

An Investigation of Campuses' Sustainability Practices in Nigerian Higher Education Institutions

Ibrahim Bamidele Jimoh, Amelia Clarke, Amr ElAlfy and Olaf Weber
School of Environmental, Enterprise and Development
University of Waterloo

Pre-publication version (Author Accepted Manuscript = AAM)

Published in:
International Journal of Sustainability in Higher Education
<https://doi.org/10.1108/IJSHE-06-2024-0427>

Date Accepted: 29-Jul-2025

Citation: Jimoh, I. B., Clarke, A., ElAlfy, A., Weber, O. (2025), "An investigation of campuses' sustainability practices in Nigerian higher education institutions". *International Journal of Sustainability in Higher Education*, Vol. ahead-of-print No. ahead-of-print.
<https://doi.org/10.1108/IJSHE-06-2024-0427>

Deposit License:

Emerald allows authors to deposit their AAM under the Creative Commons Attribution Non-commercial International Licence 4.0 (CC BY-NC 4.0). To do this, the deposit must clearly state that the AAM is deposited under this licence and that any reuse is allowed in accordance with the terms outlined by the licence. To reuse the AAM for commercial purposes, permission should be sought by visiting <https://www.emeraldgrouppublishing.com/publish-with-us/author-policies/author-rights#contact>.

Abstract

Purpose

This study aims to dives into the unique context of Nigerian universities, exploring their roles in terms of campus sustainability practices and the challenges they face while implementing sustainability initiatives.

Design/methodology/approach

This study investigates sustainability practices through in-depth interviews with higher education institutions (HEIs) in developing countries. Experts from eight different government-owned universities in the Southwestern region of Nigeria participated in this study through a purposive sampling technique. The study leveraged the Sustainability Tracking and Rating System framework to determine potential sustainability management indicators tailored to the Nigerian context.

Findings

The findings reveal a limited degree of engagement and implementation and show that HEIs adopt a wide range of sustainability approaches. Hence, underlying the necessity for concerted efforts to enhance sustainability initiatives in Nigerian HEIs.

Originality/Value:

To the best of the authors' knowledge, no previous studies have investigated Campuses' Sustainability Practices in Nigerian HEIs. This study contributes to the body of literature by clarifying the challenges faced by Nigerian HEIs as their comprehension of sustainability practices widens, which has gotten little attention in previous literature.

Keywords: Campus Sustainability, Sustainability Practices, Higher Education Institutions, Nigerian University, Framework, Engagement, Sustainability Initiatives, Indicators.

1.0 Introduction

Sustainability is an essential area of focus for Higher Education Institutions (HEIs) as the need to address environmental, social, and economic issues becomes increasingly important. (McCowan et al., 2021; Schmitz et al., 2010). Nigeria, a rapidly urbanized nation with a growing population, has sustainability issues that call for engagement from sectors, including its HEIs (Oyeleye, 2020).

HEIs have the insight, know-how, and authority to steer the transition and make the adjustments necessary to address sustainability (Arsenault, 2021). Currently, HEIs are encouraged to assess their practices to boost campus sustainability action and convey this intention to their students, workers, and the public (Faghihi et al., 2015; Ralph & Stubbs, 2014; Žalėnienė & Pereira, 2021).

HEIs have been among the first to sign sustainability declarations. The Talloires Declaration of 1990 was the first statement of university leaders' commitment to sustainability. The leaders of HEIs voiced their profound worries about how environmental degradation, pollution, and resource depletion threaten the environment (Adams et al., 2018; ULSF, 2015). Four hundred ninety-nine chancellors and presidents of universities from 54 countries signed the Declaration in 2016 (ULSF, 2015). The 17 Sustainable Development Goals (SDGs) have also created a significant expansion of the obligations of HEIs, thus positioning HEIs as key players in the sustainability journey (Filho, 2011; Podgórska & Zdonek, 2024; UNESCO, 2022; United Nation, 2015). The SDG4-Quality Education, SDG17-Partnership, and SDG11-Sustainable Cities and Communities have highlighted the vital role HEIs play in exploring and advancing sustainability on a global scale through operations, research, teaching, and knowledge transfer (Dawodu et al., 2022). Therefore, the mission and activities of HEIs should embrace sustainability (Ramísio et al., 2019). In addition to promoting environmental stewardship, incorporating sustainability principles into HEIs' activities also helps students, faculty, and staff develop a culture of social responsibility and economic resilience (Lambrechts et al., 2013).

However, sustainability in HEIs has taken various forms in different countries. In the global north, it emerged as a student-driven movement in the late 1980s and 1990s, whereas in the global south, where issues of campus financing, infrastructure, curriculum development, and professional development at universities differ, campus sustainability has been approached more recently as a scholarly and professional field (Beringer et al., 2008; Yazdani & Dola, 2013). In both contexts, the idea is to align campus practices with the institutions' activities, thereby supporting the

education of students and the wider community (Harris, 2014). However, the concept and movement of campus sustainability need to be understood in a global context. With universities being interconnected and interacting, there is a need to understand the similarities and differences in campus sustainability in different regions to identify and share best practices (Dawodu et al., 2022). This paper takes a step in assessing campus sustainability in the Nigerian higher education context.

Nigerian HEIs are impacted by a distinct sociocultural, economic, and political environment because of unique organizational dynamics, possibilities, and challenges (Emenike Iroegbu & Maxwell, 2017). Research on Nigeria's HEIs helps identify these institutions' problems, thereby facilitating local initiatives to improve the current situation. Despite a global upsurge in sustainability initiatives, little is known about how much Nigerian HEIs have adopted and applied sustainable methods (Adenle et al., 2021).

Gaining insight into Nigerian institutions' operations will broaden the body of literature about campus sustainability worldwide. According to Abenu et al. (2024), education for sustainable development is still relatively new in Nigeria and other HEIs in sub-Saharan Africa. This suggests that sustainability must be considered if HEIs want to be relevant in the twenty-first century and provide the kind of education adopted in other areas of the world, especially developed countries (Samuel, 2016).

Nigeria has a wealth of natural resources and a diverse population. Still, the nation also faces severe resource depletion, social inequality, and environmental deterioration (Gutti et al., 2012), highlighting the urgent need for sustainable development. Many have claimed that sufficient and purposeful education is necessary to tackle the complicated nature of sustainable development (Adenle et al., 2021). Thus making most countries position their HEIs as a major player in setting the course for a sustainable future through the development of young people, the values, knowledge, and skills necessary to help society as a whole move towards sustainable lifestyles (Babalola, 2016).

However, there is a lack of empirical studies and research findings on sustainability practices in Nigerian HEIs. The absence of adequate empirical research impedes attempts to evaluate the status of sustainability practices on campuses, pinpoint obstacles to sustainability integration, and create evidence-based plans for sustainability promotion in the Nigerian University. Also, HEIs have

been identified as essential promoters of sustainability (Karatzoglou, 2013), but the level of awareness and readiness of HEIs in such countries have not been explored adequately. Tertiary institutions bear the social duty of advising the host community (Pedro et al., 2024), teaching students, and encouraging staff and the general public on sustainable development because their actions influence economic, social, and environmental components of the immediate and extended communities (Leal Filho et al., 2019).

This research contributes to the literature by providing insight into Nigerian HEIs' emerging knowledge of sustainability practices. The study identifies challenges to sustainability in Nigerian HEIs, including a lack of awareness of sustainability concepts among stakeholders, financial constraints, and attitude limitations. Analyzing sustainability challenges will contribute to understanding the factors affecting sustainability practices in HEIs (Alhazmi et al., 2023; Babalola, 2016).

