Food Wastage Reduction Web Application: A Novel Approach to Curb Hunger and Spread Happiness

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Abstract: *The purpose of HungerFree is to free India from hunger. Every day over millions of Indians sleep without getting a meal. This problem can be solved by tackling the food wastage problem that occurs during big Indian weddings, Restaurants, etc. HungerFree is a platform that provides a solution to this problem by connecting restaurants, various NGOs to the needy. HungerFree is a web app designed and developed keeping in mind the difficulties NGOs or restaurants face to reach out to people.*

Keywords: Food waste management, food wastage, world hunger, global food security, environment

1. Problem Statement

According to the United Nations Development Programme, about 40% of the food produced in India is wasted. **[1]** Even though the food produced in India is adequate, the UN has reported that about 190 million of the Indian population remain undernourished. **[2]** These are some bleak statistics, but they should help us realize the magnitude of the problem of food waste, as much as inequity, in India. It has been recognized that no truly sustainable and developed country can exist without tackling the issue of food waste and some steps need to be taken sooner.

2. Introduction

Having food readily available whenever you want, whatever you want to have, is something to celebrate and to be grateful about, but do we ever wonder about people who are not even able to afford one meal a day.

Do we ever wonder about how much food gets wasted every day? Have you ever thought about this? No, people like us, who've food readily available, don't even take the pain to think about something like that.

Why is it that some people have so much food that it goes to waste, and why is it that some people have to go to bed without even being able to have a meal per day?

This is a question that we should be deliberately thinking about, but sadly we just don't. People who have empty bellies surely do, they all wonder what would have happened to the food?

Rather than being put into a trash can, what would the situation be like if the food that's being wasted could be used to fill up their empty bellies?

If we look closely and pay enough attention, we'll be able to see the amount of food that's being wasted every day in our household, in our society, in our city, in our county, and on the whole planet, the numbers are terrifying, the numbers themselves speak so much, that we cannot ignore this issue any further.

Some people think that this is an issue the government should be taking care of.

But what about just the food wastage?

Food is getting wasted in our household anyway, right?

One-third of the total food produced is never eaten and it eventually goes to waste. Every year, about 40% of the food that is produced is going to waste.

When we look at a world that'll have 9 billion people in the relatively upcoming few years and we've got people that are helpless to get some food to feed themselves, the idea of wasting food? There's something wrong with that.

Statistics show that out of the total amount of food wasted

every year, a large percentage of it is suitable for human consumption and can be used to feed the underprivileged to fill their empty stomachs. A lot of wasted food ends up in landfills, while it could have been used to fill and satisfy a stomach which had no hope of getting food.

The amount of food that gets wasted isn't just a problem about food getting wasted, or about food that could have made someone's stomach happy, it's also about global warming, it's also about global food security, it is a problem about food insecurity, environment and the people.

Food waste has an influence not only on the food and the people who need it, but also on the economy of the country.

Food wastage in India

Food wastage is actually a sin. The data showed that India wastes a staggering amount of food and for context, the food that's wasted in India every year is equal to the amount of food the whole United Kingdom consumes. [2]

Food waste has now reached an extent in India, where the country's roads, garbage dumps, and landfills are ample evidence of this.

According to the United Nations (UN) Development Plan, up to 40 percent of total food production is wasted and about 21 million tons of wheat are wasted annually. You don't even need to look at several resources to see how much food is wasted in the country.

During lockdown in 2020, India registered a staggering amount of food getting wasted just because of a poor supply chain. MilkBasket food delivery website lost 15,000 liters of milk and 10,000 kg of vegetables in one day after service providers were denied entry to communities & societies due to the lockdown. Farmers in the Belagavi region of Karnataka had no choice but to dump thousands of gallons of milk into the river after being unable to reach people due to the restrictions from lockdown. Millions of tons of food are wasted in India every year which is estimated at thousands of crores. In context, this number is sufficient to feed the entire state of Bihar for a year. [3]

Effects of food wastage

Food wastage not only affects people in need of that food and the environment but also leads to economic losses. Globally we waste 1.3 billion tonnes of food every year, and that's about one-third of all the food that we grow/produce for human consumption.

More than 50% of our food waste here, actually happens at consumer & retail - distribution stages. That's a whopping amount of food that could have been perfectly edible but it just isn't perfect, or you could say it just doesn't meet the beauty/ appearance standards of the society about how food should look like.

Food wastage impacts food security and environment. We as the people of the community need to think about it, what ways we can give back to our community and can make the world a better place.

FSSAI, the Indian regulatory body has drafted rules to check the food wastage in India at restaurants. FSSAI official said, "Food wastage in India is rampant and it is a careless practice that needs to stop, these rules will tell states what can be done to prevent such wastage and what is to be done to make the best use of large amounts of leftover food. We will ask the states to adopt the policy at the earliest." [4] Violation of these norms will lead to hefty fine upto 5 lakhs.

