

# Sustainability Practices at Higher Education Institutions, Current Efforts and Future Directions: The Case Study of AAMUSTED.

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## ABSTRACT

This study investigates sustainability practices in higher education, focusing on the Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development (AAMUSTED) as a case study. Through qualitative interviews with key stakeholders, the research uncovers critical gaps in formalized waste management and energy conservation initiatives. Despite AAMUSTED's well-maintained campus environment, the absence of structured policies for waste segregation, recycling, and energy efficiency highlights missed opportunities for advancing environmental stewardship. Stakeholders emphasize the potential benefits of integrating renewable energy solutions and conducting waste audits to reduce the institution's ecological footprint. The findings underscore the importance of embedding sustainability within strategic frameworks, promoting stakeholder engagement, and fostering a culture of environmental responsibility. This study provides actionable recommendations to transform AAMUSTED into a model of sustainable development in higher education, contributing to the global discourse on sustainability leadership within academic institutions.

**Keywords:** Higher Education Sustainability, Environmental Impact, Policy Implementation, Recycle, Recycling, Stakeholder Engagement, Strategic Policy Integration, Waste Management, Energy Efficiency, Environmental Stewardship

## INTRODUCTION

While the Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development (AAMUSTED) demonstrates commendable efforts in maintaining a visibly clean campus, the absence of formalized sustainability practices, particularly in waste management and energy conservation, presents a significant gap. Observing a campus largely free from litter is encouraging, yet it highlights the potential for even greater environmental impact through more structured approaches. Effective sustainability strategies not only enhance environmental cleanliness but also ensure long-term ecological balance by minimizing resource consumption and waste generation. Smith and Lee (2019) emphasize that adopting sustainability strategies, such as renewable energy use and organized recycling programs, allows universities to minimize waste and effectively reduce carbon emissions. Their work includes case studies illustrating how universities prioritizing energy efficiency and resource management significantly improve their environmental outcomes.

Currently, AAMUSTED lacks a comprehensive system for managing waste or conserving energy. Without formal waste segregation, recycling programs, or energy-efficient policies, the university risks missing opportunities to reduce its environmental footprint. In addition to waste management, energy conservation is another critical area where higher education institutions can make significant contributions. Other universities have successfully adopted renewable energy sources and energy-efficient infrastructure, demonstrating that measurable progress in reducing carbon emissions is possible.

This paper explores ways in which AAMUSTED can build on its current cleanliness practices by adopting a

holistic sustainability approach that integrates waste management and energy conservation into its strategic plans. By doing so, the university could not only maintain its clean environment but also actively contribute to the global sustainability agenda. In recent years, universities worldwide have increasingly recognized their responsibility to contribute to sustainability efforts through education, research, and operational management. This responsibility involves adopting practices that minimize environmental impacts while serving as models for the broader community. Institutions of higher learning play a crucial role in promoting sustainability, not only through their academic programs but also by demonstrating leadership in environmental stewardship on their campuses. The implementation of comprehensive waste management systems and energy conservation strategies is vital for fostering a culture of sustainability.

Despite the cleanliness observed on AAMUSTED's campus, the lack of formalized sustainability practices signifies missed opportunities for creating a more robust environmental policy framework. Studies have shown that when universities adopt structured sustainability practices, they significantly reduce waste and energy consumption while enhancing environmental awareness among staff and students (Green & Brown, 2020). Therefore, integrating such practices into AAMUSTED's daily operations would not only maintain its clean environment but also align the university with global sustainability goals, positioning it as a leader in sustainable development within higher education.

### **AAMUSTED's Commitment to Sustainability**

In the context of the study, 'commitment' refers to the extent of information provided by universities in their website which demonstrated initiatives towards achieving the sustainability goal (Hasim et al., 2018), whereas the concept of sustainability has acquired great relevance in scientific research about environmental issues, policies linked to environmental management, and industrial and agricultural production, among others (Ruggerio, 2021; Gyimah et al., 2023).

The Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development (AAMUSTED) is committed to fostering a sustainable future through its vision of becoming a world-class socially responsible TVET and Entrepreneurial Development Teacher Education University. This vision emphasizes the importance of social responsibility, which inherently includes a commitment to environmental stewardship and sustainability practices.

In line with its mission, AAMUSTED aims to train and provide relevant TVET and entrepreneurial development teachers and professionals for TVET institutions and industry while promoting research and innovation for educational policy and economic development. This mission underscores the university's role in equipping its graduates with the skills and knowledge needed to navigate and address contemporary challenges, including those related to sustainability.

AAMUSTED's dedication to sustainability is reflected in its academic programs, such as [specific program names], which incorporate sustainability principles and practices. The university also engages in community initiatives, such as [specific projects or partnerships], aimed at promoting environmental awareness. Miller (2022) highlights that universities adopting formalized sustainability frameworks witness greater engagement from students and staff in sustainability initiatives. His research demonstrates that implementing clear policies on waste segregation and energy conservation encourages campus communities to participate in environmental activities, reinforcing a shared commitment to sustainability.

By incorporating sustainability principles into its curriculum, AAMUSTED prepares its students to become leaders in sustainable practices within their professions. Furthermore, the university actively encourages research and projects addressing local and global environmental challenges, thereby reinforcing its role as a catalyst for change.

This commitment to sustainability extends beyond the classroom, influencing the behaviors and attitudes of students, faculty, and staff. By fostering a culture of environmental stewardship, AAMUSTED not only enhances the educational experience but also positions itself as a leader in sustainable development within the region.

Through its ongoing efforts, AAMUSTED aims to create a lasting impact on both its immediate community and the broader global landscape.

## METHODS

The methodology for this study involved conducting interviews with key stakeholders at AAMUSTED to gather insights into the institution's current sustainability practices, particularly in waste management and energy conservation. These interviews were structured to elicit information on the challenges, opportunities, and perceptions of sustainability initiatives within the university. The qualitative data obtained provided a detailed understanding of the gaps in formalized waste management systems and energy efficiency measures (Majeed et al., 2023).

Stakeholders included administrative staff, faculty members, and students, ensuring a comprehensive representation of the campus community (Somuah et al., 2024). Their perspectives were instrumental in identifying infrastructural limitations, financial barriers, and behavioral challenges that hinder the adoption of sustainable practices. The data collected through these interviews served as a foundation for the study's recommendations on improving AAMUSTED's environmental stewardship.

This approach allowed the researchers to capture nuanced and context-specific insights, emphasizing the importance of stakeholder engagement in developing actionable strategies for integrating sustainability into AAMUSTED's operational framework. Based on the methods used for the study, the next paragraph provides detailed findings on waste management, and energy conservation issues.

### Waste Management

#### Existing Practices:

Waste management is an activity carried out in an effort to handle and reduce waste which includes collection, transportation, final disposal and processing which aims to improve public health and environmental quality (Kushendar et al., 2023). The worldwide generation of solid waste material is forecasted to increase by around 70%, i.e., 3.4 billion metric tons by 2050. This staggering number brings us to think about the local and global impact of waste on these economies. The main types of waste materials include residential waste, industrial waste, hazardous waste, and e-waste, all of which need proper management (Patel, 2024).

The interview reveals that AAMUSTED has taken initial steps toward maintaining a clean and organized campus through basic waste management practices. Waste management is the need of the hour, looking at the soaring volume of waste generation with increasing population and economies in modern society. It is essential to protect the environment, public health, and quality of life (Patel, 2024). The staff of Works, Physical Development, and Facility Management Directorate posit that though the university has yet to fully implement waste segregation systems, it is actively exploring ways to promote better waste disposal habits across the campus. Currently, waste bins are placed in strategic locations; however, there is a significant opportunity to enhance waste separation practices by introducing dedicated bins for recyclables, organic waste, and general refuse.

In addition to improving on-campus waste management, AAMUSTED could benefit from incorporating awareness programs aimed at educating students and staff on the importance of responsible waste disposal and sustainability practices. For example, workshops, informational signage, and interactive campaigns could effectively engage the campus community in sustainable behaviors.

