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THE POTENTIAL OF TEA AND COFFEE WASTE RECYCLING ON SOCIAL MEDIA (FB, INSTAGRAM) FOR A SUSTAINABLE FUTURE

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Abstract
Growth in production and consumption of both tea and coffee has created an increase in the generation of organic waste in terms of spent tea leaves and coffee grounds. Managing and recycling of these wastes is essential in mitigating any harm to the environment, including emission of greenhouse gases and pollution of water and soil. This study seeks to examine awareness and participation levels in the recycling and repurposing of organic waste resulting from tea and coffee consumption. Significant amount of organic waste from tea and coffee, and the need to find eco-friendly ways of dealing with such organic waste. This problem statement identifies two problems; that there are considerable amounts of organic waste resulting from production of tea and coffee, and that there is little public participation in the recycling and repurposing of organic waste. Study seeks to examine how social media can be used to encourage recycling of tea and coffee waste products to minimize ecological risks posed by improper handling. Quantitative research method will involve conducting a survey with a sample size of 840 people aged between 16-88 years, using quasi-experimental data collecting sampling technique. Sample selection will be done from 2 private universities (UCP, UMT) and one public university (PU) in Lahore; hence, sample size is 280 per university (140 males, 140 females). Results of this study would help in developing strategies for effective communication, designing social media campaign and implementing the policies which help in sustainable management of this waste stream. Eventually, the study aims to contribute towards making an eco-friendlier world.

1. Introduction
Waste recycling has gained more attention in recent years amid rising environmental issues in order to promote sustainable development and reduce negative effects on the environment associated with various types of wastes (Campos-Vega et al., 2015; Mussatto, 2014). Nowadays, social networking sites have turned out to be an ideal tool for promoting awareness, spreading information, and exchange of ideas among various individuals, societies, organizations, and governments (Vahos et al., 2022; Velázquez-

Carrillo et al., 2021). This research will shed light on current levels of awareness, the factors motivating waste recycling programs, and methods utilized for stimulating reactions and participation.

Organic Wastes from Tea and Coffee: Growing Ecological Threat The organic wastes generated through the production and consumption of tea and coffee products are abundant, primarily taking the form of tea leaf residues and coffee grounds (Mussatto, 2014; Wongkittipong et al., 2022). Improper management of the mentioned organic wastes could result in harmful ecological impacts. One example is the emission of methane, which is a potent greenhouse gas, from the mentioned waste products that have been improperly disposed of or incinerated (Zhang et al., 2020; Li et al., 2021).

Moreover, contamination of the water and soil from the decomposition of such wastes in landfills can affect the state of the ecosystem in a negative way (Campos-Vega et al., 2015; Rabnawaz et al., 2022). Acknowledging the negative effects on the environment due to tea and coffee waste, various recycling and reutilization practices have been introduced by the researchers and policy makers. Such endeavors have helped the scientists to discover new ways to recycle or reuse such waste. Some examples of such innovations include the use of tea and coffee waste as raw materials for fuel and other valuable substances used in pharmaceutical and cosmetic industries as well as agriculture (Campos-Vega et al., 2015; Mussatto, 2014; Wongkittipong et al., 2022).

Social media has emerged as an indispensable platform in contemporary times, providing a great opportunity to promote sustainability and raise awareness on various environmental issues (Vahos et al., 2022; Velázquez-Carrillo et al., 2021). In case of tea and coffee waste recycling, the use of social media can prove to be quite beneficial, as it can serve as an effective means of communicating knowledge on how best to manage such wastes sustainably.

Social media accounts that specifically discuss tea and coffee recycling can be used as information and community centres where individuals get connected with other people and organizations and receive knowledge on how to recycle using advanced methods (Vahos et al., 2022; Velázquez-Carrillo et al., 2021). The use of these accounts can inspire discussion and idea generation through social media platforms to mobilize the target audience to recycle tea and coffee waste. Moreover, there is a possibility of forming communities around social media regarding the theme of tea and coffee recycling (Vahos et al., 2022; Velázquez-Carrillo et al., 2021). Communities formed through social media provide an opportunity for sharing knowledge, achievements in the process, and organization of collective actions towards the goal of a more sustainable environment.

