Helpful ReUse: A Community-Based Initiative to Reduce Cosmetic and Medicine Waste While Supporting Underprivileged Communities

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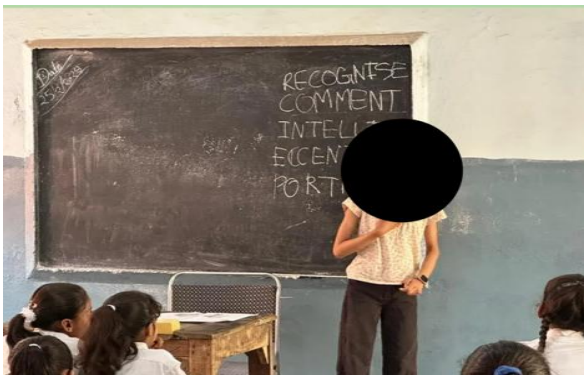
Abstract- As an IB student, I have been frequently exposed to critical global issues such as environmental conservation, sustainability, and social equity. At the same time, through my personal social initiative "Inkva Project"—an English reading program for underprivileged kids—I discovered how deeply fulfilling it is to support vulnerable members of my community.

During and after the COVID-19 pandemic, I observed two interconnected problems around me: first, the improper disposal of medicines and cosmetics; second, the difficulty faced by urban poor families in accessing basic medicines and personal care products because of high costs. I also noticed stray animals consuming discarded medicines and cosmetic containers from trash bins, and learned from an NGO that many children did not have access to essential medicines and cosmetics at all.

In response, I designed Helpful ReUse, a community-based initiative with two main goals:

1. **Environmental Aspect - Contributing to a greener environment by reducing the expired, unused/ partially used and discarded cosmetics and medicines that go into landfills and water bodies. This is done by circling back unused and unexpired cosmetics and pharmaceuticals in the community for the needy to use and disposing of the expired collections using proper disposal methods available in the local area.**
2. **Economic Aspect - Helping the urban poor working in our community like maids, labourers, etc. with cosmetics and medicines they need but cannot afford. Local NGOs will be running this distribution with my support. Cosmetics will be donated directly to the community; however, medicines will be donated to selected urban poor dispensaries in the local area.**



This research paper documents the design, implementation, and evaluation of Helpful ReUse as a small-scale prototype project. It includes my fundraising efforts (bake sale), partnership building with NGOs and dispensaries, donation drives for collection and redistribution, sorting and disposal protocols, and Excel-based tools to calculate savings and Scope 3 carbon emissions for disposed cosmetics. The paper also reflects on my learning in research skills, Excel skills, social and collaboration skills, and self-management skills, as well as the limitations and future scope of the project.

Learning Goal - The primary learning objectives of this project include gaining a deeper understanding of the challenges related to accessing essential medications and cosmetics faced by underprivileged communities due to high costs, as well as the environmental and health risks posed by their improper disposal; exploring actionable solutions; and building practical skills.

Through this project, I will enhance my knowledge of carbon emissions, their various scopes, and methods for calculating relevant metrics, which will also increase my awareness of opportunities to reduce carbon emissions in daily life. Additionally, the project will allow me to refine my advanced Excel skills by working with formulas for the required calculations. Moreover, collaborating with multiple stakeholders, including NGOs, local

dispensaries, and schools, will provide valuable experience in teamwork and interpersonal communication, enabling me to work effectively with diverse groups.

Product Goal - The primary objective of this product is to successfully organize and execute donation drives aimed at supporting various community-driven activities. These well structured drives will serve as the foundation for subsequent efforts to collect donated cosmetics and medicines. The collected materials will then be meticulously sorted to ensure their quality and usability. Reusable items will be redistributed back into the community through additional donation drives organized in nearby schools and dispensaries, where they can benefit those in need. Meanwhile, any unusable cosmetics and medicines will be carefully identified and disposed of through proper and environmentally responsible channels, ensuring compliance with safety and sustainability guidelines.

Keywords- Medicine waste, cosmetics waste, urban poor, Scope 3 emissions, carbon footprint, Excel tools, donation drives, sustainability, NGO collaboration, IB personal project

I. INTRODUCTION

1.1 Personal Context and Motivation

Since the onset of the pandemic, I started noticing something worrying in my surroundings:

- Improper disposal of medicines and cosmetics in household trash.
- People struggling to access even basic medicines like fever tablets during shortages.
- Stray dogs, cats, and cows eating from trash bins that contained discarded medicines and plastic cosmetic containers.
- Children from urban poor communities, whom I met through an NGO, lacking access to basic medicines and cosmetics.

