

 Review Article

Policy-Based Green Accounting in Basic Education Institutions in Low-Income Countries: Contributions and Missing Dimensions

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Abstract

In this paper, I argue that green accounting in basic education institutions in low-income countries receives an inevitable priority in policy innovation demands currently. The paper analyses the contributions and salient gaps in the implementation of selected environmental conventions, protocols, and policy frameworks, and local priorities for green accounting in basic education institutions. The analysis is grounded in economic theory and affirms the Sustainable Development Goals (SDGs). An online ethnographic review was used to collect and systematically analyse 26 documents, including 7 environmental conventions, 3 related protocols, 1 local policy, and 15 related research publications gathered using the PRISMA approach. The analysis reveals that green accounting faces a parochial place in the implementation of environment-affecting programmes in basic education institutions of low-income countries. This situation results from inadequate local institutional capacity in terms of finances, technicalities, and technologies necessary to comply with the contentions of implemented documents. Consequently, despite the high proportions of ratifications of the documents by the State parties, environmental conservation, protection, and rehabilitation goals are not realised to the expected extent. It is imperative that the eco-environmental economic cost implications of running basic education institutions be accounted for, and there are adjustments in policy frameworks to facilitate environmental performance in local institutions.

Keywords: Basic Education Institution, Environmental Convention, Environmental Protocol, Environmental Policy, Environmental Performance, Green Accounting, Welfare Function

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1. INTRODUCTION

Issues in contemporary environmental practices warn about humans failing to uphold the natural law of justice to our dearest environment from a theological perspective. The supernatural creation guides man to maintain the environment. Failure to maintain it has demonstrated the need for second-hand law, i.e., man-instituted law. This is the logic behind the need for conventions, protocols, and policies for States in coalitions to energise symmetrical efforts among them. Because of the wrongs to the environment humans engage in daily, culminating in incremental harm to planet Earth. This chapter analyses the contributions and salient gaps in the implementation of the selected environmental conventions, protocols, and policy frameworks. The analysis focuses on the significance of innovations in implementation and prioritisation of green accounting to guide environmentally friendly practices in secular institutions, including basic education schools in a low-income country. The chapter, therefore, dwells on the theme ‘innovative policy approaches leveraging eco-environmental economic accounting practices’. This analytical framework takes the form of a pseudo-Venn intersection (i.e., pseudo-convergence) model with some patch workings scattered around ten (10) of the seventeen (17) sustainable development goals (SDGs), with a common intersection at environmental protection and rehabilitation processes. The main intention is not merely to highlight what environmental protection policies, conventions, and protocols are delineated in the international and local capacity statements, but rather to bring into focus a discussion on environmental

performance and sustainability in the realm of green accounting in secular institutions. The analytical processes assess the policy foci for a coalition State party and ratification paces at convenience. In that regard, the analytical model provides a glimpse of the missing dimensions for green accounting in the local capacities of the institutions in the context of environmental protection. It uses a pseudo-charismatic argumentation approach with Christian faith metaphors to enunciate that the environment is self-regulating to support life in reciprocity, building on secular expertise that the environment has limits of tolerance to our actions.

Green accounting measures and reports the impacts of economic activities on the environment. Adoption of green accounting into local institutional policy frameworks is associated with reluctance that corresponds to the cost implications, which the State parties tend to avoid. Nurfaidah et al. (2013) describe green accounting as an integration of environmental cost into environmental accounting in a style that relates and includes environmental cost factors into corporate activities, i.e., environmental indirect costs. Environmental accounting includes indirect costs and benefits from economic activities, e.g., environmental and health effects of businesses. Some companies believe that the environmental costs reduce corporate profits. Wherefore, green accounting is mostly less prioritised. Notwithstanding, it presents a new way of identifying and prioritising the cost implications of the environmental impacts arising from the economic activities of the secular institutions. The policy frameworks governing operations in institutions, therefore, demand proper drafting and implementation to protect every aspect of the environment from lethal change and overcome any arising environmental adversity. This implies the need to strengthen the environmental policy frameworks and increase the enforcement capacity for accountability for what humans do to the environment. Nonetheless, inclusion of the environmental cost implications provides a proactive way of dealing with the environment in a friendly manner. Therefore, the following issues are of great concern:

1.1. Environmental Protection Policies are Engines of Hope

The ecosystem faces internal and external processes imposing forces to destabilise it. On one hand, the external (state) factors such as climate and parental material tend to control its overall structure. These factors are manipulated by human interventions. For example, climatic factors such as rainfall patterns and seasonal temperatures have a direct relationship with human economic activities. Similarly, the parental materials, such as the nature of the soil, influence the supply of mineral nutrients. Nonetheless, natural features such as topography affect the microclimate, soil development, and water movement through the ecosystem. On the other hand, internal factors are controlled and influence the ecosystem under the influence of resource inputs into the environment through air, land, and water bodies' treatment, mainly through human activities. Also, the regulation of the ecosystem is partly affected by species succession processes and population density in a given space.

Contemporary secular institutions engage in the pursuit of the best approaches to managing the environment and human activities in reciprocal beneficial relations. Whether human-environment relations become mutually beneficial, it depends on the level of awareness, intentions, willpower, and human capacity to use the environment and its resources to reach socio-economic goals. The best way humans can show love to the dearest Earth is to protect its amenities, i.e., the environment and its components. In this regard, effective environmental protection policy frameworks serve to provide the best harmonious direction for operational forces to protect land resources, water bodies, and the atmosphere from toxic materials and poisons. It is through such approaches that biodiversity can be maintained (Chandra & Idrisova, 2011). The achievements are realised by incorporating the prevention costs into the operational institutional frameworks to guide socio-economic processes that have both direct and indirect effects on the ecological environment.

For decades, the drivers for environmental frameworks' development in this scholarly area have been environmental problems, which include Ozone (O₃) layer depletion, climate change, and marine pollution, among others. The environmental conventions, protocols, and policies center on combating one or more of these problems. The main concern about the policy frameworks and environmental cost inclusions is how the State parties can afford resources and services in preventing pollution, global warming, deforestation, degradation of aquatic systems, and eventually loss of wildlife and biological diversity. The cost implications relate to the influence of signatories and ratification rates of the State parties. On this

observation, Stringer (2008) indicated that member States feel the burden to add a new ratification to the many preexisting ones. To resolve the related challenges, networks of different States at the international level, and local partners, i.e., both public and private, harmonise their various capacities to synergise human and non-human resources in the implementation of environmental policy frameworks.

