

From Waste to Wellness: Promoting Hygiene Practices through Recycling and Reuse of Soap Waste Generated from Hospitality Industry

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ABSTRACT

The present study explores the Soap for Hope initiative, which collects and recycles discarded soap from hotels to provide hygiene resources to underserved communities. From April 2023 to March 2024, the program collected 12,367.87 kg of used soap from participating hotel groups, recycling 9,490 kg into 93,716 soap bars. A total of 83,202 bars were distributed, primarily in low-income areas, in conjunction with Water, Sanitation, and Hygiene (WASH) awareness campaigns. These efforts align with global Sustainable Development Goals (SDG), particularly the targets for improving sanitation and hygiene in vulnerable populations. The data highlights the contribution of major cities such as Delhi (44% of the total soap collection), Bangalore (20%), and Mumbai (16%), while smaller cities like Chennai and Goa provided more modest contributions.

The program showcases the power of corporate social responsibility by the corporates and the hospitality industry by addressing environmental sustainability through waste reduction, and public health by improving hygiene access. Recycling soap not only diverts waste from landfills but also provides communities with a critical resource to prevent hygiene-related diseases. However, challenges remain in expanding participation to smaller hotel groups and cities and enhancing recycling efficiency. This study concludes that the Soap for Hope initiative represents a scalable model with significant benefits for both environmental sustainability and community health, offering a replicable framework for other regions and industries.

Keywords: Soap Recycling, WASH initiatives, Public Health, Environmental Sustainability, Hand Hygiene, Community Awareness

INTRODUCTION

Soaps have become an integral part of daily life, especially in the post-COVID-19 era, where their use has been crucial in maintaining hand hygiene, promoting safe practices, and preventing the spread of infections. Hand hygiene is essential not only for community health and healthcare settings but also during outbreaks of

infectious diseases such as the COVID-19 pandemic (1). Historically, soaps have been used for cleansing, employing materials like ash, wood, stone, plant seeds, fruits, and various oils combined with alkalis. Over the years, consumer expectations have shifted, leading to the transformation of soap into both a health and cosmetic product. In India, the commercial production of soap began in

1897, with the first branded soap entering the market in the early 1930s(2). This commercialization led to an increase in soap packaging waste, significantly impacting the environment. The production of soaps and their packaging involves various resources, such as raw materials, fuel, and transportation, which often have detrimental environmental effects (3). A study revealed that a 450g soap bar generates a carbon footprint of 741g CO₂e. The water footprint, divided into green, blue, and gray components, measured 1.581 liters, 1.587 liters, and 3.672 liters, respectively. The use and disposal phases of the soap account for 70% of the total water footprint and 16% of the carbon footprint. These findings reinstate the need to develop strategies to educate consumers on environmentally friendly disposal methods, thereby mitigating the environmental impact of soap use and packaging (4).

Over time, the use of soaps has flourished not only at the domestic level but also in various industries, notably the hospitality sector. In this industry, packaged soap is one of the most commonly used amenities, particularly among guests staying for one to two nights (5). It has been reported that millions of tons of soap are discarded annually in landfills in India, contributing significantly to environmental pollution and disrupting ecological balance. Every day, an estimated seven million bars of soap are discarded and left in landfills, highlighting the urgent need for sustainable waste management practices in the hospitality industry (6). Regular and proper use of soap is essential for vital for maintaining public health. According to the World Health Organization (WHO), diarrhoeal disease is the third leading cause of death among children aged 1–59 months, despite being both preventable and treatable. Each year, it results in the deaths of approximately 443,832 children under five and an additional 50,851 children aged 5 to 9 years. Many of these deaths can be prevented through the provision of safe drinking water, adequate sanitation, and proper