The "Sustainability Tracking Assessment Rating System (STARS) framework" is a tool to analyze universities' sustainability performance. STARS was chosen due to the absence of an existing framework for monitoring sustainability performance in Nigeria HEIs and for its applicability in assessing HEIs and publicly reporting on sustainability programmes. The study adopts a qualitative approach using semi-structured interviews to address the research questions. A purposive sampling of experts with relevant experience and portfolios from government-owned universities in the southwest region of Nigeria was employed.

The findings demonstrate the presence of gaps in current sustainability practices in Nigerian HEIs due to a lack of an established framework for assessing sustainability performance and the absence of distinct departments or dedicated offices for sustainability research and teaching. Theoretically, the study clarifies how sustainability concepts are incorporated into academic curricula and the significance of interdisciplinary and transdisciplinary initiatives in the sustainable education field. The research underlines the importance of local community members from various stakeholder groups in improving sustainability in Nigerian HEIs. It showcases the value of collaborations with other institutions and demonstrates the vital importance of partnerships with stakeholders in providing more comprehensive and sustainable solutions to sustainability challenges (Biggs et al., 2021; Petrosillo et al., 2015).

2.0 Sustainability in Higher Education Institutions

Sustainable HEIs aim to develop a culture of sustainability and contribute to a more sustainable and resilient society by integrating sustainability principles into their teaching, research, operations, and community engagement. (Gómezgutiérrez & Sepúlveda, 2017; Serafini et al., 2022). According to Velazquez et al. (2005), the process of transforming an HEI into a sustainable institution begins when an individual or a collection of individuals imagines that the members and stakeholders behave in accordance with sustainable development as defined by the Brundtland Commission in 1987.

How sustainability is integrated into HEIs has transformed over the past few decades. It depends on social demands, increased knowledge of global ecological issues, and universities' role as catalysts for social change (Wright & Nyberg, 2017). HEIs' early sustainability initiatives typically addressed environmental management (e.g., energy conservation). Decontextualised sustainability was HEIs' primary responsibility (Leal Filho et al., 2019). Recently, there has been an increasing awareness of sustainability, encompassing three equally important dimensions: environmental, social, and economic. Many HEIs respond to this by pursuing campus-level approaches to sustainability that integrate the three dimensions more comprehensively into campus operations, academic programs, and institutional culture (Lambrechts et al., 2013). The motivations for an HEI to embark on sustainability initiatives include institutional goals, student desires, faculty engagement, regulatory obligations, and community demands (Lozano et al., 2015).

The United Nations and its partners launched the Higher Education Sustainability Initiative (HESI) to respond to and evaluate the 2030 Agenda for Sustainable Development internationally. HESI bridges the gap between higher education, science, and policymaking by increasing the sector's visibility in promoting sustainable development, organizing multi-stakeholder conversations and initiatives, and exchanging best practices (UN, 2022). For instance, the HESI special event initiative 2021 concentrated on education for sustainable jobs, improving education, career advising, and job placement procedures to encourage sustainable careers and improve processes for communication between employers and educators (Lozano et al., 2015; UN, 2022).

Despite the growing efforts by HEIs to integrate sustainability into their systems during the past 20 years (Figueiró & Raufflet, 2015; Hoque et al., 2017; Lozano et al., 2015; Ramos et al., 2015), there are still obstacles to be resolved through the use of national and international policy

architectures that leverage the platforms provided by HEIs to achieve sustainability (Horhota et al., 2014; Yang et al., 2020). Sustainable institutions do not avoid responsibility in pursuing a better future; instead, they take part in producing and disseminating scientific knowledge and exhibit leadership that promotes fundamental change (Too & Bajracharya, 2015). It is essential to recognise that the sustainability concept encompasses more than just using sustainability literature in academic writing.

2.1 Sustainability and Higher Education Institutions in Nigeria

Nigerian HEIs increasingly acknowledge the significance of sustainability and mainstream it with HEI policies and practices (Babalola & Olawuyi, 2021). For example, the University of Ibadan created the Centre for Sustainable Development (CESDEV), concentrating on interdisciplinary sustainability research, training, and community engagement activities (University of Ibadan, n.d.).

The Centre for Sustainable Development (CSD) at the University of Lagos has incorporated sustainability dimensions in its teaching engagements by offering courses on environmental management, climate change, and sustainable development. In addition, some Nigerian institutions are implementing sustainable development programs, including energy conservation, waste treatment, and green buildings (Onwuliri, 2022). However, there are challenges to integrating sustainability into Nigerian HEIs, such as limited funds, inadequate infrastructure, and the absence of a green faculty base. Nevertheless, there is an increased awareness in Nigerian HEIs about education in sustainability. HEIs try to develop case studies and sustainability projects incorporated into the curriculum, and sustainable campus practices have been implemented (Abenu et al., 2024).

This study used the STARS framework not only because there is no specific framework to measure sustainability performance in Nigerian HEIs but also for its widespread usage in HEI assessments. STARS was developed by the Association for the Advancement of Sustainability in Higher Education (AASHE). It is a thorough self-reporting methodology that includes entryways for recognition for institutions making their initial steps toward sustainability and long-term sustainability goals for institutions that excel (AASHE, 2022). STARS aims to involve and honor all levels of HEIs (Lidstone et al., 2015). STARS has gained recognition as a reliable data source that offers a comprehensive picture of campus sustainability (Urbanski & Filho, 2014). With the

release of the enhanced STARS Version 2.0 in 2013, the standard was made available to all HEIs globally (Urbanski & Filho, 2014).

STARS is one of the most globally accepted frameworks, with over 900 participants from 40 countries (AASHE, 2023). Due to the use of STARS as a sustainability assessment within higher education, it is one of two main HEI sustainability assessments used to develop a sector-specific indicator set (Horan & O'Regan, 2021). By participating in STARS, Nigerian institutions benefit from global benchmarks and can compare their efforts with other universities worldwide. Global benchmarking shares knowledge and best practices and motivates continuous improvement in sustainability performance. Nigerian HEIs could use STARS to build their sustainability efforts and meet the national and global sustainability milestones.

The literature on sustainability practices of Nigerian HEIs is scarce, particularly when it comes to the application of frameworks such as STARS. Nonetheless, a wealth of research exists on sustainability evaluation and disclosure in HEIs worldwide. Still, more needs to be done to examine sustainability performance and its associated difficulties in HEIs in Nigeria. Therefore, the paper aims to investigate the role of Nigerian HEIs in advancing sustainable practices and the challenges these institutions encounter. Hence, our research questions are:

1. Can the STARS be used to assess the sustainability practices of Nigerian universities?
2. What are the barriers to sustainability practices in Nigeria HEIs?

3.0 Methodology

The study used a qualitative approach, conducting semi-structured interviews to address the research questions. We selected experts from public HEIs in the southwest region of Nigeria. The region was chosen because it has the oldest and highest number of HEIs, and the lead author has extensive work experience in some HEIs. Interviewees were selected based on their expertise, involvement in campus sustainability initiatives, and administrative or management team representation to gather diverse perspectives. The semi-structured interview guide consisted of open-ended questions and prompts designed to explore participants' perspectives on sustainability practices within their Nigerian HEIs, explicitly focusing on STARS indicators such as current

sustainability initiatives, best practices, institutional policies, challenges, barriers, and opportunities for improvement (see Annex 1).

The southwest region of Nigeria has 18 government-owned universities (Mogaji, 2019), all of which were contacted for interviews by phone or email. However, only eight universities responded and participated (see *Table 1*). Some universities excused their attendance because of their schedules, adherence to university regulations, or lack of experience in the sustainability field.

The methodology uses a constructivist-interpretive paradigm (Schwandt, 1998). The goal was to uncover the subjective views of the interviewees on the usefulness, the drivers, and the barriers of the STARS system in Nigerian HEIs. The approach assumes that the study participants' knowledge and opinions are based on their interaction with the STAR system.

