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# Promoting Environmental Sustainability: The Application of Green Nudging to Encourage Reusable Solutions in Campus Eateries

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**Abstract**

This research explores a Green Nudge approach aimed at promoting the use of reusable items within on-campus dining sites. Sustainable Energy and Economic Development (SEED) KPK supports this study for promoting sustainability in the region. This transition from disposable to sustainable practices is imperative in addressing the alarming concerns surrounding plastic pollution and waste management. This research adopts an exploratory sequential mixed-methods approach to delve into the promotion of reusable alternatives within on-campus dining sites, employing a combination of qualitative and quantitative methodologies. The initial qualitative phase involves data collection and analysis to establish foundational values and depict current scenarios regarding plastic waste generation, the use of single-use disposable items, and the attitudes, behaviors, and awareness levels of campus students towards climate issues, plastic pollution, and green practices. Subsequently, a quantitative phase follows, aiming to quantify the identified patterns and trends. Finally, the integration or linking of data from both phases allows for a comprehensive understanding and richer insights into the implementation of green nudges within the campus environment and their impact on waste management. The findings contribute to the development of strategies that promote sustainability within university dining services, thereby advancing efforts to mitigate plastic pollution and create a culture of environmental responsibility on campus.

Keywords: Green Nudge, SEED KPK, Reusable Alternatives, Plastic Pollution, Waste Management, On-campus Dining, Sustainability, Environmental Responsibility, Mixed-Methods Approach

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## 1. Introduction

### 1.1. Research problem statement

University of Peshawar, the mother institution of higher education in Khyber Pakhtunkhwa, hosts students from across the province. Despite its diverse student body, the campus falls short in its commitment to environmental friendliness. With such diversity, there's immense potential for the campus to promote values of environmental leadership.

According to the Global Climate Risk Index 2021, Pakistan ranks as the 8th most vulnerable country to climate change. The disposal and treatment of waste can emit several greenhouse gasses (GHGs), which contribute to global climate change(Rekacewicz, 2005). Pakistan generates approximately 49.6 million tons of solid waste a year, which has been increasing more than 2.4% annually (Khurshid, 2022). Peshawar generates 2208 tons of solid waste daily, of which only 1000 tons are collected. Waste management planning is a crucial aspect of environmental planning, involving strategies to limit, reuse, recycle, and dispose of resources in ways that minimize biophysical and socioeconomic impacts. However, the situation worsens as only 6%-7% of municipal solid waste (MSW) is converted into compost, while the remaining 90% is disposed of through landfilling. (Ahmad et al., 2020).

Waste dumps scattered throughout the campus mainly consist of thermocol packaging used for on-site dining, such as package boxes, plates, glasses, straws, and cups. Unfortunately, there's no proper waste management system or recycling programs on campus, leading to waste ending up in landfills, water canals, and university landscapes.

To shift from single-use disposable items to sustainable practices, a "green nudge" approach has been introduced at university of Peshawar in collaboration with sustainable energy and economic development (SEED) KPK. According to the United Nations Environment Programme (UNEP), nudges are positive and gentle persuasions designed to influence behavior and decision-making. These interventions, including choice architecture, default settings, social influence, and increased salience, aim to promote environmentally friendly behavior (Schubert, 2017). Green nudges encompass

awareness campaigns, competitions, workshops, seminars, and festivals aimed at gently integrating sustainable food practices into the campus dining culture.

### 1.2. Background of the research

Plastic has become an indispensable commodity in our lives due to its convenience, cost-effectiveness, disposability, and portability. Despite the great advantages that plastic offers, its associated dangers are often overlooked. The escalating reliance on plastic for our day-to-day needs is far more complex than it appears.

Over the past 70 years, plastic production has undergone an alarming surge. In 1950, global production stood at a mere two million tonnes, whereas today it exceeds 450 million tonnes (Ritchie et al., 2023). With the surge in plastic usage worldwide, Pakistan is no exception. According to the UNDP Intelligence Report "Rethinking Pakistan's Relationship with Plastics," Pakistan generates over 3.3 million tons of plastic waste annually. This staggering amount contributes to the country having one of the highest rates of mismanaged plastic in South Asia. Unfortunately, much of this plastic waste ends up in landfills, unmanaged dumps, or scattered across land and water bodies, causing significant environmental damage and posing risks to public health.

Addressing the challenges posed by plastic waste requires comprehensive strategies that go beyond mere waste disposal. It necessitates initiatives aimed at reducing plastic consumption, promoting reusable practices, and implementing effective waste management systems nationwide. By raising awareness and fostering a culture of responsible consumption and waste management, we can work towards a more sustainable future for Pakistan (Gul, 2020).

For this purpose, we re-evaluated our relationship with single-use disposable plastics used for on-campus dining. The unconscious consumption of single-use disposable items was driven by a lack of awareness and the perception that it was the only method available for consuming food. The food vendors on campus cited convenience and cost-effectiveness as their primary reasons for increasingly relying on single-use disposable plastics for their food services. The linear solutions for plastic pollution, such as bans and the introduction of biodegradable plastics, were implemented in the country but had no lasting impact on the plastic pollution issue. To ensure the long-term sustainability of efforts to tackle

plastic pollution, a behavioral and circular business approach was adopted. The "Green Nudge" initiative, known as the "Reusable Revolution," was implemented to reshape our relationship with plastics.

### 1.3. Research questions

The research addresses the following main research questions:

Q1. How effective is the Green Nudge approach in influencing on-campus diners to transition from disposable to reusable products?

Q2. What is the level of awareness and understanding among on-campus diners regarding the environmental impact of disposable products?

Q3. To what extent do environmental awareness impact the success of Green Nudge interventions in promoting the use of reusable items?