These observations made me realize that there was both a social problem (lack of access to essential products) and an environmental problem (improper disposal causing harm to animals and the environment). Reflecting on this, I felt that I could make a small difference by collecting unused and unexpired cosmetics and medicines from households and sharing them with people who needed them, while also disposing of expired items properly.

1.2 Problem Statement

The core problem this project addresses can be divided into two parts:

1. Access Problem: Many underprivileged families living in and around Noida struggle to afford basic medicines and cosmetics such as shampoo, soap, hair oil, creams, and pain relief medicines.
2. Disposal Problem: In middle-class communities, unused or expired medicines and cosmetics are often thrown into regular trash bins, flushed, or poured into sinks. This can:
    - Contaminate landfills and water bodies
    - Harm stray animals and wildlife
    - Contribute indirectly to environmental pollution and carbon emissions

There is a clear mismatch: some people are discarding usable products, while others cannot afford them. At the same time, there is no clear system for safe disposal of medicines and cosmetics at the household level.

1.3 Research Aim and Questions

The aim of this research-based personal project is to design, implement, and evaluate a small-scale prototype called Helpful ReUse that:

- Reduces waste from medicines and cosmetics through reuse and proper disposal.
- Provides economic benefits to underprivileged individuals and families by redistributing usable products.
- Measures environmental impact using basic carbon emission calculations.

The guiding research questions for this project are:

1. Social Impact:
    - To what extent can a community-based initiative improve access to basic medicines and cosmetics for urban poor families and local dispensaries?
2. Environmental Impact:
    - How much cosmetic waste can be diverted from regular trash through proper sorting, reuse, and disposal?
    - What approximate Scope 3 carbon emissions savings can be calculated for disposed cosmetics?
3. Skill Development:

- How does this project help me develop research skills, Excel-based analytical skills, social and collaboration skills, and self-management skills?

1.4 Objectives

To address these questions, I set the following objectives:

- Learning Objective: Gain a deeper understanding of:
  - Challenges faced by underprivileged communities in accessing medicines and cosmetics.
  - Environmental and health risks of improper disposal.
  - Concepts of carbon emissions, especially Scope 3, and learn to calculate basic metrics using Excel.
- Product Objective: Plan and execute:
  - A fundraiser (bake sale) to raise money for donation bins and supplies.
  - Collection drives for medicines and cosmetics across several apartment complexes.
  - Sorting and categorization of items into reusable and disposable.
  - Donation drives in schools and dispensaries to redistribute usable items.
  - Proper disposal of unusable items through hospital channels and basic carbon emission calculations.

II BACKGROUND AND LITERATURE REVIEW

2.1 Environmental Impact of Medicine and Cosmetic Waste

Improper disposal of medicines and cosmetics can lead to chemicals entering the environment, affecting soil, water, and animals. Many cosmetic products contain volatile organic compounds (VOCs) and other chemicals that can contribute to air pollution and greenhouse gas emissions when disposed of or used in large quantities. Studies, including those cited in my bibliography (such as Gao et al., 2023), show that hair products and cosmetics can release VOCs during use and disposal.

Medicines also have a significant carbon and environmental footprint. From production to distribution and disposal, drugs can contribute to greenhouse gas emissions and environmental contamination (Boyle, 2024). However, detailed emission factor data for specific medicines is often available only in paid reports or specialized databases, which was a limitation in my project.

2.2 Carbon Footprints and Scope 3 Emissions

A carbon footprint measures the total greenhouse gases produced directly and indirectly by an activity, product, or person, usually expressed as CO_2 equivalent. I used sources like Britannica and Brightest.io to understand how carbon emissions are categorized into three scopes:

- Scope 1: Direct emissions from owned or controlled sources.
- Scope 2: Indirect emissions from the generation of purchased energy.
- Scope 3: All other indirect emissions that occur in the value chain, such as use of sold products, transportation, waste, etc.

In my project, Scope 3 emissions were relevant because I was looking at the use and disposal of cosmetics by consumers, not the manufacturing process. Since medicines were more complex and data was less accessible, I focused on calculating Scope 3 emissions for disposed cosmetics only.

2.3 Access to Medicines and Cosmetics for Underprivileged Communities

Through my volunteering work and interactions with NGOs like Smile India Trust, I learned that:

- Many families in urban slums and low-income areas struggle to purchase everyday items like shampoo, soap, toothpaste, and basic medicines.
- NGOs often run donation drives for health-related products (like sanitary pads, vaccines, and basic medicines), but supplies are limited and funding is a constant challenge.

This showed me that if unused, unexpired products from middle-class homes could be collected and redistributed properly, they could create tangible savings and support for underprivileged families and local dispensaries.