Table 1: Sample (see end of this document for the table)

We selected one representative for each of the eight universities knowledgeable about campus sustainability (Appendix 1). The interviews were conducted and recorded in person or virtually. The interviewees were experienced university members, serving as either members of the management teams or as faculty, staff, or administrators with expertise in sustainability-related matters and activities. No interviewee had served at their respective universities for less than 10 years. The interviewer assured the participants of confidentiality and anonymity, emphasizing that all collected data would only be used for research purposes. The interview transcriptions were imported into NVivo software, categorized into nodes for different themes, coded by assigning nodes to text excerpts, and then analyzed to identify patterns, relationships, and themes (Naeem et al., 2023). Thematic analysis (Braun & Clarke, 2012) was employed to identify recurring themes and insights regarding sustainability practices and the barriers affecting their implementation in the Nigerian context. The sampled universities were labeled with the letter "U" during the analysis, for example, U1, U2, U3, and so on. Following the summary of the interviewees' details (refer to Table 2), the results were presented in two sections, 'Incorporating Sustainability Practices Using STARS Indicators' and 'Barriers to Sustainability Practices in HEIs', each addressing specific research questions. Utilizing NVivo for data analysis provided a framework for conducting comprehensive, replicable, and effective qualitative and mixed-methods research (Allsop et al., 2022; Chan & Ananthram, 2020).

4.0 Results

The themes that emerged after the thematic analysis include general sustainability practices, frameworks, management and governance, engagement, curriculum, innovation, and research. Figure 1 shows the outcomes relating to research question one; Figure 2 in section two shows the outcomes of research question 2.

Figure 1: Project Map for RQ1 (see end of this document for the figure)

Incorporating Sustainability Practices Using STARS Indicators

All eight universities engage in at least one sustainability practice. However, some are intentional, while some are unintentional. U3 said "As I said, they are not termed sustainability, but in a way, they relate to sustainability" while U1 noted that "some activities are there unintentional for the university". Two of the universities have adopted the SDGs. U5 has a unit set up for that purpose. The findings also revealed that some universities understand the concept of sustainability well. For example, U1, U6, U7, and U8 connect with the global view and vision of sustainable development. This was confirmed by U1, mentioning that "the university has a vision which the present Vice Chancellor had also taken firm on, is that the university is a future-ready university".

All HEIs included sustainability ideas in their academic curriculum and programs. U3 affirmed this when they stated, "we do have elements of sustainability and sustainable practices in some of the courses that we teach". Equally, U6, U7, and U8 reiterated that they have mandated that students learn about relevant sustainability topics in their courses." However, none of the universities have specific courses or fields on sustainability. U1 said, "a curriculum that is sustainable in focus not aligning or being biased to a particular course, does not presently exist". Only U5 assured that improvement has been made at the postgraduate level to introduce courses by their next academics session, claiming that "we have developed some postgraduate courses on sustainability. So, these courses will soon be approved by the university's center and will be starting". Furthermore, U4 stated, "we do not have a department that is dedicated to that". They all agreed that the management of their institutions encourages their staff to conduct research and innovation that is sustainability-focused (see Table 2).

Table 2: Summary of Themes on the Level of Sustainability Practice
(see end of this document for the table)

Some institutions engaged with external institutions organizations. U1 engaged with waste management bodies for recycling, stating that there are "bodies which have also come to campus to do what's known as recycling bazaar". U7 understands the need for universities to collaborate with external organizations, mentioning, "I will tell you authoritatively that for this type of program to be sustained, there must be effective and strategic collaborations with other institutions.

Student engagement is another theme generated during the analysis. Six HEIs engage students in sustainability activities, "there is a collaboration between the staff and students so that they can train our students on those areas of sustainability," U8 stated. "With some students who aligned to committing their time, their effort into practicing the different aspects of sustainability on campus" said U1. Town and gown relationship is another name used by four universities (i.e. U2, 3, 6 and 8) to represent public engagement that engages in the activity, usually in forumsthat discuss issues connecting the university and community. According to U8, "At present, we have an institution and community forum where the issue of student welfare and disposal system or manager management system is being discussed and how we control erosion from the school to the town."

Six HEIs have institutional management structures that support sustainability initiatives, but the other two do not have such institutional structures in place. In response to the research on institutional management structure, U1 stated that "the university has now developed a culture of environmental sustainability, where a unit is now championing the cultural behavior, the material evaluation and infusing communal participation in environmental sustainability and sustainability as a whole."

The HEIs do not have frameworks to track the sustainability practices on campus. U7 and U1 responded: "Presently there is no framework for measuring or tracking the activity of sustainability, but we are trying to improve on that", and "The university had not established a definite framework for assessing its compliance with sustainability indicators." However, some HEIs employ some informal methods of tracking sustainability performance. For example, U3 stated "talk of things that are informal, like maybe you see some management people go around, and then if they realize the campus is dirty or whatever, they call on the unit that is supposed to

work on them." Under this STARS system, it will be possible for universities to set up and enhance their sustainability tracking and assessment to ensure a standard in progress and accountability of the institutions' efforts geared toward sustainability.

Barriers to Sustainability Practices in HEIs

This section delves into the exploration of the barriers to the implementation of sustainability practices in Nigerian HEIs. Barriers influence the adoption and integration of sustainability practices in HEIs. They can differ, ranging from lack of awareness to financial constraints, government and institutional policies, and other challenges (see Figure 2).

Figure 2: Project Map for RQ2 (see end of this document for the figure)

The themes emerging from the interviews on sustainability barriers include lack of awareness, financial constraints, government and institutional policies, other challenges, and undiscovered opportunities. The level of understanding of what sustainability represents is low in most of the HEIs. U5, one of the two universities with a sustainability unit, said: "A lot of people, even in academia, do not understand what it is all about, and in the whole of the country now, I am sure the majority of the universities are not doing anything on sustainability." However, U4 confirmed that the university is trying to create awareness through training and workshops (see Table 3).

Table 3: Summary of Themes on Sustainability Barriers (see end of this document for the table)

To respond to the question on financial constraints, all HEIs agreed that the level of financial support by the government is poor. According to U1 "Nigerian institutions are less funded". U2 added, "the federal government finds it difficult to fund Nigerian universities effectively," and U3 commented, "I believe that funding is a constraint to the implementation of our sustainable practices." HEIs have to look elsewhere for funding. U5 said: "We have been looking for funding outside now. We have not succeeded in doing that, but we are already dcontacting our partners and

agencies," and U2 said, "What universities do was to eventually look inward to be able to generate funds to be able to maintain any of these to sustain many of these innovations."

Despite little or no funds, the government has put in place policies and strategies to promote sustainability initiatives. This was confirmed by U5, saying: "Nigeria has bought in this because at the Presidency we have an SDG office, we have a special adviser, and they have been doing lots in terms of training of physical structures in our universities." U6 explained, "I would say government policies support the promotion of sustainability and sustainable management, and we've gotten directives from the federal and state governments on how we should proceed." Equally, HEIs' leadership supports sustainability initiatives through policies and strategies. U4 mentioned, "We have a very supportive governing Council, so the administration can go ahead with all their lofty policies of sustainable goals, and we are doing that beautifully well."

Apart from awareness and funding, attitude is another challenge for sustainability initiatives in some HEIs. According to U7, there is an "attitude problem, but I think we are now overcoming it. When you introduce change about people's attitude, something that we have already become perpetual, it takes time for them to have that attitude change." U6 said, "People are used to their old habits, and change is something that must come, that will always come, and then because of that, there is a need for us to engage in change management activities." In response to questions on undiscovered opportunities for furthering sustainability efforts on campus, some HEIs mentioned job creation, food security, sustainable health, and scholarship opportunities.

