Assessing Factors for Increasing Recycling in Kabale, Uganda

A Capstone Presentation

Researcher: Nathan Fletcher
Readers: Dr. Wendy Bolyard and Dr. Christine Martell
Client: Dr. Jamie Van Leeuwen with the Global Livingston Institute

Background on Recycling, Kabale, and This Project

Research Question

What are factors that affect recycling in Kabale?

Collection

Uganda collects and recycles plastic at a rate of 6%, compared to South Africa's 45.5%

Informal Collectors

Employees working in a freelance fashion, self-sorting through waste to find and sell plastic to recycling centers.

Infrastructure

Public waste management infrastructure is limited, so non-profit organizations partner with local governments and for-profit entities to fill the gaps

Factors Affecting Recycling in the Literature

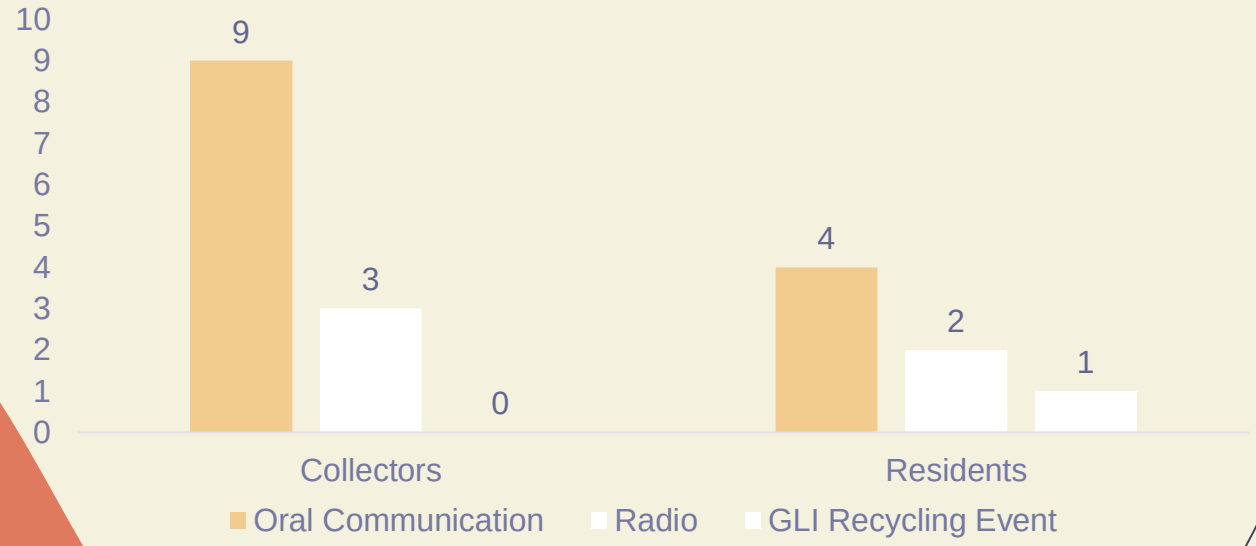
- Awareness
- Perception
- Demographic Characteristics

Results

- Awareness
- Incentives
- Disincentives
- Perceived Distance
- Education
- Income

