


THE SOLUTION IS LESS POLLUTION: Perception Survey and Assessment of Student and Staff Understanding of Existing Recycling and Solid Waste Management Policies and Procedures at the National University of Samoa

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ABSTRACT

The National University of Samoa (NUS) has progressively incorporated solid waste management elements in policies, guidelines, strategic frameworks and plans. However, as a practice, the university continues to experience low levels of recycling and reusable initiatives while continuing to experience high litter volumes by the University community. The research aims to understand what the University students and staff perceive to be the barriers and building blocks to current waste management practices on NUS campuses. The paper utilises two (2) research methods: a literature review of previous articles on the topic of waste management practices and the use of an in-depth survey collection. The study review of results emphasises the need for raising environmental awareness on campus, improving the infrastructure capacity of the campuses to collect, store and dispose of waste and strengthening the influence of the environmental perception of staff and students through the use of incentives such as financial and voluntary rewards.

1. INTRODUCTION

The world continues to experience an apprehensive growth in the issue of waste. Waste has been identified as a global environmental and social threat to the sustainability of our societies and communities (United Nations Environment Programme [UNEP], 2015). Because waste generation is inextricably linked to the way society produces and consumes, waste management is now underpinned as a component vital to sustainable development efforts. (Hoornweg & Bhada-Tata, 2012). Pacific Island Countries, or PICs, are at the frontline of experiencing the exacerbated impacts of environmental issues. Specifically issues such as waste and pollution (Nunn, 2009; McIver et al., 2016). Pacific Islands rely heavily on large quantities of imported materials, increasing hazardous waste streams such as e-waste, heavy metal and biomedical, used oil and so forth. This combination puts increasing pressure on the Pacific Islands' limited local waste

management system, fragile ecosystem, and capacity to appropriately treat or dispose of waste. (UNEP, 2015). As many Pacific economies rely heavily on the environment (agriculture, tourism, fisheries), the issue of waste and pollution will continue to threaten the livelihood of many Pacific Islands (Secretariat of the Pacific Regional Environment Programme [SPREP], 2016).

In recent years, waste has become recognised as a critical environmental priority area in Samoa on national and local levels (Ministry of Finance [MOF], 2021). On a higher educational level, the National University of Samoa (NUS) presents an ideal focal point for implementing solid waste management practices. One of the NUS (2021) Strategy 2030 enterprise capabilities is to promote environmental sustainability efforts through its 'safe and sustainable campuses' theme. Following efforts by the University to support this enterprise, NUS proceeded to develop relevant policies such as a Recycling Solid Waste Management policy and a Litter-Free Campus policy, which led to the acquisition of general waste bins and recycling cages for plastic and aluminium. In addition, a Centralised Storage Facility was endorsed and constructed to house three segregated sections (general, plastic and aluminium) for waste storage on the main Campus. However, the perception of staff and students toward waste management, particularly at the Higher Education level, seems to be an understudied topic. The majority of research is concentrated on the significance of waste management, development of waste management strategic frameworks, guidelines or plans, and producing waste audit reports (Feeney, 2008; Vargas & de Souza Campos, 2020; Budihardjo et al., 2021). This research proposes to survey the perception of staff and students on recycling and solid waste management policies and procedures in the context of the NUS. Based on this, the following survey sought to answer the following research question: *What are some of the perceived barriers to and opportunities for recycling and solid waste management policies or procedures on NUS Campuses?*

The objectives of this research include:

- a) Desktop assessment of current literature to review approaches by other universities to address the issue of waste and implement effective waste management;
- b) Use of perception survey to evaluate and assess awareness of waste management practices on NUS campuses and driving factors behind behaviour or attitude towards waste management; and
- c) Identification of barriers to and opportunities for existing waste management policies or procedures on the NUS campuses.

2. LITERATURE REVIEW: WASTE MANAGEMENT IN SAMOA AND THE PACIFIC

Recycling and Solid Waste Management is a relatively new concept and practice within the context of Higher Education and Post-Secondary Education and Training (PSET) institutions worldwide. The movement is so recent that universities such as the Technological University of

Panama (2017), University of Salford (2018), Northwestern University (2018), Swansea University (2018), University of Edinburgh (2018) and Lancaster University (2017) have all launched their first waste management plans between the years of 2017 and 2018. Other universities, such as the NUS (2020), Cambridge University (2017) and Hebron University (2014), have taken a more precautionary approach by launching “Interim” plans first. The interim plans are more flexible as they are designed with the essence of being experimental and pilot in behaviour, timeline and expected outcomes. In the South Pacific region, a very limited number of universities have waste management plans or policies, with the overwhelming majority being metropolitan-based (Groves & Naz, 2020). This suggests that recycling and solid waste management policies and procedures within the context of higher education and PSET are recent endeavours at the global and regional levels. This further goes on to propose that data and research conducted on the behaviour and perceptions of students and staff within the context of higher education and PSET institutions are equally limited. In narrowing the research scope within Samoa and the NUS as a setting, the literature is even more limiting.