## 2. Literature Review

### 2.1 Plastic Pollution

From 2000 to 2019, global plastics production doubled, reaching 460 million tonnes, contributing to 3.4% of global greenhouse gas emissions. Plastic waste also doubled during this period, reaching 353 million tonnes in 2019. The majority of plastic waste, around two-thirds, stems from plastics with lifetimes under five years, with packaging accounting for 40%, consumer goods for 12%, and clothing and textiles for 11%. Only 15% of plastic is collected for recycling, but 40% of that is disposed of as residues. Burning plastics accounts for 19%, while 50% is sent to landfills. Alarmingly, 22% of plastic waste evades proper waste management, ending up in uncontrolled dumpsites, open pits, or terrestrial and aquatic environments, particularly prevalent in lower-income nations. ( (*Plastic Pollution Is Growing Relentlessly as Waste Management and Recycling Fall Short, Says OECD*, 2022). UNEP reports that around 300 million tonnes of plastic waste, equivalent to the weight of the human population, is generated annually. As these materials degrade into microplastics, they introduce more pollutants into the human food chain, freshwater systems, and air. (*World Leaders Set Sights on Plastic Pollution*, 2022)

### 2.2 Environmental Impact of Plastic Pollution

Plastic pollution not only harms the environment but also poses a significant threat to the climate. As plastic gradually breaks down, it releases greenhouse gases such as methane and ethylene, activated by exposure to sunlight and heat. During the degradation process plastic fragments turn into smaller pieces. Furthermore, open burning of waste, prevalent in many regions worldwide, serves as a major contributor to air pollution. Burning plastics emits a hazardous mix of chemicals, including black carbon, which poses severe health risks to both the planet and people exposed to the polluted air. Black carbon, in particular, exhibits a global warming potential up to 5,000 times greater than carbon dioxide(Edmond, 2022). Steven Feit, Staff Attorney at CIEL, highlights the intertwined nature of fossil fuels and plastics, pointing out that they are both produced by the same companies. He emphasizes, "Exxon produces the fuel for your car and the plastic for your water bottle." Projections suggest that if current trends persist, plastics will consume 20% of total oil production by 2050.(*Fueling Plastics: New Research Details Fossil Fuel Role in Plastics Proliferation*, 2017).

### 2.3. Single Use Plastics (SUPs)

Single-use plastics are items predominantly crafted from fossil fuel-derived chemicals (petrochemicals) and designed for immediate disposal, typically within minutes of use. These plastics are frequently utilized for packaging and serviceware purposes, including bottles, wrappers, straws, and bags. (Lindwall, 2020) Single-use plastics (SUPs) are designed for one-time use and are widely used, including as mulching film and greenhouse materials, particularly in developing nations. According to the United Nations Environment Program (UNEP), the majority of modern plastic production has transitioned from durable plastics to SUPs, mainly in packaging. The rising demand for SUPs has led to a significant increase in global plastic production, reaching approximately 360 million metric tonnes in 2018, with SUP products accounting for half of the total output. (PlasticOceans, 2020).

### 2.4 Throw away culture

The throwaway culture is a societal norm where items are discarded after a single use, contributing significantly to environmental degradation and resource depletion. At its core, the throwaway culture promotes convenience and instant gratification over long-term sustainability and resource conservation. The prevalence of throwaway culture is evident in the widespread use of single-use plastics, disposable

utensils, and packaging materials. These items are designed for convenience, offering a quick solution to immediate needs but often at the expense of long-term environmental impact. In many societies, the convenience of single-use products has led to a mindset of disposability, where items are perceived as easily replaceable and of little value once their initial purpose is fulfilled (Morrison, 2022)[1].

For reasons of hygiene, comfort, convenience, speed, and mobility, the use of Single-Use Disposable Products (SUDPs) is justified. Similarly, the increasing utilization of Drinking straws, initially considered non-essential, became indispensable for some participants, highlighting the transition from emergent to mundane use. Concerns about over-packaging are shared across countries. In Turkey, SUDPs are valued for their practicality, affordability, and convenience, while in Japan, they're favored for their ease of use and avoidance of cleaning. However, challenges arise from excessive production and wasteful consumption of SUDPs, as well as issues with their design, functionality, and environmental impact, including their single-use nature. (ÖZER, 2017)

**2.5 Behavioral Approach to address SUPs**

Addressing the throwaway culture requires a multifaceted approach that involves shifting societal attitudes and behaviors towards more sustainable consumption patterns. This includes raising awareness about the environmental consequences of disposable lifestyles, promoting the adoption of reusable alternatives, and implementing policies and regulations that incentivize waste reduction and resource conservation. By challenging the throwaway culture and embracing a more sustainable lifestyle, individuals and communities can play a pivotal role in mitigating environmental degradation and fostering a more equitable and climate-resilient future (Morrison, 2022)[2].

The reusable product consistently exhibited lower cradle-to-gate energy use and global warming potential compared to its single-use counterpart. In terms of carbon footprint, the reusable scenario outperformed the disposable option, consistently demonstrating lower energy use and global warming potential (Alshqaqeeq et al., 2020). The manufacturing process of single use plastics can potentially harm the health of the consumers who rely on SUP for tableware or hot food purposes. To enhance the flexibility and processability of plastic, plasticizers like phthalates or phthalic acid esters (referred to as "PAEs") are commonly used in single-use plastic (SUP) products, found in items such as tableware, plastic bags, and food containers (Chen et al., 2013; Huo et al., 2017; Zhang et al., 2012). PAEs from plastic containers can leach into packaged food or the environment, entering the food chain. Reducing

SUP consumption, particularly by promoting the use of reusables, is a key strategy to address SUP waste globally. However, it's crucial to acknowledge that a single solution won't suffice in addressing plastic pollution. Comprehensive actions should target land-based sources by reducing SUP usage, altering consumer behavior, and enhancing SUP waste management and recycling. Awareness-raising efforts should be coupled with government incentives to effectively combat plastic pollution (Chen et al., 2021)