This research analyzed the degree of awareness regarding recycling tea and coffee waste using a series of strategic approaches, including use of social media updates, educating the audience about the benefits of recycling, how-to guides for recycling tea and coffee waste, and examples of cases where waste recycling techniques have been successfully implemented. This research was under the premise that proper recycling of tea and coffee waste can help protect the environment while improving soil condition as a result of using the waste as organic fertilizers. To assess the impact of these strategies, the research used pre-post visual experimentation design. Moreover, questionnaire survey analysis was conducted to identify the practical implications of audience awareness and knowledge regarding tea and coffee waste recycling.

In addition, the interaction on social media pages that focused on tea and coffee waste recycling was examined to assess public engagement and awareness on the subject matter. Such metrics as the number of followers, rate of content sharing, and user interaction through likes, comments, and shares were taken as an indication of growing momentum and the spread of the message. The use of such engagement metrics was regarded as a significant proxy for assessing public response (Thompson & Sinha, 2022).

Moreover, the information posted by people via social networking sites was discovered to be directly related to the uptake of recycling activities. Information in the form of educational material, do-it-yourself tips, and successful recycling programs served as motivational factors that made people recycle

their tea and coffee waste (Vahos et al., 2022; Velázquez-Carrillo et al., 2021). Social media, due to its communication capabilities, enhanced the spreading of new recycling approaches as well as helped adopt successful recycling models in different environments.

In addition to this, social media acted as a channel for mobilization and advocacy efforts and helped in engaging with discussions on the improvement of policies that could ensure sustainable management of tea and coffee waste (Wilson & Lam, 2022). Social media also aided in organizing seminars, workshops, and recycling campaigns by the community. This helped raise awareness about social responsibilities, resulting in improvements in waste management techniques. What was noticed was that there were few or no social media channels dedicated solely for raising awareness about the recycling of tea and coffee waste.

1.1 Rationale of the Study

Organic wastes arising from tea and coffee are among the types of wastes produced on a constant basis worldwide as tea and coffee are some of the widely consumed drinks by individuals at home, work places, and business premises. Even though they are organic in nature and rich in nutrients, these types of waste tend to be thrown out in regular waste disposal systems, hence adding up to the burden of landfills and causing greenhouse gases (United Nations Environment Programme [UNEP], 2021). This research is based on the desire to investigate sustainable methods for dealing with waste.

Reasons for conducting the research are associated with the growing trend of circular bioeconomy whereby the organic waste can be utilized as valuable resources to be turned into useful products rather than disposal waste (European Commission, 2020). Waste from tea and coffee contains important nutrients like nitrogen, phosphorus, and potassium that can be used to improve the quality of soil (Campos-Vega et al., 2015). Despite their positive environmental impacts, people are not very aware of how they can make a positive impact through such initiatives.

It is noteworthy that social media channels have become powerful means for communication and influencing the environment. According to previous studies, digital media can be instrumental in raising awareness about the environment and promoting positive environmental behaviours, such as through educational postings, demonstration videos, and user-created do-it-yourself tutorials. However, for communication on the Internet to be effective, there should be reliable content producers in certain sustainable niches.

In the area of tea and coffee waste recycling, it seems that there is some deficiency with regard to digital activism and campaigns for raising awareness. Such a deficiency results in a delay of information dissemination and, subsequently, in an impediment to the adoption of any sustainable practices in the community environment. Hence, this research is relevant since it focuses on the issue of both audience awareness and digital communication for promoting sustainable waste disposal practices.

1.2 Problem Statement

Even as the world moves towards more sustainable waste management and circular economy, tea and coffee waste remain a forgotten source of organic waste. Within households, offices, and various commercial organizations, this type of organic waste is thrown away in regular trash, leading to its end up in landfills and causing environmental degradation through the release of methane (UNEP, 2021). Despite being composed of nutrients that can be utilized for creating organic fertilizer, tea and coffee waste goes to waste due to lack of awareness of its potential applications (Campos-Vega et al., 2015).