The UN has also published 17 Sustainable Development Goals (SDG). It has issued/adopted 17 SDCs [5], which are goals that need to be achieved by 2030 to have a sense of peace and prosperity for people and the planet, now and into the future. With the same thought as soon as we saw the 2nd SDC, which was NO HUNGER [6] we thought of a world where everyone went to bed with a full belly, where there was no **malnutrition**, and no one had to worry about going to bed without getting a meal. Hence, we thought of an initiative 'HungerFree' that would help this world to be a little better place to be in or to live in.

HungerFree connects hotels, restaurants, wedding planners and party planners with customers & NGOs who then distribute this food among the people in need. HungerFree also provides a comprehensive analysis for hotels and restaurants.

3. Literature Review

Food waste is a significant issue in India as a lot of food wastage takes place in lavish Weddings, parties, pubs, restaurants, etc. It is predicted through a survey that more than 58 percent of the food that people produce for consumption is wasted every day. **[7]**

India ranks 100 among 119 countries in the Global Hunger Index. More than 65 million people in India sleep hungry which is higher than the population of a few countries. Just because of this, close to 200 million Indians are undernourished. **[7]**

There is a perception that the Indian people have which is, that they do not waste food, we consume according to what we need. But, that's not the case because 15-20 Kg of food is being wasted by an individual in India in a year. The quantity of food wasted in India is equivalent to the food consumption by the U.K. The technologically developed countries are emphasizing more on this issue, that less food can be wasted and can be distributed to the needy and poor those who cannot afford a proper meal even. But in a country like India which has a huge population to feed and that too in a developing nation it is a big challenge to use or develop such applications because a large portion is not fond of the technologies.

Most people consider that there is only a physical impact of food waste and they neglect what harm it causes to our environment. When wasted food lands into landfills it releases a greenhouse gas- Methane. This gas with CO2 and chlorofluorocarbons heats up with Earth's atmosphere, at the end which causes global warming. No such actions have been taken or none of the technologies gave it any

importance. In India, only 1 application was executed to reduce food wastage and help the needy, which is**:**

Indian food wastage reduction application. No food waste is an application from India that allows restaurants, food stalls, and parties to inform about their excessive leftover foods so that needy people can collect them for their usage. This application collects those foods and distributes those among the homeless people, slum dwellers, orphanages as well as nursing homes. The users can also notify them by showing hunger points, and They will distribute the food there. The only requirement is They take food only if it is prepared two hours before.

These applications have changed the use of artificial intelligence by providing food to needy people. It is considered one of the best uses of software development.

However, food wastage is still a bad habit. Food wastage reduction has decreased a lot due to the usage of this application, but people need to be more sensitive and careful so that a better world can be created where no food is wasted.
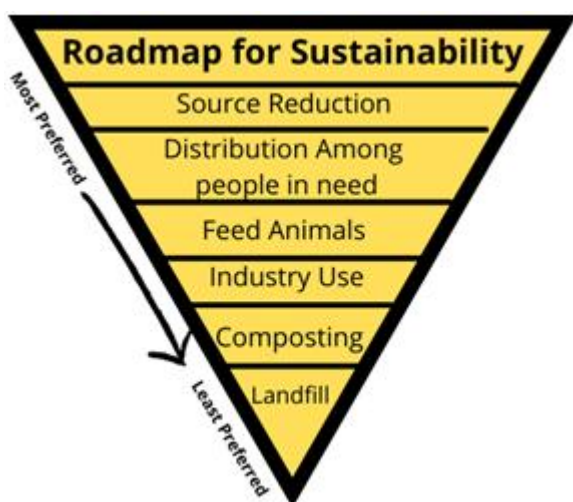

Figure 1: Food Recovery Hierarchy - Sustainable food wastage management chart

4. Methodology

The research methodologies give us an insight into food wastage reduction and help us to develop various potential sources of wastage and the reasons for the same. **[8]** Food wastage is quantified by generating statistical data through numerous sources; measurable data is used to formulate the facts and uncover a pattern in research in relevance to food wastage. **[8]**

Frontend:

HTML
The HyperText Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser. It is the language that is to be assisted by technologies such as cascading style sheets (CSS) and scripting languages such as JavaScript.

CSS

Cascading style sheets, also called CSS, is a design language intended to simplify the process of making web pages presentable and more attractive.

JavaScript

JavaScript is the most popular programming language in the world and that makes it a programmer's great choice. It is very useful as once you learn JavaScript, it helps you develop great front-end as well as back-end software using different JavaScript-based frameworks like jQuery, node.js, etc.

Backend:

NODE JS

It is a runtime environment and library. Node Js is a server side platform which is built on Google Chrome's JS V8 Engine and is used to develop I/O intensive web applications. It is event driven, single Threaded, and Asynchronous.