### 2.6. Nudge Theory

Nudging shows promising results in encouraging desired practices and behaviors among individuals. Most literature reports positive effects in nudging targeted behaviors. The nudging approach has significant potential to extend into a pro-environmental context (Wee et al., 2021) **.** Imitation culture or social contagion has also a considerable influence on the use of SUPs. Despite the importance of norms and structural frameworks, the tendency for individuals to mimic one another's behavior can perpetuate unsustainable practices (Zorell, 2020). Visual environments also influence consumers' decisions. Unlike the financial aspect, effective communication induces changes in non-monetary consumer behavior. When consumers without their own cups encounter effective communication, they are more inclined to use a reusable cup. Overall, nudging consumers through effective communication towards environmentally friendly policies positively impacts their behavior regarding reusable cups. Targeting local residents through communication strategies can facilitate the process with minimal implementation costs.. Low-cost nudges, like increasing the visibility of reusable cups, can be implemented easily. (Metta, 2020).

The cooperation among all stakeholders in the food sector is important to manage the use of Single-Use Plastics (SUPs). Effecting behavioral change and countering convenience culture necessitates a multifaceted approach to SUP reduction initiatives (Molloy et al., 2022). The effectiveness of a plastics ban in curbing global plastic pollution is found to be limited, offering only a partial solution to the problem. Alternatives, such as imposing bans or levying premium prices on single-use items irrespective of material composition, show promise in reducing consumption and pollution. Strengthening the plastics ban could involve heightened awareness campaigns to discourage improper disposal within the EU and mandating certification of paper and wood products from sustainable forestry sources (Herberz et al., 2020).

## 3. Methodology

### 3.1. Research Approach

For this study, an exploratory sequential mixed-methods approach was used. The exploratory sequential mixed methods design is characterized by an initial qualitative phase of data collection and analysis, followed by a phase of quantitative data collection and analysis, with a final phase of integration or linking of data from the two separate strands of data (Berman, 2017).

The research design employed a combination of qualitative and quantitative methodologies to establish foundational values and depict the present scenarios related to plastic waste generation, the utilization of single-use disposable items, as well as the overall attitudes, behaviors, and awareness levels of campus students regarding climate issues, plastic pollution, and green practices. The purpose of this approach was to develop a more comprehensive understanding, gain richer insights about the implementation of green nudges within the campus environment and its impact on waste management.

### 3.2 Sample Frame and Sample Size

In this research study, the sampling frame was established to encompass all potential beneficiaries within the University of Peshawar. This included food stall vendors and cafe owners, and students at the University of Peshawar. The sampling frame specifically covered the major food markets situated on the university campus, addressing various beneficiary types, such as food stall owners and students. There are 16 canteens inside the university of Peshawar. The sample was chosen based on three criteria: the canteen's scale and popularity, its location within the campus, and its focus on women-centric services.

The sample size for the baseline study consisted of 7 cafes/food markets, namely University Quetta Chai and Foods, STC Cafe, Cafe de Puta, Cafe Ammu, College of Home Economics, Jinnah College Canteen, and Madina Market. The selected food markets/ cafes are large scale markets as they fulfill the food related needs of a large number of students. Two out of the seven canteens, specifically Jinnah College Canteen and Home Economics Canteen, exclusively cater to women. Cafe de Ammu and Cafe de Puta are particularly popular among young girls, while the remaining three canteens are equally accessible to both men and women.These canteens were selected because they are located in the hub of the campus

and are quite popular among the students of the campus.For data collection, one respondent was selected from the cafe owners of the first six mentioned cafes and canteens within the University of Peshawar. Madina Market being the largest food market on campus, the sample size was expanded to four respondents . The data was then collected from four different stall owners within Madina Market.

In this study, information pertaining to students' attitudes towards the use of single use disposable items and their awareness levels regarding plastic pollution, waste generation, and climate issues was gathered from a sample size of 91 participants. The survey questionnaire was completed by 91 students, and within this respondent group, 40% were females. The sample frame specifically encompassed both male and female students within the social sciences section of the University of Peshawar. All respondents fell within the age range of 19 to 25 and were actively pursuing their bachelor's degree. This focused sample frame ensures a comprehensive understanding of the perspectives within the specified academic and age demographics.

### 3.3 Survey Design

An in-person qualitative survey was conducted with the cafe owners and individual food stall owners in University of Peshawar. Surveys are appropriate when we want to learn about a respondent's behaviors. This allows us to gather descriptive information about the respondents (Neuman, 2013). The purpose to conduct an in-person survey was to observe the verbal and non-verbal reaction of the respondents in a systematic manner. It provided the ability to study the enthusiasm, discomfort of the respondents and record the empirical analysis regarding the introduction of reusable dishware in their respective cafes or food markets.

Moreover, a survey questionnaire was crafted to collect the perspectives of campus students on their individual behaviors and responses to the introduction of reusables on campus. The ultimate objective is to cultivate a profound understanding of the issue from an individual standpoint.

### 3.4 Sampling Technique

The sampling approach employed in this study utilized a non-probability sampling technique to gather data from the target population. A combination of purposive and theoretical sampling methods was employed for data collection. As the selection of the sample is made on the basis of subjective judgment of the researcher in purposive sampling (Alvi, 2016), Respondents were chosen based on their

involvement with customers and their roles in specific cafes. The participants included owners of cafes and food stalls, selected for their valuable insights into the use of plastic and single-use disposable items, as well as their daily interactions with students who patronize their establishments. Theoretical sampling was integrated into the data collection process, guided by emerging themes and insights obtained from the respondents (Denzin, 2017)). The inclusion of students in the data collection process was prompted by the responses gathered from food stall owners.

