of co-curricular

programmes in secondary schools (Maige, 2021), while national evidence shows that climate change awareness among Tanzanians remains low, particularly regarding locally relevant mitigation actions (Afrobarometer, 2024). Educators and researchers have similarly raised concerns that climate change education, although present in national policy, often fails to shift public perception and everyday behaviour in measurable ways, limiting its capacity to produce citizens equipped to act on climate risk (Misingi, 2024).

Studies in Tanzania have examined several aspects of school-level coordination and management that are relevant to co-curricular activities. These include the challenges faced by heads of schools in managing programmes beyond the core curriculum in Kilimanjaro Region (Njau et al., 2022), weak structuring and supervision of extracurricular programmes in secondary schools in the region (Maige, 2021), unclear coordination authority among heads of schools following education decentralisation reforms (Kapelela et al., 2024), and inconsistent supervision of environmental school clubs as a co-curricular activity in northern Tanzania (Njau, 2024). However, none of these studies has focused specifically on the use of co-curricular activities as a strategy used by heads of schools to promote climate change mitigation practices in public secondary schools in Kilimanjaro Region. If this gap in coordinated, leadership-driven co-curricular engagement persists, it will continue to compromise the development of a generation of students equipped with the practical skills, knowledge, and mindset needed to respond to climate change at the local, national, and global levels, even as the region's own students report heightened awareness of climate-related risks such as crop failure (Mramba & Mapunda, 2024). Therefore, the current study focused on the Head of School's coordination of co-curricular activities as a strategy for promoting climate change mitigation practices in public secondary schools in Kilimanjaro Region, Tanzania.

3.0 Research Question

The study was guided by the following research question:

How does the strategy of coordinating co-curricular activities by Heads of Schools promote climate change mitigation practices in Kilimanjaro Region?

4.0 Significance of the Study

This study is significant to educational stakeholders, including Heads of Schools, co-curricular activity coordinators, teachers, and curriculum developers, because its findings will provide evidence-based insights into the specific strategies Heads of Schools use to coordinate co-curricular activities that promote climate change mitigation practices in public secondary schools in Kilimanjaro Region, Tanzania. The study findings will guide heads of schools in structuring time, resources, and student participation around environmental clubs, tree-planting initiatives, and other environment-related co-curricular programmes, strengthening efforts to translate climate change awareness into consistent, action-oriented student behaviour beyond the classroom. Theoretically, the study will contribute to Environmental Education Theory by linking heads of schools' coordinating role to tangible climate change mitigation outcomes, extending understanding of how school-level leadership practices, rather than curriculum content alone, shape the depth and durability of environmental action within schools. Additionally, the study will serve as a reference for researchers interested in conducting a study in a similar field. Moreover, this study will inform the implementation and refinement of national frameworks such as the Education and Training Policy (2014), 2023 Edition, and the National Climate Change Response Strategy (NCCRS 2021–2026),

particularly in strengthening the coordinating responsibilities of school heads and clarifying the place of co-curricular activities within Tanzania's broader climate change education agenda.

5.0 Theoretical Framework

This study was guided by Environmental Education Theory, founded by Stapp (1969), which emphasises developing the knowledge, attitudes, skills, and commitment individuals and communities need to understand and respond to environmental problems (UNESCO, 2023). The theory rests on several key tenets that make it relevant to this study. The first is environmental awareness and knowledge, which enables learners to understand environmental problems and their causes. The second is experiential and action-oriented learning, which encourages learners to move beyond acquiring information and participate in practical activities that address environmental challenges. The third is development of skills and a sense of responsibility, which enables learners to identify environmental problems, consider possible solutions, and take appropriate action. A further tenet is participation and involvement, through which learners are encouraged to take an active role in addressing environmental issues within their schools and communities. These tenets are reflected in co-curricular activities such as environmental clubs, tree planting, conservation activities, and other practical initiatives through which students can apply what they learn about climate change.

However, the theory provides a useful foundation for understanding the importance of environmental learning and institutional responsibility, but it does not by itself provide the specific coordination indicators required for this study. In this study, Environmental Education Theory is applied by viewing the head of school as an important institutional actor in translating environmental education principles into practical activities. The study therefore examines how heads of school coordinate co-curricular activities through time and resource allocation, teacher supervision, and sustained student participation. From this perspective, the contribution of co-curricular activities to climate change mitigation depends not only on whether such programmes exist, but also on how well schools coordinate and support them. Weak or inconsistent coordination may result in activities being implemented irregularly and having limited practical impact, even where environmental education is included in curriculum documents or supported by individual school leaders. The theory therefore directs the study attention to the head of school's coordinating practices and how these practices support the use of co-curricular activities to promote climate change mitigation.