Despite the lack of awareness, some HEIs try to enhance awareness through stakeholder workshops and training. Other challenges range from financial constraints to attitudinal challenges, with hardly any supportive government policies and institutional strategies. While some HEIs are trying to check all the boxes, overall, implementing sustainability practices remains quite spotty and underdeveloped.

5.0 Discussion

The primary objective of this study was to investigate how Nigerian HEIs may integrate sustainable practices by applying STARS. In addition, we analyzed the barriers to sustainability practices.

The result suggests a diverse scenario of sustainability practices among the Nigerian HEIs. Their sustainability engagement is characterized by practices that are both intentional and unintentional. One HEI is building its course materials on the UN Sustainable Development Goals (SDGs), demonstrating its consciousness of sustainable development. Some truly help achieve sustainability goals, while others are not overtly declaring their sustainability approaches. This degree of heterogeneity highlights the need for more focused, uniform measurements that apply to all departments and may help to coordinate efforts with sustainability objectives (Tumbas et al., 2015; U. N., 2017).

One critical aspect is that university representatives must properly grasp sustainability principles (Hoque et al., 2017). However, most universities uphold these concepts, although some substantiate them according to their vision or dream of sustainability. This aspect is crucial because otherwise, there is no way to ensure that local activities substantially contribute to global sustainable development (Leal Filho et al., 2019).

Interviews supported the findings about the incorporation of sustainability education into academic curricula. Though all HEIs incorporate sustainability ideas into some of their programs and curricula, none has an explicitly established unit to provide sustainability as a major course. This gap indicates opportunities for institutions to improve their sustainability course content by offering specialized courses or modules that aim to understand sustainability issues comprehensively. The approach corroborates the view of others that teaching sustainability as an independent subject or course would be more beneficial (Gamage et al., 2022). However, for effective and efficient learning, there is a need to combine the principles of interdisciplinary, trans-disciplinary, and self-regulated learning (Scarff Seatter & Ceulemans, 2017).

Most implementation models were adopted by the HEIs, which helped with the research and development of sustainability-focused initiatives. Our findings underline that research is essential for achieving this goal by advancing the technological capacity and knowledge to address sustainability challenges. However, some HEIs do not have distinct departments or offices devoted to sustainability research, which suggests that this area needs to be improved, for instance, by creating centers or units for sustainability research as focal points for sustainability research initiatives. A dedicated unit should spearhead sustainability initiatives and deliver the desired outcomes (Filho et al., 2019).

The themes of community collaboration and partnership with outward-facing organizations are topical in ensuring sustainability in Nigerian HEIs. Some HEIs, connected with other organizations on sustainability efforts, might benefit more if they developed a stronger partnership to equip themselves with the resources and experience. Partnerships can provide the range and adaptability needed to address difficulties more successfully. Cross-sector partners can produce more comprehensive and long-lasting solutions to current environmental concerns by cooperating and utilizing their respective expertise while pooling resources (Al-Bahi et al., 2021; Clarke & MacDonald, 2019; Nagy, 2017; N. Samuel & Clarke, 2022). Besides, student engagement also significantly helps build a sustainability culture with both on-campus and off-campus developments (Brugmann et al., 2019; Cairo, 2011).

A key discovery of this study is that no existing apparatus for monitoring sustainability practices exists. While some universities apply their unofficial measurements to check sustainability performance, these measurements are not formalized, resulting in limited capacities to evaluate progress and identify weaknesses. However, standardized sustainability assessments require putting together relevant schemes likely based on existing models such as STARS (Urbanski & Filho, 2014). However, in many HEIs, it is customary to evaluate their sustainability performance as it accelerates the process of making their practices more sustainable (Leal Filho et al., 2023; Lozano et al., 2015).

Discussing the barriers to sustainability practice in Nigerian HEIs, one significant barrier identified by this study is the reduced degree of sustainability knowledge among stakeholders. Despite efforts to raise awareness through workshops and training, many individuals, including academia, lack a clear understanding of what sustainability requires. Faculty members must play a key role in enhancing the awareness and understanding of sustainability in higher education (Alkhayyal et al., 2019). The absence of understanding hinders the execution of sustainability practices within institutions (Lopes et al., 2018).

Financial constraints arise as a considerable barrier to sustainability practice in Nigerian HEIs. The inadequate funding by the federal government poses difficulties in preserving sustainability efforts (Suryanarayanan, 2021), together with applying for needed facilities and programs. Subsequently, HEIs are forced to look for different financing resources, frequently through collaborations, to maintain their sustainability initiatives (Oteyi et al., 2023). Although federal government policy

supports sustainability initiatives, the degree of monetary assistance might not suffice to execute these efforts. Nonetheless, institutional management is essential in driving sustainability by encouraging policies combined with techniques. Despite the funding difficulties, HEIs can achieve sustainability goals through establishing governing councils, and management teams.

Attitudinal barriers present obstacles in applying sustainability efforts. Resistance to and entrenched routines might interrupt sustainability activities. Conquering these perspectives would require joint administration initiatives and continuous awareness-building (Ayarkwa et al., 2022). While some universities recognize the demand to resolve attitudinal barriers, they continue to be recurring obstacles that call for continuing initiatives. However, attitudes are an "insufficient condition for the achievement of sustainability goals" (Leiserowitz et al., 2008, p. 43). Regardless of the barriers encountered, there are opportunities for advancing sustainability initiatives within Nigerian HEIs. These changes include job creation, improving food security, promoting sustainable health practices, and leveraging scholarship chances. Discovering and profiting from these possibilities can add to dominating existing barriers and progressing sustainability agendas within institutions.

This study contributed several insights to the scholarly discussion on sustainability practices at Nigerian HEIs, including sustainability practices used by Nigerian HEIs and the corresponding prevalence of intentional and unintentional engagement. The diversity observed sheds insight into the complex nature of Nigerian HEIs' emerging understanding of sustainability practices, which has received little attention in the previous literature. Additionally, stakeholders' lack of awareness of sustainability principles, financial constraints, and attitude limitations are barriers to sustainability in Nigerian HEIs. Therefore, this study helps raise awareness of the factors influencing sustainability practices in HEIs.

Additionally, the study indicates the existence of gaps in the current sustainability practices in Nigerian HEIs. The lack of specific departments committed to sustainability initiatives, teaching and research, and a standardized framework for assessing and monitoring sustainability initiatives and performance are identified gaps. Highlighting these gaps shows that the study lays the path for future research to help establish and address these gaps and identify strategies for improving sustainability practices in Nigerian HEIs. The study further emphasizes the necessity of partnership between different actors in the host communities in enhancing sustainability in Nigerian HEIs,

demonstrating the value of collaboration with other sectors in more holistic and sustainable solutions to sustainability issues.

6.0 Conclusion, Limitations, and Future Research Outlook

The findings of this study show that HEIs widely use sustainability practices at different levels of engagement and implementation. Some institutions lack formalized approaches and resources allocated purposely for sustainability initiatives. However, others demonstrated a strong commitment to sustainability initiatives and projects through deliberate practices associated with the SDGs.

The results also underline the importance of a broader comprehension of sustainability awareness and commitment between university delegates. The implementation gap of sustainability concepts among different universities provides evidence for a uniform framework and synchronized actions toward sustainability goals, although most institutions are aware of preliminary sustainability principles. It also has the scope to enable sustainability education in the field of academic curricula by providing courses or modules focused on sustainability issues.

The study also highlights the critical role of research and development in ensuring that sustainability programs in HEIs are sustained and advanced. This might promote creativity in sustainability research, for example, through the foundation of a specialized sustainability research center or institute. Maintaining relationships and partnerships with other HEIs is essential in supporting those sustainability efforts as it provides access to the resources and knowledge needed to tackle complex environmental issues. However, a challenge is the low awareness of sustainability principles, financial limitations, and attitudes. HEIs can capitalize on opportunities to promote their sustainability agenda, enhance society, and support global sustainability objectives by overcoming these identified challenges through effective change management practices, raising awareness, securing funding, and change resistance management.