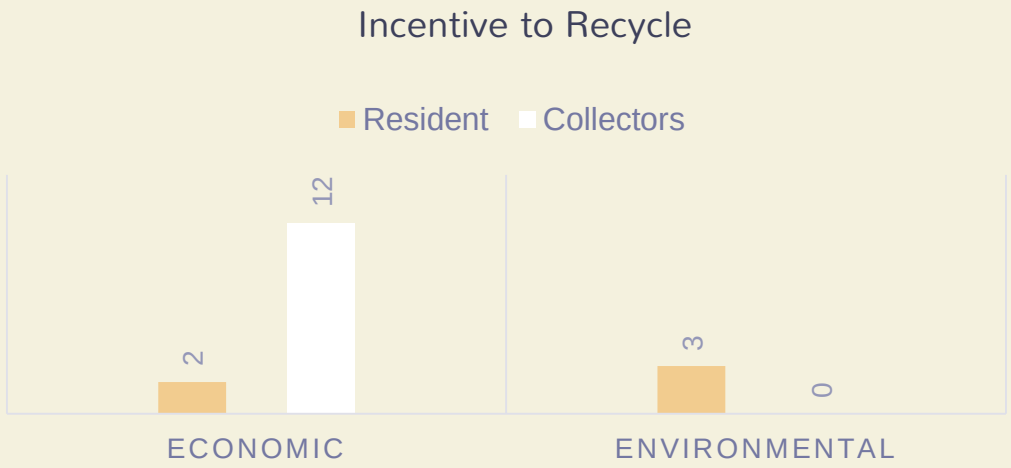
Results: Awareness

Among residents, awareness of the recycling center run by GLI was acknowledged by 5 of 12 interviewees.



Results: Incentives

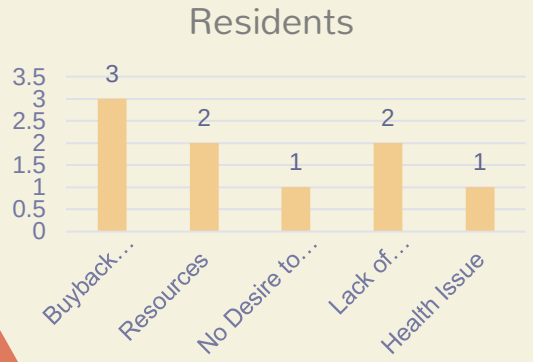
Collectors and Residents identified different incentives to recycle, but the economic incentive of the buyback program promoted recycling at the highest level.

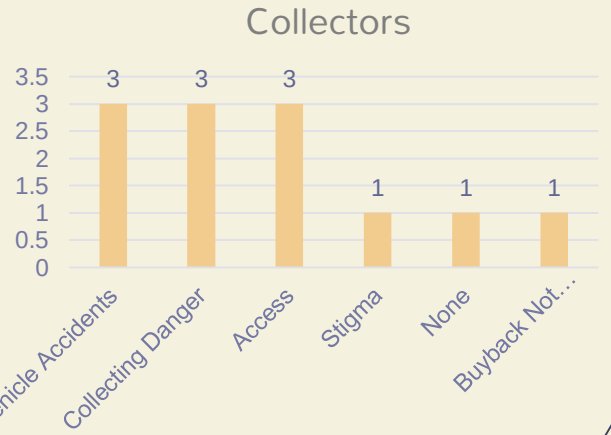


Results: Disincentives

Collectors and Residents identified different reasons they feel disincentivized to recycle:

- Residents generally report the buyback amount being too low, not having resources, and not having information.
- Collectors discuss the physical dangers and difficulties associated with recycling.