6.0 Literature review

Heads of Schools' Coordination of Co-Curricular Activities Strategy in Promoting Climate Change Mitigation Practices in Public Secondary Schools

Coordination refers to the way different activities, people, and resources are organised to achieve a common purpose. In secondary schools, co-curricular activities such as environmental clubs, tree planting, school gardening, debates, cleanliness campaigns, and community outreach can help students move beyond classroom knowledge and practise climate change mitigation in real situations. For these activities to have meaningful impact, heads of schools need to guide, support, and link them with the wider goals of environmental protection. Their role is not only to approve activities, but also to ensure that teachers, students, and community members work together in ways that encourage practical responses to climate change. Several studies have examined heads of schools' coordination of co-curricular activities in promoting climate change mitigation practices, as discussed below.

Anderson and Lee (2023) conducted a study in Canada examining how heads of schools organise co-curricular environmental activities to strengthen students' practical engagement in climate-related practices. The purpose of the study was to assess the role of school heads in coordinating eco-clubs, structured campaigns, recycling activities, energy-conservation practices, and school-greening initiatives. A study employed a mixed-methods design, targeting heads of schools, teachers, and students. The sample comprised 35 heads of schools, 180 teachers, and 300 students. Although the reviewed account does not clearly specify the sampling procedure, the nature of the study suggests that participating schools and respondents were selected from eco-school programme settings. Data were collected through questionnaires and interviews, while data analysis appears to have combined quantitative summaries with qualitative interpretation. A study revealed that schools where heads actively coordinated eco-clubs and environmental campaigns recorded stronger student engagement in recycling, energy conservation, and school greening.

The study by Anderson and Lee contributes to the present study by showing that heads of schools are central actors in organising co-curricular platforms through which learners practice environmental responsibility beyond the classroom. However, a study focused mainly on student engagement and implementation. The current study addressed this gap by examining whether participation in environmental-related activities led to lasting climate change mitigation practices. A study was also conducted in Canada, a comparatively well-resourced education system. The present study addressed this gap by explaining how heads of schools coordinate co-curricular activities in public secondary schools in Kilimanjaro, where limited funds, inadequate facilities, and weak environmental infrastructure may shape what schools can actually do. The current study addresses these gaps by examining the issue in the Tanzanian public secondary school context and collecting data from heads of schools, teachers, and students through questionnaires, interviews, document analysis, and observation.

Bauer and Schmidt (2024) conducted a study in Austria that examined how heads of schools coordinate environmental clubs, gardening projects, and other sustainability-related activities within formal school structures. The study aimed to understand how heads of schools institutionalise co-curricular environmental action and maintain continuity in students' participation. The study used a qualitative case study design involving 16 heads of schools. The target population consisted of heads of schools involved in sustainability-oriented head of schools. Data were collected through interviews with heads of schools and the analysis of activity logs and project documents. The data were analysed thematically. A study showed that heads of schools institutionalised environmental clubs and gardening projects as part of structured co-curricular systems, ensuring regular supervision and consistent student participation.

The present study benefited from Bauer and Schmidt's study because it demonstrates how heads of schools can move environmental activities from occasional events into organised co-curricular systems. However, the study focused more on organisational structures. The current study fills the gap by checking how those formal school structures translate into actual climate change mitigation practices among students. Moreover, Bauer and Schmidt's study collected data solely through interviews; hence, the idea of triangulation was lacking in their study, therefore necessitating that the current study collect data through questionnaires, a document analysis guide, and an observation guide, enabling the triangulation of information and hence validating the findings.

Kim and Park (2023) conducted a study in South Korea on how heads of schools organise student eco-projects, climate awareness campaigns, and sustainability-themed school events. The purpose of the study was to examine how school heads facilitate experiential environmental learning through co-curricular

activities. The study adopted a qualitative design, targeting heads of schools involved in environmental education programmes. The sample consisted of 20 heads of schools. Data were collected through interviews with heads of schools and analysis of student project portfolios. The data were analysed through thematic analysis and document review. A study found that heads of schools created structured systems for experiential learning, enabling students to participate in conservation activities such as waste segregation and biodiversity protection.

Kim and Park's work was vital to the present study, as it showed that co-curricular ongoing environmental programmes can provide practical learning spaces where students move beyond classroom theory into direct environmental action. Nevertheless, a study focused on program implementation and student participation. To establish whether co-curricular activities produced mitigation practices that persisted beyond school-organised events, the ongoing study extended this line of inquiry by tracing the persistence of environmental behaviours, rather than treating participation as an endpoint in itself. Moreover, the study by Kim and Park obtained data from the heads of schools involved in environmental education programmes. The current study also draws on students directly involved in co-curricular activities because they can provide first-hand accounts of how these activities are organised, experienced, and translated into everyday climate change mitigation practices.