III METHODOLOGY

3.1 Project Design: The Helpful ReUse Model

My project Helpful ReUse has two main aspects:

1. Environmental Aspect
   - Reduce the amount of expired, unused, and partially used cosmetics and medicines going into landfills and water bodies.
   - This is done by:
     - Circling back unexpired, safe products to the community through NGOs, schools, and dispensaries.
     - Disposing of unusable items using proper local channels (hospital networks, medical waste systems).
2. Economic/Social Aspect
   - Support urban poor families working in our community (maids, labourers, etc.) and underprivileged children by giving them access to cosmetics and some medicines they need but cannot afford.
   - Cosmetics are donated directly to communities (through schools and slums).
   - Medicines are donated to selected urban poor dispensaries in the local area.

3.2 Success Criteria

To evaluate the success of the project, I defined detailed criteria across different areas:

- Fundraiser (Bake Sale) – Goal: Raise around Rs. 10,000 to buy donation bins and cover packing/transport costs.
- Networking and Partnerships – Goal: Finalize at least one NGO, one proper disposal authority (hospital), and two local dispensaries.
- Sorting and Collection – Goal: Sort at least 90–100% of collected items correctly and set up multiple donation boxes in different locations.
- Donation Drives – Cosmetics – Goal: Run donation drives in local Noida schools and a nearby slum, donating most or all reusable cosmetics and collecting data.
- Donation Drives – Medicines – Goal: Work with at least three dispensaries to donate collected medicines, with proper data tracking.
- Data Analysis – Disposed Items – Goal: Calculate emission factors and Scope 3 emissions for at least 50% of disposed cosmetics.
- Data Analysis – Donated Items – Goal: Calculate savings and reuse metrics for at least 70% of donated items.

These criteria were inspired by online project management and success criteria diagrams, which I adapted to suit my project.

3.3 Fundraiser: Bake Sale

The first step was to raise money to purchase donation bins and cover other basic costs. I chose a small home bake sale instead of a large external fundraiser because:

- The required amount was modest.
- It was realistic to achieve the goal within my network of family and friends.

Key activities included:

- Calculating a rough budget and setting the target (at least Rs. 9,000).
- Procuring ingredients and packaging materials for cookies.
- Creating flyers and an email format to invite family and friends.

- Hosting the bake sale at home and collecting donations (both cash and wire transfers).
- Keeping a donor list and proofs of donation.

3.4 Partnering with NGOs, Dispensaries, and Hospitals

Next, I needed to build a network of partners:

- NGO: I contacted multiple NGOs in Noida working in healthcare and community work. Since I had previously volunteered with Smile India Trust for an English teaching assignment, I reconnected with them. They liked the project idea and agreed to support it, becoming my main NGO partner.
- Dispensaries: With the help of Smile India Trust, I identified and connected with three local government dispensaries serving urban poor communities.
- Hospital for Disposal: I discovered that there was no official system for collecting household medicine/cosmetic waste directly. After discussing with my supervisor, I used the hospital network route. I contacted two local hospitals, and one agreed to accept the sorted "disposable" medicines and cosmetics so they could feed into the proper medical waste disposal chain.

3.5 Donation Drives: Collection Phase

I conducted two types of collection activities:

1. Collection from Apartment Complexes
   - Placing 4–5 labelled donation bins in apartment complexes where my friends and relatives live.
   - Taking permission from apartment offices to place bins for around three weeks.
   - Labelling bins clearly for "Medicines" and "Cosmetics" and explaining the purpose.
   - Making announcements and using word of mouth and some basic flyers.

2. Types of Items Collected
   - Cosmetics (shampoo, hair oil, creams, soap bars, toothpaste, body powder, etc.).
   - Medicines (vitamins, fever/pain medicines, antacids, diarrhea medicine, antibiotics, etc.).

3.6 Sorting Protocol

Once the donation period ended, all collected items were brought to my home for a major sorting session. I created a rule sheet to decide whether an item was donatable or disposable.

For cosmetics, items were marked disposable if:

- The packaging was torn, leaking, or damaged.
- The product was expired or did not show a visible expiry date.
- The product was banned or had negative information online.

Only cosmetics that passed all these checks were marked donatable.

For medicines:

- I did not donate medicines directly to individuals.
- Medicines were only passed to dispensaries after checking expiry dates and packaging condition.
- Expired or damaged medicines were placed in the disposable category.

3.7 Redistribution: Donation Drives for ReUse

Once sorting was completed, I organized drives to redistribute usable products:

1. Cosmetics Donation Drives
   - With the support of Smile India Trust, I identified schools in slums and nearby villages.
   - I finalized two schools (out of an initial list of about ten) for cosmetic donation drives.
   - On the chosen days, I packed and transported all donatable cosmetics to the schools.
   - With the help of teachers and NGO volunteers, cosmetics were distributed to children and their families.
   - I collected data on the number of families/children benefitted and the quantity distributed.

