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Environmental Management Challenges and Institutional Readiness in Zimbabwean Tertiary Sports: A Mixed-Methods Investigation of Policy-Practice Alignment

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Abstract

Environmental sustainability in tertiary sports remains an emergent yet under-resourced domain, particularly in sub-Saharan Africa. This mixed-methods study examined institutional readiness for environmental management in Zimbabwean tertiary sports through quantitative stakeholder perceptions (n = 141) and qualitative document analysis of institutional policies across five tertiary institutions. Quantitative data were analyzed using descriptive statistics and one-way ANOVA (with ordinal validation via Kruskal-Wallis), revealing no statistically significant differences between stakeholder groups (athletes vs. fans; $p > 0.05$). Stakeholders consistently reported substantial institutional deficits: budget constraints ($M = 4.21$, $SD = 0.86$), absence of sport-specific environmental policies ($M = 4.08$, $SD = 0.87$), and limited technical expertise ($M = 4.14$, $SD = 0.75$). Current environmental practices scored low on implementation scales ($M = 2.39$ - 3.81), particularly for green facility design ($M = 2.44$) and renewable energy systems ($M = 2.39$). Document analysis revealed superficial sustainability references in institutional policies, with fragmented frameworks lacking sport-specific environmental guidance. The research identified a critical policy-practice gap: while tertiary institutions maintain overarching sustainability commitments, sport divisions operate without dedicated environmental management systems. Findings underscore the necessity of sport-specific regulatory frameworks, enhanced institutional capacity, and structured stakeholder engagement to align tertiary sports management with Sustainable Development Goals (SDG 12 & 13) and promote ecological responsibility in competitive excellence.

Keywords

Environmental Management, Tertiary Sports, Sustainability Governance, Institutional Readiness, Sub-Saharan Africa, Stakeholder Engagement, Policy-Practice Alignment

1. Introduction

The environmental footprint of tertiary sports has emerged as a critical policy concern within global sustainability discourse [1]. University and college sports operations—encompassing facility management, event logistics, and infrastructure maintenance—consume substantial resources, including energy, water, and materials [2]. At a global level, tertiary sports events are associated with elevated carbon emissions, resource depletion, waste generation, and ecosystem disruption. Advanced facility systems, including flood lighting, electronic scoreboards, climate control mechanisms, and transportation networks, generate considerable operational carbon footprints. Additionally, sports infrastructure development frequently involves habitat disruption, soil displacement, and air quality degradation [3] [4]. In the African context, and specifically in Zimbabwe, environmental management challenges in tertiary sports are compounded by systemic constraints. Zimbabwean tertiary institutions face critical resource limitations, including insufficient financial allocations, inadequate technological infrastructure, and limited technical human capital [5] [6]. Energy-intensive sports facilities, coupled with dependence on non-renewable energy sources (diesel generators, firewood), exacerbate greenhouse gas emissions and environmental degradation. These challenges exist within a broader institutional context in which environmental sustainability is frequently perceived as peripheral rather than integral to sports governance and operations. The disconnect between global sustainability commitments and local implementation capacity remains pronounced. While international frameworks—including the UN Sustainable Development Goals (SDG 12: Responsible Consumption and Production; SDG 13: Climate Action) and institutional statements on environmental responsibility—provide aspirational direction, tertiary sports in Zimbabwe continue to operate within poorly integrated management systems. This represents a critical theory–practice gap that warrants empirical investigation.

2. Theoretical Framework

2.1. Institutional Theory

Institutional Theory provides a foundational lens for understanding organizational change. Recent scholars emphasize that institutional change is shaped by regulative, normative, and cultural-cognitive pressures, which determine how organizations prioritize or resist sustainability [7] [8]. In Zimbabwe's tertiary sports institutions, the absence of strong environmental policies, weak enforcement mecha-

nisms, and limited normative expectations for green practices constrain the adoption of environmental management systems. Contemporary studies show that institutions in developing contexts often struggle to institutionalize sustainability due to fragmented regulatory environments and resource limitations [9] [10]. These dynamics explain why environmental management remains inconsistently applied across tertiary sports structures.

2.2. Stakeholder Theory

Building on Freeman's foundational work, recent research highlights that sustainability outcomes improve when organizations activate multi-stakeholder participation, foster shared responsibility, and ensure transparent decision-making [11] [12]. Tertiary sports environments involve complex stakeholder networks—athletes, administrators, facility managers, students, environmental officers, and national sports bodies—whose engagement is critical for coordinated green transitions. Contemporary African scholarship also emphasizes that stakeholder engagement is often the missing link in achieving sustainability in sports and education sectors [13] [14]. The findings present an inverse relationship: the absence of stakeholder engagement mechanisms—particularly involving athletes, administrators, facility managers, and environmental officers—correlated with weak environmental adoption across the institutions studied.

2.3. Legitimacy Theory

Legitimacy theory further illuminates why environmental practices remain underdeveloped in these contexts. Modern applications of legitimacy theory argue that institutions must demonstrate visible, measurable alignment with societal environmental expectations to maintain credibility [15] [16]. In the sustainability era, legitimacy is earned not through rhetorical commitment but through authentic implementation of green practices and transparent reporting. For tertiary sports institutions in Zimbabwe, legitimacy is increasingly tied to their ability to adopt eco-friendly facility management, reduce waste, and align with global sustainability norms. Recent scholarship notes that organizations failing to operationalize environmental commitments risk reputational erosion and stakeholder disengagement [17].