Waste management policies and initiatives within Samoa are only prevalent at the national Government level. Samoa is led by its National Waste Management Strategy 2019 – 2023, which gained legislative authority from the Waste Management Act 2010 and the Government of Samoa National Waste Management Policy 2001. Samoa does have other related legislations on medical and hazardous waste, which are for single-use-based mechanisms rather than mechanisms available to the public to manage recyclables and solid waste. Within the private and non-government entities, the movement for recycling and solid waste management is very recent, with few legislative initiatives at the corporate level. The Samoa Recycling and Waste Management Association (SRWMA), established in November 2017, consists of private companies and non-government organisations. SRWMA is the first association of its kind within the South Pacific Island region (SPREP, 2017). In 2021, Samoa’s second recycling association, the Samoa Tokelau Association of Recyclers (STAR), was established (Membrere, 2021). Although Samoa may have two recycling associations, the membership span and influence are limited to mainly donors, international corporations, and a small number of local businesses (Samoa Global News 2022; UNEP, 2017; and RNZ, 2017).

In terms of education institutions in Samoa, solid waste management and recycling practices at primary, secondary and PSET levels are not influential and are barely visible around the country (Feeney, 2008 & Groves et al., 2020). Although the National Waste Management Strategy (2019) for Samoa references the Government's ambitions to introduce waste management into school curriculums, not much progress has been made since the plan’s initiation in 2018 (Ministry of National Resources and Environment [MNRE], 2018). It seems as if the Government is heavily reliant on the private sector and recycling associations to implement recycling infrastructure and

initiatives within public and school environments. Perhaps the most active education levels in Samoa are higher education and PSET, with both the NUS and the University of the South Pacific actively promoting and investing in recycling and solid waste management infrastructure (PRESS, 2021). Since the establishment of the NUS, several initiatives have been implemented to address the general disposal and segregation of waste. Although these initiatives were well intended, they lacked strategic direction and sustainability. This is stated in the Interim Management Plan 2020–2021: ‘Other than the existing cooperate procedures and operational collection, storage, and transportation of waste, the waste management of the NUS has never been addressed in formal writing or policy in the past. All past and existing efforts to address waste management at the NUS have been conducted in the form of projects and donations that are not direct results of NUS policies, strategies, and plans.’ In April 2022, the NUS approved and published its ‘Recycling Solid Waste Management Policy’, which is the first of its kind in the country (NUS, 2022). In terms of research into waste management, NUS's existing research and literature are limited to waste audits and student behaviour analysis. This paper attempts to address student and staff perceptions of barriers and opportunities to waste management practices on campus.

3. METHODOLOGY

This research is a mixed method of qualitative and quantitative study. Qualitative research is described by Denzin and Lincoln (1994 cited in McLeod, 2017) as a multi-research method which involves an interpretive, naturalistic approach to its subject matter. The qualitative study includes the consolidation and explanation of the data by making sense of data in the form of the participants’ definitions of the situation (Cohen, 2007). Therefore, this research uses existing research literature (international, regional organisational reports and publications, and relevant academic literature) as its qualitative method, selected from online databases (Google Scholar, EBSCO). In comparison, quantitative study is centred on gathering and investigating numerical data to explain a particular event (Babbie, 2010). Cohen (2007) suggests that quantitative research is ‘often associated with large scale research but can also serve smaller scale investigations’ such as case studies. This data will be collected through an in-depth survey collection and analysis with key participants. Cohen makes it clear that ‘validity is an important key to effective research’ because invalid information will make it worthless (Cohen, 2007). Thus, the research data collection methods must be appropriate to the study. The research methods are divided into two phases. Phase one focuses on the research literature approach. Phase two consists of a survey and results analysis.

Phase 1

3.1 Research Literature

Research Literature is described by Prior (2003 cited by Cohen, 2007) as the appropriate method in ‘rendering more visible the phenomena under study’. This type of research has several advantages, making it a reliable and valid qualitative data research method. It gives researchers

admission to events and data otherwise inaccessible to the researcher. Cohen (2007) states that research literature is appropriate in 'longitudinal analysis, as it may show how situations have evolved over time'. The only weakness in this method, according to Cohen (2007), is that 'it is often difficult to disentangle fact from interpretation in a document'. This is because the literature analysed in this research varies from formal to informal, published to unpublished, and public to confidential documents, thus making it challenging to determine opinion from fact.

Phase 2

3.2 Online and Paper Survey Questionnaire

According to Kvale (1996 cited by Cohen, 2007), a survey is an interchange of views between two or more people on a topic of mutual interest'. One of the risks of using the survey method is the possibility of bias and false information (Cohen, 2007). To prevent bias and false data, the survey participants were selected, and the questionnaires were designed based on the data collected from the research literature. The number and 'type' of survey participants in this study was determined by the deficits in the information provided by the document analysis. The participants were selected through simple random sampling, as the population was pre-determined to target the university staff and students, but participants were selected at random within a desired population sample size, giving all a fair chance of being selected (Bhardwaj, 2019). The questionnaires were designed in the same manner to address the gaps in the data collected and further strengthen and differentiate between the opinions and facts. Cohen (2007) states that to validate the accuracy of the interview 'is to compare the interview measure with another measure that has already been shown to be valid'. Cohen (2007) further adds that 'if the two measures agree, it can be assumed that the validity of the interview is comparable with the proven validity of the other measure'. Hence, in this study, the survey data collection method is part of phase two, which allows analysis and comparison between the findings of the three data collection methods to eliminate possible bias, false or misinterpreted findings.