In essence, environmental policies in a typical low-income country are currently being formulated with the purposes of: reducing firewood consumption through the development of alternative energy sources; promoting the development of renewable energy; implementing assessment and control of development and use of energy; and improving energy efficiency and saving energy (United Republic of Tanzania [URT], 1997; 2021). This purpose is achieved by costing the resources required and financing all related processes and issues.

1.2. Costing the Toxic Emissions is Crucial in Green Accounting

Green accounting provides an avenue for realising the environmental cost implications of institutional operations. Economic activities, i.e., industrial in high-income and anthropogenic in low-income countries, contribute to toxic emissions into the environment at varying concentrations. Greenhouse gases (GHGs) and persistent organic pollutants (POPs), for instance, are among the threats arising from such activities (Ford et al., 2016; Sharma et al., 2021). Their total concentrations in the environment are the additive effect of emissions from multiple countries. While the GHGs in high concentrations may form 'blankets' for containment of the long-wave ultraviolet (UV) radiation on Earth (i.e., for global warming), the chlorofluorocarbons (CFCs) have the power to bombard and deplete the O₃ layer and reduce its efficiency in filtering the harmful UV radiation. Similarly, the POPs resist any form of degradation, including photolytic, chemical, and biological degradation. They tend to persist in the environment at low concentrations for an extended period, so they contaminate the food chain upon exposure. It is worth noting that industrial-scale activities have a larger contributing effect on these toxic substances in the atmosphere and water bodies in maritime countries than local anthropogenic activities do. The cost implications borne by the damages they cause to the environment are imperative to identify.

On this matter, Nurfaidah et al. (2013) have suggested four categories of costs in green accounting. To begin with, environmental prevention costs arise from activities that prevent dirt and production wastes from having negative impacts on the environment, e.g., costs of designing products that minimize or eliminate pollution, costs of conducting environmental studies, etc. Eco-design ensures the generation of products that are entirely environmentally friendly. It is achieved through process modification by altering production methods to reduce emissions and/or waste generation, and improvements in the skill sets in handling wastes properly and observing environmental procedures. Also, environmental detection costs include the costs incurred from the activities that bring products, processes, and other business activities within economic businesses into compliance with established standards, e.g., costs of conducting chemical tests, controlling emissions, etc. These costs accrue from verification expenses on whether products, processes, and business activities comply with environmental regulations and standards. Businesses can proactively invest in preventing future internal and/or external failure costs, such as fines, clean-up costs, etc.

In addition, environmental internal failure costs arise from activities that, once performed, generate dirt, which is disposed of into the institution's surrounding environment. These include costs of treating and disposing of hazardous wastes, the cost of recycling leftover materials, etc. Such costs are incurred on contaminants and wastes produced but not yet discharged into the surrounding environment. The costs of operating, maintaining, and repairing pollution control equipment, treatment and disposal of toxic waste, recycling scrap and residual materials, and licensing facilities to produce wastes are included in this category. Contrarily, environmental external failure (disturbance) costs are incurred after dirt and waste are disposed of into the environment surrounding the institutions. They include realised and unrealised costs. Realised external failure costs are incurred by the institutions, e.g., costs to conserve damaged land, costs to clean up a contaminated environment, etc. Unrealised external failure costs are paid by third parties outside the institutions. These are charged to the institution's business even if they are indirect results, e.g., medical costs for people who become ill due to pollution, costs for losing a healthy environment, etc. These costs are imperative considerations for new school establishment, as the body of knowledge was found not elusive in the context of the low-income countries.

1.3. The Problem

The environment faces continued disruption amid the environmental conventions, protocols, and policies ratifications, adoptions, and protection campaigns. Despite the various international and local environmental conventions, protocols, and policy frameworks' implementations, the globe experience high stake environmental problems. For instance, the value of global ecosystem services currently reported by the World Bank is around \$125 trillion per year, while environmental problems are escalating. Parts of the global community, including Tanzania, have registered severe changes in climate and rainfall patterns. These have been accompanied by high temperature changes resulting from the impacts of emissions and wastes despite policy implementations. However, the analysis of the place of (secular) basic educational institutions in Eco-environmental economic green accounting is practically parochial, such that the current analytical work was demanded. This review has considered this situation and focuses on analysing the place of ecological green accounting in conventions, protocols, and policy implementations, and so it informs policy improvement.

1.4. Research Purpose

This research analyses the contributions and salient gaps in the implementation of selected environmental conventions, protocols, and policy frameworks, and how they prioritise green accounting in basic educational institutions of a low-income country.

1.5. Research Question

The research was guided by the following questions:

1. What environmental conventions and protocols has Tanzania implemented with special focus on basic educational institutions?
2. What is the status of green accounting in basic educational institutions?
3. What are the missing dimensions in green accounting in basic educational institutions noted in environmental frameworks?

1.6. Literature Review: Economic Theory

In the context of this study, various aspects of economic behaviour affect the ecological environment. Adopting the economic theory in green accounting (*i.e.*, in conceptualising the fundamentals of economics and how they apply to the current trends in environmental issues resulting from economic activities under the environmental conventions watch), one finds that the environmental damages constitute one form of market failure. Such failure suggests that the economic institutions must sustainably protect the environments in which they operate by customising the costs of preventing and mitigating the damages. The environmental cost implications can be determined as a welfare function. The welfare function (W) equals the difference between the benefits from, and damage to, the environment.

$$\text{i.e., } W_i = \beta_i - D_i = \beta_i(\chi_1, \chi_2, \dots, \chi_i, \chi_n) - D_i(\chi_1 \dots \chi_i \dots \chi_n) \dots \dots \dots (1)$$

Where χ_i denotes emissions associated with production, β_i is country i 's benefits from the use of the environment for production and consumption activities at the international level; and D_i is country i 's damage caused by pollution in all countries.

However, if the variable is abatement, W_i becomes

$$W_i = \beta_i - C_i = \beta_i(q_1, q_2, \dots, q_i, \dots, q_n) - C_i(q_1, \dots, q_i, \dots, q_n) \dots \dots \dots (2)$$

Where q_i denotes the abatement efforts in country i , and C_i denotes the associated cost of abatement.