Together, these three theories explain the policy-practice gap documented in this research. The weak institutional pressure—characterized by low regulative and normative forces—combined with minimal stakeholder involvement and insufficient legitimacy demonstration, creates conditions for institutional inertia. However, all three constraints are addressable through deliberate institutional action: sport-specific environmental policies, enhanced organizational capacity, and structured stakeholder engagement mechanisms can catalyze meaningful transformation. Based on the integration of Institutional Theory, Stakeholder Theory, and Legitimacy Theory, the conceptual framework guiding this study is presented in **Figure 1**.

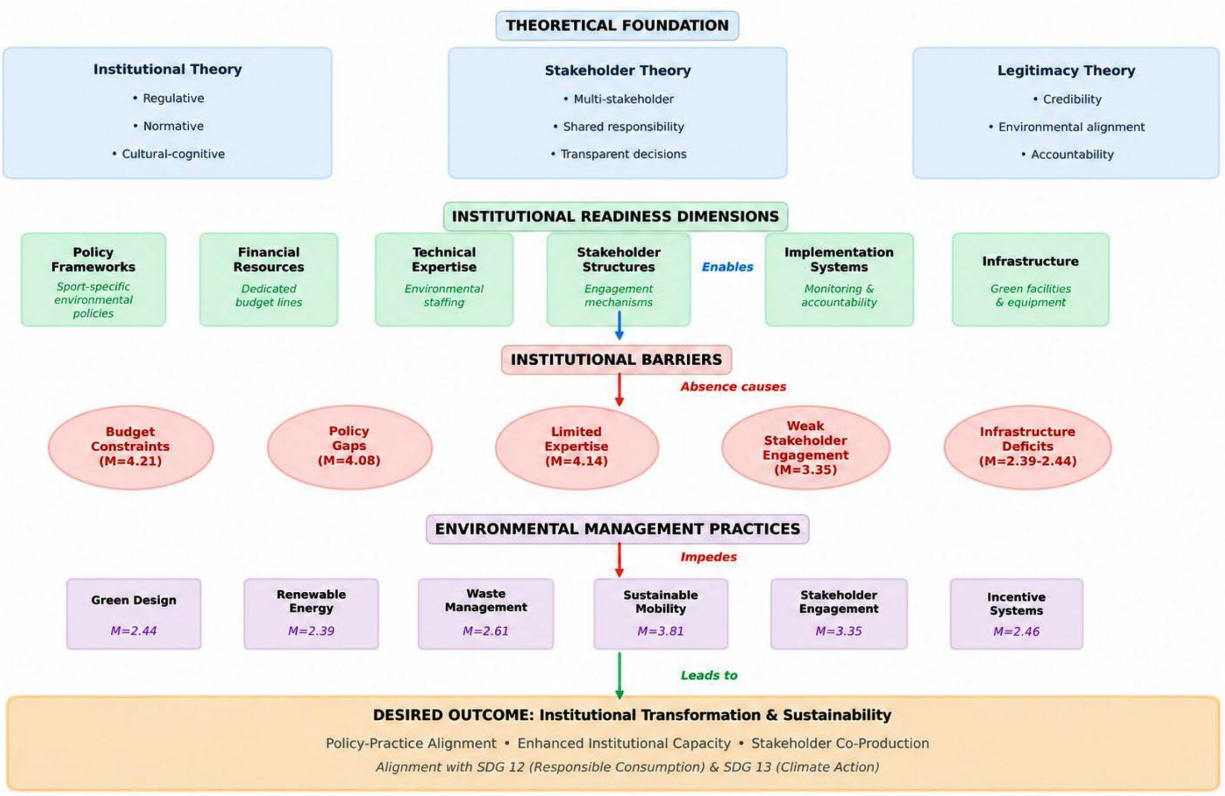

Figure 1. Conceptual framework for environmental management and institutional readiness in Zimbabwean tertiary sports.

3. Research Objectives and Questions

This study addresses the following objectives:

Objective 1: Identify dominant environmental management challenges within Zimbabwean tertiary sports settings, specifically examining waste management, energy consumption, facility maintenance, and policy gaps.

In this study, *institutional readiness* refers to the extent to which tertiary sports institutions possess the policy frameworks, financial resources, technical expertise, stakeholder structures, and implementation systems necessary to support environmental sustainability initiatives. This construct was measured quantitatively through questionnaire items assessing policy availability, institutional commitment, technical capacity, budgeting, and stakeholder participation, and qualitatively through document codes examining the presence or absence of sport-specific sustainability frameworks.

Objective 2: Evaluate the appropriateness and effectiveness of current environmental practices and policies in promoting sustainable sports management, including assessment of stakeholder engagement mechanisms.

Appropriateness of current practices refers to the degree to which existing environmental management practices align with internationally recognized sustainability standards and operational needs within tertiary sports contexts. This construct was represented by questionnaire items assessing implementation of green facility design, renewable energy systems, waste management, sustainable mobil-

ity, stakeholder engagement, and incentive systems, together with document analysis codes classifying practices as absent, limited, partially appropriate, or inappropriate.

Research Questions:

RQ1: What are the primary institutional barriers impeding environmental management adoption in tertiary sports?

RQ2: To what extent do institutional policies translate into operational environmental practices?