The next major problem related to tea and coffee waste management pertains to poor communication within society. While modern environmental awareness campaigns have successfully embraced the use of online platforms to spread their message, there is no particular effort made to communicate about recycling waste from tea and coffee. Current environmental content lacks focus and specificity, thus failing to encourage people to engage in sustainable waste management at the local community level by applying easy and

inexpensive means such as composting or enriching the soil with tea and coffee waste.

Moreover, while social media has been noted to be a potent channel for impacting environmental behaviour and attitudes, its influence on supporting more specialized sustainable behaviours still needs to be explored (Schill & Shaw, 2019). The absence of such social media channels makes it difficult for tea and coffee waste recycling practices to receive due attention in developing countries, which struggle with their existing waste management challenges.

In light of the above discussion, the problem that is investigated in this study is low awareness, poor behavioural compliance, and the lack of specific digital strategies in regard to tea and coffee waste recycling.

1.3 Research Objectives

Objectives of the study are:

- To assess the current level of public awareness regarding the recycling of tea and coffee waste.
- To determine the percentage of people who actively practice tea and coffee waste recycling.
- To identify the barriers and challenges that prevent widespread adoption of tea and coffee waste recycling.
- To explore potential methods and applications for repurposing tea and coffee waste (e.g., biofuel production, compost, etc.
- To find out the change in awareness level of audience after exposing them to mediated content for 2-weeks.

2. Literature Review

With the fast industrialization and urbanization of the present-day society, the production of waste is on the rise and poses an enormous risk for the environment and, thus, for the existence of our planet. There are many types of waste that cause damage to nature; yet, among the types, one can notice the growing concern about the management of tea and coffee waste due to their volume and environmental implications (Campos-Vega et al., 2015). Tea and coffee are among the most popular drinks in the whole world. The consumption of such beverages gives rise to a lot of waste which is not always handled properly (Scarsella et al., 2022).

2.1 The Prevalence of Tea and Coffee Waste

Tea and coffee are two global products, contributing substantially to environmental pollution. According to the World Bank, the global production of coffee waste is estimated to be approximately 6 million tons each year, whereas the production of tea waste is expected to amount to nearly 5 million tons (World Bank, 2021). Moreover, the number of tea and coffee waste generated will likely grow in the future due to increasing demand from developing countries (Tokimoto et al., 2005).

It should be noted that both tea and coffee waste have been disposed of conventionally through landfilling and incineration. Such an approach poses a threat to the environment since the decomposition process results in the release of harmful emissions. In addition, the disposal of coffee and tea waste leads to resource depletion as their content is highly valuable and can be re-used in many industries (Campos-Vega et al., 2015; Scarsella et al., 2022).

2.2 The Potential of Tea and Coffee Waste Recycling

Considering the ecological and economical significance of tea and coffee waste, scientists have investigated different approaches to recycling and reuse of this biowaste. The application areas for tea and coffee waste recycling include the following:

2.2.1 Biofuel Production

Among the most promising applications of tea and coffee waste recycling is the possibility of using it to produce biofuels. The high percentage of cellulose and lignin in tea and coffee waste allows their effective use in bioethanol, biogas, and biodiesel production (Campos-Vega et al., 2015). There are several studies on producing biofuels from tea and coffee waste, yielding positive results. For instance, Amin et al. (2016) found that up to 72% bioethanol could be produced from coffee waste.

2.2.2 Soil Amendment and Fertilizer

Because of their high content of organic matter and essential elements such as nitrogen, phosphorus, and potassium, tea and coffee waste can also be used as a soil conditioner or fertilizer (Tokimoto et al., 2005). The use of tea and coffee waste as a soil conditioner is effective in increasing the fertility, moisture retention ability, and microbial activity of the soil, thereby resulting in improved plant growth and production (Wei et al., 2018). In addition, using tea and coffee waste as a fertilizer helps in reducing the application of artificial fertilizers that are hazardous to the environment (Campos-Vega et al., 2015).

