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Green Environment, Clean Campus: Awareness and Best Practices of Solid Waste Management among Undergraduate students

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Abstract:

Solid waste management is an essential element for sustainable environment and public health. It is a process of collecting, segregating, transporting and disposing of solid wastes generated from different human activities. Higher standards of living of ever-increasing population, urbanization and industrialization have resulted in an increase in the quantity and variety of waste generated and it becoming a serious threat to our environment. Ineffective solid waste management practices can result in numerous issues related to health, environment and socio-economic factors. This study aims to assess the awareness and best practices adopted for solid waste management among undergraduate students in their daily life. In this study, descriptive survey method is used by employing a self-structured questionnaire with 25 items on a sample of 100 college students of Four Year Undergraduate Programme (FYUGP) affiliated to Gauhati University, Assam. The findings of the study observed high level of awareness on solid waste management but actual engagement in solid waste management practices relatively low due to adequate facilities, attitude and motivation. It highlights a clear gap between awareness and practices and indicates the need of practical exposure.

Keywords: Solid waste management, Green Environment, Clean Campus, Undergraduate students.

1. INTRODUCTION:

For a sustainable and well-being of present and future generations a clean and green environment is essential. Environmental degradation caused by improper solid waste management has emerged as global concern due to rapid urbanization, changing lifestyles, industrialization revolution and economic growth. It has drastically increased the bulk amount of inorganic materials in waste. At the 30th United Nations Climate change Conference (COP30), highlighted that at present waste has becoming a serious global threat to environment due to improper urban waste management. As India's population increases, urban areas expand and consumption habits change it produces bulk waste. Recent survey shown that the country produces around 170,000 tons of municipal solid waste in every day (Rout,2026) . India's current solid waste generation rate is 0.34 kg per person daily, with projections indicating it will rise to 0.7 kg per person daily by 2025. At that time, India is expected to overtake Germany, Japan, and Brazil, which presently occupy the 4th, 5th, and 6th rankings in waste generation (Clean India Journal 2025)

Solid waste management can enhance environmental sustainability. Improper disposal of solid waste can lead to significant repercussions for our ecosystems. The buildup of solid waste can also affect public health, resulting in chronic illnesses. Awareness on different solid waste and its proper management is important for well-being of a society. An informed individual who understands the underlying principles of solid waste management are actively participate and support the governmental initiatives and inclined to works together for effective and sustainable waste management (Margate &Padilla,2025).

Today, we are living in a digital era, with a fashion of use and style without knowing its harmful causes and it effects our environment as a whole. Awareness is essential to protect our environment. Everyone should aware of the current environmental issues and problems arises from generation of solid waste. Educational institutions play a very crucial role in understanding different environmental concepts and create awareness and environmental values to protect the environment. As undergraduate students are future leader of a society and they play an important role in maintaining a clean and green campus through their awareness and practices related to solid waste management. It is necessary to teach upcoming generation about current environmental status and to work together to find out solutions to the current environmental problems.

2. REVIEW OF RELATED LITERATURE:

1. Molina and Catan (2021) conducted a study on Solid waste management awareness and practices among senior high school students by applying descriptive quantitative approach. The result of the study found that students had enough knowledge on solid waste management. Although they had insufficient knowledge on different laws pertaining to solid waste management practices but they shown good solid waste management practices in terms of segregation, reduction, reuse, recycle and disposal.
2. Nawawi; et.al. (2022) investigated on awareness and practices on municipal solid waste management among students at university. The findings of the study shown that their awareness on MSWM was high but their practices on municipal solid waste in terms of segregation were average, while regarding reduce and reuse practices were both high. This study also observed a strong relationship between awareness and practices of municipal solid waste management.
3. Diestro (2022) explore students awareness and practices towards solid waste management. This study found a significant relationship between awareness and practices of solid waste. However, this study also observed that students were aware of solid waste management policies and protocols but they in general moderately practice solid waste management.
4. Paul and Daniel (2024) investigated students awareness of solid waste management practices by using mixed method approach. This study observed a potential gaps between environmental awareness, understanding and implementation of solid waste management practices.

3. NEED OF THE STUDY:

In today's world due to population growth, change in lifestyles of people, increased in use of plastic and rising consumption, Solid waste has become a serious threat to environment. Educational institutions, especially colleges and university generate a large amount of solid waste in various forms like paper, plastic, food waste and electronic waste. As a large proportion of educational institution's population

consists of students and their daily activities greatly increase the amount of waste produced. Although, many students have a general awareness of different environmental issues but is does not necessarily lead to effective solid waste management practices. This creates a gap between what students know and what they actually do. Examining undergraduate student's awareness and practices regarding solid waste management is important, because this period significantly influence in shaping their long-term habits. It also helps in identifying issues and challenges they face in managing solid waste and provide direction for meaningful environmental education and campus-based initiatives. Therefore, it is paramount for undergraduate students that enable them to follow the guiding principles of solid waste management like: prevent, reduce, reuse, recycle, recover and dispose.