RQ3: How effectively are stakeholders engaged in environmental governance processes?

4. Methodology

4.1. Research Design

This study employed an explanatory sequential mixed-methods design combining quantitative survey research with qualitative document analysis. This design prioritizes quantitative findings while using document analysis to provide contextual depth and institutional-level validation. The integration of both methods enhances validity through triangulation, permitting both numerical and contextual perspectives.

4.2. Philosophical Positioning

Research was anchored in pragmatism, a paradigm emphasizing practical problem-solving through flexible, evidence-guided approaches. Pragmatism is particularly appropriate for environmental management research, which involves interrelated systems (behavioral, infrastructural, policy-based) requiring both quantitative measurement and qualitative interpretation. This paradigm facilitated integration of disparate data sources while maintaining focus on real-world policy implications.

4.3. Population and Sampling

Participant Sampling

The study initially targeted a broad stakeholder population including sports directors, ecological officers, student-athletes, sports coaches, and sustainability coordinators across Zimbabwean tertiary education institutions. However, access constraints and data availability limitations resulted in final recruitment focused on two key stakeholder groups: student-athletes and sports fans/supporters. This narrower focus is justified for two reasons: 1) student-athletes represent direct end-users of sports facilities and are critical to understanding implementation barriers from operational perspectives; and 2) sports fans/supporters represent broader institutional stakeholders whose perceptions of environmental management reflect public expectations and engagement levels. Consequently, all quantitative and qualitative analyses are reported for these two stakeholder groups only, and conclusions are therefore limited to athlete and fan perspectives rather

than the full array of administrative stakeholders.

Sampling Strategy: Multistage purposive-stratified sampling was employed (see Table 1):

Stage 1 (Institutional Selection): Purposive selection of five tertiary education institutions known for active sports departments and documented engagement with environmental management frameworks.

Stage 2 (Stakeholder Stratification): Stratified random sampling ensured proportional representation across stakeholder categories, reducing selection bias.

Stage 3 (Participant Selection): Simple random selection within each stratum (n = 141), determined using Cochran's formula for heterogeneous populations to ensure adequate statistical power (target $\alpha = 0.05$, power = 0.80).

Sports fans/supporters were identified during inter-university sporting events and institutional sports activities held between March and May 2025. Participants were approached through venue-based convenience recruitment after verification of regular engagement with institutional sports programmes (see Table 2).

Table 1. Purposive-stratified sampling.

Participant Category	Institution A	Institution B	Institution C	Institution D	Institution E	Total (n)
Student-athletes	12	11	14	10	7	54
Sports fans/supporters	18	20	22	16	11	87
Total	**30**	**31**	**36**	**26**	**18**	**141**

The inclusion criterion requiring at least one year of experience was operationalized differently across participant categories. For student-athletes, eligibility required participation in institutional sports programmes for a minimum of one academic year. For fans/supporters, eligibility required regular attendance or involvement in tertiary sports activities over the same period.

Table 2. Final sample composition.

Category	Value
Student-athletes	n = 54 (38.3%)
Sports fans/supporters	n = 87 (61.7%)
Mean age	22.4 years (SD = 3.2)
Gender: Male	58.9%
Gender: Female	41.1%

4.4. Data Collection Instruments

4.4.1. Questionnaire Survey

A validated five-point Likert-scale questionnaire was developed, anchored from 1 (strongly disagree) to 5 (strongly agree). Item construction aligned with study objectives and incorporated validated instruments from sustainability and sports management literature [18] [19].

Instrument Validation:

Instrument validation involved several key steps to ensure reliability and clarity of the measures. A pilot test with 10 participants was conducted to refine the wording and clarity of items, resulting in improved comprehension and response accuracy. Internal consistency was confirmed through Cronbach's alpha coefficients, which exceeded 0.82 across all subscales, indicating acceptable reliability as recommended by [20]. In addition, content validity was strengthened through a structured review by an expert panel comprising five specialists, who evaluated the relevance, representativeness, and alignment of items with the study's constructs.

4.4.2. Document Analysis

Documentary analysis examined institutional policy documents collected from the five participating tertiary institutions. The document corpus comprised 47 primary-source documents spanning 2020-2025, including: 1) institutional sustainability policies and strategic plans (n = 8); 2) sports department operational manuals and administrative guidelines (n = 12); 3) facility management protocols and maintenance procedures (n = 10); 4) Environmental Management Agency (EMA) compliance reports and environmental audit records (n = 9); and 5) sustainability initiative records and strategic communications (n = 8).

Using content-based thematic coding, documents were examined for: 1) explicit references to sport-specific environmental practices (such as documented waste segregation protocols, energy targets, water conservation plans specific to sports facilities); 2) implicit references to broader sustainability principles relevant to sports operations (such as green procurement standards, renewable energy commitments, stakeholder engagement frameworks referenced in general institutional documents); and 3) notable gaps in environmental guidance (absences of expectations, standards, or accountability mechanisms for environmental performance in sports).

Coding categories were assigned using decision rules:

- "Absent" = complete lack of reference or framework
- "Limited" = sparse or non-sport-specific references lacking operational detail
- "Minimal/Ad Hoc" = basic practices without systematic integration or accountability
- "Somewhat Appropriate" = partial sport-specific application lacking comprehensive scope
- "Partially Appropriate" = practices covering some domains but not others, or lacking systematic operationalization
- "Inappropriate" = practices failing to align with sustainability standards or contradicting environmental commitments.

