

Grassroots Innovations from Youth

MAKING OUR WASTE VISIBLE

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1. INTRODUCTION

Graduate and undergraduate students of the Community-Based Research Lab (CBRL) at the University of Victoria in Canada have created a public exhibit on the theme Making our Waste Visible. During the exhibit, they also conducted interactive workshops on participatory research methods and shared a Virtual Reality simulation via VR headsets to communicate waste related issues (Figure 1).

These events were organized in partnership between CBRL and the McPherson library at the University of Victoria. The exhibit was held at the main library of the University of Victoria and during the Science Rendezvous event at Camosun College in Victoria (Canada) between April and May 2024 (Figure 2).

The overall purpose of the exhibit and the workshops were to engage the university community and the public with waste related questions, by confronting the participants with the everyday generation of waste, showing alternatives to wasting and stimulating inquiries reflecting on what happens to our waste once it is out of our reach and out of sight? What are the wider social and environmental implications of waste? Why are we generating so much garbage? Could we avoid producing waste? Are there differences in the kind of waste? The exhibit has touched on these questions by using provocative photos, infographics and texts.

2. WASTE TAKING CENTER STAGE

In 2020, humanity crossed a striking and unsettling threshold: for the first time ever, the combined mass of all human-made objects, now reaching 1.3 trillion metric tons, exceeded the total biomass of every living organism on Earth (Elhacham et al., 2020). Most of these human-made objects become waste at some point. The exponential increase in global waste generation has turned into a planetary environmental and climate crisis of unprecedented scale and complexity.

Plastic is a key villain in these developments, and in every stage of the plastic life cycle environmental health implications are generated. Another reason lies in the fact that plastics account for 3.4% of global greenhouse gas emissions (OECD, 2022). Virgin plastic production alone is responsible for around 80% of these emissions associ-

ated with the plastic life cycle (The Pew Charitable Trusts and Systemiq, 2020). Notably, approximately 75% of these emissions arise prior to the polymerization stage, underscoring the carbon-intensive characteristics inherent in chemical manufacturing processes (Karali, Khanna & Shah, 2024). In preparing key facts in the form of infographics some of the complexities related to plastic waste were brought to the visitors of the exhibit (Figure 3).

Plastic waste becomes visible as discard after consumption, when it is littered, ends up in garbage or recycling bins or when it becomes fugitive, widely distributed by wind and water, finally ending up entangled in nature and ingest-



FIGURE 1: VR section of the photo exhibit using VR storytelling.



FIGURE 2: Poster display at the exhibit in the library entrance hall.



FIGURE 3: Problems and solutions to plastic waste based on data available in 2022.

ed as microplastics. Despite these known impacts the production and consumption of plastics are still on the rise.

The negative effects of uncollected, mismanaged, dumped, or incinerated waste, affects the environment, oceans, the climate, and food chains, compromising the quality of life for humans and all other planetary life, with expected negative cumulative effects for the near future.

Another example of waste showcased in detail during the exhibit is electric and electronic waste. The following Figure 4 summarizes some of the facts to become aware of.

Food waste was another significant proportion of waste generation that was introduced during the exhibit with some facts and ideas (Figure 5). Linear food systems characterized by the production, distribution, consumption, and disposal of food, have direct and detrimental implications for ecological and social sustainability across multiple scales. Global efforts to address these challenges are compromised by the fact that an estimated 30% of all food produced worldwide remains uncollected, unsorted, and undonated, with its inherent value ultimately lost to landfills. This context underscores the urgent need to close food resource loops in order to mitigate environmental, economic, and social losses.

At each stage of the food supply chain, the primary drivers of food loss and waste are closely linked to trade requirements, external quality standards, industry specifications, inappropriate packaging decisions, and a combination of wasteful consumer and retailer behaviors. Collectively, these factors reveal the systemic nature of the forces shaping food loss and food waste patterns (Zhao et al., 2019).

3. GRASSROOTS ACTORS - WASTE PROTAGONISTS

Given the mostly informal nature, it is difficult to produce reliable statistics on the exact number of individuals working as waste pickers worldwide (Figure 6). A conservative estimate by the International Labour Organization (ILOSTAT, 2024) suggests 6.9. million people employed in the waste and recycling industry. ILOSTAT recognizes that



FIGURE 4: E-waste and ideas to address the impacts.

this is an underestimation due to data limitations, since the more marginal workers in the industry such as waste pickers that are homeless or live in collective households are excluded from this number (ILOSTAT, 2024). The international Non-Governmental Organization called Women in Informal Employment Globalizing & Organizing - WIEGO on the other hand suggests 15 to 20 million informal workers in waste management and recycling (WIEGO, n.d.). Most waste pickers work under precarious, unhealthy, and poorly paid conditions and mostly fall through the cracks of census data collection. More research is needed to refine these numbers and thus shed light on this, in many countries, still mostly unrecognized sector whose contributions to local communities and the environment are undervalued.

4. FINAL REMARKS

Current measures to reduce waste are insufficient to avoid increased pollution from waste, to address the pressures on natural systems and to achieve a circular economy. Consumers need to be better informed about the impacts of waste as well as about alternatives and solutions to reduce waste generation.