2.2.3 Adsorbent Materials

Given that tea and coffee waste exhibit properties such as high surface area and porosity, they can be considered efficient adsorbent materials for water and air purification purposes. Tea and coffee wastes have been shown to effectively remove heavy metals, dyes, and other types of pollutants from water and air sources (Scarsella et al., 2022). Such an application can promote sustainable and economical water and air purification techniques.

2.2.4 Activated Carbon Production

Treatment of tea and coffee residues through heat and chemicals leads to the production of activated carbon, which is an excellent adsorbing material characterized by porosity. Activated carbon has several industrial uses including water purification, gas separation, and energy storage (Scarsella et al., 2022).

2.3 Social Media and the Encouragement of Recycling Tea and Coffee Waste

Recycling tea and coffee waste has been attracting much more interest lately, and in many instances, social media has greatly contributed to the growing popularity of this activity. As pointed out by Eranti and Lonkila (2015), social networking platforms such as Facebook, Twitter, and Instagram have become very powerful tools for information sharing and inspiring people to act on environmental matters.

Promotion of tea and coffee waste recycling through social media may involve such activities as:

2.3.1 Informational Campaigns

The use of social media platforms can help in spreading awareness regarding the effects of tea and coffee waste on the environment and how these wastes can be recycled or re-used. In addition to this, the advantages of practicing sustainable development can also be highlighted through informational campaigns conducted via social media (Cody et al., 2015).

2.3.2 Social Media Influence and Advocacy

Influential personalities in the field of sustainability or environment protection can use the power of social media to promote the concept of recycling tea and coffee waste. Their followers can be encouraged to practice sustainable development by influencing them through social media (Cody et al., 2015).

2.4 Barriers and the challenges in Widespread Adoption

Despite the potential of tea and coffee waste recycling, there are a couple of issues that should be considered when attempting to put such solutions into practice:

2.4.1 Low Awareness Levels

Another major obstacle to wide acceptance of tea and coffee waste recycling is the lack of awareness among the general population, institutions, and lawmaking bodies concerning the technology. There might be an extensive amount of people or organizations that do not know about the various possibilities and implications of recycling and repurposing tea and coffee waste, as well as the impact on the environment (Campos-Vega et al., 2015).

2.4.2 Limited Technological Capabilities

Despite the rapid advancements in the area, there could still be some limitations related to the technologies themselves, which should be solved. The development of more effective ways of repurposing tea and coffee waste could contribute to the acceleration of their recycling process (Scarsella et al., 2022).

2.4.3 Resistance to Change

The persons who are accustomed to conventional methods of waste management like individuals and institutions can be resistant to the introduction of sustainable methods, such as recycling tea and coffee waste. Communication is required along with engaging stakeholders and presenting the benefits of recycling tea and coffee waste to overcome resistance (Eranti & Lonkila, 2015).

3. Research Hypotheses

H1: The level of public awareness regarding tea and coffee waste recycling was relatively low, resulting in limited understanding and adoption of related sustainable practices.

H2: The primary barriers to the adoption of tea and coffee waste recycling practices included lack of awareness, limited exposure to targeted educational content, and weak engagement with sustainability-focused digital communication.

H3: Exposure to targeted social media content (including educational posts, DIY tutorials, and case-based visuals) significantly increased public awareness, engagement, and willingness to participate in tea and coffee waste recycling practices.

H4: Tea and coffee waste recycling practices contributed positively to sustainable waste management by supporting circular economy principles and reducing the environmental burden of organic waste disposal.

4. Theoretical Framework

The basis of this research is three interrelated theories: Diffusion of Innovations Theory, Theory of Planned Behaviour (TPB), and Social Practice Theory. Together, all these theories give a holistic understanding of how such phenomena as awareness, intentionality, socialization, and other processes related to the structures of society determine the adoption of practices of recycling tea and coffee waste using digital means.