To ensure reliability, two researchers independently coded all 47 documents using a structured coding matrix, with disagreements resolved through consensus discussion. Cohen's kappa of 0.81 reflects substantial inter-rater agreement.

4.5. Data Collection Procedures

Data collection occurred between March and May 2025. Questionnaires were self-

administered by trained research assistants to enhance completion accuracy. Institutional administrators provided access to policy documents following formal approval. All participants provided informed written consent.

4.6. Data Analysis Procedures

4.6.1. Quantitative Analysis

Quantitative data were analyzed using IBM SPSS Statistics Version 27 significance threshold of $\alpha = 0.05$. Descriptive statistics (frequencies, means, standard deviations, and percentages) were used to summarized participant characteristics and key study variables. Group differences between athletes and fans were examined using one-way ANOVA, supported by assumption testing through Levene's test for homogeneity of variance and the Shapiro-Wilk test for normality. Because Likert-scale data may violate normality assumptions, Kruskal-Wallis H-tests were run alongside ANOVA to validate the robustness of the results. Effect sizes (partial η^2) were calculated to assess the practical significance of observed differences, while Pearson correlations explored relationships among environmental management challenges and practices. Missing data were addressed through listwise deletion for cases with more than 10% missing responses, resulting in a final sample size of N = 141.

4.6.2. Qualitative Analysis

Qualitative analysis followed a structured thematic approach, beginning with deductive codes informed by the research objectives and existing literature, complemented by inductive codes that emerged directly from the document content. These codes were refined and consolidated into key themes, including waste management, energy efficiency, policy integration, and stakeholder participation. The final themes, along with their frequencies and illustrative excerpts, are presented in the results to demonstrate how sustainability issues were reflected across the analyzed documents.

4.6.3. Integration of Methods

This study employed an explanatory sequential design in which quantitative survey data were analyzed first (March-April 2025), and results directly informed the subsequent document analysis (April-May 2025). Specifically, the high consensus on policy gaps (M = 4.08) identified in the survey prompted targeted document coding examining whether institutional policies contained explicit sport-specific environmental frameworks. Integration of methods was achieved through convergence and divergence analysis. For example, quantitative findings revealed that stakeholder engagement mechanisms scored 3.35 (above the midpoint), yet document analysis found that environmental governance excluded stakeholder input and co-production, revealing divergence between stakeholder perceptions of engagement adequacy and documented governance structures. This point of divergence led to a refined interpretation: stakeholders perceived engagement as adequate primarily within event-oriented contexts (ticketing, logistics), but environmental decision-making remained institutionally closed. Qualitative evidence was then employed to complement and explain quantitative patterns, offering a deeper

contextual understanding of why institutional barriers appeared uniform across stakeholder groups. Finally, convergence between quantitative and qualitative findings (both strands identified policy gaps and under-resourcing) strengthened confidence in identified challenge domains.

4.7. Ethical Considerations

Ethical considerations were rigorously observed throughout the study, following approval from the institutional ethics review boards and adhering to the Belmont Report principles of respect, beneficence, and justice. Participants were provided with clear information about the study and gave informed consent, with full assurance that participation was voluntary and withdrawal could occur at any time. Confidentiality was maintained by restricting access to consent forms and encrypting all digital files, while anonymity was ensured through the use of alphanumeric participant codes and the removal of institutional identifiers during analysis. Data security protocols included storing all research files on secure institutional servers with controlled access. Additionally, formal permissions were obtained from relevant institutional administrators to access documentary sources and organizational records.

5. Results

5.1. Objective 1: Dominant Environmental Management Challenges

5.1.1. Quantitative Findings: Stakeholder Perceptions

One-way ANOVA results examined whether athletes and fans perceived environmental management challenges differently (Table 3). Across all challenge dimensions, non-significant ANOVA results (all $p > 0.05$) and low partial eta-squared values ($\eta^2 < 0.01$) indicated statistically equivalent perceptions between stakeholder groups, suggesting shared recognition of institutional deficits.

Table 3. One-Way ANOVA results: stakeholder perceptions of environmental management challenges in Zimbabwean Tertiary Sports (N = 141).

Environmental Challenge	Athletes n = 54 M (SD)	Fans n = 87 M (SD)	F	p	η^2	Total Mean (SD)
Lack of a standing environmental sport policy	4.09 (0.85)	4.08 (0.89)	0.91	0.343	0.006	4.08 (0.87)
Unavailability of greening expertise	4.18 (0.71)	4.12 (0.77)	0.15	0.704	0.001	4.14 (0.75)
Shortage of green equipment	4.07 (0.86)	4.05 (0.89)	0.00	0.990	0.000	4.06 (0.87)
Budget constraints	4.24 (0.83)	4.20 (0.88)	0.25	0.615	0.002	4.21 (0.86)
Absence of sports greening innovation	4.11 (0.75)	4.06 (0.79)	0.73	0.394	0.005	4.08 (0.77)
Limited commitment by tertiary sports associations	3.59 (0.92)	3.53 (0.96)	0.50	0.483	0.004	3.55 (0.95)

Note: All ANOVA results were non-significant ($p > 0.05$). Kruskal-Wallis H-tests (Mann-Whitney U pairwise comparisons) confirmed ANOVA findings (all $p > 0.05$), validating parametric assumptions. η^2 reflects negligible effect sizes.