The country must establish the environmental cost of establishing and operating secular organisations, and related benefits. The benefits function in equation (1) is analogous to the cost function in (2), and the cost function in (2) to the damage function in (1). Both equations (1) and (2) can be borrowed and applied to study the welfare function for multiple institutions' environmental activities in local settings if benefits, damages, and abatements are deterministic. Local markets and competition may cause institutions to avoid proactive preventive intervention programmes, which are always costly. Given that the benefits of service provision are deterministically higher than the costs, secular institutions such as basic schools should incorporate protection costs into their operational frameworks.

2. METHODOLOGY

This research used an online ethnographic literature review technique to analyse the documents on themes in the three research questions, from November 2024 to April 2025. Thematic and content analyses were used. The thematic and content areas were confined to: environmental conventions and protocols Tanzania has implemented; the status of green accounting in basic educational institutions in Tanzania; and missing dimensions in green accounting in basic educational institutions noted in policy frameworks in Tanzania. Tanzania was used to represent low-income countries that have successfully ratified the important environmental conventions. A PRISMA approach was used as suggested by Page et al. (2021). The documents were retrieved from Google Scholar using the following Boolean logic for research questions: 'Environmental conventions protocols Tanzania basic education institutions PDF journal'; 'Status green accounting basic educational institutions Tanzania PDF journal'; and 'Missing dimensions green accounting basic educational institutions policy frameworks Tanzania PDF journal'.

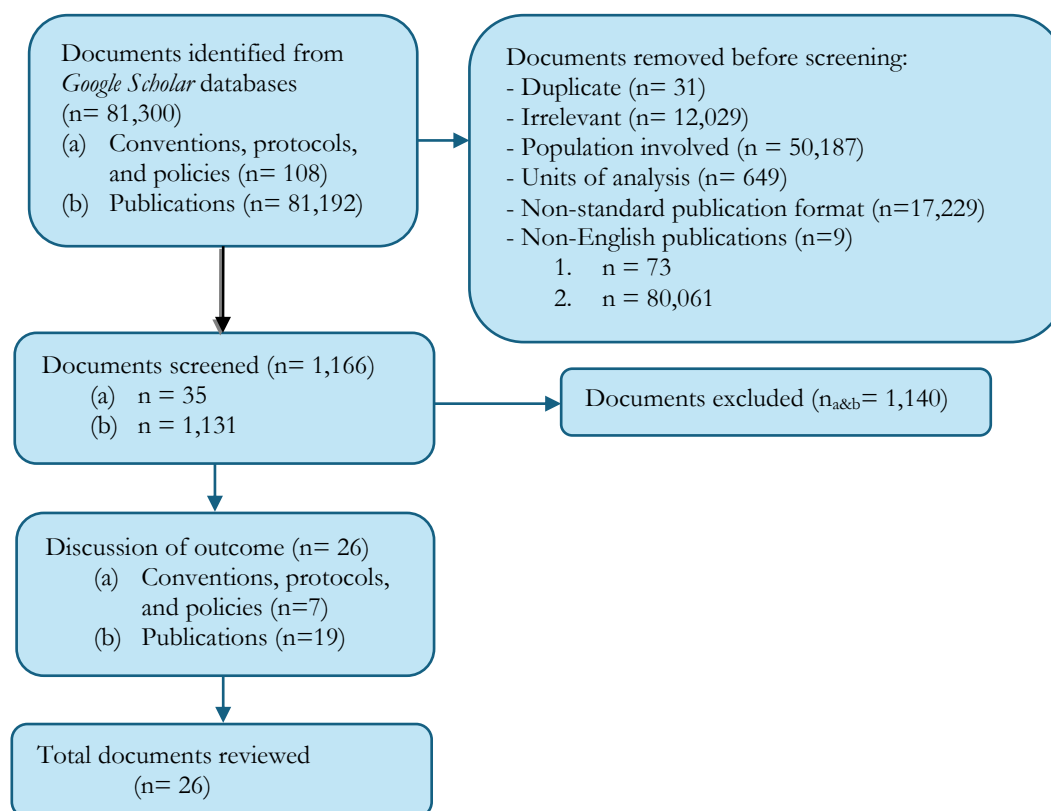


Figure 1. Environmental Conventions, Protocols, Policies, and Publications Identifications via Databases

Source: Chart improved from Page et al. (2021)

The use of Google Scholar in preference to other curated databases, including Scopus and Web of Science, was driven by its incomparable breadth and accessibility of its content. While curated databases may demonstrate high precision and controlled indexing, evidence by Gonzalez and Pena-Vinces (2022) suggests that they may run into a scarcity of literature on a research topic. In contrast, the Google Scholar database serves as a massive discovery tool that captures a wider array of literature. Yet, it may be contempt

of having a high possibility of generating gray literature due to the perception that it operates with proprietary algorithms and limited filtering capabilities. To resolve this challenge, rigorous mitigation strategies for potential biases required the inclusion of the phrase 'PDF journal' in the search strings. Inclusion of the term 'PDF journal' strategically assisted in isolating full-text, portable document format (PDF) files that represent scholarly journal articles, rather than landing on abstract pages, HTML previews, and secondary citations. Implicitly, it assisted the search engine in excluding low-quality unpublished documents, including white papers and grey literature, and provided the peer-reviewed and verified scholarly works for analysis. This process resulted in a total of 81,300 populated sources identified across the search strings.

2.1. Selection of Documents

Six criteria for inclusion, including 'non-duplication', 'relevance', 'population involved', 'units of analysis', 'standard of publication format', and 'English publication', were used to select the documents used in this analysis. Non-compliance with the criteria led to document exclusion. Publications and other records were selected against the criteria as shown in Figure 1.

Using the exclusion criteria, 26 of 81,300 documents were used in this analysis, as indicated in Table 1. The documents reviewed were retrieved from a highly populated niche where knowledge on the subject matter is rich. Relying on the criteria, this process also fostered the validity and representativeness of the findings across the search strings. In this way, the concept of ecological environmental green accounting in secular institutions of the low-income countries was objectively studied using leading Boolean logic.