Purposive sampling was employed to select students based on specific criteria, including age, gender, and program of study. Specifically, participants from the BS program, aged between 19 to 25, were chosen due to their high activity levels on campus, particularly in dining. The distribution of questionnaires ensured equal representation of both male and female students, promoting gender equality and incorporating women's perspectives in discussions related to gender and climate justice.

**3.5 Data Collection**

For the data collection, two survey questionnaires were formulated. A qualitative survey questionnaire was designed to gather data from the cafe owners regarding the behavior of the consumers during food practices as well their belief and perception regarding the introduction of reusables in their respective cafes. Secondly, a survey questionnaire was followed to address the emerging themes from the qualitative survey guide. The questionnaire consists of questions to address students' awareness levels and their response towards the introduction of reusables within the campus. This approach of data collection gave us access to in depth information and a holistic picture of campus dining culture .

**3.6 Data Analysis**

In this study, we employed thematic analysis as the primary method for data analysis and descriptive analysis as a secondary method. The qualitative survey provided valuable insights into the attitudes of both cafe owners and students regarding the integration of reusable items. Through a comprehensive thematic analysis, distinct themes emerged, shedding light on the perspectives and motivations of cafe owners and students in adopting single-use disposable items. Additionally, a descriptive analysis was employed to analyze the quantitative data. Descriptive analysis is a general type of simple statistics used by researchers to describe basic patterns in the data (Newman, 2013) .We delved into the monthly expenses associated with single-use disposable items and the disposal practices of plastic wrappers and

disposable items in each food market. This method allowed us to systematically extract information regarding the motivations behind the use of single-use items by students and food stall vendors, contributing to a comprehensive understanding of the environmental impact of such practices.

### 3.7 Ethical Consideration

In this research, we made sure to follow ethical guidelines when interacting with participants. We chose participants who agreed to be part of the study by giving their informed consent. We introduced ourselves and explained the purpose of the baseline survey, how we would use the information, and assured participants that their involvement was voluntary. They had the freedom to leave or refuse to participate at any point without facing any consequences.

When collecting data, researcher approached food stall and cafe owners to introduce themselves and ask for permission to conduct the baseline survey. In all interactions with cafe owners and participants, we respected their cultural norms and practices. To conclude each discussion, the researcher expressed gratitude to the respondents for their time, willingness, and effort in providing data for the baseline survey.

## 4. Results and Discussions

The data collected from the qualitative survey unfolded in the following themes

### 4.1 Cafes with Clean Sitting Spaces:

In cafes providing clean and comfortable sitting spaces, students chose to eat on the spot.This suggests that when an inviting and well-maintained environment is provided, students are more inclined to engage in on-site dining. This could have positive implications for reducing single-use packaging waste associated with take-out meals.

### 4.2 Cafes without Clean Sitting Spaces:

In cafes lacking clean and comfortable sitting spaces, students opted for take-away. The preference for take-away in less comfortable settings might be a result of a perceived inconvenience or lack of suitable

spaces for dining in. This behavior could contribute to an increase in single-use packaging waste, and it highlights the importance of creating conducive spaces for students to dine within the campus.

**4.3 Cafe Owners' Attitude towards Reusables:**

The cafe owners expressed a positive attitude towards the potential introduction of reusable dishware and collaboration for waste reduction. Their affirmation to contribute to waste reduction demonstrates the feasibility of implementing reusables in their cafes. One of the cafe owners stated, "It would be great if some initiative to reduce waste is taken up on campus. When I leave my cafe in the evening and walk home, the sight of waste dumps along the pathway makes me really sad. I would be happy to contribute in any way to creating a clean campus."

**4.4 Challenges encountered**

Following are some of the challenges faced by the cafe or food stall owners

The primary challenge encountered during the study revolved around ensuring hygiene in the utensils used within the campus. This aspect is critical as it directly correlates with sustainable practices. Some of the café owners expressed concerns about the cleanliness of the utensils and the responsibility for cleaning them for reuse. One of the owners responded, "Reusables are hard to maintain. With single-use items, we use them and then discard them. But with reusables, we would need to hire a dedicated person to wash the dishes, which is not convenient for us."

The second hurdle identified was the lack of awareness and cooperation among students regarding sustainable practices. The data revealed that only 1-2 students brought their own cups to cafes for reuse purposes on a yearly basis. One of the owners stated, “We welcome students who use their own reusable cups, but in practice, I have never seen any student bring their own reusable cup. Only once did a student bring one, and I remember it because she forgot it here. It's still with me in my cafe, so I can return it to her whenever she comes.”

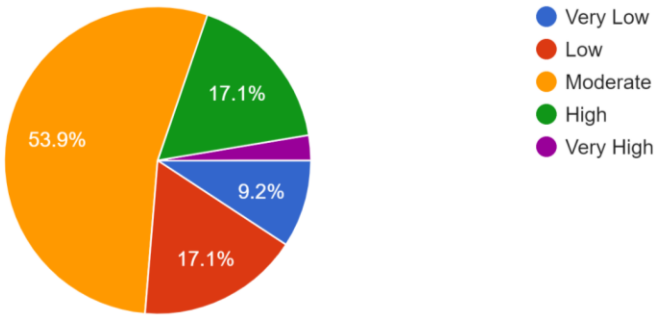
Another noteworthy challenge was the absence of effective environmental awareness within the campus community. Without proper guidance and education on the significance of green practices, individuals, including students and business owners, may struggle to understand and implement

sustainable practices. Integrating comprehensive environmental counseling programs can play a pivotal role in bridging this gap, providing the necessary knowledge and motivation for stakeholders to actively contribute to the reduction of waste.

The data collected from questionnaires revealed the following information.

