



Assessment of Administrative Practices on Management of Eco-Friendly Initiatives in Public Secondary Schools in Kirinyaga County, Kenya

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Abstract

The advocacy for sustainable practices in educational institutions globally has grown imperative due to issues such as climate change, deforestation, and waste-management. Public high schools play a crucial role in educating learners and staff about ecological stewardship, thereby contributing to sustainable development. However, management of eco-friendly initiatives in secondary schools is wanting. The study examined the status of administrative practices on sustainability management of eco-friendly initiatives in public secondary schools in Kirinyaga County, Kenya. Study objectives included; the level of teachers' awareness and extent of curriculum integration. Guided by the Institutional Theory, the study adopted a descriptive survey research design. Target population consisted of 172 principals and 1160 teachers. Stratified random sampling was employed and using 10% of target population, a sample size of 17 principals and 116 teachers were selected. Questionnaire was used to collect data from teachers while interview schedule was used for principals. Data was analysed through descriptive statistics and thematic analysis. Results revealed a moderate level of teacher awareness where 40.0% were neutral, 32.7% agreed and 27.3% disagreed. On the extent of curriculum integration, 38.84% of principals were neutral, 35.13% agreed and 26.03% disagreed. The study concludes that administrative practices have been ineffective in operationalising, communicating, and sensitising the teaching staff on green initiatives. The study recommends that school heads through departments, develop and operationalise practical cross-curricular integration matrices that explicitly guide teachers on fusing green concepts into daily lesson schemes. The study would be significant to educational and environmental policy makers for it provides useful knowledge on management of eco-friendly initiatives.

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Introduction

Globally and nationally, educational institutions are recognised as vital hubs for fostering environmental sustainability. The Kenyan government, through the Ministry of Education, encourages the greening of schools to build climate resilience. For these eco-friendly initiatives, such as waste-management, tree planting, and energy conservation, to succeed, school administrative practices, including resource allocation, planning, and supervision, must fully support sustainability.



Despite policy frameworks, the management of eco-friendly initiatives in public secondary schools within Kirinyaga County remains inconsistent, weak, and largely peripheral. School leaders have not systematically operationalised green strategies, resulting in significant implementation gaps. Food waste goes unsorted, and poor waste-management attracts pests and spreads bacteria, which pose health risks. Overreliance on firewood as a fuel source causes deforestation. Wastage of water (running taps) and electricity inflates operational costs, while a lack of hands-on green projects reduces students' interest in science.

These problems are driven by two major administrative gaps that align with the study's objectives. First, there is a deficit in teachers' awareness. Frontline educators lack targeted administrative support, ongoing professional development, and clear channels for environmental communication. This administrative neglect leaves teachers either unaware of or unequipped to lead eco-friendly initiatives, stalling school-wide implementation. Secondly, there is poor integration of the curriculum. School administrations have failed to transition environmental education from abstract textbook theories into practical, cross-curricular school programmes. Without strategic administrative oversight, sustainability remains excluded from daily instructional practices. If these administrative failures persist, public secondary schools in Kirinyaga County will continue to suffer from inefficient use of resources and environmental degradation. Moreover, schools will fail to graduate environmentally conscious citizens, directly undermining Kenya's national climate and educational sustainability goals.

Awareness and Capacity Building for Sustainability Management

Awareness and capacity building concern the knowledge, skills, confidence and organisational support needed for staff and learners to participate in sustainability work. Awareness may help individuals recognise environmental problems, but it does not necessarily produce continuing school practice. Capacity building extends beyond information by developing competence to plan, teach, coordinate, monitor, and improve eco-friendly activities. UNESCO (2020) therefore identifies educator capacity as one of the five priority areas for implementing Education for Sustainable Development. This position places school administrators at the centre of communication, professional learning and follow-up.