hygiene practices. Globally, there are nearly 1.7 billion cases of childhood diarrhoeal disease annually, making it a significant contributor to malnutrition in children under five (7,8). Understanding that hands are a primary route for germ transmission in healthcare settings and daily life is essential. Encouraging hand washing can reduce the incidence of diarrhea by approximately 30% in communities in low- to middle-income countries, as washing hands with soap and water removes bacteria, viruses, and parasites that cause disease. Research suggests that handwashing significantly reduces the risk of diarrhoeal diseases (9,10). However, over 20% of the global population lacks access to basic handwashing facilities, which include both soap and water. This lack of access results in more than half a million deaths annually, particularly in low- to middle-income countries. In recent years, approximately three-quarters of the world's population has had access to basic handwashing facilities, leaving about one-quarter without adequate facilities or relying on those without soap and/or water. Hygiene and handwashing play a vital role in achieving SDG Target 6.2, which seeks to ensure universal access to adequate and equitable sanitation and hygiene, as well as eliminate open defecation by 2030. While access to basic handwashing facilities is gradually improving worldwide, the current rate of progress must accelerate significantly to achieve universal handwashing by 2030 (11).

The promotion of improved hand hygiene is recognized as an important public health measure and one of the best defenses not only against diarrhoeal disease but also against viruses such as COVID-19. Handwashing is a simple, cost-effective act that can save lives in vulnerable communities. The importance of access to soap and raising awareness about hand hygiene cannot be overstated. To address the dual challenges of environmental sustainability and health, particularly hand hygiene, Doctors For You NGO, in

collaboration with a CSR partner, implements the innovative "Soap for Hope" program. The present paper focuses on this initiative's reach and outcome which aims to reduce waste, enhance environmental sustainability, and improve public health by making essential hygiene resources accessible to those in need.

MATERIALS & METHODS

The "Soap for Hope" program is a community-based intervention aimed at recycling used soaps from the hospitality industry and redistributing them to vulnerable and under-informed communities. The program is being implemented by Doctors For You NGO in collaboration with a CSR partner. This study analyzed data gathered from April 2023 to March 2024. The program was carried out across multiple locations in India, including Mumbai, Delhi, Kolkata, Jaipur, Bangalore Chennai, and Goa. The implementation of the program was structured into three distinct phases: soap collection, soap recycling, and community distribution.

i. Soap Collection:

Soaps are collected from participating hotels within the hospitality industry. The hotels directly delivered the soaps to designated soap-making units. The delivery is then received by the logistics person of the program, thereby making a note and acknowledging the contribution through a certificate. The hotels that generously contributed to this initiative include Taj, Radisson, Hilton, ITC, Hyatt, Oberoi, Lalit, Marriott, Accor, Sayaji, Infosys, Four Points by Sheraton, Wyndham, and the Embassy REIT group, among others, through their donations of soaps.

ii. Soap Recycling:

Equipment utilized for soap recycling included shredders, molds, drying racks, and a soap-making machine, with butter paper used for packaging. The recycling process is straightforward: collected soaps are transported to a central recycling facility at the nearest soap processing unit. The process involves sorting out the soaps, cleaning and sanitizing, and drying them at room temperature. Once thoroughly dried, the soaps are manually shredded using a grater and pressed into molds using the soap-making machine via the cold-pressed method, resulting in new bars weighing 120-160 grams each which are further cut into two pieces resulting in two 60–80-gram bar soap. Strict safety protocols are adhered to, ensuring that the recycled soaps meet health and safety standards.

iii. Soap Distribution:

The recycled soaps are packaged with butter paper and stored in a dry place. From the time of recycling the soaps are distributed in 15 days to ensure the quality of the soap is maintained. Distribution is carried out in collaboration with outreach program staff, local health workers, community leaders, etc wherein WASH awareness sessions are conducted. During these sessions with importance of hand hygiene, the correct way to use soap, hand wash steps, and other related aspects are covered. This multi-stakeholder approach aims to maximize outreach. Target areas included slums, rural regions, vulnerable groups, and low-income communities among others. Pictorial representation of soap making is given in Picture 1.



Picture 1: Soap making process

Data Collection

The present study collected quantitative data, wherein data on the number of soaps collected, recycled, and distributed was recorded.