4. DATA COLLECTION: Survey 1

This paper's case study is based on the main campus of NUS, the Le Papaigalagala Campus, and focuses on two population cohorts. The NUS has emphasised environmental sustainability components through relevant plans such as its Corporate Plan 2021/2022 – 2024/2025 and the NUS Strategy 2030. These documents act as a guide for sustainable efforts initiated by the NUS, which include waste management initiatives. The target population were NUS staff members and students. The survey data was collected through two avenues: online and in-person. One-quarter of the total number of students enrolled and staff employed was the threshold chosen to conduct the survey. Therefore, the number of staff who undertook the survey totalled 45 out of 400, and this was collected online through Google Forms and in person from those who did not have access online. The student survey results were collected in person. The number of students who

responded to the survey was 703 out of the approximate 2,850 students enrolled in semester two of 2022. The survey presented two sections - a multiple choice and a short answer. Data was then collated according to common themes of awareness, assessment and behaviour of the participants towards waste management practices on campus, assessing the motive behind why they do or do not carry out these practices on campus.

4.1 Limitations

The process of data collection was constrained in the initial planning stages of this paper. It was perceived as beyond the capacity of the research team, comprised of only four members, to collect data from the whole student population of 2,850, as referenced above. Therefore, the team opted to target approximately a quarter of the student population and staff members, who became the focus group of this research. Due to the limited number of personnel to assist with collating data, the team collaborated with the students from the Faculty of Science in the undergraduate programme. As part of their assessment, the students significantly supported the data collection and compilation. In return, they gained valuable hands-on experience in data collection, which could contribute to their current studies and broaden their future employment opportunities. Two students, particularly involved in the data compilation, were awarded subsistence allowance through financial support from the Australian Volunteers Impact Fund. Lastly, the low level of staff and student participation further delayed the data collection and analysis process as it took additional extensions to collect data to reach the required number of students and staff to accurately inform the research.

4.2 Findings

The participants indicated a mix of perceptions on campus on the topic of solid waste management and recycling. Participants also identified what they believed were key barriers to address waste management and what potential opportunities may be there to improve the waste management of the University. In summary, there seems to be a general understanding and recognition of waste management efforts taking place on campus. However, proactiveness and taking ownership of the space is still an area that requires extensive improvement amongst campus-goers for these efforts to be successful. The findings of this study have been divided into two parts: Part one discusses the tick box-based questionnaires, and part two the short answers. This survey is compartmentalised into four (4) common thematic topics for analysis, as many of the barriers and opportunities identified by the staff and students can fall into these categories. These include Awareness, Assessment, Behavior, and Attitude.

4.2.1 Part One: Tick Box Questionnaire

a. General Awareness

Part one of the research categorises the survey into four (4) sections, with their own set of statements participants can respond to with: 'strongly disagree', 'disagree', 'strongly agree' or 'agree'. However, some respondents chose not to respond. Waste management is a critical issue that affects our environment and society as a whole. The term *awareness* is generally defined as "*knowledgeable being conscious; cognizant*" or the "*state or ability to perceive, to feel, or to be conscious of events, objects or sensory patterns*" (Gafoor, 2012, p. 2). Simply put, it is the state or quality of being aware of something. In a university setting, it is essential to raise general awareness about waste management practices. The first section analysed the general awareness of selected groups, which are students and staff members, on their understanding of solid waste management. Overall, 89% of students and 92% of staff members demonstrated an understanding of the term 'Solid Waste Management'. About 92% of students and 98% of staff believe waste to be an issue with dangerous environmental and health impacts.

Although there was an understanding of the major impacts of waste on the environment and health, not all agreed that it was a significant issue on the campuses. Only 88% of the student cohort, compared to the 96% of staff seemed to agree that waste is a major problem at the NUS. Approximately 90% of students and 92% of staff are aware of the no smoking, no littering and recycling enforcement on campus. 100% of staff members agreed that waste management is a problem that the University has to pay more attention to, whereas 92% of students shared the same sentiment. From the percentages presented, there is an assumption of great awareness amongst both the students and staff groups around the topic of solid waste management and recycling. The numbers are significantly positive, especially as raising awareness is a vital component for increasing collective effort by the NUS to address problems such as waste generation.

b. General Assessment

A simple definition of *assessment* is derived from the Cambridge Dictionary online, which defines assessment as "*an act of judging or deciding the amount, value, quality or importance of something*" (Cambridge Dictionary, 2023). In this context, the section of general assessment lists several statements to provide an overall review or rating of the *quality* of recycling facilities and the *importance* of Solid Waste Management and Recycling information provided by the NUS for its community. The participants were mainly questioned on their knowledge of understanding how to use the different facilities in place (general bins, aluminium cages (plastics and aluminium), which are appropriately labelled and placed strategically throughout the campus. According to the survey results, 63% of staff believed that the recycling facilities were conveniently located within the NUS facilities, while 79% of students also agreed with this statement.