Global evidence shows that teacher competence is important but unevenly developed. Fischer et al. (2022) reviewed 158 peer-reviewed publications on teacher education for sustainable development. They found a growing field, but noted that sustainability remained a specialised area rather than a routine part of teacher education. The review also showed that many initiatives focused on particular courses, projects or competencies. This limits conclusions about whether professional learning becomes embedded in school practice. Ardoin et al. (2020) reached a related conclusion after reviewing 105 environmental education studies. Most reported positive outcomes, although the studies differed greatly in design, duration, and outcome measurement. The evidence supports environmental learning but does not show that awareness campaigns alone sustain institutional practice. Further evidence comes from Isac et al. (2022), who surveyed primary and secondary teachers in 49 schools in Flanders. Teachers who participated in Education for Sustainable Development (ESD) working groups or learning communities reported higher professional action competence, self-efficacy, pedagogical content knowledge, and willingness to implement sustainability education. However, the study was correlational and relied on self-reports. It could not establish whether co-learning produced competence or whether more confident teachers were more likely to join collaborative groups. In Nigeria, Adara (1996) used pre- and post-workshop assessments to evaluate an outdoor environmental education programme. The intervention improved teachers'



awareness, knowledge, skills, action, and commitment. Although the design offered stronger evidence of change than a cross-sectional survey, its age, short intervention period and specific setting reduce its direct applicability to Kenyan secondary schools.

In Kenyan research shows that general awareness does not guarantee administrative or instructional capacity. Kariuki et al. (2024) study found that educational laws and policies gave limited attention to school leadership roles in environmental stewardship. Cheruiyot (2019), study identified inadequate training, limited resources and weak policy guidance as barriers to environmental education implementation. Ngota (2019) examined ESD and learner awareness in Nairobi. These studies added local evidence, but both offered limited generalisability beyond their study areas. Most studies focus on learners, curriculum delivery or environmental knowledge rather than administrative organisation. This is an inference drawn from the reviewed studies. The present study addressed this relational and measurement gap in Kirinyaga County.

Administrative Support for Curriculum Integration

Administrative support for curriculum integration refers to the planning, guidance and material assistance that enable teachers to embed sustainability within teaching, assessment and co-curricular work. Curriculum integration is stronger when environmental content is connected across subjects, linked to local problems, and reinforced through practical activities. UNESCO (2024) recommends action-oriented, interdisciplinary and age-appropriate climate learning supported by teaching resources, assessment guidance, educator preparation and whole-institution implementation. These requirements make curriculum integration an administrative matter.

Global studies show that written curriculum expectations do not guarantee classroom implementation. Lee et al. (2016) examined Education for Sustainable Development activities in eight Hong Kong schools. Their grounded analysis showed that sustainability could be linked to several subjects and student projects. However, the study covered a small number of schools and one education system. It also concentrated on curriculum products rather than estimating how administrative support was related to the continuity of school environmental practices. Mogren and Gericke (2019) studied school leaders' experiences of embedding Education for Sustainable Development. They found that management structures, planning routines and a shared school vision were needed to anchor sustainability within teaching and organisational work. Their qualitative approach offered detailed organisational insights but did not test the statistical relationship between curriculum support and sustainability outcomes.

African research points to the value of practical learning and the persistence of implementation constraints. Balcha et al. (2026) study point that integrated environmental education improved learners' knowledge, attitudes and sustainable environmental-management capabilities. The intervention design provided stronger evidence of change than a one-time survey. Nevertheless, the study involved 91 learners and two teachers, limiting generalisation. Kayombo et al. (2025) used a phenomenological case study in Tanzanian secondary schools. Participants supported multidisciplinary and action-oriented environmental education but reported inadequate teacher training and government resources. Khalo et al. (2023) interviewed four South African secondary-school principals involved in a climate-education project. The principals described motivation and supportive practices, while the authors called for clearer guidance on school leaders' roles. The small purposive samples in both studies provided contextual depth but could not establish the strength of relationships among administrative support, curriculum integration and sustainability management. Mogren et al. (2019) similarly linked whole-school sustainability with school-improvement processes,



showing the importance of organisational structures and shared priorities rather than stand-alone environmental activities. However, this study, administrative practices formed the independent variable and comprised awareness and administrative support for curriculum integration.

Theoretical Framework

The study was guided by the Institutional Theory. The theory explains how organisations are shaped by rules, norms, professional expectations and widely accepted models within their institutional environments. Meyer and Rowan (1977) argued that organisations often adopt formal structures because these structures are socially recognised as legitimate and appropriate. Such adoption may improve legitimacy, stability and access to resources. However, formal policies and structures may become decoupled from everyday activities when compliance is mainly symbolic. This distinction is important because the existence of environmental policies, committees or strategic plans does not necessarily demonstrate consistent implementation of eco-friendly practices.