Data Analysis

Quantitative data tables were made using Excel to tabulate the data systematically.

RESULT

The data in the present paper is based on the number of hotel groups donating the used soaps through their respective hotels, the amount of soap collected across the country through various states, and the overall processing of these used soaps and their distribution. As seen in Table 1 data on soap donations reveals a significant contribution

from various hotel groups, with Taj leading the initiative by donating 7,584.3 kg, accounting for 61.32% of the total collection. This overwhelming contribution highlights the major role Taj played in supporting the initiative. Following Taj, Radisson contributed 1,878 kg, making up 15.18% of the total donations, placing it as the second-highest donor. ITC, with a contribution of 716 kg (5.79%), also played a notable role, though its share is significantly smaller compared to Taj and Radisson. Data on soap donations reveals a significant contribution from various hotel groups, with Taj leading the initiative by donating 7,584.3 kg, accounting for 61.32% of the total collection. This overwhelming contribution highlights the major role Taj played in supporting the initiative.

Table 1: Hotel group-wise donation of soaps received for recycling of soaps		
Hotel Group wise data	Total collection (in kgs)	% of Total
Taj	7584.3	61.32
Radisson	1878.0	15.18
Hilton	307.5	2.49
ITC	716.0	5.79
Hyatt	34.0	0.27
Oberoi	189.0	1.53
Lalit	75.0	0.61
Marriott	493.2	3.99
Accor	273.0	2.21
Sayaji	107.0	0.87
Infosys	430.0	3.48

Four points by Sheraton	177.0	1.43
Wyndham	63.9	0.52
Embassy REIT group	40.0	0.32
	12367.9	100

Following Taj, Radisson contributed 1,878 kg, making up 15.18% of the total donations, placing it as the second-highest donor. ITC, with a contribution of 716 kg (5.79%), also played a notable role, though its share is significantly smaller compared to Taj and Radisson.

Other hotel groups, including Marriott (493.2 kg, 3.99%), Infosys (430 kg, 3.48%), Accor (273 kg, 2.21%), and Hilton (307.5 kg, 2.49%), each contributed between 2% to 4% of the total collection, showing moderate participation in the initiative. Smaller yet impactful contributions were made by hotel groups like Oberoi (189 kg, 1.53%), Four Points by Sheraton (177 kg, 1.43%), Sayaji (107 kg, 0.87%), Lalit (75 kg, 0.61%), Wyndham (63.9 kg, 0.52%), and the Embassy REIT Group (40 kg, 0.32%). Hyatt contributed 34 kg, representing 0.27% of the total. Although the smaller contributors provided lower quantities of soaps, their collective efforts are still essential. Even small donations of used soap can make a significant impact when recycled and reused. The process of recycling these soaps and redistributing

them to underserved communities ensures that a potentially wasted resource becomes a valuable tool for promoting hygiene.

As seen in Table 2, the total collection of soaps from various hotel groups between April 2023 and March 2024 amounted to 12,367.9 kg, with significant variation in contributions across different cities. Delhi led the initiative by contributing 5,428 kg, accounting for 44% of the total collection, making it the most substantial contributor. Following Delhi, Bangalore contributed 2,446.6 kg, which represents 20% of the total. Mumbai, another major city, provided 1,935.8 kg, making up 16% of the overall collection. Cities such as Jaipur and Kolkata also played important roles, contributing 1,092 kg (9%) and 726 kg (6%) respectively. These contributions reflect moderate engagement from hotels in these regions. On the lower end of the spectrum, Chennai and Goa contributed 393.5 kg and 346 kg each, both representing 3% of the total. While Delhi's significant participation stands out, smaller contributions from cities like Chennai and Goa are also noteworthy.

Cities	Soap received (kgs)	Percentage
Mumbai	1935.8	16%
Delhi	5428	44%
Bangalore	2446.6	20%
Jaipur	1092	9%
Kolkata	726	6%
Chennai	393.5	3%
Goa	346	3%
Total	12367.9	100%

Even though these amounts are comparatively modest, every kilogram of soap collected can positively impact public health by being recycled and redistributed to those in need.