A better understanding of the impacts, complexities and dimensions involved in the daily act of generating waste is urgently needed. While waste is part of our everyday life experience, we distance ourselves from whatever happens to waste after discard, and we believe that the waste management system takes care of it. Waste management is more than just a man behind a truck, as Marsha Serville-Tertulien, a Professor at Trent University, had put it in one of my classes. Education and awareness building is important to address the global crises, stressing the need to rethink and change practices, behaviors, principles, worldviews, institutions, social structures, and systems in general. Studying waste allows us to draw these connections to key societal issues ranging from environmental degradation and climate change to poverty and justice, public policy to community development and Sustainable Development Goals. This was one of the objectives pursued with the exhibit the workshops and the Virtual Reality immersion.

The exhibit can be visited at: <https://sway.cloud.microsoft/QKP18jSAKncuusX4?ref=email>.

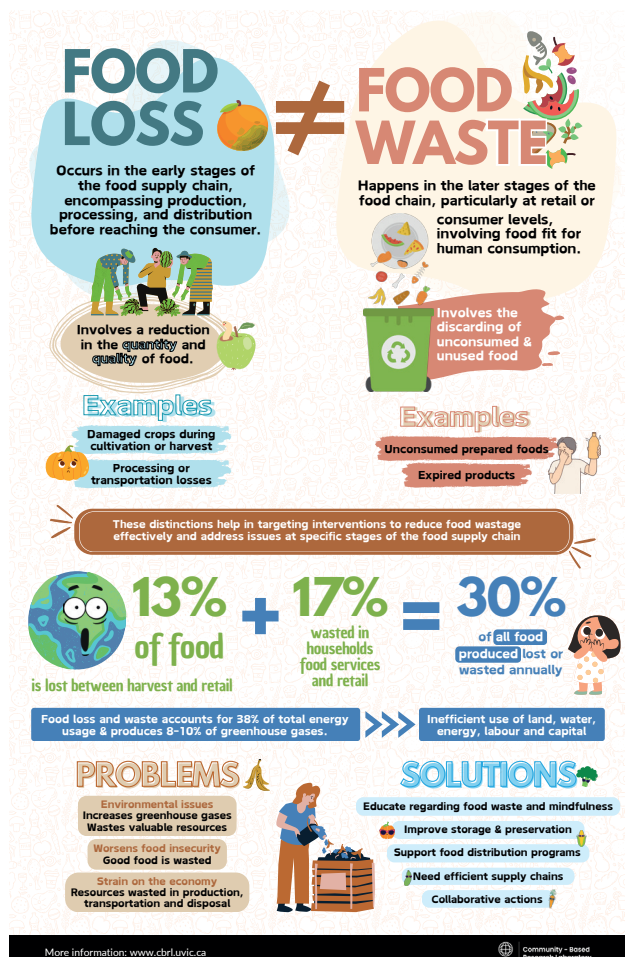


FIGURE 5: Problems and solutions associated with food loss and food waste.



FIGURE 6: Facts on waste pickers.

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REFERENCES

- Elhacham, E. E., Ben-Uri, L., Grozovski, J., Bar-On, Y. M., & Milo, R. (2020). Global human-made mass exceeds all living biomass. *Nature*, 588(7838), 442-444. <https://doi.org/10.1038/s41586-020-3010-5>
- ILOSTAT (2024) Beyond the bin: Decent work deficits in the waste management and recycling industry. ILO Available at: <https://ilostat ilo.org/blog/beyond-the-bin-decent-work-deficits-in-the-waste-management-and-recycling-industry/>

- Karali, N., Khanna, N., & Shah, N. (2024). Climate impact of primary plastic production. Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA (United States). Technical Report. DOI: <https://doi.org/10.2172/2336721>. Available at: <https://www.osti.gov/biblio/2336721>
- OECD (2022) Global Plastics Outlook Economic Drivers, Environmental Impacts and Policy Options. Available at: https://www.oecd.org/content/dam/oecd/en/publications/support-materials/2022/02/global-plastics-outlook_a653d1c9/Global%20Plastics%20Outlook%20I.pdf
- The Pew Charitable Trusts and Systemiq (2020) Breaking the plastic wave. Available at: https://www.systemiq earth/wp-content/uploads/2020/07/BreakingThePlasticWave_SummaryReport.pdf
- WIEGO - Women in Informal Employment Globalizing & Organizing (n.d.). Occupational Groups in the Informal Economy. <https://www.wiego.org/informal-economy/occupational-groups/waste-pickers/>
- Zhao, G., Liu, S., Chen, H., Lopez, C., Hernandez, J., Guyon, C., Iannaccone, R., Calabrese, N., Panetto, H., Kacprzyk, J., & Alemany, M. (2019). Value-Chain Wide Food Waste Management: A Systematic Literature Review. In P. S. A. Freitas, F. Dargam, & J. M. Moreno (Eds.), *Decision Support Systems IX: Main Developments and Future Trends* (Vol. 348, pp. 41-54). Springer International Publishing. https://doi.org/10.1007/978-3-030-18819-1_4