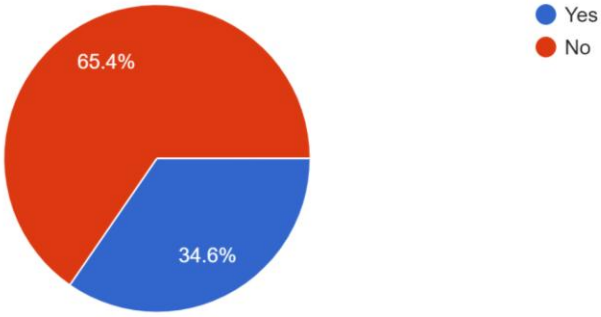
### 4.5 Green Nudge for Awareness Level

In terms of awareness about climate change, the pre-green nudge awareness level of students is depicted in the chart below. Among respondents, 53.9% indicated a moderate level of awareness, 17.1% reported a low level, and 9.2% expressed very low awareness. Conversely, only 21.8% demonstrated a high level of awareness regarding climate change.



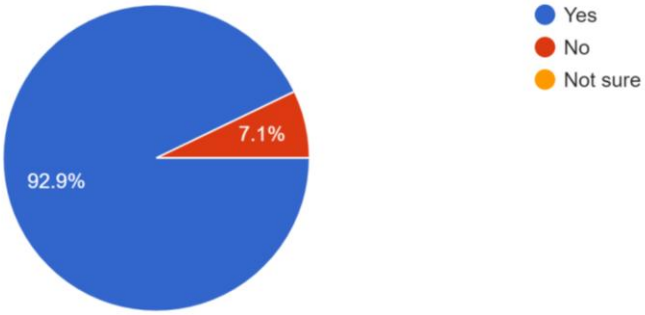

*Question title: How would you rate your level of awareness regarding climate change?*

When asked about their participation in campus seminars, workshops, or events related to climate change, 65.4% of the students responded negatively. This highlights a clear need for increased student involvement in activities concerning climate issues on campus.




*Question title: Have you attended any seminars, workshops, or events related to climate change on campus?*

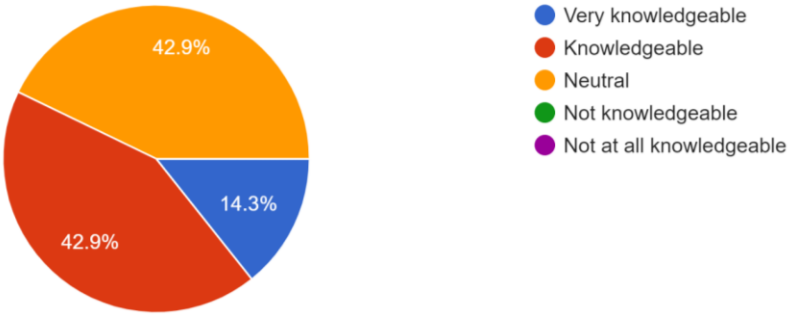
After the Green Nudge, there has been a significant improvement in the awareness level of students regarding climate change. 92.9% of the respondents indicated that they were aware of the ongoing campus-wide awareness program named Green Campus.




*Question title: Were you aware of the campus-wide sustainability campaigns promoting the use of reusable items?*

**4.6 Environmental Impact of Single use disposable**

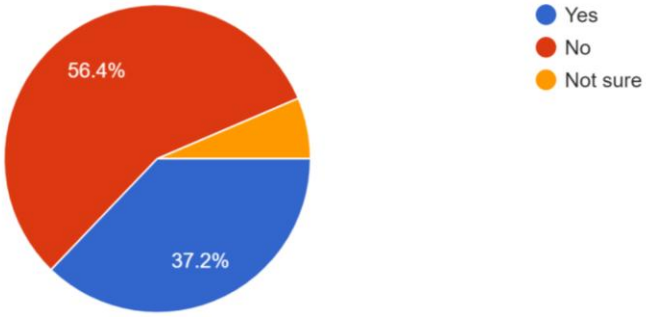
When inquiring about respondents' knowledge of the environmental impact of single-use disposable items, the responses varied from neutral to very knowledgeable. Specifically, 14.3% of respondents indicated that they are very knowledgeable about the environmental impact of single-use disposable items.




*Question title: How knowledgeable do you consider yourself about the environmental impacts of single-use disposable items?*

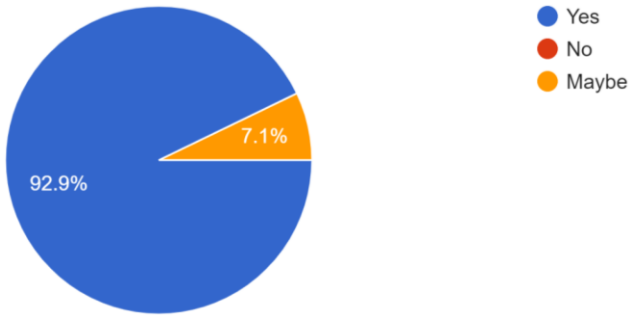
**4.7 Campus Sustainability Participation**

Before the Green Nudge, only 37.2% of the respondents demonstrated any engagement in environmental or sustainability initiatives on campus. This highlights a pressing need to actively involve a larger percentage of students in activities related to sustainability on campus.




*Question title: Are you currently involved in any environmental or sustainability initiatives on campus?*

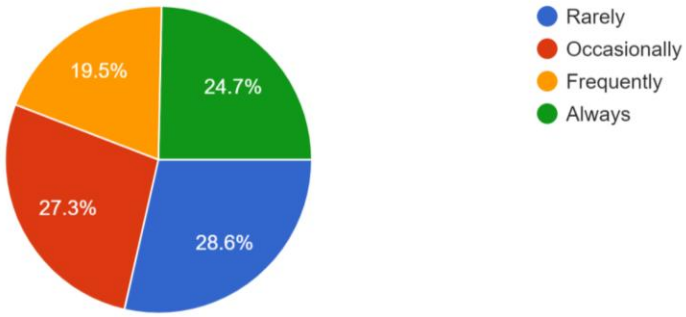
After the Green Nudge, 92.9% of respondents showed interest in sustainability initiatives within the campus.