Descriptive statistics represent a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Consistently high mean scores (M = 3.55 - 4.21) across all environmental challenges revealed broad stakeholder consensus regarding substantial institutional deficits**.** The most pressing challenges identified were: 1) budget constraints (M = 4.21), 2) absence of technical expertise (M = 4.14), and 3) lack of sport-specific environmental policy (M = 4.08). Limited commitment by sports associations registered lower but still elevated concern (M = 3.55), suggesting moderate-to-high perceived institutional inertia.

5.1.2. Qualitative Findings: Document Analysis

Comprehensive review of institutional policy documents (5 institutions, 47 documents analyzed) revealed limited environmental management integration in sports operations (Table 4). Policy references to sustainability appeared predominantly in general campus greening or infrastructure maintenance sections, rather than sport-specific guidance.

5.1.3. Integrated Interpretation

Convergence between quantitative perceptions and documentary evidence revealed systemic environmental management deficits originating at institutional policy and governance levels, not merely operational neglect. The absence of sport-specific environmental frameworks (documented) directly corresponded with stakeholders' high-consensus perception (M = 4.08) of policy gaps. This alignment strengthens confidence in the identified challenge domains.

Table 4. Document-derived environmental management challenges in Tertiary Sports Settings.

Policy Domain	Documentary Evidence	Identified Gap/Challenge	Institutional Implication
Waste Management	Minimal mention in the general campus sanitation policies	Absence of formal waste segregation, recycling, or composting protocols specific to sports events	Waste streams from sports activities are not systematically managed or monitored
Energy Use	Completely absent from the reviewed sports-related documents	No renewable energy initiatives, energy audits, or efficiency targets for sports facilities	Energy consumption patterns are unmonitored; fossil fuel dependence continues
Facility Maintenance	General maintenance procedures noted, but environmental performance not integrated.	Green design principles and sustainable construction criteria are not embedded in facility protocols.	Infrastructure development proceeds without environmental considerations
Water Use	Brief mention in general facility upkeep policies	No sport-specific guidelines for water conservation in venues, showers, or irrigation	Water consumption unquantified; conservation opportunities unaddressed
Policy Integration	Environmental management is addressed separately from sports operations	Fragmented policy architecture; limited interdepartmental alignment	Sports divisions operate with no unified sustainability policy framework
Stakeholder Participation	Addressed only in relation to athlete welfare and regulatory compliance	No environmental awareness programmes, collaboration mechanisms, or decision-making platforms	Environmental governance excludes stakeholder input and co-production

5.2. Objective 2: Appropriateness of Current Environmental Practices

5.2.1. Quantitative Findings: Implementation Assessment

One-way ANOVA examined differences between athlete and fan perceptions of environmental practice implementation (Table 5). Again, non-significant results across all practices (all $p > 0.05$) with negligible effect sizes ($\eta^2 < 0.01$) indicated convergent stakeholder assessments.

Table 5. One-Way ANOVA results: stakeholder perceptions of environmental practice implementation in Zimbabwean Tertiary Sports (N = 141).

Environmental Practice/Initiative	Athletes M (SD)	Fans M (SD)	F	p	η^2	Total Mean (SD)
Green design in facility construction	2.46 (0.86)	2.43 (0.90)	0.03	0.873	0.000	2.44 (0.88)
Energy-saving systems (solar, etc.)	2.41 (0.87)	2.38 (0.90)	0.41	0.525	0.003	2.39 (0.88)
Recycling of solid waste	2.65 (1.02)	2.59 (1.07)	1.75	0.189	0.012	2.61 (1.05)
E-communication for waste reduction	3.09 (1.00)	3.04 (1.03)	0.00	0.991	0.000	3.06 (1.02)
Promotion of sustainable mobility	3.85 (1.01)	3.79 (1.05)	1.99	0.161	0.014	3.81 (1.03)
Accessibility of waste bins during events	3.68 (1.04)	3.63 (1.09)	0.35	0.555	0.002	3.65 (1.07)
Stakeholder identification & satisfaction	3.38 (0.82)	3.33 (0.87)	1.45	0.231	0.010	3.35 (0.85)
Digital platforms for green engagement	3.01 (1.00)	2.96 (1.03)	0.81	0.370	0.006	2.98 (1.02)
Incentives for green practices	2.48 (1.01)	2.45 (1.04)	0.73	0.393	0.005	2.46 (1.03)

Note: All ANOVA results were non-significant ($p > 0.05$). Kruskal-Wallis H-tests confirmed ANOVA conclusions. Effect sizes (η^2) are negligible across all items. Descriptive statistics represent a 5-point Likert scale; higher scores indicate greater implementation.

Mean scores (M = 2.39 - 3.81) indicated modest, inconsistent environmental practice implementation. Notably:

- Lowest Implementation: Green facility design (M = 2.44) and renewable energy systems (M = 2.39) revealed minimal integration of sustainability principles into infrastructure and operations.
- Moderate Implementation: Waste management practices (M = 2.61 - 3.65) and sustainable mobility (M = 3.81) showed partial engagement, though primarily for logistical rather than environmental motivations.
- Engagement Incentives: Stakeholder engagement mechanisms scored moderately (M = 3.35, above the scale midpoint of 2.5), suggesting some institutional effort to identify stakeholders and assess satisfaction. However, incentive structures for environmental behavior change scored considerably lower (M = 2.46, below midpoint), indicating weak reward or recognition systems to motivate environmental adoption. Documentary evidence clarifies this divergence: institutions engaged stakeholders primarily for event logistics (such as ticket sales and volunteer recruitment) but excluded them from environmental governance and decision-making, explaining why perceived engagement adequacy did not translate into environmental commitment or behavioral incentives.

