

Smart Tech for a Growing Crisis: Tackling Food Waste Head-On

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Abstract—Honestly, food waste isn't just a minor oversight anymore—it's a massive global headache. It hits our environment, our wallets, and our communities where it hurts. Every single day, mind-blowing amounts of perfectly good food get tossed out by families, hotels, and local markets. This doesn't just waste a meal; it squanders the water, labor, and energy used to produce it. Plus, it fills up landfills that pump out nasty greenhouse gases. My work here focuses on building a smart, tech-driven system to track and analyze these waste patterns so we can finally start cutting down on this unnecessary loss.

I. The Real Problem

Food is the most basic human need, yet we live in a world where millions of tons of it are thrown away every year. This 'leakage' happens everywhere—from the farm and the delivery truck to the grocery store shelf and, eventually, our own dinner tables. Restaurants and homes are huge contributors to this mess. The goal of this project is to see how smart monitoring can actually turn the tide on these habits.

II. WHAT THE EXPERTS SAY

We aren't the first to notice this. Gustavsson's research famously pointed out that about one-third of all food produced globally never actually gets eaten. Other experts, like Papargyropoulou, have focused on the 'how-to' of sustainability, pushing for better management practices. Meanwhile, studies by Thi et al. have looked at the back end of the problem—turning unavoidable waste into something useful like compost or biogas.

III. WHAT THIS PROJECT AIMS TO DO

I started this project with a few clear goals in mind:

- Figure out exactly why we waste so much and the damage it causes.

- Take a deep dive into the waste habits of homes and local restaurants.
- Build a functional, smart system that can watch waste levels in real-time.
- Find better ways to recycle what we can't save.

IV. THE METHOD: HOW IT ALL WORKS

The process was broken down into four practical steps. No fluff, just direct action:

Step 1: Gathering Real Data. We didn't just guess; we collected actual waste data from local canteens, restaurants, and family kitchens.

Step 2: Designing the System. We built a monitoring setup using hardware sensors and custom software to track what's being thrown out as it happens.

Step 3: Finding the Patterns. Once we had the numbers, we looked for the 'why'—identifying the habits that lead to the most waste. It's usually about storage or buying too much.

Step 4: Trying Solutions. We tested everything from better portion control and donating surplus food to setting up simple composting bins.

V. FINAL THOUGHTS

The results were eye-opening. The smart monitoring system we proposed successfully helped identify and cut down on unnecessary wastage. This project proves that tech-based systems aren't just a 'nice-to-have' tool—they are vital if we want to change our habits and protect our resources for the future.

REFERENCES

- [1] FAO, 'Global Food Losses and Food Waste,' Food and Agriculture Organization, 2011.
- [2] J. Gustavsson et al., 'Global Food Losses and Food Waste,' FAO Report, 2011.
- [3] UNEP, 'Food Waste Index Report,' 2021.