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Formulating Knowledge Transfer Strategy for Sustainable Waste Management: The Case of Assosa University, Ethiopia

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Abstract- Rapid urbanization, economic growth, and population expansion have made waste management in developing nations more difficult. Inefficient waste management on college campuses can have negative effects on the environment and human health. In order to improve sustainable waste management at Assosa University in Ethiopia, this study intends to create a knowledge management framework and a knowledge transfer strategy. Surveys, interviews, and a review of the literature were all used in a mixed-methods approach. SPSS version 25 was used to analyze quantitative data, and in-depth interviews were used to extract qualitative insights. Results reveal that the absence of a structured knowledge management system and formal knowledge transfer mechanisms are significant barriers to effective waste management. The proposed framework incorporates knowledge creation, storage, sharing, and application. The knowledge transfer strategy emphasizes capacity building through training, mentoring, and participatory programs. The study found a statistically significant positive relationship ($p < 0.001$) between knowledge management and sustainable waste management practices. This research provides a replicable model for institutions seeking to improve waste practices through institutional knowledge systems and strategic knowledge dissemination.

Keywords- Knowledge Management System, Knowledge Transfer Strategy, Sustainable Waste Management.

I. Introduction

The rate of waste generation is on the rise in schools/universities mainly in developing countries due to growth of population, urbanization and institutional expansion(Elsaid & Aghezzaf, 2015). Ineffective waste management techniques have had a negative impact on sustainability initiatives, the environment, and human health(Ja tau, 2013). The environment, human health, and sustainability initiatives have all suffered as a result of inefficient waste management practices(Elsaid & Aghezzaf, 2015). Assosa University and other Ethiopian institutions are under increasing pressure to manage waste in a sustainable manner.

Knowledge management (KM) and knowledge transfer strategies (KTS) offer powerful tools for addressing these challenges(Igbinovia & Adetimirin, 2019),(Bigsten & Gebreeyesus, 2009). A well-implemented KM system captures, stores, and disseminates institutional knowledge related to waste handling, while a robust KTS ensures that this knowledge reaches key stakeholders(Manab & Aziz, 2019). This study seeks to bridge the gap by proposing a framework tailored to the specific needs of Assosa University.

Even though waste management has become a major public health and environmental concern in urban areas of Ethiopia, only 2% of the population receives solid waste management services(Tassie & Endalew, 2020). Poor waste management impacts social, economic, and environmental aspects of life(Jatau, 2013),(Abdurehman & Abdi, 2021). However, in underdeveloped nations, the situation is different. The followings are current problems that are the result of the lack of an existing system for waste can cleaning.

A knowledge transfer strategy can provide waste management organizations with access to a broader range of expertise and perspectives(Chiwanza et al., 2013),(Steeves, 2015). This can allow them to make improved waste management strategy and resource allocation choices. The problem addressed in this study is the lack of a formal KMS and knowledge transfer strategy for sustainable waste management at Assosa University in Ethiopia. Although there were efforts to improve waste management practice, the University faces challenges related to waste generation, disposal, and environmental sustainability.

Lack of formal KMS and knowledge transfer plan for waste management are the major bottlenecks in the university. Without a systematic knowledge management and transfer process, the university is not able to effectively create, store, share, and use knowledge related to waste management. This study aims to resolve this problem by designing a framework for a knowledge management system and developing a knowledge transfer strategy for sustainable waste management at Assosa University.

II. Objectives of the study

General objective
The main objective of this study is to create a knowledge transfer plan for sustainable waste management in the Assosa University context.
Specific objectives are: To identify the causes of waste management problems, to prolong waste management practices through knowledge management system sharing among stakeholders, to develop a strategy for knowledge transfer in putting in place sustainable waste management and to design a knowledge management system structure for sustainable waste management.

III. Literature Review

The literature identifies significant barriers to sustainable waste management in universities, such as lack of awareness, poor stakeholder coordination, and inadequate technical infrastructure(Igbinovia & Adetimirin, 2019). Knowledge Management Systems (KMS) can address these issues by promoting the systematic handling of knowledge resources through processes like creation, storage, sharing, and application(Manab & Aziz, 2019),(Rhea, 2004). The SECI model (Socialization, Externalization, Combination, and Internalization) by(Nonaka & Lewin, 1994)provides a conceptual foundation for KM in waste management. Moreover, integrated frameworks that incorporate the 3Rs (Reduce, Reuse, Recycle)(Bireda, 2018) have proven effective in similar institutional contexts(Asemahagn, 2016).Previous studies (Elsaid & Aghezzaf, 2015) demonstrate the role of KM in enhancing efficiency and

sustainability. However, there remains a research gap in localized application, especially within Ethiopian universities.