The coverage of this study is limited to a particular region in Nigeria, so the findings may not truly represent the entire landscape of sustainability practice across HEIs in Nigeria. This provides direction for studies in other areas of the country using a larger or more representative sample to ensure broader insight. Also, these findings might only apply to the Nigerian context and may be

difficult to extrapolate to other countries or regions with distinct institutional and socioeconomic settings. As such, care should be taken when extrapolating these results to different contexts. Considering other stakeholders' points of view may help to comprehend the potential, difficulties, and priorities surrounding sustainability in higher education. Including stakeholders in the research process may also increase support and buy-in for sustainability actions (Chakraborty et al., 2019). Finally, analyzing the role of government regulations and policies that fit sustainability methods within Nigerian HEIs might offer a valuable understanding of the more comprehensive institutional and systemic elements affecting sustainability application.

References

- AASHE. (2023). *AASHE STARS*. IUPUI Sustainability. <https://sustainability.iupui.edu/about/aashe-stars/index.html>
- Abenu, A., Yusufu, F., & Ugochukwu, P. (2024). Sustainability Practices in Nigeria Higher Education Institutions: The Case Study of a Public Tertiary Institution in North Western Region of Nigeria. *Journal of Sustainability and Environmental Management (JOSEM)*, 3(1), 19–27.
- Adams, R., Martin, S., & Boom, K. (2018). University culture and sustainability: Designing and implementing an enabling framework. *Journal of Cleaner Production*, 171, 434–445. <https://doi.org/10.1016/j.jclepro.2017.10.032>
- Adenle, Y. A., Chan, E. H. W., Sun, Y., & Chau, C. K. (2021). Assessing the relative importance of sustainability indicators for smart campuses: A case of higher education institutions in Nigeria. *Environmental and Sustainability Indicators*, 9, 100092. <https://doi.org/10.1016/j.indic.2020.100092>
- Al-Bahi, A. M., Abd-Elwahed, M. S., & Soliman, A. Y. (2021). Implementation of Sustainability Indicators in Engineering Education Using a Combined Balanced Scorecard and Quality Function Deployment Approaches. *Sustainability*, 13(13), Article 13. <https://doi.org/10.3390/su13137083>
- Alhazmi, A., Zain, A., Alsakkaf, N., & Othman, Y. (2023). Identification of Sustainability Barriers in Higher Education Institutions (HEIs) and the Role of Technology in Improving Sustainability in HEIs. *Journal of Science and Technology*, 28, 30–37. <https://doi.org/10.20428/jst.v28i1.2126>
- Alkhayyal, B., Labib, W., Alsulaiman, T., & Abdelhadi, A. (2019). Analyzing Sustainability Awareness among Higher Education Faculty Members: A Case Study in Saudi Arabia. *Sustainability*, 11, 6837. <https://doi.org/10.3390/su11236837>
- Arsenault, N. S. (2021). *The Role of Universities Towards a Sustainable Future: Integrating the Sustainable Development Goals* [York University]. https://euc.yorku.ca/wp-content/uploads/2022/04/Arsenault_N_MES-FINAL-December-2021.pdf
- Ayarkwa, J., Opoku, D.-G., Antwi-Afari, P., & Li, R. Y. M. (2022). Sustainable building processes' challenges and strategies: The relative important index approach. *Cleaner Engineering and Technology*, 7, 100455. <https://doi.org/10.1016/j.clet.2022.100455>
- Babalola, A., & Olawuyi, D. S. (2021). Advancing Environmental Education for Sustainable Development in Higher Education in Nigeria: Current Challenges and Future Directions. *Sustainability*, 13(19), Article 19. <https://doi.org/10.3390/su131910808>
- Babalola, S. (2016). Achieving Sustainable Development in Nigerian Higher Education Institutions (HEIS) Now and Beyond the 21st Century. In *Education in Nigeria: Looking Beyond The 21st Century – a book of readings*. (pp. 457–478). Department of Teacher Education, University of Ibadan, Ibadan.
- Beringer, A., Wright, T., & Malone, L. (2008). Sustainability in higher education in Atlantic Canada. *International Journal of Sustainability in Higher Education*, 9(1), 48–67. <https://doi.org/10.1108/14676370810842184>
- Biggs, R., Clements, H., De Vos, A., Folke, C., Manyani, A., Maciejewski, K., Martín-López, B., Preiser, R., Selomane, O., & Schlüter, M. (2021). *What are social-ecological systems and social-ecological systems research?* (pp. 3–26). <https://doi.org/10.4324/9781003021339-1>
- Brugmann, R., Côté, N., Postma, N., Shaw, E., Pal, D., & Robinson, J. (2019). Expanding Student Engagement in Sustainability: Using SDG- and CEL-Focused Inventories to Transform Curriculum at the University of Toronto. *Sustainability*, 11(2), 530. <https://doi.org/10.3390/su11020530>
- Cairo, A. (2011). Student Engagement in Campus Sustainability. *Facilities Manager*.
- Chakraborty, A., Singh, M., & Roy, M. (2019). Engaging stakeholders in the process of sustainability integration in higher education institutions: A systematic review. *International Journal of Sustainable Development*, 22, 186. <https://doi.org/10.1504/IJSD.2019.10027063>