Pearson correlation analysis examined relationships between perceived environmental challenges and implementation of environmental practices. Significant negative correlations were observed between policy deficits and implementation effectiveness ($r = -0.48$, $p < 0.01$), as well as between budget constraints and green infrastructure adoption ($r = -0.52$, $p < 0.01$). Technical expertise availability positively correlated with stakeholder engagement mechanisms ($r = 0.41$, $p < 0.01$). These findings suggest that institutional readiness factors significantly influence environmental practice implementation within tertiary sports contexts.

5.2.2. Qualitative Findings: Policy-Practice Alignment

Document analysis evaluated the clarity, operationalization, and institutional commitment reflected in environmental practices outlined in official policies (Table 6).

Table 6. Document-derived assessment of environmental practices and policy implementation in Tertiary Sport.

Practice/Policy Area	Documentary Evidence	Implementation Status	Appropriateness Rating
Green Facility Design	No evidence of eco-certified guidelines or low-impact construction standards	Absent	Inappropriate—Sustainability not embedded in construction/renovation standards.
Energy Efficiency	No reference to solar systems, energy audits, or renewable infrastructure for sports facilities	Absent	Inappropriate—Comprehensive energy management framework lacking
Waste Management	Event guidelines mention "clean-up teams" and general sanitation; no recycling system is documented.	Minimal/Ad hoc	Partially Appropriate—Basic cleaning present; systematic recycling is unintegrated
Sustainable Mobility	Limited mention of bus transport for large events; no emission-reduction or carbon-accounting strategy	Limited	Somewhat Appropriate—Logistics-driven rather than sustainability-motivated
Stakeholder Engagement	Sports associations encourage student participation; no environmental dialogue or decision-making forums are documented.	Participation-focused	Inappropriate—Engagement event-oriented; sustainability governance excluded
Incentive Systems	No documented incentive, recognition, or reward programs for environmental performance	Absent	Inappropriate—Behavioral motivation mechanisms are absent

5.2.3. Integration: Policy-Practice Gap Analysis

Comparison of quantitative perceptions and documentary evidence revealed a pronounced gap between policy rhetoric and operational reality. While institutional policies make aspirational references to sustainability, sport divisions lack dedicated environmental management systems, resource allocations, or stakeholder engagement forums. This gap manifests as:

- First, there is a clear disconnection between broad institutional sustainability policies and the absence of sport-specific operational directives needed to guide implementation.
- Second, under-resourcing remains a persistent challenge, as most institutions lack dedicated budget lines, staffing, or technical capacity to support environmental management within sports departments.
- Third, stakeholder exclusion is widespread, with key sports actors—such as

athletes, coaches, facility managers, and student representatives—rarely incorporated into environmental governance or decision-making structures.

- Finally, a significant measurement deficit exists, reflected in the lack of monitoring mechanisms, performance indicators, and accountability frameworks to track environmental outcomes within tertiary sports settings.

6. Discussion

6.1. Synthesis of Major Findings

This investigation documented pervasive institutional barriers to environmental management in Zimbabwean tertiary sports, confirming a critical policy-practice gap. Findings align with international research indicating that tertiary sports organizations in resource-constrained contexts struggle with sustainability implementation [3] [4], yet extend this understanding through sport-specific institutional analysis.

6.1.1. Institutional Policy Deficits

The most striking finding was the absence of sport-specific environmental policies across the reviewed institutions. While tertiary organizations maintain overarching sustainability commitments, sports divisions operate without dedicated environmental management frameworks [21]. This institutional fragmentation reflects broader governance challenges documented in sub-Saharan African higher education [22]. The result is that environmental considerations remain peripheral to sports management priorities, perpetuating operational patterns that disregard ecological impacts. This policy vacuum is particularly problematic given sports' growing scale. As tertiary sports participation and event frequency expand, cumulative environmental impacts intensify without corresponding management systems. Scholars have documented similar dynamics in sports contexts across the developing world, where institutional capacity lags behind operational growth [23].

6.1.2. Resource Constraints as Systemic Barriers

Budget constraints emerged as the most pressing challenge (M = 4.21), aligned with documented realities of African higher education financing crises [24] [25]. Financial scarcity constrains the adoption of green infrastructure, technical staffing, and capacity-building. Without dedicated funding streams for sports environmental initiatives, institutions default to status quo operations. These findings underscore how financial marginalization of sustainability efforts perpetuates environmental degradation—not through deliberate malfeasance, but through systemic neglect.

Similarly, the unavailability of technical expertise (M = 4.14) reflects broader human capital deficits and environmental governance challenges in African institutions [24]-[26]. Sports administrators lack training in environmental management systems, waste protocols, or renewable energy integration. This knowledge gap, coupled with limited professional development opportunities, perpetuates institutional inertia.