2. Medicine Donation Drives
   - Donatable medicines were packed in sealed zip-lock bags.
   - They were delivered to three local dispensaries identified by the NGO.
   - Doctors in charge received the packs and were informed that these were unexpired and properly sorted medicines.
   - I collected data on the quantity and approximate value of medicines donated.

3.8 Disposal Drive for Unusable Items

For items marked as disposable:

- I packed them in special disposable bags.
- I contacted the hospital that had agreed to help and coordinated the timing.
- The bags were delivered to this hospital so that the medicines and cosmetics could enter the existing medical waste disposal system.

This step ensured that the unusable material was not thrown into regular trash, reducing environmental and health risks.

3.9 Data Collection and Excel-Based Tools

To properly evaluate my project, I created multiple Excel workbooks:

1. Sorting Tool – To record:
   - Total units collected, donation-ready, and disposable for each category.
2. Savings Tools – To estimate economic benefits:
   - Medicines Savings Tool: Calculated the total value of medicines donated to dispensaries based on average price per unit.
   - Cosmetics Savings Tool: Calculated the total value of cosmetics donated to families and average benefit per family.
3. Emissions Calculator – For disposed cosmetics:
   - Used freely available emission factors (activity-based and spend-based).
   - Calculated Scope 3 emissions for disposed cosmetics using two formulas:
     - Spend-based: Activity Metric (Spend in USD) × Emission Factor ($kgCO_2e$/USD).
     - Activity-based: Activity Metric (Total weight) × Emission Factor (grams/kg or similar).

All these tools were designed and tested using real project data, which helped me develop my Excel skills significantly.

3.10 Timeline (Gantt Chart Approach)

I mapped all activities in a Gantt chart from June to November. The main steps included:

1. Fundraiser preparation and bake sale
2. Finding and finalising NGOs Setting up donation bins and running collection drives
3. Sorting of collected items
4. Distribution of cosmetics at schools
5. Distribution of medicines at dispensaries
6. Disposal of unusable items
7. Final Excel calculations
8. Feedback collection from stakeholders

This month-by-month breakdown helped me manage my time, coordinate with stakeholders, and monitor progress.

IV RESULTS

4.1 Collection and Sorting Outcomes

Using the Sorting Tool, I recorded the following data

PHARMA/ MEDICINES			
ITEM TYPE COLLECTED	UNITS COLLECTED	DONATION READY	TO BE DISPOSED
Vitamins/ Supplements			
Kids Medicines/ Syrups			
Adult Analgesics/ Fever/ Pain			
Diarrhea Medicine			
Stomach Antacids			
Adult Antibiotics			
Kids Antibiotic Syrup			
Ear Drops			
Skin Topical Tube			
Cough/Cold/Antihistamines			
Electral/ Electrolytes			

Statins/ Insulin			
Thermometer			
Totals			

COSMETICS			
ITEM TYPE COLLECTED	UNITS COLLECTED	DONATION READY	TO BE DISPOSED
Shampoo	12	10	2
Hair Oil	57	55	2
Hair Dye	2	0	2
Cream	80	70	10
Soap Bar	60	60	0
Conditioner	7	0	7
Cosmetics/ Beauty Supplies	35	10	25
Liquid Soap	7	0	7
Hand Sanitizer	3	0	3
Toothpaste	58	56	2
Body Powder	50	50	0
Mouth Wash	3	0	3
Totals	374	311	63

I was able to sort nearly 100% of the collected items using my rule sheet, which met and even slightly exceeded my success criteria.

4.2 Economic Savings: Medicines and Cosmetics

Using the Savings Tools, I estimated the economic value of donations.

PHARMA METRICS - FOR DONATION			
ITEM TYPE CATEGORY	UNITS	AV. PRICE/UNIT	TOTAL AMOUNT
Vitamins/ Supplements	20	53	1060
Adult Analgesics/ Fever/ Pain	42	19	798
Diarrhea Medicine	20	22	440
Stomach Antacids	20	26	520
Adult Antibiotics	20	90	1800
Cough/Cold/Antihistamines	20	94	1880
Electral/ Electrolytes	30	4	120
TOTAL DONATED	172		6618

Medicines: Dispensary Benefits

- Total number of dispensaries: 2 (initially), later extended to 3.
- Average amount of medicines donated per dispensary (for 2 dispensaries): Rs. 3309.