- Clarke, A., & MacDonald, A. (2019). Outcomes to Partners in Multi-Stakeholder Cross-Sector Partnerships: A Resource-Based View. *Business & Society*, 58(2), 298–332. <https://doi.org/10.1177/0007650316660534>
- Dawodu, A., Dai, H., Zou, T., Zhou, H., Lian, W., Oladejo, J., & Osebor, F. (2022). Campus sustainability research: Indicators and dimensions to consider for the design and assessment of a sustainable campus. *Heliyon*, 8(12), e11864. <https://doi.org/10.1016/j.heliyon.2022.e11864>
- Doris, D. S. (2023). *Topic: Universities in Nigeria*. Statista. <https://www.statista.com/topics/8520/university-in-nigeria/>
- Emenike Iroegbu, E., & Maxwell, M. (2017). *Internationalization of Higher Education in Nigeria: A Cross -Border Education Perspective* (pp. 66–84).
- Faghihi, V., Hessami, A. R., & Ford, D. N. (2015). Sustainable campus improvement program design using energy efficiency and conservation. *Journal of Cleaner Production*, 107, 400–409. <https://doi.org/10.1016/j.jclepro.2014.12.040>
- Figueiró, P. S., & Raufflet, E. (2015). Sustainability in higher education: A systematic review with focus on management education. *Journal of Cleaner Production*, 106, 22–33. <https://doi.org/10.1016/j.jclepro.2015.04.118>
- Filho, W. L. (2011). About the Role of Universities and Their Contribution to Sustainable Development. *Higher Education Policy*, 24(4), 427–438. <https://doi.org/10.1057/hep.2011.16>
- Filho, W. L., Will, M., Salvia, A. L., Adom̃bent, M., Grahl, A., & Spira, F. (2019). The role of green and Sustainability Offices in fostering sustainability efforts at higher education institutions. *Journal of Cleaner Production*, 232, 1394–1401. <https://doi.org/10.1016/j.jclepro.2019.05.273>
- Gamage, K. A. A., Ekanayake, S. Y., & Dehideniya, S. C. P. (2022). Embedding Sustainability in Learning and Teaching: Lessons Learned and Moving Forward—Approaches in STEM Higher Education Programmes. *Education Sciences*, 12(3), 225. <https://doi.org/10.3390/educsci12030225>
- Gómezgutiérrez, D., & Sepúlveda, J. A. M. (2017). Sustainability Indicators for Universities: Revision for a. *Global Journal of Researches in Engineering: J General Engineering*, 17(5).
- Gutti, B., Aji, M., & Magaji, G. (2012). *Environmental Impact of Natural Resources Exploitation in Nigeria and the Way Forward*.
- Harris, Z. (2014). Best Practice in Campus Sustainability. *International Sustainable Campus Network*.
- Hoque, A., Clarke, A., & Sultana, T. (2017). Environmental sustainability practices in South Asian university campuses: An exploratory study on Bangladeshi universities. *Environment, Development and Sustainability*, 19(6), 2163–2180. <https://doi.org/10.1007/s10668-016-9845-0>
- Horan, W., & O'Regan, B. (2021). Developing a Practical Framework of Sustainability Indicators Relevant to All Higher Education Institutions to Enable Meaningful International Rankings. *Sustainability*, 13(2), Article 2. <https://doi.org/10.3390/su13020629>
- Horhota, M., Asman, J., Stratton, J. P., & Halfacre, A. C. (2014). Identifying behavioral barriers to campus sustainability: A multi-method approach. *International Journal of Sustainability in Higher Education*, 15(3), 343–358. <https://doi.org/10.1108/IJSHE-07-2012-0065>
- Karatzoglou, B. (2013). An in-depth literature review of the evolving roles and contributions of universities to Education for Sustainable Development. *Journal of Cleaner Production*, 49, 44–53. <https://doi.org/10.1016/j.jclepro.2012.07.043>
- Lambrechts, W., Mulà, I., Ceulemans, K., Molderez, I., & Gaeremynck, V. (2013). The integration of competences for sustainable development in higher education: An analysis of bachelor programs in management. *Journal of Cleaner Production*, 48, 65–73. <https://doi.org/10.1016/j.jclepro.2011.12.034>
- Leal Filho, W., Salvia, A. L., & Eustachio, J. H. P. P. (2023). An overview of the engagement of higher education institutions in the implementation of the UN Sustainable Development Goals. *Journal of Cleaner Production*, 386, 135694. <https://doi.org/10.1016/j.jclepro.2022.135694>
- Leal Filho, W., Vargas, V. R., Salvia, A. L., Brandli, L. L., Pallant, E., Klavins, M., Ray, S., Moggi, S., Maruna, M., Conticelli, E., Ayanore, M. A., Radovic, V., Gupta, B., Sen, S., Paço, A., Michalopoulou, E., Saikim, F. H., Koh, H. L., Frankenberger, F., ... Vaccari, M. (2019). The role

- of higher education institutions in sustainability initiatives at the local level. *Journal of Cleaner Production*, 233, 1004–1015. <https://doi.org/10.1016/j.jclepro.2019.06.059>
- Leiserowitz, A., Kates, & Parris, T. (2008). Sustainability Values, Attitudes, and Behaviors: A Review of Multinational and Global Trends. *PSN: Environment (Topic)*, 31. <https://doi.org/10.1146/annurev.energy.31.102505.133552>
- Lopes, R., Mesquita, C., Rama, D., & Álvarez García, J. (2018). Developing Sustainability Awareness in Higher Education. In *Strategies and Best Practices in Social Innovation: An Institutional Perspective* (pp. 131–152). https://doi.org/10.1007/978-3-319-89857-5_9
- Lozano, R., Ceulemans, K., Alonso-Almeida, M., Huisinigh, D., Lozano, F. J., Tom Waas, Wim Lambrechts, Rebeka Lukman, & Jean Hugé. (2015). A review of commitment and implementation of sustainable development in higher education: Results from a worldwide survey. *Journal of Cleaner Production*, 108, 1–18. <https://doi.org/10.1016/j.jclepro.2014.09.048>
- McCowan, T., Filho, W., Brandli, L., Salvia, A., Ruiz Vargas, V., Muthu, N., Edwin, G., Liu, J., Pretorius, R., & Newman, J. (2021). *Universities facing Climate Change and Sustainability*.
- Mogaji, E. (2019). *Types and Location of Nigerian Universities* (SSRN Scholarly Paper 3442737). <https://papers.ssrn.com/abstract=3442737>
- Nogy, C. N. (2017). *Environmental NGO-Private Sector Partnerships: A Tool to Generate Business Value and Protect the Natural World* [University of San Francisco]. https://repository.usfca.edu/cgi/viewcontent.cgi?params=/context/capstone/article/1757/&path_in_fo=auto_convert.pdf
- Nyimbili, F., & Nyimbili, L. (2024). Types of Purposive Sampling Techniques with Their Examples and Application in Qualitative Research Studies. *British Journal of Multidisciplinary and Advanced Studies*, 5, 90–99. <https://doi.org/10.37745/bjmas.2022.0419>
- Onwuliri, I. N. (2022). Revitalizing Higher Education for Sustainable National Development in Nigeria. *International Journal of Research Development*, 13(1).
- Oteyi, J., Godfrey, C., & Nnadijeze. (2023). Meeting the Challenges of Funding Higher Education for Sustainable Development in Nigeria. *International Journal of Economics, Environmental Development and Society*, 4(4), 492–500.
- Oyeleye, O. (2020). *Challenges of urbanization and urban growth in Nigeria*.
- Pedro, E., Alves, H., & Leitão, J. (2024). Sustainable development practices in public higher education: A new conceptual framework for nurturing student satisfaction and reinforcing attractiveness to international students. *Sustainable Development*, 32(3), 2565–2582. <https://doi.org/10.1002/sd.2798>
- Petrosillo, I., Aretano, R., & Zurlini, G. (2015). Socioecological Systems. In *Reference Module in Earth Systems and Environmental Sciences* (pp. 1–7). <https://doi.org/10.1016/B978-0-12-409548-9.09518-X>
- Podgórska, M., & Zdonek, I. (2024). Interdisciplinary collaboration in higher education towards sustainable development. *Sustainable Development*, 32(3), 2085–2103. <https://doi.org/10.1002/sd.2765>
- Ralph, M., & Stubbs, W. (2014). Integrating environmental sustainability into universities. *Higher Education*, 67(1), 71–90. <https://doi.org/10.1007/s10734-013-9641-9>
- Ramísio, P. J., Pinto, L. M. C., Gouveia, N., Costa, H., & Arezes, D. (2019). Sustainability Strategy in Higher Education Institutions: Lessons learned from a nine-year case study. *Journal of Cleaner Production*, 222, 300–309. <https://doi.org/10.1016/j.jclepro.2019.02.257>
- Ramos, T. B., Caeiro, S., van Hoof, B., Lozano, R., Huisinigh, D., & Ceulemans, K. (2015). Experiences from the implementation of sustainable development in higher education institutions: Environmental Management for Sustainable Universities. *Journal of Cleaner Production*, 106, 3–10. <https://doi.org/10.1016/j.jclepro.2015.05.110>
- Samuel, B. (2016). *Achieving Sustainable Development in HEIs in Nigeria Now and Beyond the 21st Century*. <https://www.researchgate.net/publication/338423397>
- Samuel, N., & Clarke, A. (2022). Partnerships and the Sustainable Development Goals. *Springer*.