Table 1. Document Retrieval Using Boolean Logic and Selection of Used Documents

Boolean Logic	Number of Documents Retrieved	Number of Documents Discarded	Number of Documents Used
Environmental conventions protocols Tanzania basic education institutions PDF journal	22,500	22,489	11
Status of green accounting basic educational institutions Tanzania PDF journal	37,800	37,793	07
Missing dimensions green accounting basic educational institutions policy frameworks Tanzania PDF journal	21,000	20992	08
Total	81300	81274	26

Content analysis was used to generate data from the documents. The documents used in this manner are referenced following the APA version 7 referencing style. The integration of economic activities into ecological green accounting is done under several methods. A theoretical approach can be used to study the integration of operations in educational institutions into the arrangements for environmental sustainability. Policy and legal responses to proper operations that conserve and protect the environment can be assessed. The use of a welfare function approach in local educational institutions is effective in determining their environmental performance. It can provide a comprehensive cost-benefit analysis of the environment-affecting activities in schools, as it does for economic activities in industries, agriculture, engineering, etc.

3. RESULTS

This section presents and interprets the review findings on the environmental conventions and protocols implemented by Tanzania, and the status of, and missing dimensions in, green accounting in basic educational institutions.

Table 1. Selected Environmental Conventions Foci, Ratification, and Perceived Implementation Gaps: Basic Education Institutions

Year	Name	Focus	Ratification pace	Weakness and/or gap
2013	Minamata Convention on Mercury(MC) ¹	To protect human health and the environment by preventing Mercury (Hg) poisoning; by monitoring its release in the atmosphere, water, and on land	Tanzania ratified on 5 October 2020, becoming one of the 123/195 countries in the world	No strict policy and legal monitoring and control mechanisms for Hg bottling, use, and disposal in school labs
2001	Stockholm Convention (SC)	Preventing and reducing long-range transport of Persistent Organic Pollutants (POPs) harmful to human health and the environment	Tanzania ratified on 30 April 2004 and became a signatory among 152/186 of the State parties	Inadequate frameworks for assurance of prevention of the production of the POPs, and their containment in their eventual case of their occurrence
1998	Rotterdam Convention (RC)	Regulation of international trade in chemicals and pesticides	Tanzania ratified on 24 February 2004, and became a signatory among 72/166 of the parties	Though quality labels of imported goods have been emphasised and verified on samples, no internal stable mechanisms to monitor the quality of ingredients in chemical labs over time
1994	UN Convention to Combat Desertification (UNCCD)	To combat desertification and mitigate the effects of drought through national action programmes	Tanzania ratified in 1997, becoming one of the 196 State parties	Institutions are founded by tillage of larger land covers, than they compensate for afforestation and reforestation
1992	UN Framework Convention on Climate Change (UNFCCC)	Mitigation of the causes of climate change	Tanzania ratified on 12 June 1992 as one of the 152/195 countries at the Rio “Earth Summit”	Institutions’ task forces are low-capacitated at the basic education institutions level, even though they form the largest segment of the secular institutions operating in the fashion of the indigenous anthropogenic groups contributing to the GHGs.
1992	Convention on Biological Diversity (CBD)	Conservation of biodiversity, sustainable use of biodiversity, and fair and equitable sharing of the benefits arising from the use of genetic resources	Tanzania ratified on 1 March 1996, so it is one of the 188/198 State parties	There is inadequate enforcement and capacity building for basic educational institutions’ action groups to conserve biodiversity.
1989	Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal	To reduce the movement of hazardous wastes between nations, and specifically to restrict their transfer from high-income to low-income countries, and minimise the rate and toxicity of the wastes generated	Tanzania status—NA, 191/198 State parties	Institutions lack the financial and technological capacity to recycle and dispose of hazardous wastes

3.1. Selected Environmental Frameworks Implemented, and Related Peer-Reviewed Publications

Several conventions and protocols have been ratified and incorporated into Tanzania’s internal environmental policy frameworks. Selected documents indicate engagements into different foci, which the government ratified at various paces, some with long delays. The findings have also revealed generality and

¹See Minamata convention on Mercury, Article 7, <https://minamataconvention.org/en/about/convention-text>

lack of particularity for some of the implementation programmes and projects, focusing on specific domains for basic educational institutions. This means even if there were initiatives focusing on environmental preventive measures in basic educational institutions, they would not be backed up by policy adequacy and eventually would not sustainably succeed in the question of developing and securing the required financial capacity. Table 1 shows the different foci, ratification paces, and noted policy gaps or/and/or weaknesses.

Some States ratify the conventions and frameworks on the environment. Ratification rates among States, however, vary for particular documents. For example, the UNFCCC has 197 State parties and 1 regional economic integration organisation (*i.e.*, the European Union). The environmental protocols derive from relevant conventions. They provide detailed guidelines through which the coalition parties can operationalise the activities for the convention. For instance, the Cartagena Protocol on Biodiversity of 2000 derived from the CBD of 1992, which aims at ensuring safe handling, transport, and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity and human health. Similarly, the Kyoto Protocol of 1997 and the Montreal Protocol of 1987 were put in place to phase out O₃-depleting substances from the environment.

Moreover, Tanzania has incorporated international environmental frameworks into its local politics and policy frameworks. The National Environmental Policy of 1997 and its amendments of 2021, for instance, address six major environmental problems. It aligns with the domestic and international laws relating to forests and wildlife, water pollution, and food safety.

Nonetheless, the protocol and policy frameworks have their real affirmation through the SDGs. For instance, SDG 3 focuses on ensuring healthy lives and promoting well-being for all by 2030. The relevance is based on all forms of conventions (*e.g.*, the Minamata Convention) aiming at preventing diseases and suffering from environmental pollution because of human activities. Other affirmations include SDG4 on good quality education, SDG6 on ensuring availability and sustainable management of water and sanitation for all, SDG7 on ensuring access to affordable, reliable, sustainable, and modern energy for all by 2030, SDG9 on building resilient infrastructure, promoting inclusive and sustainable industrialization, and SDG11 on making cities and human settlements inclusive, safe, resilient, and sustainable. The list extends to SDG 12 on responsible consumption and production, SDG13 on taking urgent action to combat climate change and its impacts, SDG14 on conserving and sustainably using the oceans, seas and marine resources for sustainable development, and SDG15 on protecting, restoring, and promoting sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation, and biodiversity loss.