Al-Hassan and Ibrahim (2023) conducted a study in Saudi Arabia examining how heads of schools coordinate school greening programs, awareness campaigns, and environmental partnerships. The study used a qualitative design, targeting heads of schools involved in environmental initiatives. The sample comprised 18 heads of schools. Data were collected through interviews and documentation analysis. The data were analysed thematically, supported by evidence from school documents. The results revealed that heads of schools played a connecting role, linking teachers, students, and external environmental agencies to support organised environmental activities.

The study by Al-Hassan and Ibrahim (ibid) was useful to the current study because it highlighted the coordinating role of heads of schools in connecting school-based environmental activities with external support systems. Still, the study focused mainly on coordination processes and institutional linkages, while giving inadequate attention to the actual environmental outcomes of student participation. The present study addresses this gap by examining how heads of schools coordinate co-curricular activities to encourage students to practice climate change mitigation. This study was also conducted in Saudi Arabia, where the study's findings may have limited applicability to Tanzania because they were drawn from Saudi Arabia, where school governance, funding, and institutional conditions differ from those in Tanzanian public secondary schools; therefore, the present study addresses this gap by examining how heads of school coordinate co-curricular activities in the specific financial, infrastructural, and environmental conditions of Kilimanjaro Region.

Mensah and Boateng (2023) conducted a study on the support of heads of schools for environmental clubs, clean-up exercises, and tree-planting initiatives in Ghana. The purpose of the study was to examine how school leadership involvement in co-curricular activities influences student engagement in environmental practices. The study employed a mixed-methods design and targeted heads of schools, teachers, and students. The sample involved 28 heads of schools, 250 teachers, and 200 students. Data were collected using questionnaires and interviews. Data analysis included descriptive statistics for quantitative responses and thematic analysis for qualitative data. The study showed that students who actively supported environmental clubs, clean-up campaigns, and tree-planting activities recorded higher levels of student engagement.

The study by Mensah and Boateng (2023) demonstrates that active leadership support strengthens student participation in co-curricular environmental activities. Its inclusion of heads of schools, teachers, and students is also useful because it recognises that coordination is experienced differently across the school community. However, the study examined whether leadership involvement in co-curricular activities influences students' participation in those activities, and how that participation is sustained over time. The current study addresses this gap by examining how heads of schools coordinate co-curricular activities to translate participation into observable climate change mitigation practices, such as waste-reduction behaviour, school greening, and environmental stewardship, within public secondary schools. A study also relied mainly on self-reported data through a questionnaire and interview guide. Building on the questionnaire and interview approach used by Mensah and Boateng, the current study added an observation guide to record visible environmental practices within the school compound and school environment document analysis to examine records such as club minutes, activity reports, and greening plans, alongside a student questionnaire. Together, these instruments allowed reported participation to be considered alongside observable evidence of practice.

The study conducted by Mkhize and Dlamini (2024) in South Africa examined how heads of schools coordinate environmental clubs, sustainability events, and environmental themes within school co-curricular calendars. The purpose of the study was to assess how school heads embed environmental education into co-curricular systems to strengthen student engagement. The study used interviews, questionnaires, and document analysis to collect data. Its target population consisted of 22 heads of schools and 38 teachers, with a sample of 22 heads of schools and 38 teachers. A study showed that heads of schools facilitated clubs, organised sustainability events, and integrated environmental themes into school calendars to support continuity of student engagement.

The study by Mkhize and Dlamini (2024) is relevant because it shows that heads of schools can coordinate co-curricular environmental activities by embedding them in the school calendar rather than treating them as irregular events. Yet a study paid attention to heads of schools overseeing the organisation of environmental clubs, sustainability-focused events, and the integration of environmental themes into the school's co-curricular calendar. To address this gap, the current study focused on how heads of schools coordinate co-curricular activities to promote climate change mitigation practices, as this coordination creates sustained opportunities for students to engage in environmentally responsible behaviour. Moreover, Mkhize and Dlamini's target population comprised heads of schools and teachers. The current study addressed the population gap by using students only because the study focused on the outcomes of coordination; students, as the direct participants who carry out the practices, were taken as the only population. The study assessed the influence of heads' coordination through its visible effects on students, supported by observation and document analysis.