- Scarff Seatter, C., & Ceulemans, K. (2017). Teaching Sustainability in Higher Education: Pedagogical Styles that Make a Difference. *Canadian Journal of Higher Education*, 47(2), 47–70. <https://doi.org/10.47678/cjhe.v47i2.186284>
- Schmitz, C. L., Stinson, C. H., & James, C. D. (2010). Community and Environmental Sustainability: Collaboration and Interdisciplinary Education. *Critical Social Work*, 11(3), Article 3. <https://doi.org/10.22329/csw.v11i3.5834>
- Schwandt, T. (1998). Constructivist, Interpretivist Approaches to Human Inquiry. *Handbook of Qualitative Research* Thousand Oaks, California: Sage.
- Serafini, P. G., Moura, J. M. de, Almeida, M. R. de, & Rezende, J. F. D. de. (2022). Sustainable Development Goals in Higher Education Institutions: A systematic literature review. *Journal of Cleaner Production*, 370, 133473. <https://doi.org/10.1016/j.jclepro.2022.133473>
- Suryanarayanan, S. (2021). *Barriers and Enablers to the Adoption of Sustainability Initiatives at the Municipal Level in Canada* [University of Waterloo]. https://uwspace.uwaterloo.ca/bitstream/handle/10012/17023/Suryanarayanan_Snehaa.pdf?sequence=1&isAllowed=y
- Too, L., & Bajracharya, B. (2015). Sustainable campus: Engaging the community in sustainability. *International Journal of Sustainability in Higher Education*, 16(1), 57–71. <https://doi.org/10.1108/IJSHE-07-2013-0080>
- Tumbas, P., Matkovic, P., Sakal, M., & Pavličević, V. (2015). *Sustainable University: Assessment Tools, Factors, Measures and Model*.
- U. N. (2017, April 27). *Greening Universities Toolkit V2.0: Transforming Universities into Green and Sustainable Campuses: A Toolkit for Implementers - Advance Copy*. UNEP - UN Environment Programme. <http://www.unep.org/resources/report/greening-universities-toolkit-v20-transforming-universities-green-and-sustainable>
- ULSF. (2015). *The Association of University Leaders for a Sustainable Future*. <https://ulsf.org/>
- UN. (2022). *Higher Education Sustainability Initiative | Department of Economic and Social Affairs*. <https://sdgs.un.org/HESI>
- UNESCO. (2022). *Knowledge-driven actions: Transforming higher education for global sustainability—UNESCO Digital Library*. <https://unesdoc.unesco.org/ark:/48223/pf0000380519>
- United Nation. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development | Department of Economic and Social Affairs*. <https://sdgs.un.org/2030agenda>
- University of Ibadan. (n.d.). *Centre for Sustainable Development (CESDEV) | Research*. Retrieved April 21, 2023, from <https://research.ui.edu.ng/centre-sustainable-development-cesdev-0>
- Urbanski, M., & Filho, W. (2014). Measuring sustainability at universities by means of the Sustainability Tracking, Assessment and Rating System (STARS): Early findings from STARS data. *Environment, Development and Sustainability*, 17. <https://doi.org/10.1007/s10668-014-9564-3>
- Velazquez, L., Munguia, N., Platt, A., & Taddei, J. (2005). Sustainable university: What can be the matter? *Journal of Cleaner Production*, 14(9), 810–819. <https://doi.org/10.1016/j.jclepro.2005.12.008>
- Yang, S., Zhao, W., Liu, Y., Cherubini, F., Fu, B., & Pereira, P. (2020). Prioritizing sustainable development goals and linking them to ecosystem services: A global expert's knowledge evaluation. *Geography and Sustainability*, 1(4), 321–330. <https://doi.org/10.1016/j.geosus.2020.09.004>
- Yazdani, S., & Dola, K. (2013). Sustainable City Priorities in Global North Versus Global South. *Journal of Sustainable Development*, 6. <https://doi.org/10.5539/jsd.v6n7p38>
- Žalėnienė, I., & Pereira, P. (2021). Higher Education For Sustainability: A Global Perspective. *Geography and Sustainability*, 2(2), 99–106. <https://doi.org/10.1016/j.geosus.2021.05.001>

Appendices

Table 2: Sample Frame

S/N	University Name	Location	Response Status
1	Federal University of Technology	Akure	Responded
2	Ladoke Akintola University of Technology	Ogbomoso	Responded
3	Lagos State University	Ojo	Responded
4	Olabisi Onabanjo University	Ago-Iwoye	Responded
5	Osun State University	Osogbo	Responded
6	Tai Solarin University of Education	Ijebu Ode	Responded
7	University of Ibadan	Ibadan	Responded
8	University of Lagos	Akoka	Responded

Source: Generated using NVivo 14, Interview Data, 2024

Table 2: Summary of Themes on the Level of Sustainability Practice

Themes	Initial Codes	Universities								Results	
		U1	U2	U3	U4	U5	U6	U7	U8	Yes	No
Sustainability Practices	Sustainable vision	✓	x	x	x	✓	✓	✓	✓	5	3
	Conservation of resources	x	✓	x	✓	x	✓	✓	✓	5	3
	Adoption of SDGs	✓	x	✓	x	✓	x	x	x	3	5
	Sustainability units or programmes	✓	x	✓	x	✓	x	x	x	3	5
	Unintentional sustainability practices	✓	x	✓	x	x	x	x	x	2	6
Curriculum, Research and Innovation	Courses on sustainability	✓	✓	✓	✓	✓	✓	✓	✓	8	0
	Existing field or department on sustainability	x	x	x	x	x	x	x	x	0	8
	Sustainable innovative idea	✓	✓	✓	✓	✓	✓	✓	✓	8	0
	Sustainable research is encouraged	✓	✓	✓	✓	✓	✓	✓	✓	7	1
Engagement	Public engagement	x	✓	x	x	x	x	✓	x	2	6
	Student engagement	✓	x	✓	x	✓	✓	✓	✓	6	2
	Partnership with external institutions	✓	x	x	✓	x	✓	✓	x	4	4
	Town and gown relationship	x	✓	✓	x	x	✓	x	✓	4	4
Management and Governance on Campus	Supportive management	✓	x	x	x	✓	✓	x	x	3	5
	Sustainable structure	x	✓	x	x	x	x	✓	✓	3	5
Framework	Framework	x	x	x	x	x	x	x	x	0	8
	Other methods apart from the framework	x	✓	✓	✓	x	x	x	x	3	5

Source: Authors' own creation using Interview Data, 2024

Table 3: Summary of Themes on Sustainability Barriers

Themes	Initial Codes	Universities								Results	
		U1	U2	U3	U4	U5	U6	U7	U8	Yes	No
Lack of awareness	Low Awareness	✓	✓	✓	✓	✓	×	×	✓	6	2
	More Awareness	×	×	✓	×	×	✓	✓	×	3	5
Financial Constraints	Less Funded	✓	✓	✓	✓	✓	✓	✓	✓	8	0
	Looking Elsewhere for Funding	×	✓	×	✓	✓	×	✓	×	4	4
Government and Institutional Policies	Government Supportive Policy	✓	✓	✓	✓	✓	✓	✓	×	7	1
	Institutional Strategy and Policy	✓	×	✓	✓	✓	✓	×	✓	6	2
Other Challenges	Attitude Problem	✓	✓	×	✓	×	✓	✓	×	5	3
	Leadership Problem	×	✓	×	×	×	×	×	×	1	7
	Non-Appreciation of Sustainability	×	×	✓	×	×	×	×	×	1	7
Undiscovered Opportunity	Create more Jobs	×	×	×	×	×	×	✓	×	1	7
	Food Security	×	×	×	×	×	×	×	✓	1	7
	Ownership System	✓	×	×	✓	×	×	×	×	2	6
	Scholarship Opportunity	×	×	×	×	✓	×	×	×	1	7
	Sustainable Health	×	✓	×	×	×	×	×	×	1	7