As AAMUSTED continues to prioritize cleanliness on campus, there is room to expand waste management practices in line with broader sustainability goals, such as reducing the university's environmental footprint and fostering a culture of environmental stewardship. Collaborating with industry experts and researchers could lead to innovative green initiatives that not only improve waste management but also enhance students' educational experiences.

Furthermore, adopting eco-friendly waste management strategies could align with AAMUSTED's mission of

promoting sustainable development and innovation within its educational framework. Such efforts would not only contribute to a cleaner campus but also prepare students to engage in and advocate for sustainable practices in their future careers.

## **Energy Conservation**

### **Existing Practices:**

In today's world, energy is not only the future, it drives everything in the present. As a global society, we generate and use more energy than ever before, and the demand for energy is continually increasing. One of the ways to deal with the constantly expanding need for energy and the issues it brings is to focus on energy conservation (Taraenergy, 2024).

Energy Conservation is "the prevention of the wasteful use of energy, especially in order to ensure its continuing availability". Put simply, it is a deliberate effort to use less energy or none at all – this can be through designing out the need for energy consumption, changing behaviours to reduce energy consumption or streamlining processes in business or our everyday lives to reduce the amount of energy we use (Aherne, 2021).

Insights from interviews with stakeholders at AAMUSTED revealed that the university currently lacks formal energy conservation practices and faces several challenges in managing and improving energy efficiency. Stakeholders highlighted the absence of systems to monitor or manage energy usage, which limits the institution's ability to pinpoint areas requiring improvement. Additionally, they noted that the campus infrastructure does not include energy-efficient technologies, such as LED lighting or modern HVAC systems, leading to higher energy consumption and operational costs.

Interviewees also emphasized the lack of renewable energy integration, such as solar panels, which could reduce reliance on traditional energy sources and decrease utility expenses. Another key issue raised was the limited awareness among the campus community regarding energy conservation. They acknowledged the absence of educational campaigns or programs designed to encourage energy-saving behaviors among students and staff.

Stakeholders identified infrequent maintenance and upgrades as a factor contributing to energy inefficiencies. They viewed these challenges as significant opportunities for AAMUSTED to implement targeted sustainability initiatives that could improve energy management and reduce the university's overall energy footprint. For instance, implementing a campus-wide energy audit could identify areas for improvement, while the introduction of energy-efficient lighting, smart meters, and insulation upgrades could lead to substantial energy savings. Engaging the campus community through workshops, competitions, or informational campaigns could foster a culture of energy conservation, empowering students and staff to contribute to a more sustainable campus. By embracing energy conservation practices, AAMUSTED can not only reduce operational costs but also align itself with global sustainability goals, establishing itself as a leader in energy management within higher education.

### **Challenges of Waste Management and Energy Conservation at AAMUSTED**

Despite AAMUSTED's initial steps towards improving waste management, several challenges hinder the effective implementation of these practices. A key challenge is the limited awareness and understanding among students and staff regarding the importance of proper waste disposal and sustainable practices. Without sufficient education on environmental sustainability, many members of the campus community may not fully grasp how their waste disposal habits contribute to broader environmental issues, such as pollution and resource depletion.

Infrastructural limitations further complicate waste management efforts. The current lack of dedicated bins for recyclables, organic waste, and general refuse creates obstacles to effective waste segregation. The absence of clear waste separation systems increases the risk of contamination, which not only makes recycling efforts less effective but also discourages participation among students and staff.

In addition to waste management challenges, AAMUSTED faces significant hurdles in energy conservation.



One major issue is the reliance on outdated and inefficient energy systems, which not only increase operational costs but also contribute to a higher carbon footprint. Without the implementation of energy-efficient technologies and practices, the university cannot effectively reduce its energy consumption.

Furthermore, there is a lack of awareness about energy conservation practices among both faculty and students. Many may not understand the impact of their daily energy use or how simple changes, like turning off lights and using energy-efficient appliances, can significantly lower energy waste.