Njau (2024) conducted a study in Northern Tanzania to explore the role of school-based environmental clubs in promoting environmental awareness among students. The study adopted a qualitative fieldwork design and targeted heads of schools and students in selected secondary schools. The sample was drawn from two secondary schools, including school heads and students. Data were collected through interviews with students and heads of schools, as well as observation of club activities. The data were analysed thematically. The study revealed that heads of schools coordinated environmental clubs by scheduling meetings, mobilising resources, and overseeing teacher involvement. The activities were mainly centred on conservation practices such as tree nurseries, cleanliness campaigns, gardening, and waste management, which indirectly strengthened students' climate change awareness.

Njau (2024) highlighted the important role of heads of schools in coordinating environmental clubs by organising meetings, mobilising resources, and supervising teachers' participation. The study further showed that activities such as tree planting, gardening, cleanliness campaigns, and waste management can enhance students' awareness of climate change. However, the study mainly focused on awareness and did not sufficiently explain how school coordination leads to students' actual climate change mitigation practices. It also concentrated largely on environmental clubs, leaving other environmental co-curricular activities less explored. This creates a gap in understanding how school leaders coordinate broader activities that encourage students to adopt practical environmental behaviours. Therefore, this study shifts the focus from awareness to observable climate change mitigation practices among students. It examined how heads of schools coordinate various co-curricular activities, including environmental events and activities incorporated into the school calendar, to promote students' participation in climate change mitigation practices in public secondary schools.

Research Gaps

Although studies from Canada, Austria, South Korea, Saudi Arabia, Ghana, South Africa, and Tanzania provide useful insights into the coordination of co-curricular environmental activities, they largely focus on participation, student engagement, and the structures used to organise activities such as environmental clubs, tree planting, gardening, and clean-up campaigns. Less attention has been given to whether these activities lead to lasting climate change mitigation practices among students. Some studies, including Anderson and Lee (2023), Kim and Park (2023), and Mensah and Boateng (2023), were conducted in relatively well-resourced settings or depended mainly on self-reported information. This makes it difficult to understand how such activities are coordinated in public secondary schools that face financial, infrastructural, and environmental constraints, as is often the case in Tanzania. Studies closer to the Tanzanian context also leave important questions unanswered. Al-Hassan and Ibrahim (2023) concentrated mainly on coordination with external partners, while Njau (2024) described the activities of environmental clubs without examining in depth whether the coordination strategies used by heads of schools resulted in sustained practices such as waste reduction, school greening, and environmental stewardship. In addition, several previous studies involved only heads of schools, or heads of schools and teachers, even though students were the main participants in these activities. Therefore, evidence remains limited on how heads of schools' coordination of co-curricular activities contributes to sustained climate change mitigation practices in Tanzanian public secondary schools, particularly in the Kilimanjaro region. The present study addresses these gaps by drawing evidence from students' questionnaires, document analysis, and observation to provide a more comprehensive understanding of heads of schools' coordination of co-curricular activities strategy in promoting climate change mitigation practices in public secondary schools in Kilimanjaro Region, Tanzania.

7.0 Research Methodology

This study adopted a mixed-methods approach, employing a convergent research design in which quantitative and qualitative data were collected concurrently and then merged during interpretation, allowing the strengths of each approach to offset the limitations of the other. Data were collected through three instruments: questionnaires, document analysis, and observation guides. The target population comprised 105,450 respondents across 249 public secondary schools in the Kilimanjaro Region. The study sample included 400 public secondary school students. Students were selected through a stratified random sampling technique. Four experts from Mwenge Catholic University (MWECAU) reviewed the

instrument for validity: three specialists in educational planning and administration and one specialist in climatology from the Department of Social Sciences and Humanities. The experts assessed the instruments for their relevance and suitability in addressing the study objectives. The reliability of the students' questionnaire was assessed using Cronbach's alpha, which yielded a coefficient of 0.837, indicating good internal consistency among the questionnaire items. This value exceeded the commonly accepted minimum threshold of 0.70 for research instruments, supporting the questionnaire's suitability for data collection. The quantitative data obtained from the students' questionnaires were analysed using descriptive statistics, including frequencies, percentages, and mean scores. The qualitative data from document analysis and observation were analysed thematically. The analysis involved organising the data, familiarisation, coding, categorisation, theme identification, interpretation, and reporting, drawing on the qualitative analysis principles discussed by Creswell and Creswell (2023). The trustworthiness of the qualitative findings, including credibility, dependability, confirmability, and transferability, was ensured through peer debriefing, an audit trail, and triangulation. Ethical considerations were observed, such as obtaining research permits from all responsible authorities, such as the Vice Chancellor of Mwenge Catholic University, the Regional Administrative Secretary Office, and the District Administrative Secretary Office, obtaining participants' informed consent, as well as ensuring anonymity and proper acknowledgement of all the sources used in this journal article.