Waste management is the various approaches and procedures planned and implemented to detect, control, and handle the different types of waste from generation to disposal in each area of the economy generate waste(Ngulube, 2002),(Endalew et al., 2020). A large amount of solid waste is produced every day at the university from a variety of sources, including offices, classrooms, labs, restaurants, resident halls, and other facilities, in addition to building and demolition waste(Endalew et al., 2020),(Massoudi et al., 2012). A waste management system is a set of processes and practices that are designed to manage waste in an efficient, safe, and environmentally responsible manner(Endalew et al., 2020).

The waste management system can also involve the implementation of waste reduction and recycling programs to minimize the amount of waste that is generated and to promote the reuse of Materials(Endalew et al., 2020). KMS is a term used to describe the development of knowledge repositories, enhancement of information access and sharing, enhancement of the knowledge environment, and management of knowledge as an asset for an organization(Hanneman et al., 2008). A strategic mindset is required to build a long-lasting competitive edge(Zahim Fisal & Adel Hamed, 2022).

IV. Methods

Both quantitative and qualitative data were gathered using a mixed-methods design.

Research Design and Sampling.

The survey research design was applied not just because of its descriptive character but also because of its interpretive nature, enabling the researchers to describe and interpret the patterns observed. Survey research design was supplemented by purposive and simple random sampling techniques. A deeper comprehension of the contextual and social factors influencing the subject was made possible by the qualitative approach (Nassaji, 2016). The validity and reliability of the results were improved by triangulating the two approaches, which guaranteed both breadth and depth in data collection and analysis. In order to support sustainable waste management strategies, the framework was developed using the Reduce, Reuse, and Recycle (3Rs) principles. It integrated participant narratives and numerical evidence (Tekele, 2019).

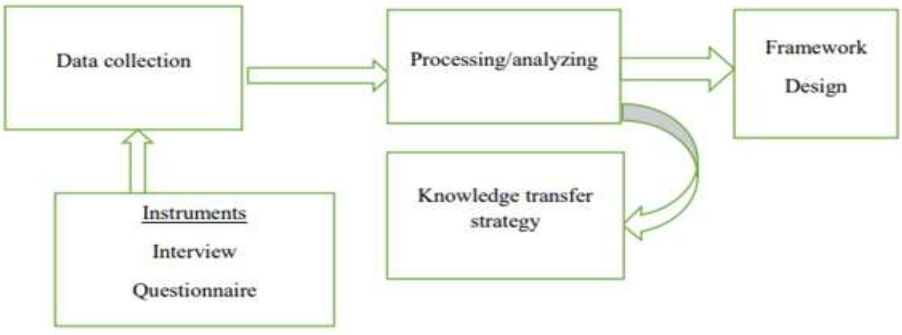

Figure 1: Research design

The population included students, environmental health and engineering staff, and general service directors of Assosa University. The sample size (n=265) was calculated using Yamane's formula with a 5% margin of error.

Data Collection Instruments
Semi-structured interviews and observations were used to obtain qualitative insights, while structured questionnaires were used to collect quantitative data. Informed consent was guaranteed, and ethical clearance was acquired.

Data Analysis.
SPSS version 25 was used to analyze quantitative data. Relationships were found using regression analysis, descriptive statistics, and Pearson correlation. Qualitative data were thematically analyzed and triangulated to enrich the findings.

V. Results

Response Rate and Demographics
A 94.72% response rate was obtained from the 251 returned questionnaires out of the 265 that were distributed. Undergraduate and graduate students, faculty, and administrative staff were among the participants. The distribution of genders was 35.9% female and 64.1% male.

Key Findings
Factors Affecting Waste: A sizable percentage of participants (72.5%) pointed to the absence of knowledge transfer procedures as a major cause of waste. Inadequate stakeholder engagement, inadequate facilities, and poor planning were additional factors. Current Waste Practices: More than 70% of participants emphasized the lack of efficient waste management guidelines, and more than 84% of participants stated that formal knowledge transfer strategies were absent. Impacts on Health and the Environment: 90.8% of respondents concurred that poor waste management practices lead to pollution and disease.

Statistical Analysis
Regression analysis confirmed a statistically significant relationship between the application of KMS and improvements in waste management outcomes ($p < 0.001$). Pearson correlation showed strong positive associations between stakeholder engagement, technological infrastructure, and sustainable waste management.

IV. Discussion

The study highlights the critical role of knowledge systems in transforming institutional waste management. Non-inclusion of knowledge processes at Assosa University has led to disjointed activities and inefficiency. Implementation of the proposed framework can enhance structured knowledge flow, ensure enhanced collaboration among stakeholders, and enhance enhanced monitoring and evaluation of waste initiatives. This is in harmony with global findings in bringing KM into focus as an essential enabler of operational excellence in environmental practice. By integrating models like

the SECI framework and 3Rs, universities can achieve genuine gains in terms of sustainability.