6.1.3. Stakeholder Engagement Deficits

Low stakeholder engagement scores (M = 2.98 - 3.35) and minimal incentive structures (M = 2.46) documented weak collaborative governance. Institutional Theory predicts that normative pressures and stakeholder engagement drive organizational change [25]. Evidence from Zimbabwean tertiary sports demonstrates the inverse of this principle: absence of stakeholder engagement mechanisms correlates with minimal environmental adoption. Recent research on ESG implementation in sports organizations emphasizes stakeholder co-production as essential for legitimacy [27]. The documented exclusion of stakeholders from environmental governance processes in Zimbabwean tertiary sports undermines both implementation effectiveness and institutional credibility.

6.1.4. Infrastructure and Facility Design Gaps

Green facility design (M = 2.44) and renewable energy integration (M = 2.39) registered the lowest implementation scores. These infrastructure deficits reflect both financial constraints and the absence of planning frameworks. Scholarly literature increasingly recognizes sustainable facility design as foundational for institutional environmental performance [28]. Without green building standards embedded in institutional policy, new construction and renovation perpetuate inefficient, high-carbon infrastructure.

6.2. Theoretical Implications

6.2.1. Institutional Theory Application

Findings provide strong empirical support for Institutional Theory's predictions regarding organizational change [29] [30]. The weak regulatory framework for sports environmental management (minimal government mandates), limited normative pressures (few peer-institution benchmarks), and negligible internal organizational norms (absent internal champions) combine to maintain inertia. Institutional theory suggests that external regulatory pressures and increased normative expectations—through updated government policy, peer institution comparison, or accreditation criteria—could catalyze change. However, without such external pressures, institutional inertia persists. The concept of "institutional isomorphism" [6] [30] partially explains observed patterns: sports organizations adopt minimal, symbolic environmental practices (waste bins, occasional recycling) to maintain surface legitimacy while avoiding substantive operational transformation. This mimetic isomorphism reflects organizations' adoption of visible practices from peers without fundamental change.

6.2.2. Stakeholder Theory Application

Consistent with Stakeholder Theory, the absent stakeholder engagement mechanisms correlated with weak sustainability implementation [31]. [32] argues that inclusive decision-making processes involving multiple stakeholder perspectives generate more robust, legitimate organizational outcomes. Zimbabwean tertiary sports evidence reveals the inverse: exclusion of stakeholders perpetuates environmental neglect. Future applications of Stakeholder Theory in this context should

emphasize multi-level engagement: athletes (end-users of facilities), administrators (policy-makers), environmental officers (technical expertise), students (future leaders), and community representatives (environmental justice perspectives).

6.3. Comparative Analysis with International Contexts

6.3.1. Contrasts with Developed-World Practices

North American and European tertiary institutions have integrated sustainability into sports management through green facility design, renewable energy investment, waste segregation, and stakeholder engagement frameworks [33]. For example, research on sports sustainability in European contexts documents formalized environmental management systems, dedicated staffing, and third-party environmental certifications. Zimbabwe's tertiary sports significantly lag these benchmarks. However, this comparison must be contextualized within resource disparities. While Zimbabwean institutions face genuine financial and technical constraints absent in wealthy economies, comparative analysis reveals that commitment levels—not merely resources—differ markedly. Some resource-constrained contexts, such as South African universities, have implemented innovative sustainability programs despite financial limitations through creative partnerships and stakeholder mobilization [31]. This suggests that while resources matter, institutional will and governance structures are equally consequential.

6.3.2. Alignment with Global Developments (2023-2025)

Recent scholarship emphasizes systems-level integration of ESG (Environmental, Social, Governance) principles in sports organizations [27] [34]. A 2025 study on ESG implementation in sports clubs identified waste management, stakeholder engagement, and facility sustainability as priority areas [28] [35], precisely the domains where Zimbabwean tertiary sports show deficits. Contemporary practice in sport sustainability increasingly emphasizes:

- Circular Economy Integration: Minimizing waste through closed-loop systems, reuse, and resource recovery (Gerke, 2024).
- Renewable Energy Transition: Solar and wind infrastructure deployment in sports facilities [36].
- Digital Stakeholder Engagement: Utilizing technology platforms for transparency and participation [28].
- Governance Reform: Embedding sustainability into organizational strategy and leadership [35].

Zimbabwean tertiary sports remain distant from these contemporary practices, representing a 5 - 10-year gap in institutional sustainability maturity relative to global leaders.

6.4. Implications for Policy and Practice

6.4.1. Policy Framework Development

Recommendation 1: Sport-Specific Environmental Policy

Tertiary institutions and national sports councils must develop dedicated envi-

ronmental management policies for sports operations, distinct from general campus sustainability plans. These policies should include:

- Mandatory waste segregation and recycling protocols for sports events.
- Renewable energy targets for sports facilities (e.g., 30% by 2030).
- Water conservation guidelines specific to sports (landscaping, facility cleaning, athlete services).
- Green procurement standards for sports equipment and supplies.
- Stakeholder engagement mechanisms for environmental governance.

Recommendation 2: Institutional Capacity Building

- Establish dedicated environmental management positions within sports divisions (minimum: part-time environmental coordinator).
- Provide mandatory environmental training for sports administrators and facility managers.
- Develop formal partnerships with environmental consultants and engineering firms for technical support [37].

Recommendation 3: Financial Mechanisms

- Allocate dedicated budget lines for sports environmental initiatives (target: 3% - 5% of sports operational budgets).
- Establish environmental sustainability funds through sports revenue (ticketing, broadcasting) for green infrastructure projects.
- Leverage private partnerships and corporate sponsorships conditional on environmental commitments.