DiMaggio and Powell (1983) extended institutional analysis by explaining why organisations operating within the same field often become similar. They identified coercive, normative and mimetic forms of institutional isomorphism. Coercive pressures arise from laws, government directives, funding conditions and organisations on which an institution depends. Normative pressures develop through professional training, occupational standards and shared expectations among practitioners. Mimetic pressures occur when organisations facing uncertainty imitate institutions regarded as successful or legitimate. Scott (2014) later organised institutional influences around regulative, normative and cultural-cognitive pillars, highlighting that compliance may arise from legal obligation, social expectations or taken-for-granted beliefs.

Applied to this study, public secondary schools operate within an institutional environment shaped by Kenyan education policies, environmental legislation, county priorities, professional expectations and international sustainability standards. Coercive pressures may encourage schools to comply with statutory waste management and climate-education requirements. Normative pressures may arise through professional development, administrative guidance and expectations placed on educators. Mimetic pressures may lead schools to reproduce visible practices adopted by recognised green schools, including environmental clubs, tree planting, waste segregation and water conservation. These pressures may influence administrative awareness, curriculum support, policy development and resource allocation.

Institutional Theory was particularly relevant to the policy-practice gap examined in the study. A school may possess a written environmental policy, establish a committee or include sustainability within its strategic plan while implementing related activities irregularly. It also supports examining whether administrative practices reflect substantive institutionalisation rather than ceremonial compliance. A strength of Institutional Theory is its capacity to explain how external expectations and legitimacy concerns shape organisational practices. It also clarifies why schools may adopt similar programmes despite differences in resources and internal capacity. Institutional Theory places the school within an environment of laws, professional expectations and organisational practices. It helps account for the adoption of environmental policies, committees and programmes in response to regulatory, normative and legitimacy pressures. It also draws attention to the possibility that formal structures may exist without consistent implementation. A school may therefore display a policy or establish a committee while routine environmental practice remains weak.

While institutional pressures originate at the systemic level and are funnelled through administrative awareness and resource allocation, this study focuses specifically on the downstream manifestation



of this process: how these conditions successfully permeate the classroom to influence teacher awareness and subsequent curriculum integration. The most effective approach to logically link the principal to the teacher is to adopt an institutional theory or top-down implementation framework such as Policy Implementation Theory, that explicitly connects macro-level institutional pressures to micro-level classroom execution. Administrative awareness acts as the institutional filter that determines how macro-level pressures such as mandates and policy shifts are translated into classroom reality. Institutional pressures do not land directly on teachers in a vacuum; they are interpreted, prioritised, and resourced by school principals. An administrator's level of awareness and commitment directly dictates the allocation of resources such as time, materials and professional development, which in turn shapes teacher awareness and sets the boundary for curriculum integration.

Research Design

The study employed the descriptive research design which was suitable because it describes the situation the way it is on the ground. According to Creswell (2017), a research design provides the blueprint for answering research questions.

Study Area

The study was conducted in Kirinyaga County, located in Central Kenya. The county comprises five sub-counties, namely Kirinyaga East, Kirinyaga West, Kirinyaga Central, Mwea East and Mwea West. The county encompasses both rural and peri-urban settings and has diverse public secondary schools. The region therefore provided an appropriate context for study.

Target Population

Target population comprised 172 principals and 1160 teachers serving as heads of department. These respondents were selected according to school categories (National, extra-county, county and subcounty). They also occupied different roles in the administration and implementation of eco-friendly practices, for they were directly involved in planning, implementing and participating in eco-friendly practices within schools.

Sampling and Sample Size

Sampling refers to the process of selecting a representative proportion of a target population from which conclusions can be drawn (Kothari & Garg, 2014). The study employed stratified random sampling techniques. Sample size refers to the number of respondents or cases selected from a population for participation in a study. The 10% of target population was used Mugenda & Mugenda, 2019). The realised sample comprised 18 principals and 116 teachers giving a total of 134 respondents.

Data Collection

Quantitative data was collected through the use of structured questionnaire for teachers. A questionnaire is a tool of research which consists of a series of items or questions for the purpose of gathering information from respondents (Cresswell, 2019). An interview schedule was used for principals to obtain the required information.