Cosmetics: Family Benefits

COSMETICS METRICS - FOR DONATION			
ITEM TYPE CATEGORY	UNITS	AV. PRICE/UNIT/ RS	TOTAL AMOUNT
Shampoo	10	35	350
Hair Oil	55	30	1650
Cream	70	25	1750
Toothpaste	60	32	1920
Soap Bar	56	15	840
Body Powder	50	22	1100
Conditioner	10	55	550
TOTAL DONATED (RUPEES)	311		8160

- Total number of families/representative kids benefitted: 50
- Average donation per family: approximately Rs. 163.2

4.3 Scope 3 Emission Calculations for Disposed Cosmetics

I gathered emission factor data for cosmetics from freely available online sources. For example:

- Activity-based emission factors in grams per kg for specific product types (shampoo, creams, hair oil, etc.).
- Spend-based emission factors in $kgCO_2e$ per USD for categories like soap/cleaning compounds and cosmetics/perfumes.

Using this data and my Excel-based calculator, I computed Scope 3 emissions for disposed cosmetics using both spend-based and activity-based methods.

Spend-Based Scope 3 Emissions (Approximate)

- Total spend value (in USD) for disposed cosmetics: around $52.89
- Resulting Scope 3 emissions: approximately 16.41 $kgCO_2e$

Activity-Based Scope 3 Emissions (Approximate)

- Total weight of disposed cosmetics: 5800 grams
- Resulting Scope 3 emissions: approximately 104.73 grams (depending on factors per product type)

Due to limited free data, I could not calculate Scope 3 emissions for medicines. That remains a future research area.

V. DISCUSSION

5.1 Social Impact

The Helpful ReUse project showed that even a small-scale community initiative can make a meaningful difference:

- Families Benefitted: Around 50 families (through school/slum drives) received essential cosmetics such as shampoo, soap, toothpaste, creams, etc.
- Dispensaries Benefitted: Three dispensaries received a combination of donated and newly purchased basic medicines worth more than Rs. 6600, which they could use for patients.
- Awareness: Donors, NGO staff, school principals, and dispensary doctors became more aware of the issues related to medicine and cosmetic waste and the importance of reuse and proper disposal.

5.2 Environmental Impact

Environmentally, the project:

- Diverted 63 units of cosmetics and 83 units of medicines from regular household trash into proper medical waste streams.
- Demonstrated a basic methodology for calculating Scope 3 emissions for disposed cosmetics using both spend-based and activity-based formulas.
- Showed that even small amounts of disposal handled properly can lead to measurable emission savings when scaled up.

5.3 Development of ATL Skills

5.3.1 Research Skills

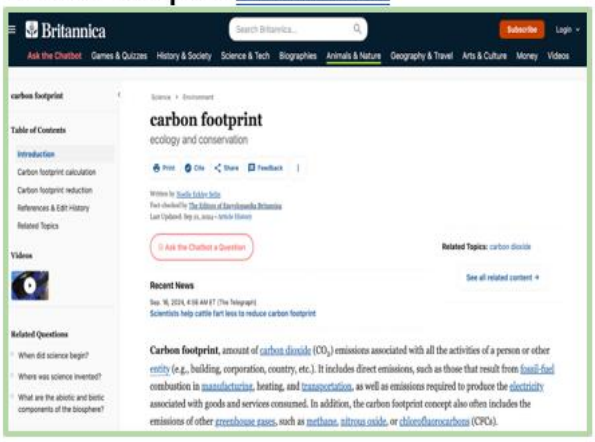
My research skills improved through:

- Primary Research: Conducting an in-person interview with a relative who is a zoology university professor to understand the environmental and biological aspects of waste and emissions in more depth. He provided credible, scientific explanations about how discarded medicines and cosmetics can affect animals, ecosystems, and human health, which helped me ground my project in real-world biological impact.
- Secondary Research: Using sources like Britannica, AAMC, Brightest.io, and others to learn about:
    - Carbon footprint and Scope 1, 2, and 3 emissions, especially how Scope 3 relates to product use and disposal.
    - Emission factors and how companies use them and different formulas to calculate carbon footprints.
    - The environmental impact of drugs and cosmetics, including how their production, use, and disposal contribute to pollution and emissions.