Unfortunately, implementations of the contentions of the frameworks seem not realistic in many countries. The GHG emissions in basic education institutions, for instance, are neither well accounted for nor controlled in the low-income States, let alone the fact that the highly industrialised commercial nations have not stopped releasing the lethal excess emissions. The domestic policy frameworks espoused consider the contentions in the conventions and protocols that guide the commonly agreed practices for the States parties to adhere to. Even though the noted weaknesses and gaps may accrue from inadequate financial and technical capacities of the local governments.

Analysis of the peer-reviewed publications on environmental protection practices in Tanzania indicates similar weaknesses, evidenced from field work on adoption, uptake, and implementation of global, regional, and local environmental frameworks. Table 2 shows the nineteen (19) peer-reviewed serial publications used in the current analysis, their quality in terms of the methodology producing them, and relevant content on the environmental frameworks.

Table 2. Reviewed Publications and Indicative Thematic Evidence on Environmental Frameworks

Year	Author(s)	Objective Tasks	Thematic Evidences
2026	Taifa & Mwano	Surveys, interviews, and analysis of 97 documents using the Leadership in Energy and Environmental Design (LEED) framework	The policy design implementation is associated with low sustainability levels, and implementation barriers related to financial constraints, lack of material availability, and regulatory challenges
2024	Adebayo	Qualitative empirical analysis of policy gaps and stakeholder engagement in Africa	Lack of integration of environmental concerns into social policy across various sectors

Year	Author(s)	Objective Tasks	Thematic Evidences
2024	Thuy	Surveys and Case Studies	Management agencies impact the implementation of green accounting, as there is a lack of transparency in information on environmental expenses
2024	Wania & McLachlan	A review of the acceptance and utility of the Stockholm Convention	Atmospheric monitoring globally indicates that more POPs have been released to the environment than ever since its initiation two decades ago
2024	Doobee et al.	Panel data on green accounting practices and company performance in Nigeria	Green accounting contributes to the environmental performance of the activities of oil and gas companies
2023	Wiredu et al.	Online questionnaire survey in Ghana	Environmental compliance and business efficiency affect sustainability and mediate the impact of green accounting on sustainability; and Lack of holistic and coordinated actions to leverage societal actions for the environment is noticed
2023	Mike	Case studies on Chinese firms in developing countries	Chinese firms adhere to the environmental, social, and governance standards dimensions, unlike other industrialised World
2022	Akhtar-Schuster et al.	Analysis of the UN Convention to Combat Desertification	There is a perceived lack of knowledge on combating the problems of desertification, land degradation, and drought
2022	Wanki et al.	Analysis of the Basel Convention	There is a lack of financial capacity and technology in low-income countries
2022	Novovic et al.	Survey, and a classification decision tree (DT) model	Socio-demographic factors impact the understanding of the importance of green accounting
2022	Gonzalez & Pena-Vinces	Systematic review of Scopus and ISI sources	150 Colombian industrial and commercial companies had not yet implemented environmental practices with the accounting systems
2022	Osuntuyi & Lean	EKC hypothesis (Model)	Environmental growth is a long-term solution to environmental deterioration in high- and upper-middle-income countries, while the opposite holds low-middle-income and low-income countries; while Energy consumption links to environmental deterioration across all income groups.
2021	Muller et al.	Comparative mapping of African energy transition across 34 countries' policies	The progress towards SDG7 is still limited and difficult to trace, and it needs to consider the justice dimension for holistic implementation
2019	Sharma et al.	Analysis of the Minamata Convention	Poor control of Hg and safety in Hg-added products
2019	Núñez-Rocha & Martínez-Zarzoso	Analysis of the Rotterdam and Stockholm Conventions	Lack of measures to monitor compliance in low-income countries
2019	Hansson et al.	Empirical analysis of pollutants	Existence of functional markets for emissions trading and selling, <i>e.g.</i> , biofuel for export amid ethical dilemma; and Increased production volumes of solid biomass for export, <i>e.g.</i> , sugarcane and jatropha— increases bioenergy demand
2019	Pirmana et al.	Systematic review of empirical research on the system of environmental-economic accounting (SEEA) for monitoring SDGs	Inadequate human resources in quantity and quality in the implementation of the SEEA in developing countries
2017	Rahman et al.	Case studies on natural resource governance	Institutional gaps coexist, limiting the achievement of resource management and regulation
2016	Ford et al.	Analysis of the Convention on Climate Change	Poor performance in environmental protection among peasants

3.2. Ecological Green Accounting in Educational Institutions

The economic theory used in green accounting provides the basis for analyses of demand and supply, showing resource scarcity and unlimited needs and choices as a problem of concern in low-income countries. Under this basis, the mileages towards achieving the benefits of conserving the environment are theoretical in public and political spaces, rather than practical. The existing local bodies are expected to address the local environmental problems. Tanzania, in particular, has incorporated international environmental frameworks into its local policy frameworks. For instance, the National Environmental Policy of 1997 and its 2021 amendments have the strategic implications of preventing harm to the environment. The amendments were geared towards gaps realised in policy implementation amidst its enforcing Environmental Management Act Number 20 of 2004. Innovations in practices are emphasised in several policy dimensions, including genetically modified organisms and carbon monitoring, among others. However, the cost of harming the environment and the health of users of the environment in basic education institutions has not been quantified previously. The damages and abatements are not well analysed and speculated. Consequently, the secular institutions do not always proactively prevent some lethal applications in school chemical labs, for instance, presumably because of the unfavourably high cost of changing the approaches from the preexisting ethos. As damages are not always pre-determined, it also becomes difficult to identify the cost implications of the institutional discharge of see wage, laboratory chemicals, etc.

Anecdotal evidence has indicated the lack of a complete ministry dealing with environmental legislation due to budget bottlenecks common in most low-income countries. In Tanzania, particularly, the government appoints a minister to be in charge of the environment, who controls the two organisations administering the environmental issues: the Department of Environment (i.e., Environment Division, currently under the Vice President's Office) and the National Environment Management Council (NEMC). This arrangement is effective at minimising the costs of running a ministry for the environment. The major concerns for decades have been in the foci of mining centres, large-scale industries, and large-scale deforestation activities. The proliferant secular institutions, however, particularly the basic education institutions, have not been adequately centred at the heart of the implementation processes.