Piloting research instrument

According to Kothari & Garg (2014) research instrument should be subjected to a pilot study before the main study is undertaken. The piloting was conducted in two schools which were not included in actual study. Split-half method was used to test reliability and Cronbach's alpha, yielded a coefficient of $\alpha = 0.78$, signifying a high level of internal consistency. Repke, Birkenmaier and Lukas (2024), define



validity as the degree to which the instruments accurately assess what it is supposed to measure. Validity was assessed by experts who were research supervisors.

Data Analysis

Data analysis is a process of interpreting data that has been collected (Kothari and Garg, 2014). Data analysis requires some computation as well as good understanding of variables to determine which relationships to investigate (Alem, 2020). The collected data was analysed using descriptive statistics and thematic analyses. Descriptive statistics summarise the main features of a dataset using numerical measures such as frequencies, percentages, means and standard deviations.

Results and Discussion

Table 1: Level of teachers' Awareness on eco-friendly initiatives

Statement	SD %	D %	N %	A %	SA %	Mean	SD
Knowledge of integrating sustainability management topics in subject area	0.86	0.00	47.41	48.28	3.45	3.53	0.61
School administration provides regular briefings on eco-friendly sustainability goals	0.86	14.66	33.62	49.14	1.72	3.36	0.78
Awareness of school strategic plan for sustainability management	0.86	21.55	32.27	42.24	2.59	3.24	0.85
Recognition of the link between school administration and green culture	4.31	25.86	37.07	29.31	3.45	3.02	0.93
Awareness of the NEMA guidelines regarding waste-management in educational institutions	5.17	37.93	43.10	10.34	3.45	2.69	0.86
Aware of specific budget or resource allocated for sustainability management	9.48	42.24	45.69	0.86	1.72	2.43	0.75
Average	27.3%		40%	32.7%			

The overall average mean rating across all evaluated indicators is 3.04 out of 5.00. The overall average percentages were 27.3% disagreed while 40.0% neutral and 32.7% agreed. This indicates a moderate/neutral overall level of awareness among teachers. However, the data reveals a clear hierarchy of awareness. Teachers report high awareness of classroom-level pedagogical integration, moderate awareness of internal school administration, and low awareness regarding external legal regulations (NEMA) and financial allocations for sustainability as discussed below.

High awareness areas were in pedagogical & internal communication. In integrating eco-friendly topics into subject areas, 51.73% of the respondents agreed, 47.41% were neutral and 0.86% disagreed with a mean = 3.53 & SD = 0.61. This is the highest-rated item. Teachers feel most confident in embedding environmental concepts into their teaching subjects. The low standard deviation (0.61) indicates strong consensus among respondents.

Regular administrative briefings on sustainability goals had a mean = 3.36 and SD = 0.78. Half of the respondents 50.86% agreed, 33.62% were neutral and 15.52% disagreed. This implies that over half of the teachers acknowledge receiving routine updates from school administration regarding environmental goals, indicating functional internal communication.

Moderate awareness areas were in the institutional alignment & leadership. Awareness of the school strategic plan for eco-friendly initiatives had a Mean = 3.24 and SD = 0.85). Further, 44.83% of the teachers agreed, 32.76% were neutral and 22.41% disagreed. This means that while a plurality agrees,



over 55% were neutral or unaware of a formal strategic plan. This suggests that green initiatives are often ad-hoc rather than documented in long-term strategic plans.

Recognition of the link between leadership and school green culture had a mean = 3.02, and a SD = 0.93. Moreover, 32.76% of participants agreed, 37.07% were neutral and 30.17% disagreed. Results show that responses were almost evenly split across all three categories. A mean of 3.02 shows neutrality, indicating that school leadership has not yet positioned environmental stewardship as a core institutional priority.

Critical knowledge gaps were in compliance & financial governance. Awareness of national NEMA waste management guidelines had a Mean = 2.69 and SD = 0.86. The findings revealed that 13.79% of respondents agreed, 43.10% were neutral and 43.10% disagreed. This implies that only 13.79% of teachers were aware of National Environment Management Authority (NEMA) waste guidelines. Combined with 86.2% falling into neutral/disagree categories, this represents a major regulatory compliance gap.