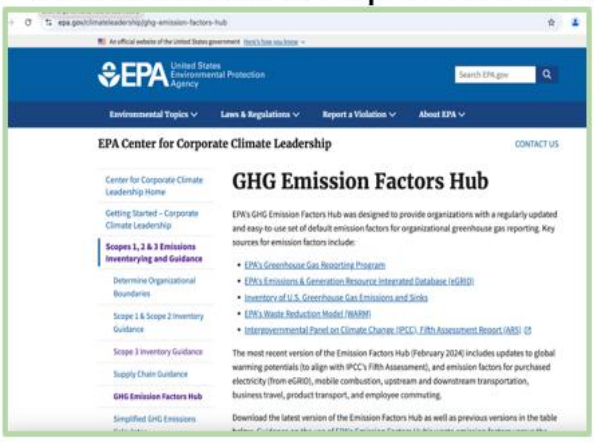
Challenges in research:

1. I faced an information overload using google and I had to conduct explanatory, descriptive and survey research. I also conducted OPVLs to help find credible resources.
2. Emission factors are published by multiple private companies and agencies; however the information is generally not freely available. Since I couldn't pay the high subscription fees for most of the sources; I relied on free resources.
3. I had a learning gap in using excel, which also I had to learn to utilize it correctly.

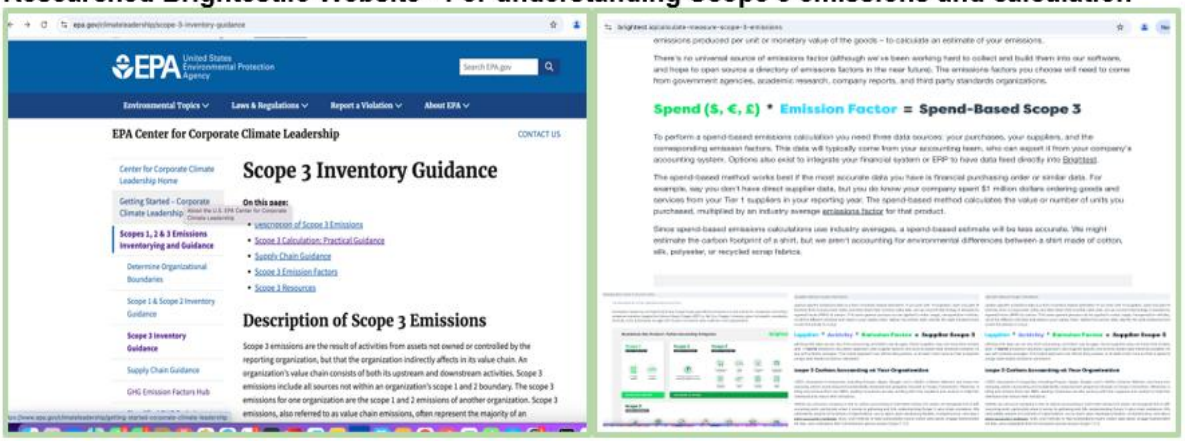
Carbon Footprint - Britannica



EPA.GOV - Sources of scope 3 emission factors



Researched Brightest.io Website - For understanding Scope 3 emissions and calculation



5.3.2 Excel-Based Analytical Skills

Since this initiative served as a small-scale prototype to tackle the societal issue described, accurate assessment of its impact and effectiveness was crucial for scaling the efforts to reach a wider audience. Creating these Excel-based tools involved extensive research into carbon emissions and calculation methods. I had planned to leverage online resources such as credible scientific journals and publicly accessible datasets to design and implement these tools effectively.

1. Saving Tool - Separate savings sheets were created for cosmetics and medicines to maintain a clear and accurate record of all donations. These records were shared with all stakeholders to ensure transparency.
2. Sorting Tool - A sorting sheet was designed to efficiently and accurately categorize large volumes of donated cosmetics and medicines.
3. Disposal Tool - For cosmetics marked for disposal, a carbon emissions calculator was developed in Excel. This tool utilized freely available emission factor data and standard "spend-based" and "activity-based" formulas to estimate the carbon emissions saved through proper disposal methods, compared to regular waste disposal practices.

These Excel tools turned my project from just a “donation drive” into a small research study with measurable outcomes.

5.3.3 Social and Collaboration Skills

Because of the nature of my project, I had to collaborate with multiple organisations for my project to handle donation and disposal processes. For instance, I collaborated with organisations like Smile India Trust to organise drug and cosmetic donation campaigns, three pharmacies in Noida to provide collected medications, and a local hospital to handle the appropriate disposal of used drugs and cosmetics. I also got in touch with friends and relatives so that I could set up donation boxes in their apartment buildings. To raise money to pay for the prices of collecting containers, I also had to organise a small bake sale with the help of family and friends. After working on this project, my social and cooperative abilities have significantly improved, though there were challenges at first.

Social and teamwork challenges I faced and how I overcame them -

1. I had to talk to multiple foundations in Noida who work in this area; when I finalised Smile India Trust, it took me some time to get a point of contact assigned for myself.
2. Finding a disposal dump for this kind of medical/cosmetic waste was a challenge and I spoke to 2 local hospitals to help me out. One of them agreed. I had to do this, as the disposal of medicines is via hospital network from where the medical waste is picked by the local authority.
3. I faced a unique challenge in a particular donation box location; where I realized that people had stolen a few donated cosmetics. I had to have someone do a daily pickup from that location.
4. Lastly, I had no experience baking cookies, but it was an amazing learning experience with my mother.