3.3. The Missing Dimensions in Ecological-Environmental Protection

A keen analysis of the contents of the environmental conventions has indicated several issues that limit efficiency in implementation. To begin with, the conventions have the inherent problem of generality and vagueness. They assume homogeneity of the Member States in terms of technical and financial capacities and the level of harm they cause to the environment. However, while some States have critical contributions to the high concentrations of pollutants in the environment, others appear to form potential sinks for pollutant discharge. This inequitable relation leaves room for the question of efficiency in achieving the objectives of the contentions. Nonetheless, the less technologically advanced States have low efficacy in adopting proper means to contain, recycle, and prevent the discharge to the environment.

In special cases, the coalition member States may lack rigorous mechanisms to control Mercury (Hg) contamination and safety in Hg-added products such as thermometers. For example, no elaborate control and disposal of the chemical in basic education institutions' chemical labs, where junior learners stay for long. Anecdotal evidence has indicated a problem of a lack of technical know-how to dispose of Hg containers, and Hg spillage from broken instruments. The Hg and other serious chemicals may be casually discharged to run-offs in the environment with continuous educational processes. This suggests a need for reforms in in-service training programmes for science education teachers and laboratory technicians for them to be conversant and coherent with environmentally sensitive initiatives.

Also, some basic education institutions are left to operate in the indigenous anthropogenic group's fashion, resulting in uncontrolled release and contributions to anthropogenic gases. For instance, this analysis notes inadequate frameworks for the prevention of the production of POPs in chemical laboratory settings, the release of GHGs, and tillage of large land covers, which they compensate for by afforestation and reforestation during institution establishment. This problem may extend to financially well-off multilateral governments and institutions. In fact, extended and complicated negotiations on the climate

change problem imply difficulties in practically achieving large, stable, and substantial international environmental agreements.

In addition, the conventions are designed such that the implementing States are self-enforcing, *i.e.*, no supra-national authority that implements and enforces environmental policies on a sovereign State. In essence, the relations do not offer space to discuss and intervene adequately on the limited local capacity of some States, especially the low-income States. This weakness is aggravated by high asymmetry among coalition countries in both costs and benefits from reducing pollution. While the highly industrialised States may benefit from operations that add contaminants to the environment at a higher rate, the less industrialised ones may not be so, while they suffer the outcome of pollution, both in terms of mitigation and compensation costs. One immediate approach to resolve this issue is for the States that produce pollutants to finance mitigation processes for sinks.

4. DISCUSSION

This section discusses the findings on the three research objectives. The themes and content of the section, therefore, align with environmental conventions implementation in low-income countries, including Tanzania, ecological green accounting in basic education institutions, and the missing dimensions in green accounting in basic education institutions.

4.1. Environmental Conventions Implementation

The low-income countries have ratified a number of global environmental protection documents. The adoption of the contentions to domestic environmental policies, however, faces some challenges. One of the key issues that appears similar to many low-income countries is the avoidance of the costs of operations associated with abatements. For instance, the findings have indicated serious gaps between the convention's contentions, such as the Minamata Convention on Mercury (Hg), and real implementations in basic educational institutions' chemical labs. School operations involving the use and disposal of Hg present risky handling practices to users. Notwithstanding, it seems that the poor practices extend far beyond the educational institutions to the mining sites along the supply chains. This fact appears in several previous writings. For example, the scholarly works by Bento (2017) and Sharma et al. (2019) indicate the absence of rigorous mechanisms to control Hg contamination and safety in Hg-added products in Tanzania, similar to Burkina Faso, Ghana, India, and Mali. Bento's (2017) findings revealed serious exposure of children to Hg poisoning in artisanal and small-scale gold mines in the northern part of Tanzania and these member States. The findings, however, were not exhaustive of how the situations in basic schools were for Hg-added instruments such as thermometers. The current analysis identifies that Hg containers are not well monitored to contain their spillover, discharge, or disposal to the environment. Its mild concentrations may be regularly discharged to the environment over the years. Warningly, Hg poisoning is known to cause serious *Minamata disease* in the long run. Nonetheless, this happens together with poor management of seriously poisonous chemicals such as Barium compounds, which are regularly used and handled poorly in school chemical labs. This could be of special interest in the foci of SDG12 on responsible consumption and production and SDG3 on ending diseases by 2030. The relevance also extends to all forms of conventions aiming at preventing diseases and suffering from environmental pollution attached to human activities. This part of the debate seems to correspond to one of the most expensive green accounting policy lines. The low ratification pace between 2013 and 2020 (*i.e.*, a time lapse of 7 years) for Hg, in particular, may imply arrangements for review of financial and structural capacity for enforcement. For similar possible reasons, the findings have shown that 72 of the 195 State parties had not ratified the convention by 2020.

Also, weaknesses have been noticed in the implementation of the SC to detect and monitor the POPs in and out of school labs. It is worth noting that the negotiations among the State parties persisted from the 1990s through the 2000s, with delayed ratification. Meanwhile, the main POPs producers are based in high-income countries. Attached to this fact is the learning that no preventive measures have been effective, such that 20 years after the SC implementation, the environment continues to accumulate much additional POPs, which are likely a result of their long-range environmental transport (Wania & McLachlan, 2024). Even though evidence has indicated a reduction of 16 percent in shipments of the POPs. This line of findings appears similar to that in RC. In this case, the empirical findings by Núñez-Rocha and Martínez-

Zarzoso (2019) show that the reduction in the import of hazardous substances in the ratified countries (*i.e.*, for RC) was less than 7 percent. However, the analysis has further indicated that deceitful individuals and firms find loopholes to send dangerous products to low-income States (Núñez-Rocha & Martínez-Zarzoso, 2019). This problem is aggravated by the weakness that there is no specific measure developed and applied to monitor compliance in low-income countries (Oh, 2006). Notwithstanding, the RC and SC foci present themes of relevance to SDG 11 on making cities and human settlements inclusive, safe, resilient, and sustainable, but progress in a negative sense of failure. The cost implications of non-monitored POPs and hazardous substances are either underscored or avoided, particularly in the basic educational institutions' chemical labs. The latter case would imply why only 72 countries had ratified the RC in 2004, just six years later.