Awareness of Budgets or Resources for Eco-Friendly Projects had a Mean = 2.43 and SD = 0.75. Only 2.58% of teachers Agreed, 45.69% were Neutral and 51.72% Disagreed. This is the lowest-rated statement. Over half (51.72%) disagreed that they know of any budget allocation for green projects. This points to either severe underfunding of school environmental projects or a complete lack of financial transparency.

The pattern concurs with Fischer et al. (2022), who found that Education for Sustainable Development remained insufficiently embedded in routine teacher education. Gugssa (2023) also linked weak implementation to limited training and continuing support. The low rating for knowledge of national guidelines is consistent with Kariuki et al. (2024), who reported poor understanding of environmental-stewardship laws and policies among teachers.

Table 2: Extent of Curriculum Integration on Eco-friendly initiatives

Statement	Disagree %	Neutral %	Agree %	Mean	SD
Use of local examples in teaching eco-friendly practices	4.31	27.59	68.1	3.66	0.65
Inclusion of environmental topics in weekly lesson plans	6.89	28.45	64.66	3.59	0.68
Administrative encouragement of cross-curricular projects	12.93	47.41	39.66	3.28	0.74
Practical outdoor activities supplement classroom theory	27.58	51.72	20.69	2.94	0.75
Adequate teacher preparation for integrating green competencies	36.52	38.26	25.22	2.90	0.83
Provision of teaching aids for environmental education	50.00	34.48	15.52	2.68	0.83
Inclusion of sustainability questions in student assessments	43.96	43.97	12.07	2.63	0.89
Average	26.03%	38.84%	35.13%		

The overall composite mean for the extent of curriculum integration is 3.10 out of 5.00 with an overall distribution of 26.03% disagree, 38.84% neutral, and 35.13% agree. This indicates a moderate-extent of curriculum integration overall. However, the dataset reveals a sharp contrast between



intended/theoretical curriculum integration (planning and content localisation) and enacted/evaluated curriculum integration (outdoor application, instructional materials, and testing).

High-extent curriculum integration was at the Classroom & Planning Level. Use of local examples in teaching eco-friendly practices had a Mean = 3.66 and SD = 0.65. Majority of the respondents at 68.10% Agreed, 27.59% were Neutral and 4.31% Disagreed. This item achieved the highest level of agreement. Teachers actively contextualise learning by referencing local environmental phenomena and practices, making concepts relatable without requiring formal budget or institutional changes.

Inclusion of environmental topics in weekly lesson plans (Mean = 3.59, SD = 0.68). Most of the teachers at 64.66% Agreed while 28.45% were Neutral and 6.89% Disagreed. Almost two-thirds of respondents systematically embed environmental topics into their official documentation and weekly schemes of work, demonstrating strong compliance at the lesson-planning stage.

Moderate-Extent Curriculum Integration was at the Cross-Disciplinary & Experiential. Administrative encouragement of cross-curricular projects had a Mean = 3.28, SD = 0.74). A number of respondents at 39.66% Agreed, 47.41% were Neutral and 12.93% Disagreed. While administrative backing exists, the high neutral response (47.41%) indicates that cross-curricular integration remains largely voluntary or unstructured rather than an institutionalised mandate.

Practical outdoor activities supplement classroom theory had a Mean = 2.94, SD = 0.75. A few participants at 20.69% Agreed, 51.72% were Neutral and 27.58% Disagreed. The results reveal that Experiential and field-based learning falls below the neutral threshold (Mean < 3.00). Only 20.69% agree that theory is supplemented by outdoor activities, showing that curriculum delivery remains predominantly sedentary and textbook-bound.

Low-Extent Curriculum Integration was at the Support Systems & Evaluation. Adequate teacher preparation for integrating green competencies had a Mean = 2.90 and SD = 0.83. A number of teachers at 25.22% Agreed, 38.26% were Neutral and 36.52% Disagreed. *This show that over 74% of teachers feel neutral or ill-prepared to deliver green competencies, pointing to a gap in pedagogical preparedness and specialised training.*

Provision of teaching aids for environmental education (Mean = 2.68, SD = 0.83). Some of the teachers at 15.52% Agreed, 34.48% were Neutral and 50.00% Disagreed. Half of the respondents (50.00%) disagree that adequate instructional materials are provided, making material resource scarcity a primary barrier to full integration.