When it came to assessing whether the NUS provided adequate information about solid waste management, there was a similar percentage of responses from both participant groups, as only 58% of students and 48% of staff agreed with this statement—indicating that there seems to be limited information provided on campus. With regards to practising waste management on campus by using existing facilities, about 79% of students and 84% of staff agreed that they practice this. Another statement evaluated the knowledge of these groups on the usage of recycling facilities, whereby 76% of staff and 80% of students claimed that they are knowledgeable when it comes to using these facilities. When queried on whether they use existing facilities appropriately, according to the type of waste, about the same proportion claimed to practice this, about 76% for staff and 75% for students. However, this leaves approximately 24% or 25% of other users who do not utilise the facilities appropriately.

c. Personal Behaviour

This section assessed respondents' behaviour towards waste management. *Personal behaviour is generalised as an implication of the conduct, action, or reaction of a person towards something or someone.* In which a “single behaviour is determined by the intention to perform the behaviour in question” (Ajzen & Fishbein, 1977, p.1). It is often referred to as the outward expression of one's attitude, influenced by other factors such as environmental action or stimulus (Ajzen, 1989). The personal behaviour of students and staff towards waste management plays a crucial role in ensuring a cleaner and healthier environment. For staff, 87% and about 81% of students claim to be committed to recycling. Approximately 84% of students and 89% of staff members have stated that practising recycling gives them a sense of happiness and well-being. With a similar number, staff claimed to recycle personal items and recycle at home. However, there was a division among the students regarding implementing this practice. About 59% claimed to do this but the other 40% proportion of students do not practice this. An approximate 77% of students and 82% of staff practice recycling at home. When it came to assessing whether these groups have the time or access to facilities off-campus, 80% of staff and 71% of students claimed that they have time to recycle. About 50% of staff agreed that they lack access to such facilities off campus. However, only 23% of students agreed that they lack access outside of campus grounds.

People are often motivated in their conduct of waste management when there is a clear approach and solution that can be taken with positive outcomes (Zurbrügg et al., 2014). Individual conduct towards waste, therefore, becomes less about an obligation and difficulty and more about individual and collective responsibility. Both staff and students indicated varying responses to the different questions posed in this category. While some agreed that recycling has a positive impact on their sense of well-being, a major barrier seems to be the accessibility to recycling facilities outside of the campus. Both groups demonstrate an understanding of how waste management and recycling have a positive impact on the environment and future

generations. Interest and time are important variables that should be considered when assessing the attitude of relevant participants toward waste since it takes time and interest in waste management to influence one's standpoint on the matter. It is a gradual but long-term investment, as time and interest could also serve as significant barriers that prevent change in one's attitude towards a particular action (Putrantomo et al., 2021).

4.2.2 Part Two: Short Answers

In part two of the research survey, respondents were given an opportunity to provide short answers on their perception of barriers and building blocks or opportunities for effective waste management on campus. Participants were also asked what actions they would like NUS to take to address this issue on campus. Both groups were asked to identify the main reasons for the lack of effective recycling and the building blocks that can potentially improve waste management on the NUS campus.

a. Barriers

Both group participants were asked, *“What are some barriers you face or what stops you from recycling/reusing/reducing waste?”* The majority of responses from staff agreed that the lack of facilities (cages/general bins) or resources (finances/expertise) to encourage recycling, reusing or reducing waste served as a major barrier to practising waste management. In fact, approximately 52% highlighted this as a key issue in terms of the unrepresentable, inconvenient or inaccessible placement of facilities. Some staff members identified a significant lack of facilities to cater to the volume of waste generated on campus. Another major barrier that staff highlighted was the lack of awareness or understanding (20%). As staff believe not enough is being done or promoted on campus to illustrate the NUS commitment to waste management. Only 13% of staff admitted that lack of motivation prevented them from practising waste management. For students, the barrier they mostly identified was their own lack of motivation. About 23% agreed that they see no value or purpose in recycling or that laziness is a major factor that prevents them from using bins correctly or at all. Students also highlighted that the lack of facilities or resources (20%) served as a major barrier. Only 18% of students believed that the lack of awareness was a barrier. Please refer to figure 1 below for reference:

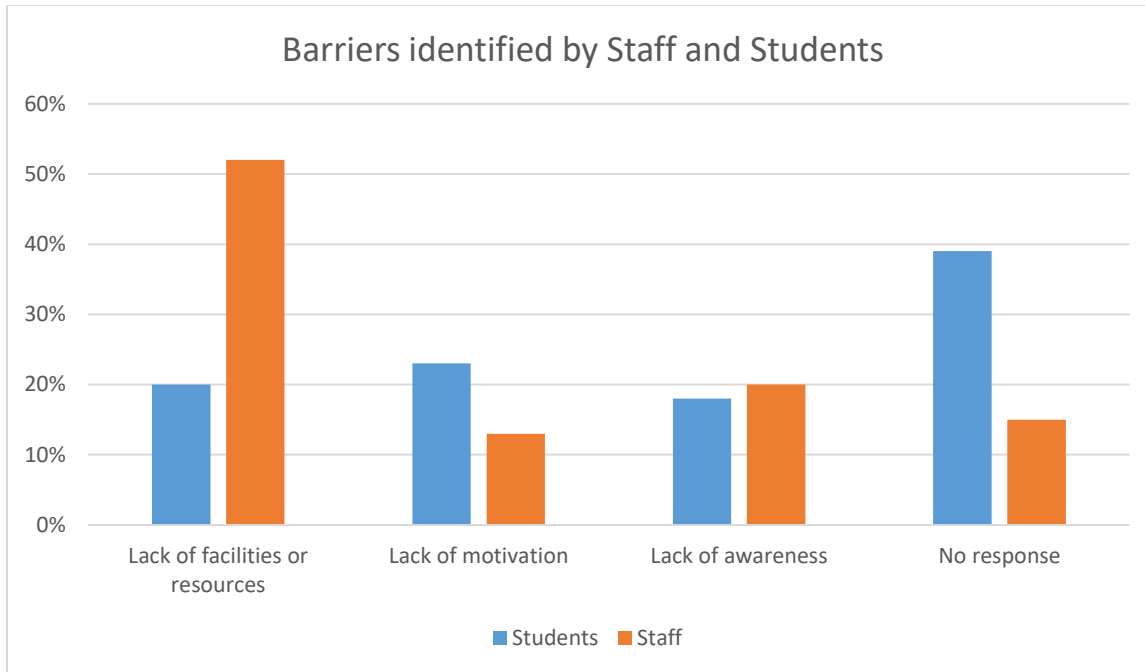


Figure 1: Barriers that prevent staff and students from practising waste management

b. Opportunities

Participant groups were asked, “What are some ways that will motivate you to recycle/reuse or reduce waste?” Both groups highlighted the same opportunities that would encourage them to practice waste management on campus. Staff highlighted the need for contributive incentives to propel motivation (48%). For students, about the same percentage (40%) agreed that contributive incentives should be incorporated in practices on campus. Participants emphasise that for campus-goers to take collective responsibility, an incentive is needed. This could be through educational competitions, community work, or creative recyclable or reusable initiatives on campus. About 33% of staff and 29% of students emphasised the need for educational programmes or training to raise awareness for waste management and recycling on campus, highlighting the use of social media platforms to spread awareness or through informative posters, signages, etc. Approximately 19% of staff and students highlighted the need for more conveniently placed facilities. Therefore, clear instructions on types of rubbish that need to be segregated and recycled should be clearly labelled on the different bins, and such bins should be placed strategically, as well as these facilities strategically placed for convenience and accessibility. Refer to the graph below for reference on opportunities:

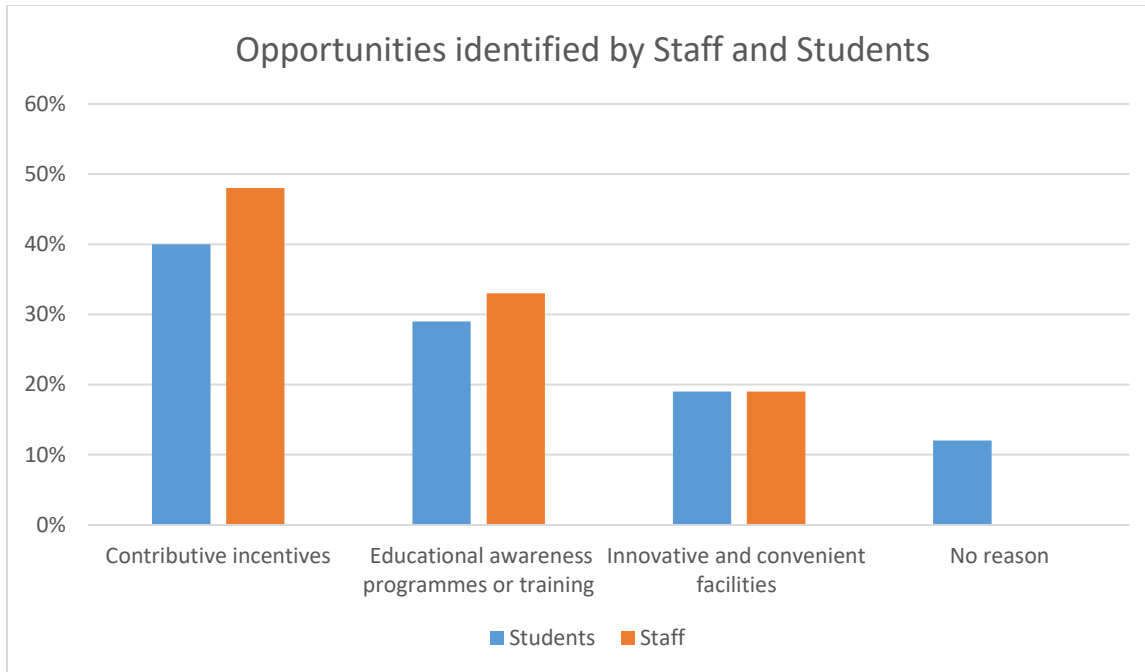


Figure 2: Opportunities that motivate staff and students to practice waste management