8.0 Data Presentation, Interpretation, and Discussion of Findings

This section presents and discusses data on how the Heads of Schools Coordination of Co-Curricular Activities Strategy Promoted Climate Change Mitigation Practices. We collected data on this aspect through questionnaires, document analysis, and observation guides. The questionnaire included students because they are the direct recipients of school-level coordination and can indicate whether co-curricular activities are visible, regular, inclusive, and connected to practical climate action. The Likert scale measured respondents' level of agreement or disagreement with each statement. As Vasileiou et al. (2018) explained, mean scores from 1.00 to 1.49 indicate strong disagreement, 1.50 to 2.49 indicate disagreement, 2.50 to 3.49 indicate neither agreement nor disagreement, 3.50 to 4.49 indicate agreement, and 4.50 to 5.00 indicate strong agreement. For this research question, the response categories were: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree. Table 1.1 presents students' responses.

Table 1.1

Students' perceptions of HoS' coordination of co-curricular activities strategy in promoting climate change mitigation practices (n = 341)

No	Statement	SD		D		N		A		SA		Mean
		f	%	f	%	f	%	f	%	f	%	
i	HoS coordinate climate change (CC)-related clubs in ways that enhance students' involvement in climate action initiatives within the school and community.	11	3	24	7	43	13	115	34	148	43	4.1
ii	HoS ensure that CC-related clubs provide students with	79	23	103	30	69	20	57	17	33	10	2.6

	opportunities to engage actively in discussions about climate mitigation strategies.											
iii	HoS coordinates CC-related club activities that encourage students to participate in events and projects promoting environmental conservation.	82	24	85	25	75	22	52	15	47	14	2.7
iv	HoS coordinates environmental club activities that encourage students to adopt small daily practices that protect the environment.	73	21	83	24	63	18	69	20	53	16	2.8
v	HoS coordinates CC-related club activities that motivate students to share knowledge and raise climate change awareness within the school and community.	18	5	19	6	59	17	103	30	142	42	4
vi	HoS coordinates CC-related club activities that improve students' understanding of climate change impacts and their long-term environmental effects.	78	23	83	24	79	23	47	14	54	16	2.8
vii	HoS coordinates CC-related club activities that deepen students' knowledge of climate mitigation strategies and their significance.	105	31	73	21	58	17	64	19	41	12	2.6
viii	HoS ensure that environmental club activities teach sustainable environmental practices that students can apply at school and at home.	55	16	107	31	65	19	59	17	55	16	2.9
ix	HoS coordinates environmental club activities that expand students' knowledge of sustainable practices and how to apply	70	21	86	25	64	19	76	22	45	13	2.8

	them at school and in daily life.											
x	HoS use environmental club activities to increase students' awareness of government policies and global efforts to mitigate climate change.	102	30	128	38	87	26	14	4	10	3	2.1
	Grand mean											2.9

Source: Field data (2025)

Key: SD =strongly disagree, D= disagree), N= Neutral, A= agree, SA=strongly agree

Data in Table 1.1 show that 77% of students agreed that Heads of Schools (HoS) coordinated climate change-related clubs in ways that enhanced students' involvement in climate action initiatives within the school and community. The mean score was 4.1, indicating agreement. This suggests that students generally recognised the contribution of school leadership in providing opportunities to participate in practical environmental activities. However, the questionnaire findings alone do not establish whether the school regularly implemented and sustained such activities over time. Evidence from the observation guide further supports this finding Figure 1.1.

Figure 1.1:

An example of CC initiatives within the school, made by CC related student club members



Source: Field data (2025)

KEY

1. The Students' Environmental Club planted trees and flowerbeds decorated with recycled plastic bottles.
2. Students' Environmental Club members recycled plastic bottles used as decoration
3. Students' Environmental Club members' tree nursery.
4. Students' Environmental Club members prepared a garden for vegetable planting
5. Sandbags were placed by Students' Environmental Club members to reduce soil erosion.

Observation findings provided further evidence of students' participation in environmental activities. As illustrated in Figure 1.1, students participated in tree planting, establishing tree nurseries, preparing vegetable gardens, reusing plastic bottles to decorate flowerbeds, and placing sandbags in areas affected by soil erosion. These activities demonstrate that environmental clubs in the observed settings provided opportunities for learners to participate in practical environmental conservation. The activities also suggest that students were exposed to different ways of protecting the school environment through vegetation management, waste reuse, gardening, and erosion control. Nevertheless, the observed activities do not, by themselves, establish how frequently they were conducted or whether all students had equal opportunities to participate. For this reason, we examined the observational data alongside the available school documents.