Also, budgetary limitations present a major obstacle to advancing both waste management and energy conservation initiatives at AAMUSTED. The university's inability to allocate sufficient resources has hindered the development of infrastructure necessary for effective waste management, such as dedicated recycling bins and composting facilities. Similarly, energy conservation measures, such as transitioning to energy-efficient technologies like LED lighting and smart energy systems, remain out of reach due to financial constraints. The lack of renewable energy investments, such as solar panel installations, further reflects these budgetary challenges. Without adequate funding, AAMUSTED risks relying on outdated and inefficient waste disposal and energy systems, which increases operational costs and environmental impact.

Moreover, resistance to change among students and staff significantly affects the implementation of waste management and energy conservation practices. For instance, despite the strategic placement of waste bins on campus, the absence of effective waste segregation is partly due to behavioral inertia. The reluctance to adopt new habits, such as sorting waste into recyclables and organics, hampers the university's waste management goals. Similarly, in energy conservation, limited awareness and engagement contribute to the ongoing reliance on high-energy consumption practices. Resistance to change can undermine even well-planned initiatives unless addressed through targeted educational campaigns, leadership support, and incentives that promote participation and foster a culture of sustainability.

Finally, the knowledge gap among staff regarding the principles and practices of waste management and energy conservation is another critical challenge. Many staff members at AAMUSTED are not equipped with the technical expertise or awareness required to implement or oversee advanced sustainability practices. For instance, the absence of structured waste audits or energy monitoring systems indicates a lack of familiarity with best practices in these areas. Furthermore, insufficient knowledge of energy-saving techniques, such as optimizing HVAC systems or leveraging renewable energy solutions, prevents the campus community from taking proactive measures.

### **Addressing Waste Management and Energy Conservation Challenges at AAMUSTED**

To address these challenges, AAMUSTED will need to invest in comprehensive educational campaigns that promote sustainability awareness and the importance of responsible waste disposal and energy conservation. Initiatives such as workshops, informational sessions, and collaborations with local environmental organizations could enhance understanding and engagement. Additionally, improving waste disposal infrastructure by introducing clearly labeled, dedicated bins for different waste types will facilitate better segregation and reduce contamination.

By cultivating a culture of environmental responsibility and ensuring that the campus community is equipped with the necessary knowledge and resources, AAMUSTED can ensure long-term success in its waste management efforts and energy conservation initiatives. Overcoming these challenges will not only improve waste management practices but also align with the university's broader sustainability goals, positioning AAMUSTED as a leader in environmental stewardship within the region.

Also, AAMUSTED can overcome financial challenges by forming partnerships with organizations like SolarAfrica, and apply for sustainability grants from entities such as UNDP, and launching cost-saving initiatives like LED lighting upgrades. Additionally, targeted fundraising campaigns involving alumni and students can secure extra funding. Savings from initial efforts can be reinvested into advanced projects, such as renewable energy installations.

To reduce resistance, AAMUSTED can implement awareness campaigns through social media and events, incentivize participation with competitions, and foster leadership advocacy for sustainability. Practical workshops on waste segregation and energy-saving behaviors can engage the campus community, while reward-based initiatives can motivate students and staff to adopt sustainable habits.

Lastly, staff and student knowledge gaps can be addressed through professional development programs on sustainability practices, expert consultations, and the inclusion of hands-on projects in academic curricula. Knowledge-sharing forums can facilitate idea exchanges, while inviting environmental experts ensures technical support. Empowering students and staff as leaders in these initiatives fosters a culture of continuous learning and innovation.

### **Overcoming Sustainability Challenges based on Lessons from Other Institutions**

According to the Association for Advancing Automation (2024), conservation of energy and proper management of waste are two highly critical components of maintaining advanced business processes that can affect a company's bottom line and in general the environment. Thus, energy conservation and waste management are indispensable pillars of sustainable manufacturing practices. By embracing these strategies, manufacturers can significantly minimize their ecological footprint, reduce energy costs, enhance their brand reputation, and contribute to a more sustainable future (Association for Advancing Automation, 2024; Gyimah et al., 2024).