Inclusion of sustainability questions in student assessments (Mean = 2.63, SD = 0.89). Few teachers at 12.07% Agreed, 43.97% were Neutral and 43.96% Disagreed. This was the lowest-rated indicator. With only 12.07% agreement, eco-friendly concepts are largely excluded from tests and examinations, which reinforces a perception among teachers that sustainability is an optional subject area. Over 87% of respondents indicate that green topics are rarely or never evaluated in formal school tests and examinations, reducing student and teacher motivation to prioritise the subject. The overall mean of 3.10 reveals that curriculum integration of eco-friendly practices in secondary schools is shallow and surface-level. While teachers successfully integrate environmental themes into paper lesson plans and classroom lectures using local context, integration fails to progress to hands-on experiential learning, resourced instruction, or formal assessment.



Table 3: Qualitative Analysis

Theme	Institutional Theory Construct	Principal Voicing Theme (f)	Prevalence Rate (%)	Analytical Interpretation
Paper vs. Practice	Decoupling	15	83.3%	Formal green policies satisfy external inspectors while daily practices remain strictly focused on exam preparation.
Audit-Driven Compliance	Coercive Isomorphism	14	82.3%	Environmental regulations are implemented reactively to avoid administrative sanctions rather than to build a green culture.
Teacher Passion & Voluntary Clubs	Normative Isomorphism	13	76.4%	Professional ethics and personal values among teachers drive classroom integration in the absence of administrative funding.
Copying Peer School Projects	Mimetic Isomorphism	16	94.1%	Principals reduce strategic uncertainty under tight budgets by copying visible, low-cost green projects from neighbouring schools.
Promoting School Image	Organisational Legitimacy	12	70.6%	Environmental projects are leveraged as visual symbols to build prestige and secure trust among parents and community stakeholders.

The qualitative dataset captures interview insights from $N = 17$ secondary school principals. The prevalence rates (70.6% to 94.1%) demonstrate that institutional mechanisms heavily govern how school administrators navigate sustainability initiatives in resource-constrained environments. Rather than adopting eco-friendly practices purely out of intrinsic educational planning, principals operate in a defensive and pragmatic mode. By mitigating uncertainty through peer imitation (Mimetic Isomorphism: 94.1%), maintaining symbolic compliance on paper while prioritising exam results (Decoupling: 83.3%), and satisfying external quality assurance audits (Coercive Isomorphism: 82.3%).

Conclusion

The fact that 40% of teachers remained neutral indicates a profound state of cognitive indifference or a lack of definitive information. Teachers are neither actively opposed to nor actively championing environmental programmes. In addition, there is inadequate administrative communication. Administrative practices have failed to clearly communicate environmental goals. This communication gap has left the majority of the staff sitting on the fence, with only a narrow margin separating those who are aware (32.7%) from those who are not (27.3%).

Based on the composite mean of 3.10 and the response distribution showing 38.84% neutrality, 35.13% agreement, and 26.03% disagreement, the study concludes that the extent of curriculum integration of eco-friendly initiatives in public secondary schools in Kirinyaga County is only moderate, fragmented, and severely lacks institutional depth. The high level of neutrality combined with a low affirmative response implies that school administrations have failed to establish clear, structured instructional frameworks to guide teachers in blending sustainability concepts into classroom teaching. From a theoretical perspective, this moderate mean score reflects a distinct state of institutional decoupling, where environmental policy goals are formally recognised but remain largely detached from the daily technical core of classroom teaching.

HODs should mandate that every department schedule at least one practical outdoor project per term (e.g., school garden monitoring in Biology, waste auditing in Geography, or green technology designs in Physics). Academic heads should create interdisciplinary project frameworks that allow students



to receive credit across multiple subjects for single comprehensive sustainability projects (e.g., a joint Agriculture-Chemistry soil restoration project).

School leadership should actively involve teaching staff in formulating 3- to 5-year environmental strategic plans, establishing clear school-wide green targets (e.g., waste segregation, tree cover expansion, solar transition). School academic committees should mandate at least one outdoor, project-based eco-learning activity per term within relevant departments.

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