The researcher reviewed school environmental reports for information on waste management, energy use, water conservation, environmental education programmes, conservation activities, and the implementation of sustainability initiatives. The researcher also examined environmental club records, including meeting minutes, membership lists, attendance records, activity plans, timetables, event reports, and project files. Documentation was limited in all 25 schools. Many files contained little more than letters requesting tree seedlings or invitations to environmental events. Certificates showing participation, club membership, or recognition for environmental performance were also available. However, the available certificates were at least three years old at the time of the study, as illustrated in Figure 1.2

Figure 1.2:
An example of different certificates related to environmental clubs





Source: Field data (2025)

However, the document analysis guide revealed weaknesses in the formal recording and monitoring of environmental activities across all 25 schools. The documents obtained from the schools consisted mainly of letters requesting tree seedlings and invitations to environmental events. Detailed records of club activities, student attendance, project implementation, and follow-up were limited. Many schools also lacked formal environmental reports documenting sustainability activities and their progress. For example, in some schools, certificates showing participation, club membership, or recognition for environmental performance were also available. However, the available certificates were at least three years old at the time of the study, as illustrated in Figure 1.2.

The quantitative findings indicated that participants agreed that Heads of School (HoS) coordinated climate change-related clubs to encourage students to participate in climate action initiatives within schools and communities. The qualitative findings supported this view by showing that some schools provided students with opportunities to engage in practical environmental activities. However, evidence of consistent planning and monitoring was limited, raising concerns about how well these activities were integrated into school programmes and sustained over time. These findings are consistent with Anderson and Lee (2023), who reported that active coordination of environmental clubs and campaigns by heads of schools was associated with stronger student engagement in recycling, energy conservation, and school greening. Similarly, Mensah and Boateng (2023) highlighted the importance of leadership support in promoting student participation in environmental clubs and conservation activities. Nevertheless, the present findings suggest that participation opportunities alone may not be sufficient to ensure continuity in climate action initiatives. Heads of School should therefore strengthen the coordination of

environmental clubs through regular activity schedules, clear responsibilities, adequate supervision, and systematic monitoring. Such measures could help integrate environmental activities into routine school programmes and provide students with more consistent opportunities to participate in climate change mitigation initiatives.

Table 1.1 indicates that 72% of students agreed that HoS coordinated climate change-related club activities that motivated them to share environmental knowledge and raise awareness within the school and community. The mean score was 4.0, indicating agreement. This suggests that students generally viewed environmental clubs as useful platforms for communicating environmental information and raising awareness. However, dissenting responses suggest that some schools did not provide enough support, audience, time, or organised opportunities for students to influence others. Observational evidence from two schools supported this information in Figure 1.3.

Figure 1.3:

An example of an environmental club garden and students engaging in environmental practices



Source: Field data (2025)

KEY

1. The Students' Environmental (climate change-related) Club Cabbage Garden within the school environment.
2. Students weeding bananas as one of the activities in the environmental club.

Observation findings provided evidence of practical environmental learning opportunities that could support such communication. As illustrated in Figure 1.3, students were involved in maintaining a cabbage garden and weeding banana plants. These activities exposed students to practical aspects of gardening and vegetation management. Such experiences could provide examples that students share with their peers and

community members. However, observing practical activities alone cannot show that students actually communicated what they learned to others.

To determine whether formal arrangements supported these activities, the researcher examined available school documents. Document analysis revealed that some schools maintained environmental club records, timetables, activity reports, and other materials related to environmental initiatives. The documents also included letters requesting tree seedlings and invitations to environmental events. However, the quality and completeness of the records varied, and detailed documentation of student-led awareness campaigns, peer-education sessions, and community outreach was limited. In addition, the absence of structured environmental education handouts and manuals in many schools may have constrained the systematic dissemination of environmental knowledge.

The qualitative findings revealed that environmental clubs gave students opportunities to learn about environmental issues and exchange knowledge with peers. However, the evidence also revealed limitations in implementing the environmental club activities. Although some schools implemented practical environmental activities, formal learning resources and activity records were not consistently available. Consequently, it was difficult to establish how regularly environmental awareness activities occurred and how widely they reached the school community. These findings suggest that, although participants viewed HoS coordination positively, the schools studied did not fully demonstrate consistent environmental knowledge-sharing and broad reach. Quantitative findings further indicated that participants generally agreed that Heads of School (HoS) coordination of environmental club activities motivated students to share environmental knowledge and raise awareness.