5. Proposed Solution

The solution is the "Food waste reduction web application". It enables restaurants and various non-profit organizations to interact with each other. The web application comprises of two logins:
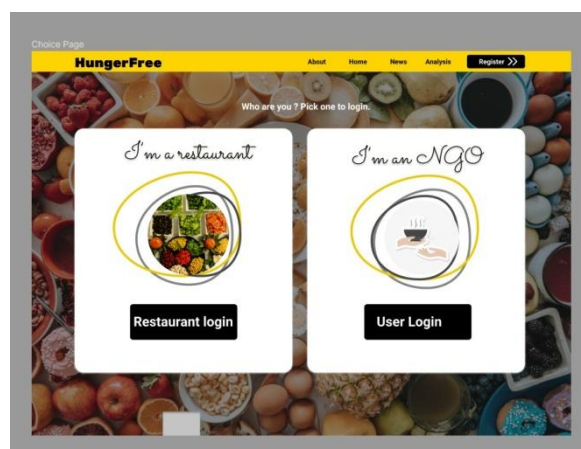

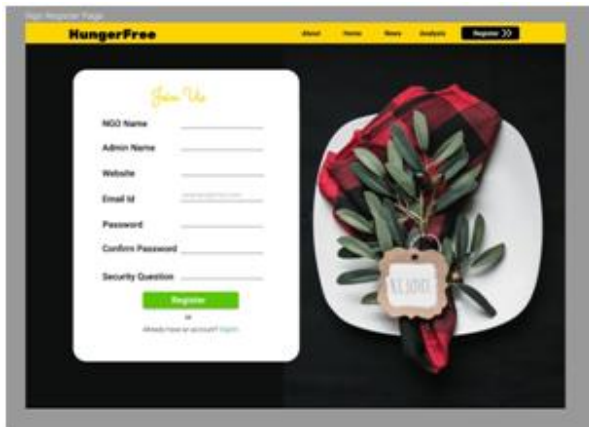**Figure 2:** HungerFree Choice page is a selection page that lets users register themselves.

Figure 3: HungerFree NGO Registration page enables NGOs to register themselves.

Figure 4: HungerFree Restaurant Register page enables restaurants to register their brands.

This allows users and restaurants to interact with the application easily. The users can find the restaurants nearby while restaurants will be able to donate the leftover food. This food can then reach out to the people in need. The restaurants and users can interact with the application by signing up. On signing, users' authentication is checked and confirmed.
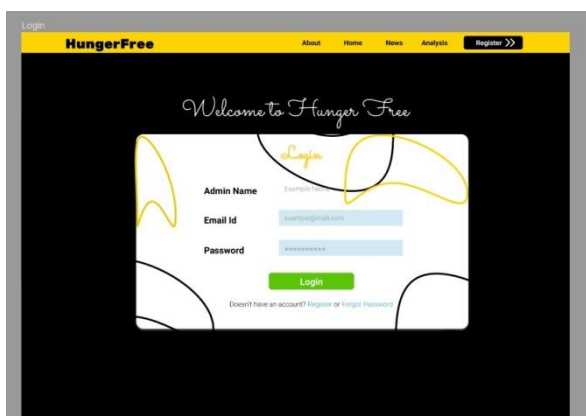

Figure 5: HungerFree Login page is for the users to log in to the respective interface

After successful login, users or restaurants will be landed on their respective pages. Restaurants will be able to perform CRUD operations i.e. to create food availability posts, read the data, update the data and delete the post. These posts could be read by the users.

Non-profit organizations will be able to contact these restaurants and then collect the food from them. This food which was once getting wasted now with the help of NGOs will reach out to people in need. The interface of the website has been designed in such a way to help the people navigate through easily. The web app also helps in bringing attention to the wastage of food.

6. Conclusion

Food wastage is a major problem**.** This paper focuses attention on keeping in view the vast population that needs food to curb hunger and what steps can be taken with the usage of new technologies.

Food waste is a result of throwing away good eatable food before it even reaches the mouths of humans. Food storage is causing the untimely death of approximately 3.1 million children under the age of five across the world. Wastage of food is a real issue faced by society concurrently with other environment-related issues. Hunger will only be controlled by avoiding food waste in any way and at the time of marriage since they make a good amount of food instead of throwing it away more food, the plan should be confirmed to manage unhealthy foods.

Food waste in fast food restaurants is a serious issue that contributes to social, environmental, and economic problems. It leads to higher rates of food insecurity, especially among needy families, causes atmospheric pollution, and results in millions of dollars wasted on inputs. To combat this issue, we proposed a plan to encourage fast-food chains to donate excess food, utilize biodegradable supplies.

The web app aims to encourage better food waste reduction. Our proposed solution will reduce food wastage by facilitating food sharing and distribution in the Indian community using this technology. This work is an initial step towards designing a better system to reduce daily food waste.

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