Firstly, according to the Diffusion of Innovations Theory (Rogers, 2003), innovations are ideas, actions, practices, or technologies that spread and diffuse among members of a certain social group throughout the course of time. Within the scope of this study, recycling tea and coffee waste can be seen as a new innovation in sustainable environmental behaviour that should be adopted by people. The main factors affecting innovation adoption are relative advantage, compatibility, complexity, trialability, and observability. By providing educational information, DIY tips, and videos about recycling on different social media platforms, people can make practices more observable and triable. In addition, the role of influencers and peers who disseminate such information increases its diffusion.

Secondly, the Theory of Planned Behaviour (Ajzen, 1991) offers a psychological model explaining the individual process of making decisions. The key aspects of TPB are that the formation of the behavioural intention depends on three fundamental determinants: attitudes towards the behaviour itself, subjective norms, and perceived behavioural control. In this case, the attitude of the respondent towards the reuse of coffee and tea waste will be formed based on the knowledge about its environmental advantages, for example, the reduction of waste in landfills and organic farming. The subjective norm is affected by social media usage, where interaction with peers, "likes", sharing, and other types of feedback are seen as signs of social approval. Finally, the aspect of behavioural control is associated with the possession of information and necessary resources, as well as the ease of implementation of recycling behaviour (composting techniques or making your own fertilizer).

Lastly, the framework of Social Practice Theory (Shove et al., 2012) moves the focus from individual cognition to more complex systems responsible for the shaping of practices. According to this theory, behaviour is developed through the interrelation between three aspects, including meanings, materials, and competences. In the current research, meanings are defined as environmental values and the narrative around sustainability that is disseminated via the use of digital media platforms. Materials are associated with physical infrastructure, which includes compost bins, waste collection methods, and organic gardening tools. Finally, competences reflect the necessary skills for the re-use of organic waste. In order to understand the process of behaviour change, this approach is vital because it is important to

understand why mere awareness may be insufficient for behavioural changes due to lack of skills or infrastructure.

Overall, three theories are integrated in order to develop a multidimensional approach to studying tea and coffee waste recycling behaviour. In particular, Diffusion of Innovations provides insights into how the practice spreads, whereas TPB contributes to the understanding of how individuals make decisions regarding behaviour. Lastly, the theory of Social Practice offers an opportunity to view behaviour within the context of broader systems.

5. Methodology And Research Design

For the purpose of determining the effectiveness of social media content on awareness, attitude, and behavioral intention about the recycling of tea and coffee wastes, a quantitative pretest-posttest quasi-experiment research design was utilized. The target population for this study was university students enrolled in higher educational institutes based in Lahore. The number of subjects chosen for this study were 450 from UCP, UMT, and PU through stratified convenience sampling. The process of data collection took place in three distinct stages.

During the pre-test stage, students were required to fill out an objective questionnaire regarding their awareness levels about tea and coffee recycling wastes, their concern about the environment, attitudes towards recycling, behavioral intentions, and their exposure to sustainability content on social media platforms. In the second stage, subjects were exposed to an awareness campaign for two weeks that includes educational material, infographics, video content, DIY instructions for recycling, and success stories related to the same.

The same questionnaire was applied as a post-test after the intervention to evaluate any change in awareness, attitudes, and behavioural intention. Exposure to sustainability-oriented content from social media sites constituted the independent variable, while the dependent variables included awareness, concern about the environment, attitude towards recycling, and behavioural intention. The data collection process utilized a structured questionnaire, which is anchored on a five-point Likert scale. Reliability of the measurement tool was verified using Cronbach's Alpha, and data analysis was done using SPSS via descriptive statistics, paired-sample t-tests, independent sample t-tests, one-way ANOVA, and multiple regression analysis.

6. Results

Table 6.1 Descriptive Statistics (Awareness Scores)

Pre-test awareness scores indicated low baseline knowledge (M = 2.41, SD = 0.73). Post-test awareness scores showed a significant increase (M = 4.12, SD = 0.66).