*Question title: Would you be interested in more sustainability initiatives and campaigns on campus?*

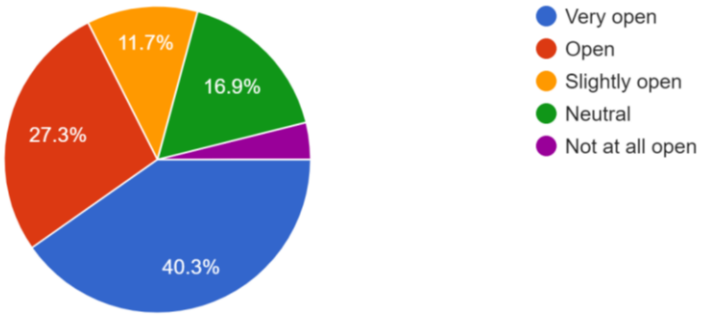
**4.8 usage frequency of single-use disposable items Analysis**

The chart below illustrates the frequency of usage of single-use disposable items (such as plastic water bottles, disposable cutlery, and take-out containers) by students on campus. According to the survey, 24.7% of the respondents reported always using single-use disposable items, 27.3% used them occasionally, 19.5% used them frequently, and 28.6% used such items rarely.



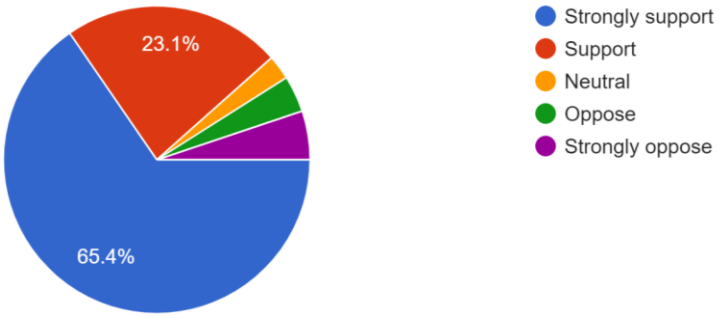

*Question title: On average, how often do you use single-use disposable items (e.g., plastic water bottles, disposable cutlery, take-out containers) on campus?*

When asked about their willingness to replace single-use disposable items with reusable alternatives on campus, 40.3% expressed strong openness, 27.3% indicated being open, 11.7% leaned towards slight openness, and 16.9% maintained a neutral stance. These responses underscore a significant level of acceptance among students towards the adoption of reusable items on campus.




*Question title: How open are you to the idea of replacing single-use disposable items with reusable alternatives on campus?*

When asked about endorsing the implementation of reusable items such as water bottles, cutlery, and containers on campus, 65.4% expressed strong support, while 23.1% indicated their approval of the initiative. These responses highlight significant potential for transforming the campus into a more environmentally friendly and sustainable environment.




*Question title: Would you support the introduction of reusable items (e.g., reusable water bottles, cutlery, containers) on campus?*

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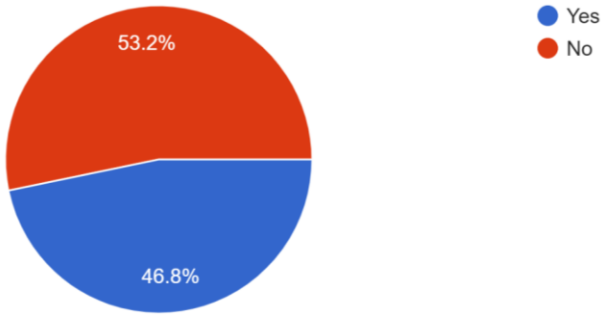
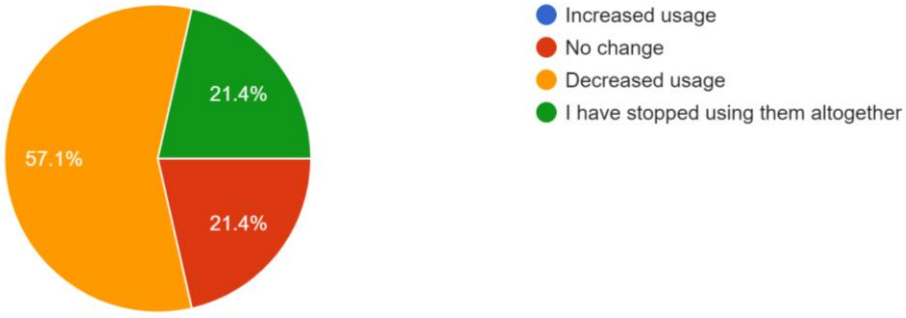
When asked about the practice of students bringing their own reusable items to campus, 53.2% of the respondents answered negatively, revealing a concerning scenario characterized by plastic waste generation and a lack of climate consciousness on campus.



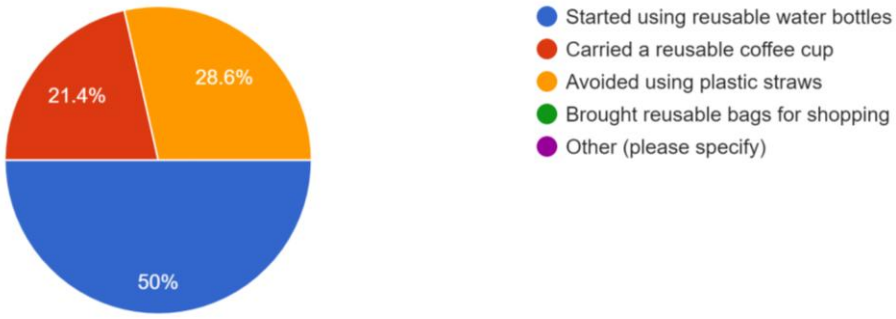

*Question title: Do you currently bring your own reusable items to campus?*

After the implementation of Green Nudges, the use of single-use disposable items decreased by 57.1% while 21.4% stopped using them altogether.