c. NUS Action

The staff and student participants were also asked, “How the University can better improve recycling or reducing waste on campus?” The majority of staff and students suggested they would like for the NUS to action more awareness and advocacy of waste management on campus. The students (47%) highlighted that the staff should be role models and ambassadors to take the lead for students and the general public. Students also suggested a more authoritarian approach, which includes implementing rules and regulations or enforcing strict penalties for those who litter. Staff mostly suggested promotional activities, workshops and campaigns that need to be implemented on campuses. 61% of staff recommended this action. Coming in second to this, both staff (28%) and students (36%) would like to see more facilities exist on campus. Students mostly emphasised that more facilities are needed to be placed in convenient and accessible locations. Staff also suggested the same actions should be taken.

Lastly, both group participants suggested that seeing more contribution incentives on campus can motivate or create change in the behaviour and attitudes of staff and students. Through a collaborative approach to initiating waste management practices. This can simply be done by organising a NUS clean-up day of the whole campus, working alongside the NUS custodians responsible for handling waste. Another contributive suggestion by group participants was to ensure clean and consistently emptied bins which are visually pleasing and motivate them to use them well. About 11% of staff and 10% of students suggested this action.

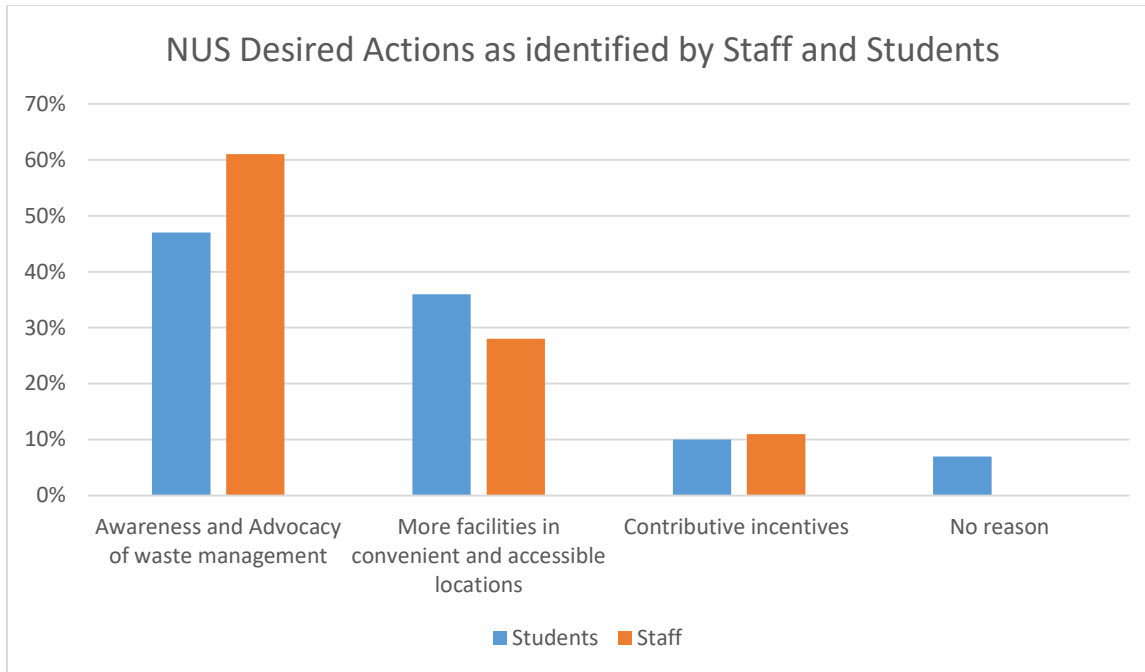


Figure 3: NUS Desired Actions Identified by Staff and Students

5. DISCUSSION

Below are the discussions of this paper:

5.1 Raising Environmental Awareness

Awareness raising has been identified as one of the driving factors for behavioural change in a targeted audience towards a certain idea or issue. Sayers (2006) highlights four (4) components of effective awareness raising, which should be defined and described in any planning of an awareness campaign: 1) Message, 2) Audience, 3) Strategy, and 4) Timing. These components should be supported by various approaches that fit the context of the targeted audience. Studies have shown that awareness raising can be done via informative methods or through advocacy methods, which the NUS can adopt and implement (Mulholland et al, 2019). Based on these findings, it is recommended that the University adopt a participatory approach using a mix of informative and advocacy methods. The participatory approach is a popular means of achieving sustainable development in various areas through effective engagement of stakeholders at all levels (Asian Development Bank [ADB], 2004; Zurbrügg, Caniato, & Vaccari, 2014; United Nations Economic and Social Commission for Asia and the Pacific [UN ESCAP], 2019). A participatory approach gives NUS the opportunity to gain valuable insight from relevant stakeholders on how NUS can better improve their waste management practices and processes. But also ensure that accurate and in-depth data is shared with stakeholders on the impacts of successful waste management and recycling. The approach is meant to be a two-fold solution to empower people

to take responsibility for this waste issue and transparency for actions implemented by the NUS to support waste management.