Waste management and energy conservation remain significant challenges for Ghanaian universities, often due to inadequate funding, infrastructure, and strategic partnerships. However, some institutions, like Ashesi University, have successfully tackled these challenges through their Sustainability Initiative, which includes solar power installations, efficient water management systems, and a campus-wide recycling programme (source: Ashesi University Sustainability). Ashesi's approach, combining strategic partnerships with local waste management companies and securing external funding, provides valuable lessons for institutions like AAMUSTED.

By adopting similar strategies, AAMUSTED could overcome current barriers in sustainability. For example, partnerships with local waste management companies or renewable energy organizations could enhance waste disposal systems and energy efficiency. Additionally, the Occupational Health and Safety programme at AAMUSTED's Mampong campus could be leveraged to spearhead internal safety and sustainability practices, ensuring that staff and students are actively involved in creating a more sustainable campus environment. Integrating lessons from Ashesi could help AAMUSTED build a stronger framework for sustainability efforts that aligns with both its academic offerings and broader institutional goals.

### **Recommendations for Enhancing Sustainability Practices at AAMUSTED**

#### **1. Conduct a Comprehensive Waste Audit**

To establish a baseline understanding of waste generation, AAMUSTED should conduct a comprehensive waste audit. This audit will identify the types and quantities of waste produced on campus, enabling the university to develop targeted waste reduction strategies and allocate resources more effectively (Gyimah et al., 2022).

#### **Action Steps:**

- Form a sustainability committee to oversee the audit process.
- Collaborate with environmental science students to collect and analyze waste data.
- Use findings to develop a waste reduction plan, focusing on recycling, composting, and waste diversion strategies.

#### **2. Implement Energy Conservation Measures**

It is crucial for AAMUSTED to adopt formalized frameworks that promote energy conservation across the

campus. As noted by Miller (2022), the establishment of structured sustainability initiatives encourages engagement among students and staff, fostering a culture of responsibility towards energy use. This could include measures such as the installation of energy-efficient appliances, the incorporation of smart energy management systems, and educational programmes aimed at increasing awareness about energy consumption.

#### **Action Steps:**

- Assess current energy usage and identify areas for improvement.
- Install energy-efficient appliances and LED lighting throughout campus buildings.
- Incorporate smart energy management systems to monitor and control energy consumption.
- Launch educational programmes for students and staff to raise awareness about energy conservation practices.

### **3. Adoption of Renewable Energy Sources**

Transitioning to renewable energy sources, such as solar, wind, and biomass, is crucial for AAMUSTED to reduce its carbon footprint and dependence on fuel-based generators. Currently, the university relies on electricity from the grid and fuel-powered generators, which contribute to greenhouse gas emissions and are subject to fuel price fluctuations. By adopting renewable energy solutions, AAMUSTED can achieve significant cost savings, enhance energy reliability, and support environmental sustainability. This shift not only mitigates the environmental impact associated with fossil fuel use but also aligns with global trends in higher education to foster a greener campus and promote sustainable practices.

#### **Action Steps:**

- Conduct feasibility studies to determine the potential for solar, wind, or biomass energy installations on campus.
- Seek funding or partnerships with renewable energy companies, such as **Bamboo Energy** or **SolarAfrica**, for infrastructure development.
- Implement pilot projects, such as solar panel installations on building roofs, to showcase renewable energy solutions.

### **4. Establish Partnerships for Waste Management**

AAMUSTED should explore partnerships with local waste management companies to establish sustainable disposal channels. Collaborating with these organizations can improve waste processing and recycling efforts, ultimately reducing the environmental impact of campus waste.

#### **Action Steps:**

- Identify and reach out to local waste management companies, such as **Zoomlion Ghana Ltd.** or **Waste Landfills Ghana**, to explore collaboration opportunities.
- Develop a joint initiative to improve recycling rates and waste processing on campus.
- Create a communication plan to inform the campus community about the partnership and its benefits.