Over time, my communication and collaboration skills improved significantly.

Social Media Coverage

5.3.4 Self-Management Skills

Self-management was critical because I was in Grade 10 with summative assessments while running this project.

1. Time Management: Effective time management, which helps me balance the demands of many activities and academic work, is a crucial ability that I have acquired from this initiative. Being in grade 10th I had to manage my studies in parallel, thus time management was essential. During a summative cycle, I balanced my time to carry out donation and sorting efforts, and I was fairly successful in both.

2. Organizational Skills: One of the most crucial abilities for this initiative was organisation. Starting from bake sale, to procurement of donation boxes, sorting of all the collected material, to disposals and driving reuse, I had to plan everything. There was a lot of data and I had to find a way to keep track of it all. I, therefore, made an excel spreadsheet with all the data to make organising easier. For the scope 3 emissions calculation, I used excel extensively. This gave me an opportunity to learn and use excel effectively.
3. Handling Distractions: I learned to navigate social events, family functions, and other distractions while maintaining project quality.

Although the project was an individual one, my parents supported me with logistics, such as driving me to different locations.

5.4 Changes to the Initial Idea

Two major changes happened:

1. Scope 3 for Medicines Dropped

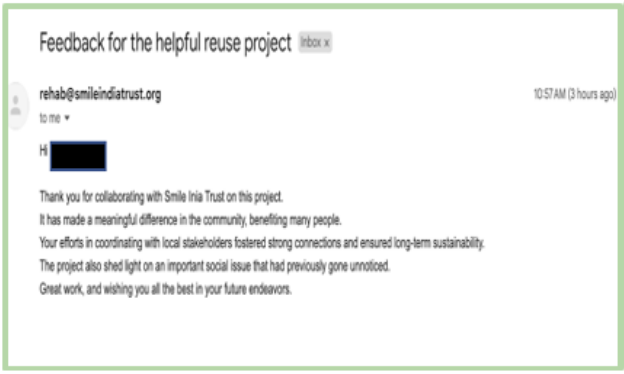
Initially, my goal for this project was to calculate the Scope 3 emissions for both discarded cosmetics and medicines. However, after exploring available emission factor data for medicines and realizing the complexity and cost involved in acquiring the necessary reports, I chose to adjust my approach. I decided to focus solely on calculating the Scope 3 emissions for cosmetics instead.

2. Disposal Mechanism Revised

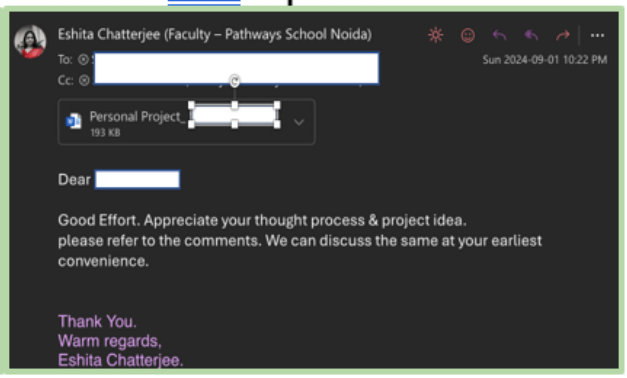
My original plan involved coordinating with local authorities to ensure the proper disposal of cosmetics and medicines. However, I soon discovered that no formal process exists for collecting household waste of this kind. After discussing the issue with my project guide, she advised me to leverage the local hospital network for disposal. Following her guidance, I arranged for the remaining materials to be dropped off at a nearby hospital for appropriate collection.

After all the activities of the project were completed, a survey was conducted to gather feedback from various stakeholders involved in the project, including donors, representatives from Smile India Trust, participating dispensary doctors, and a few of my friends, to assess their understanding of this environmental issue.

Feedback From Smile India Mentor



Feedback From Supervisor



VI. REFLECTION AND IDEOLOGY

6.1 My Ideology and Learning

Helpful ReUse was not just an activity; it reflected my belief that small, well-planned community projects can create real impact. The project allowed me to:

- Explore how much carbon emissions could be reduced through small-scale reuse and proper disposal.
- Understand the everyday struggles of underprivileged communities in accessing basic health and personal care items.
- See firsthand how NGOs and dispensaries operate.
- Experience the satisfaction of turning an idea, born out of a painful memory of seeing a dog chewing medicine waste, into a complete project.