VII. Proposed Framework

The model established has four KM elements: Knowledge Creation: Foster innovation by utilizing participatory problem-solving and environmental clubs. Knowledge Storage: To preserve protocols, data, and best practices, make use of institutional databases and electronic storage. Knowledge Sharing: Provide mentorship programs, workshops, and departmental peer-to-peer learning. Application of Knowledge: Apply acquired procedures to daily operations, course materials, and campus regulations. The strategy for knowledge transfer utilizes stakeholder training, continuous feedback loops, and performance incentives to promote adoption.

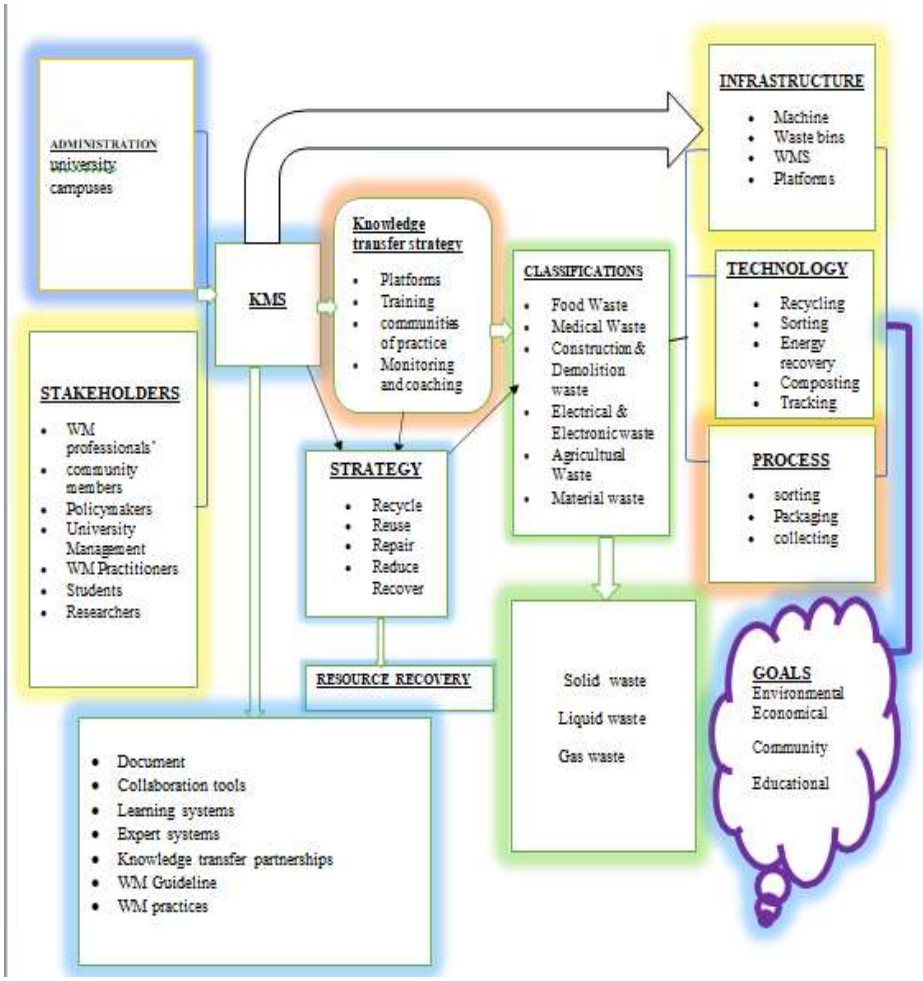

Figure2: the proposed framework for sustainable waste management Source:

Modified and adopted from (Obule-abila n.d)

Table1: Key Challenges Identified in Waste Management at Assosa University

Waste Management Challenge	Respondent Agreement (%)	Mean Score
Lack of Knowledge Transfer Practices	72.5%	1.41
Poor Waste Minimization Response	68.9%	1.40
Lack of Planning	74.1%	3.31

VIII. Conclusion

This study indicates that knowledge management and transfer are essential in achieving sustainable waste management in institutions of higher learning. The proposed framework and strategy for Assosa University offer a replicable model in comparable settings, especially developing nations. Implementation of these systems can help bring about radical reduction in waste, increased institutional effectiveness, and improved environmental stewardship.

Recommendation

To enhance sustainable waste management for Assosa University and other such institutions, the suggested KM framework of knowledge creation, storage, sharing, and application needs to be instituted institutionally. There must be a professional waste management unit to manage KM and KTS activities. Integrating waste management topics into academic courses can help in developing sustainable long-term habits among students. Stakeholder involvement needs to be increased through regular training, participatory programs, and awareness campaigns on information. Institutional repositories and mobile platforms need to be used as digital avenues to facilitate easy sharing of knowledge. Formal policies and reward schemes also need to be put in place by the university to promote and compensate effective KM practices. Mechanisms for monitoring and evaluation should be put in place to determine the success of these programs, and partnership with external actors can offer supplementary technical, financial, and capacity-building assistance.

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