These findings are consistent with Mensah and Boateng (2023), who highlighted the importance of school leadership support in promoting student participation in environmental clubs and conservation activities, and Al-Hassan and Ibrahim (2023), who emphasised the role of Heads of School in connecting students and teachers with external environmental organisations. From an environmental education perspective, Palmer (1998) explains the importance of learning about, in, and for the environment, linking environmental knowledge with practical experience and responsible action. Environmental clubs therefore give students opportunities to develop environmental awareness, share knowledge, and participate in environmental conservation. However, achieving these benefits requires consistent leadership support, appropriate learning materials, regular awareness campaigns, peer-education activities, and community involvement. Heads of School should also maintain proper records of club activities to monitor their frequency and reach, thereby strengthening environmental knowledge-sharing and encouraging students to apply what they learn in climate change mitigation practices.

Table 1.1 shows that 47% of students disagreed that HoS ensured environmental club activities taught sustainable practices that could be applied at school and at home, while 33% agreed. The mean score was 2.9, indicating a neutral response. These findings suggest that students were not consistently convinced that the activities provided them with practical skills that could be transferred to everyday life.

Observation findings showed that students participated in school cleaning, waste collection, tree planting, and gardening. However, some activities were occasional rather than continuous. Paper waste generated in schools was generally not recycled, and tree planting was often seasonal. These observations suggest that students were exposed to some environmental practices, but the opportunities to practise sustainable waste management and other everyday behaviours were not consistently evident.

Document analysis provided further evidence of weaknesses in continuity. Many schools lacked formal environmental reports to track waste management, water conservation, energy use, and other sustainability

practices. Environmental initiatives were often informal and lacked long-term plans. Although some schools introduced tree planting and related activities, the documents did not show consistent implementation of a comprehensive programme to develop sustainable practices.

The qualitative findings suggest that some practical learning opportunities existed, but their continuity and systematic monitoring were limited. These findings indicate that the main challenge was not necessarily the absence of environmental activities, but the limited evidence that these activities were consistently organised to help students develop and maintain sustainable habits in different settings. The quantitative findings indicate that participants disagreed that HoS ensured environmental club activities taught sustainable practices they could apply at school and at home. These findings align with Njau (2024), who reported that Heads of School supported environmental clubs through tree nurseries, gardening, cleanliness campaigns, and waste management activities. They also align with Bauer and Schmidt (2024), who emphasised incorporating environmental initiatives into formal school structures to promote continuity. From the perspective of environmental education, Palmer (1998) highlights the importance of connecting learning about the environment with practical experiences and action for the environment. This perspective suggests that students need repeated opportunities to practise environmental responsibility and apply what they learn in real-life situations. Heads of School should therefore strengthen environmental club activities by linking school-based learning with everyday practices such as waste reduction, reuse, responsible waste disposal, water conservation, and care for vegetation. Regular follow-up activities and simple monitoring records could help schools assess the continuity of these practices and encourage students to apply them at home.

Data in Table 1.1 indicate that 29% of students agreed that HoS coordinated climate change-related club activities that encouraged participation in environmental conservation events and projects, while 49% disagreed. The mean score was 2.7, indicating a neutral response. The distribution suggests that students' opportunities to participate in conservation projects varied across schools and that a substantial proportion did not consider such opportunities adequate.

Observation findings showed that students participated in environmental activities such as tree planting, tree nursery establishment, gardening, plastic bottle reuse, and soil erosion control. These activities demonstrate that some schools provided practical opportunities for students to contribute to environmental conservation. However, the observation evidence does not establish that the activities were implemented regularly or that participation extended to all students.

Document analysis revealed that many schools had initiated basic environmental activities, particularly tree planting, but sustainability initiatives were limited and inconsistently implemented. The documents available were mainly letters requesting tree seedlings and invitations to environmental events, with limited detailed records of project implementation and student engagement. The absence of comprehensive activity plans and reports made it difficult to establish whether conservation projects were regularly organised, monitored, and evaluated.