4.OBJECTIVES OF THE STUDY:

i. To assess the level of awareness regarding waste management among the undergraduate students.
ii. To examine the waste management practices followed by undergraduate students in their daily life.
iii. To assess the institutional best practices adopted for solid waste management in their institutions.

5.DELIMITATION OF THE STUDY:

This study is delimited to the college students of Four Year Undergraduate Programme (FYUGP) affiliated to Gauhati University, Assam.

6.METHODOLOGY OF THE STUDY:

The investigators have employed descriptive survey method. The study has been conducted on 100 undergraduate students of Four Year Undergraduate Programme(FYUGP), which are randomly selected from different colleges affiliated to Gauhati University. For the collection of the data from the undergraduate students the investigator has used a structured questionnaire with 25 close ended questions. Secondary data from websites and journals also used for this study.

7. DATA ANALYSIS & INTERPRETATION:

The present study titled, 'Green Environment, Clean Campus: Awareness and Best Practices of Solid Waste Management among Undergraduate students' aims to asses awareness and practices of solid waste management among undergraduate students. The study also aims to find out issues and challenges faced by undergraduate students in their campus. The findings of the study are discussed according to the mentioned objectives:

Analysis and Interpretation of objective No.(i): To assess the level of awareness regarding solid waste management among the undergraduate students.

For objective No.(i), the data is analysed using descriptive statistics and percentage analysis to interpret the responses collected through the structured questionnaire. The analysis of level of awareness regarding solid waste management data is presented below:

Table 1: Distribution of responses on awareness of Solid Waste Management

SL NO.	Statement	Strongly Agree(%)	Agree %	Neutral %	Disagree %	Strongly Disagree%
1.	For sound and sustainable environmental proper management of solid waste is important.	47.5	35	15	2.5	0
2.	Protection of the environment and management of solid waste is the only responsibility concerned authority not our own.	5	12.5	12.5	32.5	37.5
3.	Improper collection and disposal of solid waste effects the health of the people.	47.5	35	12.5	5	0
4.	Segregation of solid waste plays a very crucial role to reduce environmental pollution.	46.2	30.8	12.8	10.2	0
5.	Education on proper household solid waste management practices in school level, campaigning, public education is an effective way to manage solid waste efficiently.	52.4	32.6	10.8	4.2	0
6.	Reduce, re-use and recycling the solid waste help to reduce non-biodegradable waste like plastic, glass, metal etc.	42.5	45	9.03	3.47	0
7.	Government should educate, train and create awareness on proper solid waste management practices.	65	35	0	0	0

The analysis of the data reveals that majority (82.5%) of the students either strongly agreed and agreed and very few students (2.5%) reported disagreed that for sound and sustainable environmental proper management of solid waste is important, also majority (70%) of the respondent dot not believe responsible responsibility of protection of the environment and management of solid waste only concerned authority. A very high majority (82.5%) of the respondents reported that segregation of solid waste plays a very crucial role to reduce environmental pollution. (87.5%) of the respondents strongly agreed or agreed that reduce, reuse and recycling helps to reduce non-biodegradable waste. In addition to this, all the respondents strongly agreed or agreed that Government should educate, train and create awareness on proper solid waste management practices.

Analysis and Interpretation of objective No.(ii): To examine the waste management practices followed by undergraduate students in their daily life.

For objective No.(ii), the data is analysed using descriptive statistics and percentage analysis to interpret the responses collected through the structured questionnaire. The analysis and interpretation of the data on practices of solid waste management data is presented below:

Table 2: Distribution of responses on practices of Solid Waste Management

SL.NO.	Statements	Always %	Sometimes %	Never %
1.	Do you segregate solid waste as biodegradable and non-biodegradable waste?	31.7	39	29.3
2.	I throw waste material in open dump on the street.	0	32.5	67.5
3.	I bring water in reusable water bottles than buying water in one used plastic bottles at the college.	47.5	37.5	15
4.	I throw my garbage anywhere when there are no dustbins nearby.	8.5	22.5	69
5.	I reuse my old materials than buying a new one.	42.5	52.6	4.9
6.	I reuse washables food containers.	75	20	5
7.	I convert or redesign waste materials into a new product.	20	65	15
8.	I ignore the importance of 4R's principles (Reduce, Reuse and Recycle, Recover) of solid waste management.	2.5	25	72.5
9.	I burn waste materials.	7.5	67.5	25
10	I make decors out plastic wrappers and other waste materials.	17.9	53.8	28.3

From the table.2 it is observed that (39%) of the respondent reported sometimes and (31.7%) of the respondent always of segregate solid waste as bio-degradable and non-biodegradable waste. Majority of the respondents (67.5%) reported never and few of the respondent (32.5%) reported sometimes throw their waste material in open dump on the street. In addition to this, (47.5%) of the respondent always brought reusable water bottle than buying a new one. (69%) of the respondents reported never throw their garbage anywhere when there are no dustbins nearby them. Majority of respondent (52.6%) sometimes reuse their old materials than buying a new one and 4.9% of the respondent never reused their old materials. About (75%) of the respondent always reuse washable food containers and majority of the respondent (65%) respondent sometimes convert their waste material into a new product. The majority of the respondents (72.5%) never ignore the importance of 4R's principles (Reduce, Reuse and Recycle, Recover) of solid

waste management but few respondents (25%) sometimes ignore it while about (67.5%) of the respondent sometimes burn their waste materials. However, almost (53.8%) sometimes make decors out plastic wrappers and other waste materials and 28.3% never did this.