*Question title: After being exposed to the sustainability campaigns, how has your attitude towards using single-use items changed?*

Upon asking them what actions they took to decrease the use of single-use disposable items, 50% stated that they started using their own reusable water bottle, 21% opted to use their own coffee mug, and 28.6% chose to avoid using plastic straws.




*Question title: What specific actions have you taken to reduce your consumption of single-use items as a result of the awareness campaigns? (Select all that apply)*

**4.9 Post Nudge Impact**

Following the implementation of the Green Nudge approach to promote reusables within on-campus dining sites, significant social changes have been observed within the campus community.

Several students have reported feeling a sense of guilt when consuming food in single-use disposable items, leading them to consciously reduce their consumption of such items. One student shared their experience, stating, "I initially felt guilty once I volunteered for the reusable revolution. My conscience told me it was wrong. Now, I make a conscious effort to avoid eating from plastic packaging. I either go home to eat or take time out to dine in because it's served in reusables."

During visits to Quetta Caffe, students have expressed pleasant surprise and appreciation for the use of mud crockery as reusable alternatives for breakfast, which not only adds a traditional touch to the dining experience but also fosters a deeper connection to the earth. .A student enrolled in the 8th semester of the Department of Economics, shared her experience, stating, "I recently visited Quetta Caffe, and I was delighted to witness the use of mud crockery for breakfast. It resonated with my love for nature, and owner Abdullah's passion for sustainability was truly inspiring. Indulging in paratha, chai, and chanay became even more enjoyable in an eco-friendly setting. Quetta Caffe's dedication to being environmentally conscious sets a remarkable example, and I sincerely hope that more cafes will follow their lead."

Quantitatively, the impact of these changes is recorded, with a decline in the quantity of single-use disposable items, from 775,550 to 570,000 items per month, reflecting a total reduction of 191,350 items per month. Concurrently, there has been a notable increase in the adoption of reusable alternatives, with their frequency rising from zero to 13,950 uses.

With that, there are also some indirect impacts of The Green Nudge. It has initiated important conversations about sustainability and environmental consciousness within our academic community. A Green Campus Shuttle Service was launched in collaboration with PEDO and BRT Peshawar, aimed at replacing traditional fuel-powered vehicles with eco-friendly options. Additionally, in partnership with the Khyber Pakhtunkhwa Forest Department, we initiated a plantation campaign called "One Person, One Tree," with the goal of planting 20,000 trees by the end of the year. A youth climate fellowship, developed in collaboration with Transparency International, has been established to train future climate advocates from our campus. With the support of Unilever, benches and dustbins were installed at selected sites within the campus to create a clean environment. The Green Nudge approach has brought about meaningful change within our university, fostering hope for a sustainable future and promising a lasting impact on our relationship with the environment.

***Pre-Nudge and Post-Nudge Comparison***

| S.no | Cafe Name | Before Nudge | After Nudge | Impact |
|---|---|---|---|---|
| 1 | University Quetta Chai and Foods | 9,750 items(per month | 2600 items (per month) | 7150 items (per month) |
| 2 | STC Cafe | 41,600 items (per month) | 19000 items (per month) | 22,600 items (per month) |
| 3 | Cafe de Puta | 7,800 items (per month) | 3900 items (per month) | 3900 items (per month) |
| 4 | College of Home Economics | 52,000 items | 19,000 items (per month) | 33,000 items (per month) |

| | | | | |
|---|---|---|---|---|
| | | | | |
| 5 | Jinnah College for Women | 50,700 items (per month) | 26000 items (per month) | 24,700 items (per month) |
| 6 | Madina Market | 600,000 items(per month) | 500,000 items (per month) | 100,000 items (per month) |
| 7 | Total | 775,550 items (per month) | 570,000 items (per month | 191.350 items (per month) |

The quantity of single-use disposable items witnessed a decline from 775,550 to 570,000, reflecting a total reduction of 191,350 items per month. Concurrently, the adoption of reusable alternatives experienced a notable increase, surging from zero to a frequency of 13,950 uses.

**5. Conclusion**

In conclusion, the transition from disposable to sustainable practices within on-campus dining sites through Green Nudges mitigated plastic pollution to some extent and promoted environmental sustainability. Through the implementation of a Green Nudge approach, focused on encouraging the adoption of reusable alternatives, significant changes can be made in reducing the reliance on single-use plastics.

Throughout this research, it has become evident that the adoption of reusable options within on-campus dining sites not only contributes to waste reduction but also creates a culture of environmental responsibility among students, faculty, and staff. By leveraging behavioral insights and employing strategies such as choice architecture and social norms, on-campus dining sites can effectively promote the use of reusables while minimizing barriers to adoption.

The findings of this research also highlighted the ongoing challenge posed by the convenience factor associated with single-use plastics (SUPs), which continues to hinder the widespread adoption of reusable alternatives. While the environmental impacts of SUPs are well-documented, the convenience they offer remains a significant barrier to behavior change. Moving forward, there is a critical need for comprehensive research and innovation dedicated to making sustainable and environmentally friendly practices more convenient and accessible to the general population. By prioritizing the development of convenient alternatives to SUPs, we can effectively mitigate their negative environmental consequences and promote the widespread adoption of reusable options.