The qualitative findings confirm that some conservation activities were taking place, but the available documentation revealed weaknesses in planning, recording, and monitoring their implementation. This suggests that although Heads of School supported certain environmental initiatives, schools did not clearly establish the formal arrangements needed to provide consistent opportunities for student participation. The quantitative findings indicated a neutral response from participants that HoS coordinated climate change-related club activities that encouraged participation in environmental conservation events and projects. These findings relate to Bauer and Schmidt (2024), who emphasised that incorporating environmental

clubs and gardening projects into formal school structures, together with regular supervision, could promote continuity in student participation. They also correspond with Njau (2024), who highlighted the importance of scheduling club meetings, mobilising resources, and ensuring teacher supervision of environmental activities. These studies reinforce the importance of school leadership in ensuring that conservation initiatives are organised rather than conducted as isolated events. Heads of School should therefore strengthen conservation projects through clear activity schedules, defined responsibilities, appropriate supervision, and systematic follow-up records. Such arrangements could provide students with more regular opportunities to participate in environmental projects and strengthen the contribution of co-curricular activities to climate change mitigation.

Table 1.1 shows that 53% of students disagreed that HoS ensured climate change-related clubs provided opportunities for active discussions about climate mitigation strategies, while 27% agreed. The mean score was 2.6, indicating a neutral response. These results suggest that opportunities for structured discussion were not consistently experienced by students. Students' disagreement indicates that, in many students' experiences, environmental club activities did not provide sufficient opportunities to discuss climate mitigation strategies.

Observation findings help explain this pattern. During school visits, the researcher observed environmental facilities and activities, including waste-disposal points, green spaces, school gardens, environmental awareness posters, and some recycling initiatives. However, there was little visible evidence of regularly organised forums for discussing climate mitigation strategies. Scheduled debates, discussion meetings, reflection sessions, and displayed plans for climate-related dialogue were uncommon. Where environmental activities provided opportunities for informal conversation, these were not necessarily organised as structured learning sessions.

Document analysis revealed that many schools lacked structured environmental education materials, including climate change handouts and manuals. The available documents also contained limited detailed records of club activities that could demonstrate whether climate mitigation discussions were regularly planned and conducted. Although some schools-maintained club timetables and other environmental activity records, the documentation did not consistently establish that structured discussions formed part of the co-curricular programme.

The qualitative findings show that practical environmental activities and facilities were more evident than organised opportunities for climate dialogue, while documentary evidence revealed limitations in learning materials and records of planned discussions. These findings suggest that environmental clubs may have emphasised practical tasks more than discussion, reflection, and exchanging ideas about climate change mitigation practices. The quantitative findings revealed a neutral response from the participants that HoS coordinated climate change-related club activities that encouraged participation in environmental conservation events and projects. The findings relate to Kim and Park (2023), who demonstrated how structured experiential environmental learning could be organised through student projects, climate awareness campaigns, and sustainability-related events. However, participation in practical activities does not necessarily provide sufficient opportunities for students to examine environmental problems critically or discuss possible solutions. From the perspective of environmental education, Palmer (1998) emphasises the importance of connecting environmental knowledge, practical experience, and responsible action. Students therefore need opportunities not only to participate in environmental activities but also to discuss environmental challenges, compare mitigation strategies, and reflect on the implications of their actions. Heads of School should consequently ensure that environmental clubs incorporate regular discussions,

debates, peer presentations, and reflection sessions alongside practical activities. Providing appropriate learning materials and keeping records of these sessions would also help schools monitor opportunities for students to develop and share knowledge about climate change mitigation.

Generally, the coordination of co-curricular activity strategy used by heads of schools promotes climate change mitigation practices by supporting school env. clubs, study tours, connecting schools with environmental organisations, and giving students opportunities to engage in climate change-related activities. However, in some schools, co-curricular activities are inactive, while in some schools there were fragmented documentation. and inconsistent environmental club activities, which limited students' opportunities for sustained engagement in climate change mitigation practices.

9.0 Conclusion

The study concludes that heads of schools coordinate co-curricular activities to promote climate change mitigation practices by supporting environmental clubs and student-led activities such as tree planting, school gardening, waste management, plastic reuse, erosion control, and awareness campaigns. However, poor documentation, limited monitoring, inconsistent implementation, inadequate opportunities for climate discussions, and weak links with national and global climate policies in some schools reduce the effectiveness of these activities.

10.0 Recommendations

Heads of Schools should establish and strengthen environmental clubs and other environmental-related activities by making greater use of low-cost, locally available materials to promote climate change mitigation practices, such as waste recycling. Additionally, heads of schools should appoint teacher(s) as environmental patrons, ensure elected student environmental leaders are in place, maintain an annual activity calendar, and keep a small operational budget. Schools should monitor activities through simple records showing what was done and what was achieved. For example, schools should record the survival of planted trees rather than merely counting seedlings, the amount of waste collected or reused, and whether gardens and erosion-control structures remain functional. School assemblies, debates, exhibitions, and club meetings should also give students regular opportunities to discuss local climate problems and connect their activities with national environmental priorities and the Education for Sustainable Development Guidelines.

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