

CASE STUDY

Convenience and Collective Action: Reducing Plastic Waste at UP Diliman, Philippines



Summary

The [University of the Philippines Diliman](#) (UPD), a large and densely populated campus with approximately 50,000 residents and nearly 30,000 students, generates substantial plastic waste driven by convenience-oriented consumption in its food sector. To address this, a multi-phase behavioral intervention piloted plastic-free vendor systems and improved waste management practices in the [Gyud Food UP Food Hub](#), a multi-vendor commercial food park hosting more than 30 vendors and nearly 2,000 daily customers, generating approximately 56 kg of plastic waste per day. The initiative combined infrastructure upgrades, behavioral nudges, and communication strategies to shift both vendor and consumer behavior.

Across pilot phases, the intervention demonstrated measurable reductions in plastic use, including significant decreases in plastic straw consumption and improvements in waste segregation and recycling recovery. By aligning convenience, incentives, and social norms, the project illustrates how behavior-centered approaches can reduce plastic waste in complex, high-traffic environments.



Framing the Challenge

Environmental challenge: UPD generates significant volumes of plastic waste, much of it originating from food vendors relying on single-use plastics for packaging and takeaway consumption. Weak waste segregation systems, limited recycling infrastructure, and high convenience of disposables contribute to persistent environmental leakage.

Core actors:

- Food vendors (ambulant and non-ambulant)
- Customers (students, faculty, staff, visitors)
- Housekeeping and waste management staff

Target behaviors:

1. Vendors adopt non-plastic or compostable alternatives
2. Customers bring reusable containers and avoid single-use plastics
3. Customers and staff properly segregate waste
4. Housekeeping staff consistently recover recyclables during waste segregation



Empathize: Research & Methods

The project used a combination of qualitative and quantitative methods to understand behavior:

- **Baseline waste audits and tally sheets** to quantify plastic consumption and waste generation
- **Surveys and focus group discussions** with vendors and customers to assess attitudes, barriers, and motivations
- **Behavioral monitoring during pilot implementation**, including tracking reusable container usage and waste segregation practices
- **Feedback loops with vendors and staff** to refine interventions and identify operational constraints

This mixed-methods approach revealed both behavioral and structural barriers, informing iterative intervention design. Some of the key insights included:

- **Infrastructure constraints:** Poor bin placement, unclear labeling, and limited collection systems hinder proper waste segregation.
- **Cost sensitivity:** Vendors and customers are negatively influenced by the higher cost of sustainable alternatives and may be hesitant to change their status quo.
- **Motivation varies across actors:** Vendors are generally willing to adopt more sustainable practices but are constrained by operational realities such as cost, convenience, and the need to maintain customer satisfaction. Customers, despite high awareness, tend to default to convenience and established habits, responding more strongly when sustainable choices are easy, visible, or socially reinforced. Staff and frontline actors, on the other hand, respond strongly to clear systems, training, and defined roles, and can become key champions of change when they understand the benefits and are supported with appropriate structures and incentives.



Mapping Key Insights

- **Convenience vs. sustainability.** Sustainable behaviors must be easier or equally convenient to compete with disposables.
- **Defaults shape behavior.** Removing or hiding plastic options (e.g., straws, bottled water) reduces usage.
- **Visibility drives action.** Clear signage, labeled bins, and visual cues reduce obstacles to proper waste segregation.
- **Incentives influence decisions.** Discounts and cost signals can shift customer and vendor behavior, though not always sufficiently alone, and often not sustainably over time on their own.
- **System gaps limit behavior change.** Without adequate infrastructure and enforcement, behavior change is difficult to sustain.



Building a Solution Prototype

The intervention combined multiple behavioral levers to increase the efficacy of the campaign based on the various target actors and behaviors:

Material Incentives

Provision of compostable alternatives and discounts for customers bringing reusable containers.

Information

Posters, seminars, and communication materials promoting bring-your-own (BYO) practices, waste segregation, and environmental awareness.

Choice Architecture

Improved waste bin systems with clear labels, visual guides, and strategic placement; “straw upon request” policies to shift defaults.

Emotional Appeals

Framing participation as contributing to a sustainable campus and collective environmental responsibility, appealing to a sense of shared responsibility and pride in the university community.

Social Influence

Public commitments and visible participation by vendors, including signing pledges, creating painted handprints as symbols of commitment following vendor seminars, and displaying signage on vendor stalls promoting “Strawless Monday,” reinforced peer influence within the campus community.

Rules and Regulations

Reinforcement of institutional policies, including plastic bans and pilot initiatives such as straw reduction programs.



Testing the Solution

Pilot implementations revealed several key insights:

- **Discounts alone were insufficient** to significantly increase reusable container use
- **Removing plastic defaults** was more effective than encouraging voluntary change
- **Visual aids** (e.g., labeled bins, sample waste) greatly improved segregation accuracy
- **Vendors faced operational challenges** related to cost, durability, and supply of alternatives

Iterative adjustments improved usability, clarity, and adoption across stakeholders.



Launching the Pilot

The intervention was implemented across selected vendors and later expanded to larger food hubs. The approach emphasized shared responsibility among vendors, customers, and staff. Key elements included:

- Deployment of communication materials across physical and digital channels
- Installation of improved waste segregation systems and infrastructure
- Coordination with university units and local government
- Engagement of multiple stakeholders across the waste lifecycle



Photo Credit: University of Philippines Dilliman



Assessing Impact

Behavioral outcomes:

- Vendor adoption of non-plastic alternatives increased significantly (up to ~93%)
- Customers consistently and correctly segregating waste rose from 33.69% to 56.92%
- The percentage of staff consistently recovering recyclables increased from 16.7% to 100% after the seminar
- Customers using reusable containers showed incremental increases, though adoption remained constrained by convenience barriers

Environmental outcomes:

- Significant reduction in plastic waste generation including a 9.28% reduction in daily plastic utensil use and a 63.97% reduction in plastic straw consumption across 19 stores
- Distribution of over 42,000 compostable items during the pilot
- Plastic straw consumption reduced by approximately 64%
- Plastic recyclables recovery rate increased from an initial 0% to an average of 63.39% per day.

Operational outcomes:

- Improved efficiency in waste collection through new infrastructure (e.g., electric vehicles, segregation systems)
- Increased staff engagement and motivation, including income opportunities from recyclables.

Lessons Learned

- **Convenience is critical.** Sustainable behaviors must reduce friction to succeed
- **Defaults drive change.** Shifting default options is more effective than relying on voluntary action
- **Clear systems enable participation.** Visual cues and infrastructure improvements significantly improve outcomes
- **Incentives matter but are not sufficient alone.** Behavioral and structural interventions must work together
- **Multi-stakeholder engagement is essential.** Durable change requires coordination across vendors, customers, and institutions
- **Iteration improves effectiveness.** Continuous feedback and adaptation are key to success.

Diversity, Equity, and Inclusion Considerations

- Interventions engaged diverse groups, including informal vendors, students, and staff.
- Accessibility challenges (e.g., convenience of BYO for different users) were identified and informed adjustments to intervention design, including improving bin placement, simplifying systems, and strengthening communication to make participation easier and more inclusive.
- Efforts focused on making participation simple, visible, and inclusive across stakeholder groups.

Acknowledgments

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