Looking ahead, it is imperative to continue monitoring and evaluating the effectiveness of Green Nudge interventions in promoting reusables within on-campus dining sites. Additionally, further research is needed to explore the long-term impacts of these initiatives on waste reduction, resource conservation, and overall sustainability outcomes.

**References**

Ahmad, W., Hassan, M., Nawaz, T., Ashfaq, M., & Khan, M. A. (2020, February). Status of Solid Waste Management in Peshawar, Pakistan. *ResearchGate*.

Alshqaqeeq, F., Griffing, E., Twomey, J., & Overcash, M. (2020, July 5). Comparing reusable to disposable products: Life cycle analysis metrics. *Journal of Advanced Manufacturing and Processing*, *2*(4). https://doi.org/10.1002/amp2.10065

Alvi, M. H. (2016). A Manual for Selecting Sampling Techniques in Research. *MPRA*. https://mpra.ub.uni-muenchen.de/id/eprint/70218

Berman, E. A. (2017). An Explor An Exploratory Sequential Mix y Sequential Mixed Methods Appr ed Methods Approach to Understanding Researchers' Data Management Practices at UVM: Integrated Findings t ated Findings to Develop Resear elop Research Data Ser ch Data Services. *Journal of eScience Librarianship*, *6*(1), e1104. https://doi.org/10.7191/jeslib.2017.1104

Chen, Y., Awasthi, A. K., Wei, F., Tan, Q., & Li, J. (2021, January 15). Single-use plastics: Production, usage, disposal, and adverse impacts. *Science of the Total Environment*, *752*. https://doi.org/10.1016/j.scitotenv.2020.141772

Denzin, N. K. (2017). Theoretical Sampling. In *Sociological Methods: A Sourcebook* (1st ed.). Taylor & Francis Group. https://doi.org/10.4324/9781315129945

Edmond, C. (2022, January 19). *This is how plastic pollution causes climate change*. The World Economic Forum. Retrieved March 12, 2024, from https://www.weforum.org/agenda/2022/01/plastic-pollution-climate-change-solution/

*Fueling Plastics: New Research Details Fossil Fuel Role in Plastics Proliferation*. (2017, September 21). Center for International Environmental Law. Retrieved March 12, 2024, from https://www.ciel.org/news/fueling-plastics/

Gul, E. (2020, March 4). *The good, the bad and the ugly of plastics in Pakistan*. United Nations Development Programme. Retrieved March 21, 2024, from https://www.undp.org/pakistan/blog/good-bad-and-ugly-plastics-pakistan

Herberz, T., Barlow, C. Y., & Finkbeiner, M. (2020, May 5). Sustainability Assessment of a Single-Use Plastics Ban. *Sustainability*, *12*(9), 3746. https://doi.org/10.3390/su12093746

Khurshid, M. (2022, June 13). *Sustainable solid waste management*. The Express Tribune. Retrieved March 21, 2024, from https://tribune.com.pk/story/2361263/sustainable-solid-waste-management

Lindwall, C. (2020, January 9). *Single-Use Plastics 101*. NRDC. Retrieved March 12, 2024, from https://www.nrdc.org/stories/single-use-plastics-101#what

Metta, J. (2020, May 4). Promoting discount schemes as a nudge strategy to enhance environmental behaviour. *FAERE*. https://faere.fr/pub/WorkingPapers/Metta_FAERE_WP2020.11.pdf

Molloy, S., Varkey, P., & Walker, T. R. (2022, March). Opportunities for single-use plastic reduction in the food service sector during COVID-19. *Sustainable Production and Consumption*, *30*, 1082–1094. https://doi.org/10.1016/j.spc.2022.01.023

Morrison, R. (2022, December 22). *Throwaway Culture Is Drowning Us in Waste*. Earth.Org. Retrieved March 12, 2024, from https://earth.org/throwaway-culture/

Neuman, W. L. (2013). Survey Research. In *Social Research Methods: Qualitative and Quantitative Approaches* (seventh ed., p. 317). Pearson.

Newman, w. L. (2013). Analysis of Quantitative Data. In *Social Research Methods: Qualitative and Quantitative Approaches* (seventh ed., p. 415). Pearson.

ÖZER, D. (2017, June). An Inquiry on sustainability and consumption through single-use disposable products. *Middle East Technical University.* http://etd.lib.metu.edu.tr/upload/12621160/index.pdf

*Plastic pollution is growing relentlessly as waste management and recycling fall short, says OECD*. (2022, February 22). OECD. Retrieved March 12, 2024, from https://www.oecd.org/environment/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm

Rekacewicz, P. (2005). *Contribution from waste to climate change*. GRID-Arendal. Retrieved March 21, 2024, from https://www.grida.no/resources/5665

Ritchie, H., Samborska, V., & Roser, M. (2023). *Plastic Pollution*. Our World in Data. Retrieved March 12, 2024, from https://ourworldindata.org/plastic-pollution

Schubert, C. (2017, February). Green nudges: Do they work? Are they ethical? *Ecological Economics*, *132*, 329-342. https://doi.org/10.1016/j.ecolecon.2016.11.009

Wee, S. C., Wee, S. C., Choong, W. W., & Low, S. T. (2021, December). Can "Nudging" Play a Role to Promote Pro-Environmental Behaviour? *Environmental Challenges*, *5*. https://doi.org/10.1016/j.envc.2021.100364

*World leaders set sights on plastic pollution*. (2022, February 16). UNEP. Retrieved March 12, 2024, from https://www.unep.org/news-and-stories/story/world-leaders-set-sights-plastic-pollution

Zorell, C. V. (2020, December 13). Nudges, Norms, or Just Contagion? A Theory on Influences on the Practice of (Non-)Sustainable Behavior. *Sustainability*, *12*(24), 10418. https://doi.org/10.3390/su122410418