In addition, efforts to tackle the problem of desertification have been espousing success globally. Many countries show significant efforts to combat desertification, especially in the Sahel region. In fact, 196 of 198 State parties had ratified the UNCCD in 1997, just three years later. Contrary to the expected outcome, it is surprising that estimates of the area affected by soil and land degradation could show an increase in 2008, just eleven years later. This led to the formulation of the UNCCD special secretariat in 2013 on the basis of the criticality of steering implementation of the convention's contentions among the State parties. However, while the established 2013 UNCCD science-policy interface (SPI) has addressed the Parties' needs since 2015 and increased knowledge and advice on combating the problems of desertification, land degradation, and drought (Akhtar-Schuster, 2022), it is not refuted that estimations of affected area size continue to increase globally (Stringer, 2008). The nature of activities and land tillage and clearing of large volumes of flora in construction sites, including educational campuses, remains a problem of concern for control over desertification.

Furthermore, mitigation of the causes of climate change by the UNFCCC has similarly shown some pitfalls, contrary to what researchers such as Ford et al. (2016) would expect of environmental performance in secular institutions. The global climate is changing. Rain seasons for farming and related peasant microeconomics are being destabilised, with unexpected droughts, floods, and heavy rains causing landslides. This implies that ecological water cycles in human habitats are interfered with by deforestation processes. Yet, there is limited space for incorporating the voices, needs, and priorities of indigenous peoples in decisions around adaptations and policy change. For instance, policy directives on fuel adaptations to replace the use of charcoal and firewood materials are still impractical. In fact, the current data indicate that the global charcoal harvest was 53.2 million tons in 2018, with about 64 percent produced in the African region, with Ethiopia, Tanzania, and Mozambique showing hikes in records. In fact, the analysis presented by Muller et al. (2021) on 34 countries' environmental policies indicates failure in achieving SDG7 on access to affordable, reliable, sustainable, and modern energy for all. Currently, DRC, Nigeria, and Ethiopia are running up to Brazil, which is the leading wood charcoal producer globally. Despite the public sensitisation programmes by the governments and other non-State players, rampant harvesting of forest resources is real. Notably, basic educational institutions currently consume a large proportion of the forest resources (*i.e.*, wood). This reduction of sinks for carbon happens simultaneously with other operational activities that increase the levels of carbon dioxide release and other GHGs, resulting in global warming.

Nonetheless, the CBD on conservation of biodiversity and use of genetic resources faces similar weaknesses in implementations likewise. There are inadequate implementation practices in basic educational institutions in low-income countries and transition economies. This is due to limited financial capacity, lack of science, coordination legislations, and monitoring of on-the-ground implementation of biodiversity programmes (Chandra & Idrisova, 2011). There is a loss of fauna in increasingly occupied and reoccupied land with plantations cleared. For instance, the establishment of new buildings takes up large areas in a lateral rather than vertical way. This is a serious problem as human populations are rapidly approaching the maximum carrying capacity the environment can support amid rapid urbanisation.

Notwithstanding, relations between high-income countries and low-income countries have been strengthened in the control of transboundary movement of hazardous materials and their disposal by implementing the Basel Convention. However, there's still a weak environmental performance record among the State parties. In fact, a piece of evidence presented by Gonzalez and Pena-Vinces (2022) shows that 150 industrial and commercial companies in Colombia, an upper-middle-income country, for instance, did not include green accounting practices in their operations. In low-income States, for instance, there is

a lack of capacity in terms of finance and technology to recycle the material wastes (Wanki et al., 2022). In that sense, basic educational institutions have not devised adequate institution-based programmes to recycle the material wastes such that institutions in close proximity to the household communities cause environmental disturbances.

4.2. Ecological Green Accounting

Green accounting of secular organizations of the education industry in a low-income State has the characteristics of inadequate quantification of the benefit function, cost function, and damage function, as well as the abatement costs in dealing with the environment. There are hence unmanaged lab chemicals, environmental effects of typical indigenous anthropogenic emissions, population density effects, water misuse, poor waste disposal, and a lack of capacity for recycling of non-degradable materials. This implies a negative development in the achievement of SDG4 on 'good quality education' in schools. It is imperative, considering that in some cases low-income countries take charge of major roles that create sinks for the air pollutants from industrialised countries, especially when they are funded programmes. For instance, they are involved in making artificial plantations and reforestation activities, which are funded by the Global Environment Facility (GEF) established by the UN Development Programme, the UN Environment Programme, and the World Bank. However, this takes a financing model that excludes capacity building of the stakeholders at the grassroots level. This is one of the situations noted contributing to the reduced environmental performance of the conventions. To curb these situations, green accounting must be prioritised from macro- to institutional levels. Its primary objectives must include determining the part of gross domestic product that reflects the costs necessary to compensate for the negative effects of economic growth, the linkage of physical resource accounts with monetary environmental accounts, environmental costs and benefits, maintenance of tangible resources, and the indicators of environmentally adjusted product and income (Sadiku et al., 2021). Surprisingly, even the Gross Domestic Products (GDPs) of the States overlook the environmental factor, so they stand for revisions to Green GDPs. The Green GDPs incorporate the green accounting component to overcome the environmental performance weaknesses. Large economic contributors, including educational institutions and companies, must include ecological-environmental green accounting in their operations. In this regard, the evidence presented by Doobee et al. (2024) indicates that green accounting is paramount for big companies and institutions. It is particularly important for countries to realise the achievements of SDG12 on responsible consumption and production.

4.3. The Missing Dimensions

Trends of the past and present policy statements and the various global and local declarations and protocols have led to a clear understanding of the practices, successes, and failures in terms of green accounting in the educational institutions in Tanzania. The noted shortfalls apply to the majority of countries worldwide. Weaknesses and gaps have been identified for decades and have led to the establishment of the 2013 UNCCD's science-policy interface (SPI) to address the Parties' needs from the working group on scientific advice (Akhtar-Schuster, 2022). Among the noted weaknesses, financial and technical expertise have been the major limiting factors. In this case, some countries have been withdrawing and re-acceding, e.g., Canada was the first to withdraw from the UNFCCC in 2013 and came back in 2017.