6.4.2. Institutional Readiness Enhancement

Readiness Assessment Framework:

Institutions should conduct comprehensive environmental readiness audits assessing:

- Policy clarity and specificity to sports operations
- Staff competence and capacity
- Infrastructure adequacy (monitoring systems, storage, sorting facilities)
- Stakeholder participation mechanisms
- Financial resource allocation
- Performance monitoring and accountability

Table 7. Phased implementation strategy.

Phase	Timeline	Key Activities
Phase 1	Months 1 - 6	• Development of sustainability and sports-specific policies • Stakeholder awareness and communication campaigns
Phase 2	Months 7 - 12	• Infrastructure setup to support environmental management • Staff training and capacity-building initiatives
Phase 3	Months 13 - 24	• Pilot programme implemented in 1–2 sports venues • Rigorous monitoring, data collection, and performance evaluation
Phase 4	Months 25+	• Scaling to all sports facilities • Continuous evaluation, adaptation, and institutionalization

Table 7 outlines a four-phase implementation strategy that progresses from policy development and stake-holder engagement to capacity building, pilot implementation, and ultimately the full institutionalization of environmental sustainability initiatives across tertiary sports facilities.

6.4.3. Stakeholder Engagement Innovation

Institutions should implement structured stakeholder engagement:

- Environmental Advisory Committees: Multi-stakeholder forums meeting quarterly to address sports environmental concerns.
- Athlete Environmental Champions: Student-athlete leadership positions focused on environmental advocacy.
- Community Environmental Partnerships: Collaboration with local environmental NGOs for technical support and community accountability.
- Digital Engagement Platforms: Online forums for stakeholder input on sustainability initiatives and progress monitoring.

6.5. Limitations

- Sample Scope: Data derived from five tertiary institutions; generalization to all Zimbabwean tertiary sports carries limitations. Broader representation would strengthen conclusions.
- Stakeholder Sample: Overrepresentation of sports fans (61.7%) relative to athletes (38.3%) may skew perceptions. Fans lack operational familiarity with facility management, potentially overestimating challenges or implementation gaps.
- Self-Report Bias: Questionnaire data reflect participant perceptions, potentially subject to response bias. Social desirability bias may lead respondents to overstate institutional environmental commitment or understate personal environmental consciousness.
- Document Analysis Constraints: Institutional documents may not reflect actual practices; conversely, undocumented, informal environmental practices may exist unrecognized. Document inaccessibility at some institutions limited the sample size.
- Cross-Sectional Design: The study captures a single time point; a longitudinal design would better document change trajectories and causal relationships.

6.6. Future Research Directions

- Longitudinal Investigation: Multi-year tracking of environmental initiatives would document implementation trajectories and identify factors predicting successful adoption versus continued stagnation.
- Sport-Specific Assessment Tool Development: Development and validation of a contextually-appropriate environmental sustainability assessment instrument for African tertiary sports organizations, integrating environmental management, social engagement, and governance indicators.
- Qualitative Stakeholder Perspectives: In-depth interview research exploring administrators' and athletes' lived experiences navigating environmental sus-

tainability barriers would provide a nuanced understanding of implementation constraints.

- Comparative Regional Analysis: Cross-country comparison within Southern Africa examining how institutional context, national policy frameworks, and resource availability shape tertiary sports environmental management capacity.
- Intervention Research: Pilot-test and rigorously evaluate specific environmental management interventions (such as waste segregation programs, stakeholder engagement frameworks) with randomized control or quasi-experimental designs to identify effective implementation strategies.
- Policy Analysis: Detailed examination of national sports and environmental policy interfaces, identifying policy barriers and opportunities for integration supporting tertiary sports sustainability.

7. Conclusion

This mixed-methods investigation documented substantial environmental management challenges and institutional readiness deficits in Zimbabwean tertiary sports. Despite tertiary institutions' commitment to sustainability, sports divisions operate without dedicated environmental management systems, adequate resources, or structured stakeholder engagement. The policy-practice gap identified represents a critical institutional failure with cumulative environmental consequences. Stakeholders unanimously identified budget constraints, policy gaps, and limited technical expertise as primary barriers. Current environmental practices remain inconsistent, under-resourced, and largely reactive, reflecting an early stage of sustainability adoption rather than mature integration. However, this research also reveals opportunities. The unified stakeholder perception of challenges suggests receptiveness to change. The identified barriers—policy, capacity, resources, engagement—are addressable through deliberate institutional action. By developing sport-specific environmental policies, enhancing institutional capacity, securing dedicated financing, and implementing structured stakeholder engagement, Zimbabwean tertiary institutions can transform sports from environmental liabilities into sustainability catalysts. This transformation aligns tertiary sports with global sustainability imperatives (SDGs 12 & 13), enhances institutional legitimacy, and positions sports as educational exemplars of ecological responsibility. More importantly, such transformation recognizes the intrinsic connection between physical activity, health, community well-being, and environmental stewardship [38]. The pathway forward requires political will, institutional commitment, and coordinated stakeholder action. This research provides the empirical foundation for evidence-based policy reform and targeted capacity-building initiatives necessary to advance sustainable tertiary sports in Zimbabwe and comparable contexts across the Global South.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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