Variable	Mean	SD	Interpretation
Pre-test Awareness	2.41	0.73	Low awareness
Post-test Awareness	4.12	0.66	High awareness

Awareness level pre-test and post-test was assessed by using a paired sample analysis.

The results of pre-test awareness revealed that students had poor awareness level (M = 2.41, SD = 0.73). Whereas post-test awareness revealed that there was a great increase in awareness level (M = 4.12, SD = 0.66).

Table 6.2 Paired Sample t-test (Awareness Difference)

Pre-test Awareness	2.41	0.73			
Post-test Awareness	4.12	0.66	-14.82	149	.000

The results showed a significant difference between the pre-test and post-test scores regarding awareness, $t(149) = -14.82$, $p < .001$. The implication is that the intervention was highly effective in raising awareness regarding

the recycling of tea and coffee waste among the participants.

Table 6.3 Behavioral Intention (Paired t-test)

Pre-test Intention	2.58	0.81			
Post-test Intention	4.05	0.69	-12.36	149	.000

There is a statistically significant increase in behavioral intention following the intervention, $t(149) = -12.36$, $p < .001$, implying that there is an enhanced behavioral intention towards adopting recycling behaviors.

Table 6.4 Chi-Square Test (Exposure × Awareness)

Test	Value
Pearson Chi-Square (χ^2)	32.74
df	4
p-value	.000

There was a statistically significant relationship between the extent of exposure to social media and level of awareness, $\chi^2(4, N = 150) = 32.74$, $p < .001$. Those with high levels of exposure had higher levels of awareness.

Table 6.5 Chi-Square Test (Engagement × Willingness)

Test	Value
Pearson Chi-Square (χ^2)	28.19
df	3
p-value	.000

There is a statistically significant relationship between engagement level and willingness to engage in recycling behaviors, $\chi^2(3, N = 150) = 28.19$, $p < .001$.

6.1 Analysis & Findings

The results of the study were organized according to the research objectives, which focused on assessing awareness levels, evaluating the effectiveness of social media-based interventions, and examining audience perceptions of tea and coffee waste recycling practices.

6.1.1 Pre- and Post-Intervention Awareness Levels

From the analysis done before and after the visual experiment, there is a clear indication that the level of awareness among the subjects in terms of tea and coffee waste recycling was quite high following the presentation of learning materials and videos. Before the intervention exercise, there was little awareness about the positive implications of recycling of such waste on the environment, not to mention its application. But following the intervention exercise, the results showed an increased awareness level, meaning that visual presentation did play a key role in improving the cognition of the subjects.

6.1.2 Changes in Engagement and Behavioural Intentions

The questionnaire results showed that participants became more willing to take up recycling behaviours regarding tea and coffee waste post-intervention. It was found that participants had greater intentions to compost and recycle their tea and coffee waste in cases where there is a clear and detailed set of instructions to guide their activities. Furthermore, ease of use and environmental

benefits were factors which contributed significantly to behavioural intentions.

6.1.3 Social Media Engagement Analysis

The analysis of the social media engagement metric showed that while content about tea and coffee waste recycling created relatively modest engagement, there was a noticeable upward trend in engagement throughout the course of the study. Metrics such as likes, comments, shares, and even increases in followers all pointed to an increasing level of interest from the public. It seemed that instructional content attracted more attention than plain information.

6.1.4 Perception of Environmental Impact

Finally, responses from surveys revealed that the participants gradually perceived tea and coffee waste as an organic material useful for agriculture and gardening purposes rather than wastage material that could not be utilized. Respondents believed that tea and coffee waste materials could be easily recycled into fertilizers, which would make gardening activities more effective and sustainable.

6.1.5 Overall Findings

The findings clearly showed that the targeted use of visual content on social media can play a critical role in increasing participants' awareness regarding coffee and tea waste management practices. Moreover, visual content was effective in enhancing participation and behavioural intention to undertake such activities.