Analysis and Interpretation of objective No.(iii): To assess the institutional best practices adopted for solid waste management in their institutions.

For objective No.(iii), the data is analysed using descriptive statistics and percentage analysis to interpret the responses collected through the structured questionnaire. The analysis and interpretation of the data on best practices adopted for solid waste management in their institutions are presented below:

Table 3. Distribution of responses on best practices of Solid Waste Management in their institution

SL.NO.	Statement	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly Disagree%
1.	Separate waste bins are provided across the campus.	35	30	22.5	12.5	0
2.	My institutions regularly collect and dispose of waste properly.	20	61.5	16.5	2	0
3.	Awareness programmes on waste management are conducted by the institution.	20	50	15	12.5	2.5
4.	Waste bins are clearly labeled for segregation.	17.5	50	17.5	12.5	2.5
5.	My campus promotes on eco-friendly and plastic free practices	32.5	45	15	4.5	3
6.	Composting or recycling practices are followed on campus.	22.5	35	30	9	3.5

From the table.3 it is observed that majority (65%) of the respondents reported strongly agreed or agreed and also (22.5%) remains neutral on Separate waste bins are available across the campus. Almost (70%) of the respondent either strongly agreed or agreed and few respondents (22.5%) remain neutral that their institutions regularly collect and dispose of waste properly. Although, majority of the respondents (67.5%) reported strongly agreed or agreed and almost (15%) reported disagreed or strongly disagreed that waste bins are clearly labeled for segregation in their campus. Regarding awareness programmes on solid waste management conducted by institutions (77.5%) of the respondent reported strongly agreed or agreed and (15%) of the respondent remained neutral. Majority (77.5%) of the respondent reported strongly agreed or agreed that their campus promotes on eco-friendly and plastic free practices and (57.5%) and (30%) of

the respondents reported strongly agreed or agreed and neutral respectively regarding composting or recycling practices are followed on campus.

Apart from these, investigator has included two questions, one is related to major problems they face in practicing solid waste management and it is observed that 42.5% respondent reported due lack of awareness, 40% respondents reported due to Lack of facilities and 17.5% respondents reported due to lack of attitude and motivation. Another question is related to segregation of solid waste and it is observed most of the respondents i.e. 42.5% reported due to lack of facilities, 37.5 % reported due to lack of awareness and 20% of the respondents reported due to lack of attitude and motivation.

8. DISCUSSION:

The descriptive statistics and percentage analysis reveals that the undergraduate students posses high level of awareness on solid waste management. It also revealed that majority of the students are responsible towards protection of environment and solid waste management. Apart from this most of the students agreed that following principles of solid waste management can reduce waste generation. However, despite their satisfactory awareness, actual engagement in solid waste management practices relatively low due to lack of adequate facilities, awareness, attitude and motivation, they faced problems in practicing solid waste management and it discourage them to segregate and follow the principles of solid waste management.

9. SUGGESTIONS:

Based on the analysis and interpretation of the data, the following suggestions are drawn:

1. Integrate the concept of solid waste management practices in their curriculum across all disciplines. Importance should be given practical components such as field visits, project-based learning, waste reduction, waste segregation, recycling etc. to promote sustainable behaviours among them.
2. Educational institutions can take proactive steps like – organizing workshop, seminar, lectures by environmental experts and observance of world Environment Day, Swach Bharat Abhiyan to create awareness and develop positive attitudes on solid waste management among undergraduate students.
3. Proper facilities encourages students to practice principles of solid waste management consistently. So, Educational institutions should provide adequate facilities like clearly labelled colour coded bins for waste segregation wet, dry and electronic waste.
4. Educational institutions should conduct training programs on ‘waste to best’ concept, which emphasizes transforming waste into useful and valuable products. This program could cover topics such as composting biodegradable waste, repurposing plastic and paper waste and engaging in creative upcycling projects.

10. CONCLUSION:

This study presents the awareness and practice of solid waste management among undergraduate students. With the aforesaid results, it may conclude that the undergraduate students possess high level of awareness regarding solid waste management and they are responsible towards environmental protection. Results

also revealed that they have enough knowledge regarding the effect of improper solid waste management, principles of solid waste like reduce, reuse, recycling and importance of segregation of solid waste. Although undergraduate students have high level of awareness but their practice of solid waste management is moderate. To create awareness and positive attitude on solid waste management some proactive steps like workshop, seminar, training programs on 'waste to best' concept for transforming waste into useful products and adequate facilities to practice solid waste management consistently are essentials in educational institutions. The findings of the study highlight a clear gap between awareness and practices and it indicates the need for practical exposure.

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