The University has already implemented the informative method through the installation of awareness signages and posters but also through the developed and implemented NUS Waste Management Plan (WMP) 2022/2023 – 2025/2026 (NUS, 2023). The NUS have existing waste management courses that students can undertake as well. However, the University can benefit greatly, by integrating waste management in the primary and secondary level of education. Therefore, it is highly suggested that a collaboration with the Ministry of Education, Sports and Culture or MESCC, and community organisations is crucial in promoting sustainable practices like waste segregation from an early age. Implementing educational programs that teach children about the importance of recycling will create future generations that value environmental responsibility. In addition, the University should consider developing a clear Monitoring and Evaluation framework for meeting targets outlined in the Waste Management Plan. The M&E framework is an integral tool for ensuring the effective operation of waste management initiatives on NUS campuses (Markiewicz & Patrick, 2016). The advocacy method takes on a more active approach towards raising awareness. To indicate vocally and effectively, the actions being implemented by the University to support a cause. In this case, advocacy for waste management practices on the NUS campus can help create a positive change in people or transform services that affect the overall well-being of certain people or audiences. The NUS, through externally funded projects like the Australian Volunteer Impact Fund, has initiated two awareness programmes on waste management through talk shows, having competitions, training and workshops in the years 2022 and 2023 (Smith, 2022a; Smith, 2022b). Despite this, motivation amongst staff and students continues to be low. NUS can take this as an opportunity to build upon these training and workshop programmes, by prioritising or allocating funding for waste management practices on campus. Furthermore, being consistent with keeping people actively informed of waste audit reports and goals to track the rate of reducing waste generation or increased recycling.

5.2 Strengthening Infrastructural Capacity

A study conducted at the University of Southampton indicated the significance of sustainable waste management and its growing importance within Higher Education Institutions. The study summarised vital actions that can lead to sustainable waste management. One of these highlighted factors is the development of infrastructure and relevant services (Zhang, 2011). The staff and students emphasised the lack of available facilities or infrastructure to tackle waste generation. This is a prevalent issue across Pacific Island Countries that share common features such as a smaller scale, remoteness, narrow economic base and being a major import-based nation. These are all contributing factors that hinder the progress of PIC in development. As such,

it is expected that waste management is an essential initiative but Pacific Islands are limited in providing a wide-scale variety of such services (Dever, Every & Egis Consulting Australia, 2002; SPREP, 2006). However, the NUS has made progress in separating existing recyclables such as plastics and aluminium and general waste. So far, the University has been able to purchase 40 each of these cages to separate the recyclables and additional general waste bins. A root problem identified is not necessarily the lack of facilities, but more so, the inconvenience and inaccessibility of these facilities. The practice of waste management can only be further encouraged if there are available means for the people to do so.

The infrastructural capacity of the NUS plays a key role in formalising plans to manage waste. Recycling facilities are increasingly important components of waste infrastructure, which are essential for reducing the amount of waste that gets sent to landfills while preserving natural resources (Kanatas, 2023). A major barrier faced on the national level reflects this same issue raised on campus. The collection, segregation and disposal facilities' inadequacy result in constraints for the government or NUS to provide effective waste management services. Such a challenge indicates the financial constraints of Samoa to cater to this need. The areas of need for a nation determine the allocation of funding. However, the Pathway for the Development of Samoa or PDS FY2021/22 – 2025/2026 lists as one of their Key Strategic Outcomes: (4) Secured Environment and Climate Change. This highlights the significance of sustainable practices and initiatives by Samoa (MOF, 2021). Under this Outcome, NUS can give more attention to reviewing the long-term risk implications of waste generation and rationalise the need for setting aside funds for this focus area (Takahashi, 2001). However, it is a complex circumstance that is interrelated and affected by national government capacity. But a worthwhile investment that the NUS can gradually incorporate and ensure sustainable funding.

It is suggested through this paper, that the NUS can bring attention to this issue by assisting in raising the visibility profile of the quality of waste management within a small Pacific Island such as Samoa. Small NGOs like SRWMA have done tremendous work, in the practicality of waste management. SRWMA has brought visibility on a national level by connecting with major donors, and private and public partners within Samoa, and on a regional and international scale. In recent years, more waste audits and reports have been conducted by major organisations such as ADB and UN, highlighting these various issues encountered by the waste sector within Samoa (Samoa Bureau of Statistics [SBS], 2019; UNESCAP, 2019; World Bank Group, 2021). It is emphasised in many of these reports, the progress Samoa has made but also the great potential Samoa has, to contribute recyclable material to future recycling activities at a regional level. Based on an assessment by the ADB (2013), it was also stated that in comparison with other Pacific islands, the current solid waste management system in Samoa is well advanced. This supports the

initiatives by the NUS, specifically if the University plans to branch into other forms of recycling, such as paper waste, organic waste, hazardous waste and so forth.