7. Discussion

The results obtained from this study have shown that social media intervention significantly raised awareness, behavioral intentions, and perceived value associated with tea and coffee waste recycling. First, the statistically significant gain in awareness between the two tests ($t = -14.82$, $p < .001$) shows that the use of social media posts, DIY tips, and examples helped raise the knowledge of people concerning the environment. Such results coincide with existing literature, which suggests that social media intervention can play a great role in raising awareness regarding sustainable practices (Schill & Shaw, 2019).

Next, the gain in behavioral intention ($t = -12.36$, $p < .001$) proves the usefulness of Theory of Planned Behavior (TPB) for understanding the reasons behind people's willingness to recycle tea and coffee wastes. In particular, TPB states that people's behavioral intention is defined by attitude toward the subject matter, subjective norms, and perceived behavioral control (Ajzen, 1991). In our case, attitude was raised because of learning about the beneficial effect that tea and coffee waste recycling could produce. Finally, subjective norm emerged because of social media use when people started liking and commenting on each other's posts. These observations are in line with earlier research that demonstrates how digital interaction among peers enhances environmental intentions through social validation mechanisms (Vahos et al., 2022).

According to the obtained results, there was also a statistically significant connection between the level of social media exposure and awareness ($\chi^2 = 32.74$, $p < .001$), as well as between the engagement and participation in recycling activities ($\chi^2 = 28.19$, $p < .001$). As seen, regular exposure and interactions facilitated participants' awareness and behavioural readiness. This idea may be discussed within the context of Diffusion of Innovations Theory proposed by Rogers (2003). Specifically, it implies that the success of new practice dissemination depends on such factors as visibility, channels for communication, and social reinforcement of the behaviour. The use of visually attractive DIY videos helped increase the observability and trialability of the recycling practices under discussion. This finding resonates with similar observations in environmental communication scholarship (Wilson & Lam, 2022).

Furthermore, the research findings suggest that social practice theory can be used as a theoretical framework to explain why the change in behaviour occurs due to several factors other than personal attitude. In addition to the heightened awareness and intention observed among participants, the study indicates that the adoption of environmentally friendly practices is contingent upon availability of necessary means, including proper composting equipment, infrastructure, and knowledge base.

In summary, the findings suggest that social media can serve as a useful mechanism for communicating about the environment provided that the content of such communications is both visually attractive and practical. Nevertheless, the lack of any dedicated online platforms related to tea/coffee waste recycling indicates the deficiency of environmental activism in this regard.

Finally, this research has shown that it is important to consider the combined application of Diffusion of Innovations Theory, TPB, and Social Practice Theory to explore how digital interventions affect environmental behaviours. Additionally, the research has proven that it is crucial to have an organized and ongoing social media campaign to ensure that people keep recycling their garbage in a sustainable manner.

8. Conclusion

This research looked into the attitudes, awareness, and intentions of the population regarding the recycling of tea and coffee waste using sustainability communication and sustainable behaviours approaches. The outcomes show that although the general awareness of the environmental impact of organic waste recycling may be quite high, there is a low level of actual practice.

Further, it shows that the reasons behind the lack of practice in recycling tea and coffee waste are mostly related to the absence of convenient conditions for such actions, including lack of infrastructure, as well as the absence of proper encouragement from the authorities and other organizations. Finally, behavioural intention was shown to be positively related to environmental benefits and social pressure on people.

Concurrently, this research reiterates the significance of the Diffusion of Innovations theory since the acceptance of the innovation depends upon certain parameters, such as perceived usefulness, convenience, and visibility of the action. People who were previously exposed to campaigns promoting recycling have shown more interest in recycling tea and coffee waste; thus, communication is a crucial factor that aids in the spread of the desired behaviour.

In conclusion, this research suggests that tea and coffee waste recycling should not only depend on communication but must require a multifaceted strategy for successful execution. By addressing issues related to infrastructure and changing people's behaviours, the research finds ways to make tea and coffee waste a valuable resource rather than an ignored burden in the environment.

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