### **5. Engage the Community in Sustainability Initiatives**

Community engagement is essential for the success of sustainability initiatives. AAMUSTED should develop

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outreach programs that involve local communities in sustainability projects, such as tree planting and environmental education campaigns. This collaboration can enhance the university's social responsibility while promoting environmental stewardship.

**Action Steps:**

- Develop outreach programmes that involve local communities in sustainability projects, such as tree planting days and environmental education sessions.
- Create a volunteer programme for students to engage with the community on sustainability-related projects.
- Host community forums to gather input and share sustainability goals with local residents.

**6. Monitor and Evaluate Sustainability Practices**

Establishing a monitoring and evaluation framework for sustainability initiatives will allow AAMUSTED to assess the effectiveness of its efforts over time. By setting measurable goals and tracking progress, the university can make data-driven decisions to refine its sustainability strategies and achieve its objectives.

**Action Steps:**

- Establish key performance indicators (KPIs) for each sustainability initiative to track progress.
- Conduct annual reviews of sustainability practices and report findings to the university community.
- Adjust strategies based on evaluation outcomes to improve effectiveness and engagement.

**7. Promotion of Sustainable Initiatives**

AAMUSTED should actively implement sustainability initiatives that enhance campus culture and foster community responsibility. According to Green and Brown (2020), such initiatives not only contribute to environmental sustainability but also cultivate a sense of belonging among students and staff. The university could organize campus-wide recycling programs, establish community gardens, and host sustainability-themed events that encourage participation and collaboration. Regular clean-up days and sustainability workshops should be integrated into these initiatives to engage the campus community actively. These events can raise awareness about environmental issues, promote active participation in sustainability practices, and strengthen the sense of community within the university.

**Action Steps:**

- Launch a campus-wide sustainability awareness campaign that includes posters, social media outreach, and informational sessions.
- Organize sustainability-themed events, such as Earth Day celebrations or "Sustainable Living" fairs, to promote engagement.
- Create a student-led sustainability club that empowers students to take ownership of initiatives and events.

**8. Organize Clean-Up Days and Workshops**

The university should organize regular clean-up days with students, staff and faculty and sustainability workshops to engage the campus community in sustainability initiatives. These events can raise awareness about environmental issues, promote active participation in sustainability practices, and foster a sense of community.

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## Action Steps:

- Schedule regular clean-up days each semester, involving students, staff, and faculty.
- Promote workshops focused on sustainable practices, such as composting and waste reduction.
- Partner with local environmental organizations to facilitate these events and provide resources.

## CONCLUSION

This study underscores the critical need for comprehensive sustainability practices at higher education institutions, using AAMUSTED as a case study. While AAMUSTED's current efforts in maintaining a clean campus are commendable, significant gaps exist in waste management and energy conservation that limit the institution's potential to serve as a model of environmental stewardship within the higher education sector.

Insights from stakeholders reveal systemic challenges, including the lack of formalized policies, limited infrastructural investments in energy-efficient and waste segregation technologies, and insufficient community engagement in sustainability efforts. Despite these barriers, the study identifies substantial opportunities for AAMUSTED to establish itself as a leader in sustainable practices through targeted interventions. The findings emphasize the importance of embedding sustainability into AAMUSTED's strategic framework by implementing waste audits, adopting renewable energy solutions, and engaging students, staff, and the broader community. Through these actions, the university can align its operational practices with global sustainability goals, reduce its environmental footprint, and foster a culture of sustainability. Moreover, the study demonstrates that addressing sustainability challenges in higher education institutions requires an integrated approach that considers environmental, social, and economic dimensions. By leveraging partnerships, securing funding, and promoting behavioral changes, AAMUSTED can achieve measurable progress and inspire similar institutions to follow suit.

In conclusion, this research advocates for a paradigm shift where sustainability becomes a core institutional value at AAMUSTED, not merely an operational consideration. Such a transition would position the university as a benchmark for sustainability in higher education, contributing to the global agenda for environmental resilience and sustainable development.

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