Source: Authors' own creation using Interview Data, 2024

Project Map for RQ1

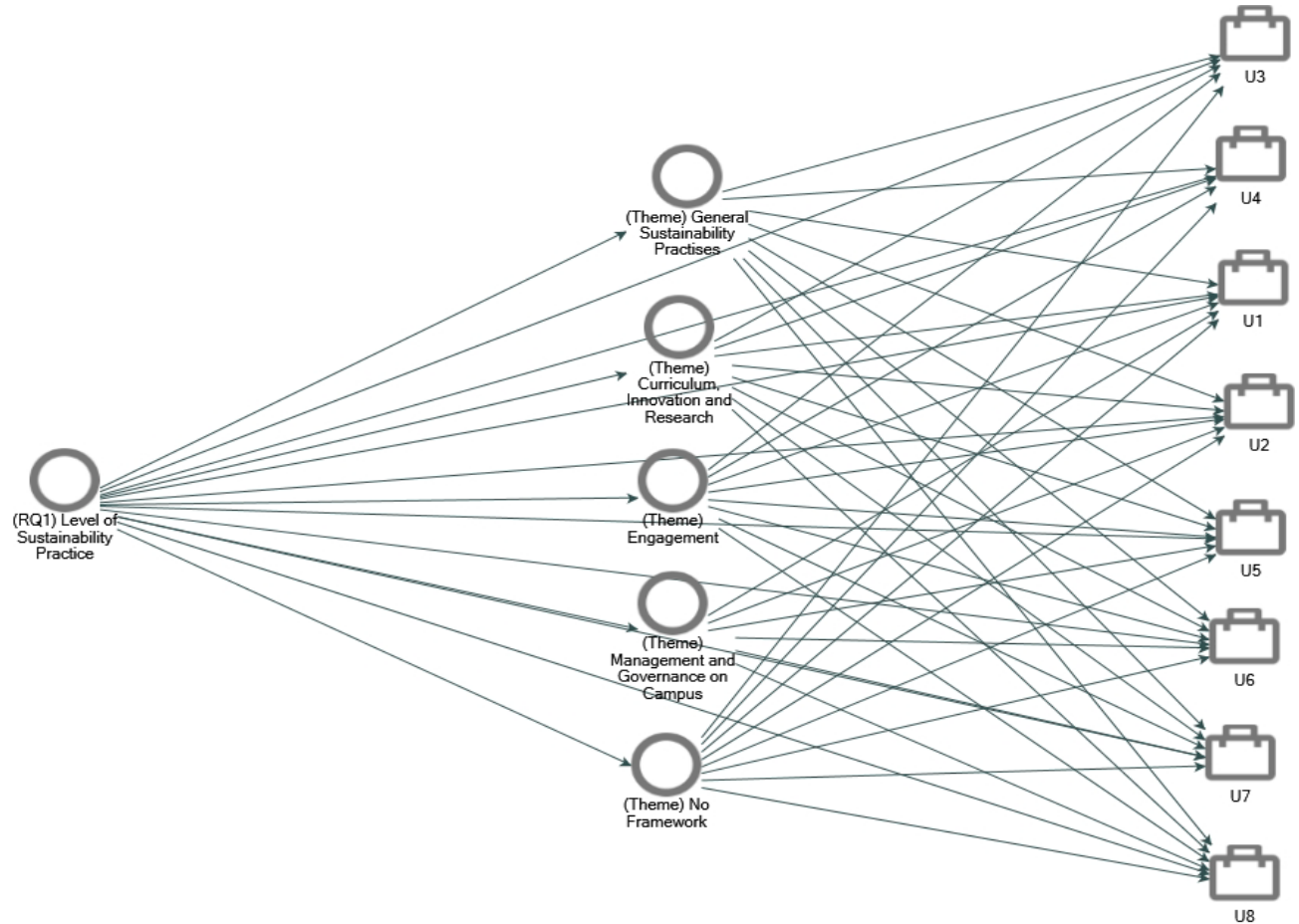


Figure 2: Project Map for RQ1

Source: Generated using NVivo 14, Interview Data, 2024

Figure 1 shows the outcomes of the assessment of sustainability practices in Nigerian university using STARS Framework3 (Source: Generated using NVivo 14, Interview Data, 2024).

Project Map for RQ2

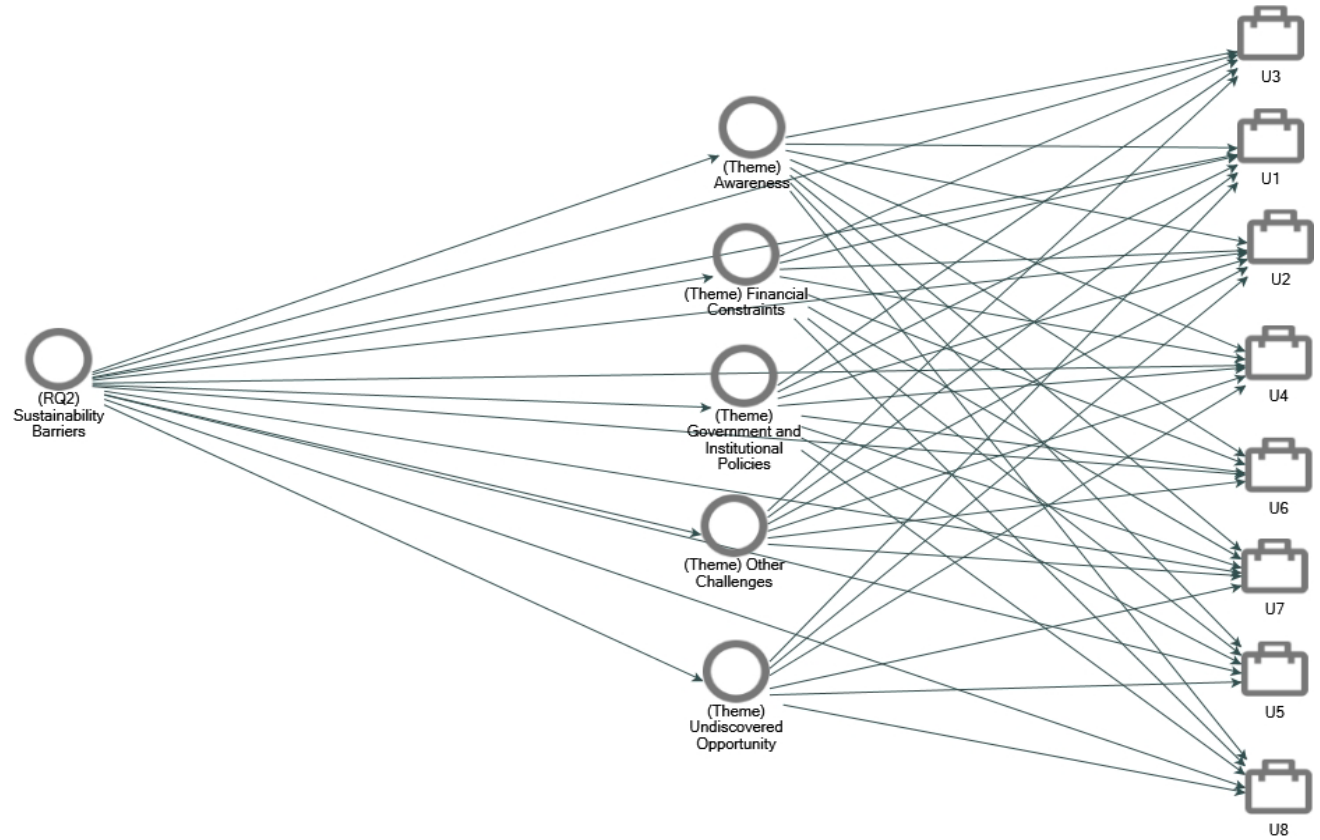


Figure 4: Project Map for RQ2

Source: Generated using NVivo 14, Interview Data, 2024

Figure 2 shows the themes emerging from the interviews on sustainability barriers that influences the adoption and integration of sustainability practices in HEIs (Source: Generated using NVivo 14, Interview Data, 2024).