6.2 KWL Chart Summary

What I knew before:

- Only basic Excel skills.
- Some vague idea of carbon footprint, but not how it is calculated.

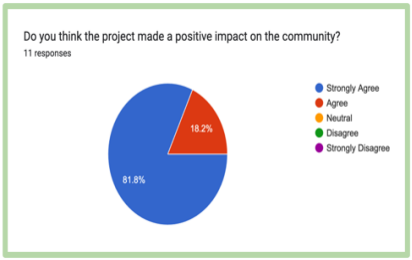
- That cosmetic and medicine disposal in residential colonies was unstructured.
- That NGOs worked in healthcare, but not the full details of their operations.

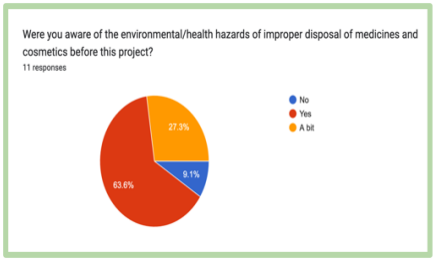
What I wondered:

- How to use advanced Excel formulas, macros, and charting in real projects.
- How to calculate Scope 3 emissions for medicines.
- How to create a better system for collecting and disposing of domestic medical/cosmetic waste.
- How NGOs manage multiple projects in healthcare.

What I learned:

- Use of formulas and pivot tables in Excel.
- The different scopes of carbon footprint and how emission factors are used.
- The actual flow of domestic medical waste disposal in my city and its gaps.
- The range of projects NGOs like Smile India Trust run, such as vaccine drives and sanitary pad distribution.





VII. LIMITATIONS AND FUTURE SCOPE

7.1 Limitations

- Scale: This was a small-scale prototype with limited time and resources. A larger project could provide more statistically significant data.
- Emission Factors: I used freely available emission factors, mainly for cosmetics. For medicines, I could not obtain free data, making emissions calculations incomplete.
- Dependence on Manual Data Entry: All data was entered manually in Excel, which can introduce human error.
- External Constraints: Festival seasons, school holidays, and weather reduced the number of donation drives I could complete.

7.2 Future Scope

In the future, I would like to:

- Expand Helpful ReUse by partnering with more NGOs and schools to increase impact.
- Work with a biology teacher or researcher to tackle the complexity of medicine-related emission factors.
- Explore technology-based solutions (like an app) for residents to schedule medicine and cosmetic waste pickup for safe disposal.
- Conduct more detailed environmental analysis, including water and soil impact of improper disposal.

VIII. CONCLUSION

The "Helpful ReUse" project holds a very special place in my heart. For the last couple of years, I had been looking to do impactful work that could both improve the efficiency of medicine access for the poor and reduce unnecessary waste. This project finally allowed me to bring that vision to life. I am truly elated that I was able to drive the project to closure and achieve the results I was initially aiming for. From organizing a highly successful fundraiser to conducting multiple material donation drives, the journey covered everything from collection and sorting to reuse and finally the environmentally responsible disposal of unusable items. Each phase of the project was completed to my utmost satisfaction, and I could clearly see how much dedication, careful planning, and persistence had gone into making it all work.

Beyond the tangible outcomes, this project was an extraordinary learning experience for me. It gave me

invaluable insights from both an implementation and a research perspective. One of the most significant learnings was understanding the process of calculating carbon emissions, a concept that felt very difficult and abstract when I first encountered it. I had to face a steep learning curve to properly understand the scopes of carbon emissions and how they are measured. During this process, I discovered many useful online resources, but Brightest.io turned out to be the most valuable for helping me understand Scope 3 emissions and the methods to calculate them. I am also very grateful to my project supervisor at school, who guided me in the initial stages when everything felt overwhelming. In addition, I spent considerable time learning Excel formulas that I had never used before, which has now become a long-term skill I can apply in future projects.

Managing this project meant constantly balancing multiple activities and working with diverse stakeholders, which made it even more complex. The festival season in India, along with school closures, and unexpected challenges due to monsoon weather, made time management particularly difficult. At the same time, I had to keep up with my academic workload in IB, which really tested my organizational skills and emotional resilience. However, instead of discouraging me, these challenges ultimately helped me refine my time management abilities and made me more disciplined and efficient.

Despite all these hurdles, I am thrilled to say that every aspect of the project was completed successfully and largely on schedule. Leading the "Helpful ReUse" project has been truly transformative for me. It has left me with a deep sense of accomplishment and a clearer understanding of how impactful initiatives can be thoughtfully planned, executed, and measured. Most importantly, it has ignited in me a stronger passion for sustainability and reinforced my commitment to continue working on projects that make a positive difference in society.

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