In the context of NUS, it is an opportunity to bridge gaps between the work that these major parties implement by involving the upcoming youth, young adults or students. The campus presents an audience that has the potential to be the front spokesperson of these waste issues and implement it within the campus space before students are exposed to the workforce environment. The idea of building a visibility profile is to show practicality what the NUS is doing to be more proactive in solving or addressing this waste issue on campus. Therefore, it raises the need for strengthening the existence or capacity of the infrastructure available, especially from the segregation, storage, collection, and disposal steps in the process. To do so, the NUS should continue to network and build partnerships with relevant waste industry organisations in order to put waste discussions into practice. The University should also consider the strategic placement of its existing facilities for visibility purposes and ease of access. Ensuring that facilities are maintained and appropriately utilised, lengthens the durability of these facilities and brings more meaning to its use. This is where education is vital to teach students and staff alike the importance of segregation. Therefore, to encourage waste segregation or recycling, it is essential to provide convenient infrastructure, such as separate bins for different types of waste on campuses. In addition, making recycling accessible will make it easier for people to adopt this practice as part of their daily routine.

5.3 Influencing Environmental Perception

A recurring suggestion by both student and staff cohorts is to introduce contributive incentives to bolster motivation and emphasise the benefits of practising recycling and managing waste. Focused towards changing the mindset or perspective that has persisted for years towards waste management, especially in the context of Samoa. Nowadays, more universities are becoming more aware of their environmental performance and the need to build their 'green' image (Putrantomo et al, 2021). Through the survey conducted, staff and students have emphasised that 'laziness' is a key barrier that hinders them from practising waste management and recycling. This is not uncommon, as a study conducted at the University of Denver also assessed the motivation of waste management on the campus, finding that 'laziness' was a frequent response from university students (Beltran et al., 2022). Many of the students and staff recommended the need for incentives to encourage the practice of waste management and recycling on campus. The students mainly highlighted in the survey that there is no motivation behind practicing waste management. The practice of using incentives to motivate or encourage others to take a specific action or avoid action is not a new phenomenon. Often, incentives are used in organisations to encourage action or discourage action by its employees and steer their performance.

It is also used to drive a desired behaviour for a desired outcome, with the aim to ensure the value of the action is communicated across (Alfandi & Alkawsaneh, 2014; Haron & Khadijah, 2023). In the context of waste management and recycling, there are various schemes being implemented within this area to promote the benefits of waste management. A report investigated the impact of recycling incentive schemes on personal and communal levels in the UK. Concluding that, while there are various schemes, it can be categorised into two, which are voluntary and financial incentive schemes. The voluntary incentive scheme is useful for the promotion and awareness of recycling but does little to improve performance. Whereas the financial incentive scheme has a greater impact or influence due to monetary benefits/loss. People are more responsive to this scheme, specifically if there are financial rewards or penalty costs involved (Holmes et al, 2014). Different countries have implemented various schemes to encourage recycling or discourage the generation of waste. However, the NUS can take a few examples from these nations and apply them within the capacity of the University to implement.

A few suggestions are provided below that are within the capacity of the NUS to begin implementation:

- Recognition for outstanding efforts in waste management;
- Incorporate providing additional recycling bins (glass, paper, organic waste etc.);
- Installation of water dispensers around campus grounds to discourage the purchase of plastic bottles;
- Vouchers for recycling activities on campus;
- Discounts on the use of eco-friendly products or services;
- Tax benefits;
- Penalty for littering on campuses

The above states both voluntary and financial incentive schemes. The University should encourage the use of both as each provides a different approach to influencing the perception or behaviour of the university community towards recycling and waste management.

6. CONCLUSION: RECOMMENDED NUS ACTION

The results highlighted barriers and building blocks that prevent or encourage staff and students to practice sustainable waste management. Furthermore, the students and staff brought perspective on actions that the NUS can implement to improve waste management and recycling on campuses. It is important that the NUS amplify environmental awareness amongst the students and staff. This requires taking on an approach that involves the targeted audience in decision-making and planning processes, by using two methods – informative (education) and advocacy (workshop/training) for better accountability and transparency of the issue. Moreover, the University should deliberate investing or allocating funding to the infrastructural capacity of

waste collection, segregation, storage and disposal on campus. Having the means to counter the generation of waste, will be able to alleviate the littering problem on campus. But also includes teaching students and staff on how to correctly utilise facilities. Lastly, the NUS should consider influencing the environmental perception through the implementation of incentives that would encourage waste management practices. These results prove useful for recommending feasible actions that the NUS can implement for the better improvement or recognition of recycling and waste management initiatives on its campuses.

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