Meanwhile, the shortage of land resources is a growing challenge worldwide. The grazing potential and population of around 7.8 billion, of which Tanzania alone contributes about 60 million people (Worldometer, 18th September, 2024), is running over the carrying capacity humans should live on. This happens at the geometric growth rates of the micro-populations, with Earth resources shrinking amid arithmetic economic growth. Implicitly, resources and space are becoming major threatening and limiting factors for competitive vigour in human livelihoods- the weak should be severely weakened by strong economies in the competition. Consequently, the environment cannot fully provide for human needs because it is not appropriately taken care of. A real separation in practices from environmental conventions is noticed in the way the States adopt and ratify the international frameworks for the reduction of pollutants to balance the climate and influence the normal global temperature, for instance. The member States of the environmental coalitions may have incentives to cheat on one another- declaring ratifications while doing otherwise. Evidence is real. The Montreal Protocol of 1987 proved a failure, which is why the Kyoto

Protocol of 1997 was formulated ten years later. Worse, since the adoption of the Kyoto Protocol, there has been a significant raise in the GHGs. In fact, the highest record of global GHG emissions was 60.63 billion tons in 2025. The global temperature likewise has been increasing to a record of 1.55 °C in 2024, above the 1900 pre-industrial level. A piece of evidence presented by Osuntuyi and Lean (2022) reveals that high energy consumption in both high- and low-income countries is at stake, causing environmental destruction.

It is unfortunate that the level of inhuman behaviour has reached intolerable levels in the atmosphere, land, and underground streams. The environment is signaling that it is no longer capable of tolerating human deeds. The CFCs, CH₄, O₃ bombardiers, CCl₄, toxic and poisonous substances, and heavy metals, among others, provide evidence of the new identity of unfair humans. What happens then? Evidence has shown in the history of planet Earth through five major extinctions of species in some geological generations that it only keeps life in reciprocity to its maintenance. It plays unfairly when it is confronted and compromised in its environmental ingredients, especially while man, as a voluntary custodian, becomes a master destroyer of its systems.

5. CONCLUSIONS

Effective conservation measures result from unified multi-sectoral and political support. This support facilitates integrating the environmental factors into policy-based decision-making processes. Environmental conventions, protocols, and policies provide the best directions to tackle environmental issues. However, implementation of their contentions and clauses faces impediments, so that their objectives are not well realised in most cases. One of the key issues in this context is the fact that the cost of paying for environmental conservation is high. Eco-environmental economic accounting encompasses the green accounting processes concerned with measuring and reporting the cost implications of economic activities related to the ecological system (i.e., ecosystem). The reality is the persistence of incidents of human activities causing harm to the environment and its flora and fauna. Worse, the harmful effect is not always accounted for or compensated for. Policies are not strictly implemented due to financial barriers and a lack of adequate skills and technologies in low-income States.

6. IMPLICATIONS AND RECOMMENDATIONS

Environmental stability may be affected as ecosystems face periodic disturbances. Although there is a natural resistance providing the capacity for ecosystem recovery processes, humans have moral obligations to carry out the roles essential to protecting the environment. Doing fairly by the obligations, the enactment of the conventions, protocols, and policies relevant to this purpose is inevitable. In spite of the conventions on the environment, including the Minamata Convention, the Stockholm Convention, the Rotterdam Convention, and the CBD, among others, no potential achievements are realised as a whole. While data have shown no strict policy measures, monitoring and control of issues under the Minamata Conventions in public basic educational institutions, for instance, strengthening the frameworks and stabilising the internal mechanisms on one hand, are recommended for State parties to realise the objectives of the conventions, protocols, and policies generally.

On the other hand, State parties and their development partners should increase investments in strategic activities focused on conserving and restoring damaged environments. In particular, afforestation, reforestation, and sustainable monitoring should be prioritised in areas of deforestation and potential desertification. This should go simultaneously with the need for State governments to invest in monitoring GHG-releasing activities. In this case, while Hickmann et al. (2021) argue that the UNFCCC secretariat coordinates and steers the initiatives of non-State actors for compliance and good practice among the parties regarding the global climate policy, the lessons learned from this analysis suggest that State governments should be seriously concerned with combating environmental problems proactively. Specific knowledge and information sharing mechanisms, participatory platforms, educational programmes, multi-level governance, and policy coherence may be used to achieve this purpose.

Nonetheless, State governments should strategise the green accounting knowledge in institutional activities affecting the environment. Integrating economic activities in schools into green accounting, in

particular, can provide the best way to comprehend the relationship between economic growth in the locales and environmental sustainability on the one hand. As Sadiku et al. (2021) present, the traditional growth measures are recast as sustainable growth. The benefits, costs, damage function, as well as the costs of abatement, should be determined. This guides the generation of the complete picture of the relationship between the economic activities and the four prime ecological components: biotic factors, abiotic factors, interaction within and between biotic and abiotic factors, and their physical space.

On the other hand, the findings have revealed the situations of delayed ratifications and institutional inefficiencies in the uptake of the contentions of the ratified frameworks. There is a caveat. The findings presented by Wiredu et al. (2023) from Ghana indicate a lack of holistic and coordinated actions among institutional actors. While the current analysis presents specific issues, including financial bottlenecks that impede implementation, there seems to be a sense of failure related to a lack of awareness and required skill sets among the implementers. This thought also appears in the analysis presented by Akhtar-Schuster et al. (2023) on the UN Convention to Combat Desertification. I do recommend further studies on institutional awareness of environmental management issues and skill sets to operationalise ecological-environmental green accounting responsively, in secular institutions, including schools, and how socio-demographic characteristics impact the environmental protection processes in school communities.

7. STUDY LIMITATIONS

This study was implemented using an online ethnographic survey of environmental frameworks and related empirical studies. Online ethnographic research is a powerful tool for understanding phenomena, but it faces a number of limitations. To begin with, the credibility of the findings used relies on computer-mediated interactions through recognised source databases, which may provide a low number of retrievals subject to biases. This study used a Google Scholar database to increase the inclusivity and diversity of the documents used. To ensure the quality of the documents used, documents from high-quality publishers were used under specific criteria of inclusion and exclusion, as explained in the methodology section. Even so, the results are restricted to environmental frameworks and secondary sources. The most conspicuous limitation in this sense is the lack of the voices of the members of the institutions, which the discussion has implied, particularly on their awareness, readiness, and skill sets to exercise green accounting for protecting the environment, due to the nature of the review and its demands.

Study Contribution. The current author conceptualised the study, executed the PRISMA process, analysed and discussed the findings.

Research Ethics. This research ensured that biases were minimised, and the review process adhered to strict standards regarding intellectual property, practicing accurate citation, and avoiding plagiarism.

Data Availability Statement. All data can be obtained from the corresponding author.

Conflicts of Interest. The author declares no conflicts of interest.

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