Table 3 provides data on soap collection, recycling, production, and distribution from

April 2023 to March 2024, emphasizing the scale of the soap recycling initiative and its contribution to community health through distribution and WASH (Water, Sanitation, and Hygiene) awareness programs.

Soap production details	Amount
Tota soap collected from Apr 23' to Mar 24' (in Kgs)	12367.87
Total soap recycled from Apr 23' to Mar 24' (in Kgs)	9490
Total soap made (in units) (~60-80 g each)	93,716
Total soap distributed in the community (in units)	83,202

During this period, a total of 12,367.9 kg of soap was collected from various hotel groups, out of which 9,490 kg was successfully recycled. This demonstrates a recycling efficiency of approximately 77%, highlighting the initiative's effectiveness in repurposing used soap for public benefit. From the recycled soap, a total of 93,716 units of soap were produced, each weighing between 60 to 80 grams. The initiative also achieved substantial outreach by distributing 83,202 soap units to underprivileged communities, ensuring access to essential hygiene products. The redistribution of recycled soaps is accompanied by WASH-related awareness programs, which aim to educate communities on the importance of proper hand hygiene and sanitation, helping to prevent communicable diseases and promote overall health.

DISCUSSION

The results from the Soap for Hope initiative highlight a critical intersection between environmental sustainability and public health. The initiative's collection of over 12,367 kg of used soap from prominent hotel chains, including Taj and Radisson, and recycling of nearly 9,490 kg provides a significant reduction in hotel soap waste, a growing concern in urban hospitality industries (5,6). The recycling rate of approximately 77% demonstrates the efficacy of the collection, processing, and redistribution mechanism. The repurposing of 93,716 soap bars, of which 83,202 units were distributed in vulnerable communities, gives us the broader landscape of the initiative's social impact. These recycled soaps provided an essential hygiene product to populations in need, contributing to WASH promotion goals, which are integral to reducing the spread of diseases, particularly in underserved areas (12). This

initiative aligns with previous research showing the effectiveness of hygiene interventions in reducing diarrhea, a leading cause of mortality in children under five in developing regions (8,9,13).

Additionally, the geographical distribution of the soap collection reflects regional variations in contributions, with Delhi and Bangalore accounting for the majority, followed by Mumbai and Jaipur. These urban centers may have better-established CSR programs, explaining their higher participation. Smaller cities like Goa and Chennai, although contributing less soap, still play a crucial role in supporting this initiative, demonstrating that even smaller contributions can collectively result in a significant community impact. Moreover, this initiative not only contributes to public health but also fosters environmental sustainability by preventing substantial quantities of soap from entering landfills. According to the Environmental Protection Agency (EPA), diverting waste through recycling can significantly reduce greenhouse gas emissions, contributing to climate change mitigation efforts (14). By coupling recycling with public health education on proper hygiene practices, the initiative effectively addresses both immediate health concerns and long-term environmental issues.

Despite the program's success, challenges remain, particularly in ensuring consistent engagement from hotels across all regions and improving collection systems in smaller cities. Future studies could explore strategies to increase participation from a wider array of hotel chains and assess the program's long-term sustainability.

CONCLUSION

The "Soap for Hope" initiative has proven to be an effective model for upcycling waste

while simultaneously addressing public health challenges in vulnerable communities. By repurposing discarded soaps from the hospitality industry and redistributing them to underserved populations, the program not only reduces waste but also supports WASH objectives, contributing to better hygiene and health outcomes. The high level of engagement from hotel groups and the impressive recycling rate demonstrates the feasibility of expanding such initiatives to other regions. To ensure long-term sustainability, efforts must focus on increasing hotel participation, enhancing community education on hygiene practices, and scaling the model to include a broader range of stakeholders.

Declaration by Authors

Ethical Approval: Not Applicable

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