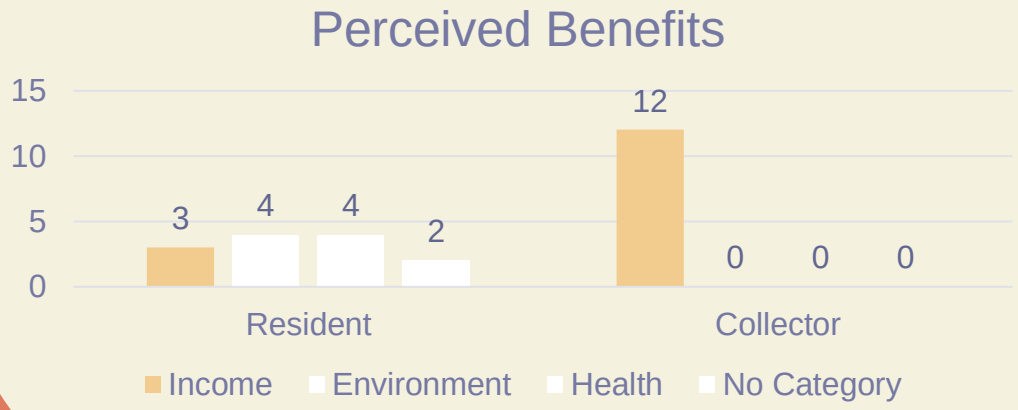


Results: Perception

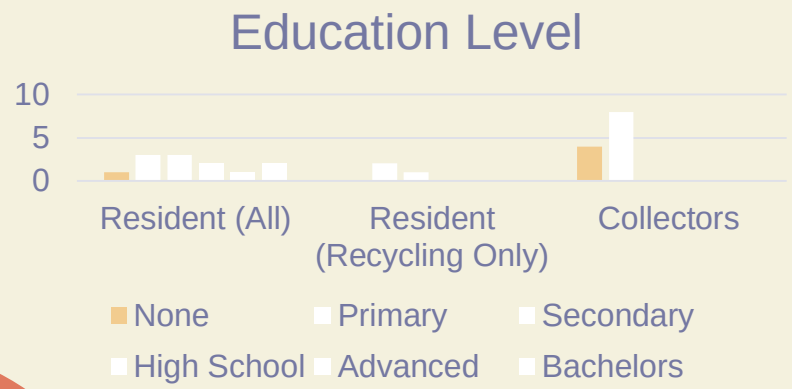
Distance: The perceived distance between the two sample populations was consistent, with each group reporting eight convenient and four inconvenient.

All three residents that recycle at center identified it as convenient.

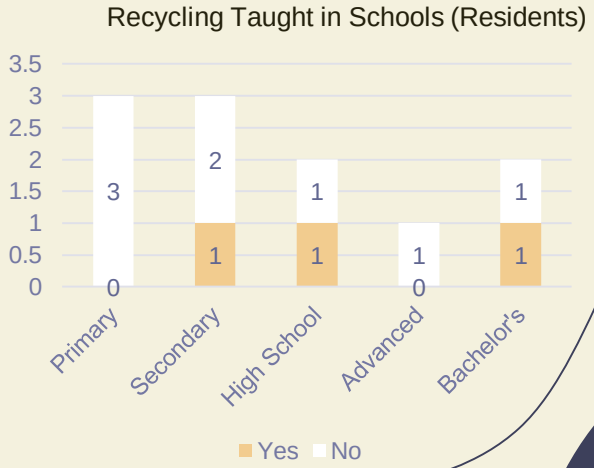
Benefits:



Results: Education



Eight Collectors had attended primary school, five had learned about recycling.



Results: Income

- Means
  - Resident: Ushs225,625
  - Collector: Ushs159,000

Collectors averaged 39.5% less in approximate monthly income than residents. Only one collector identified having another source of income.

Discussions: What Does This Mean?

- **Income and Economic Incentives Affect Recycling**
  - Collectors are doing so exclusively for the income, and environmental benefits are not currently driving people to recycle.
  - Several residents who choose not to recycle identify the buyback being too low as their primary disincentive.

- **Awareness affects recycling**. Awareness among residents even a short walk away is only at 41.6% (5/12). Awareness is the first step in motivating recycling. Without increasing broad awareness of the center, it will be hard to increase collection.

- **Education may play a role in increasing awareness, but does not demonstrate an effect on recycling outcomes**, and every collector interviewed either had none or stopped at primary school. The system is not a reliable tool to improve awareness of the importance of recycling.

Discussions: Continued

- **Access (perceived distance) plays a role in terms of convenience and perceived safety from collectors**. While each population group had 4/12 individuals report the location was inconvenient, all three residents that recycled identified it as convenient. Individuals who do not need the center as their primary or only source of income are not demonstrating willingness to recycle in an inconvenient location.

- **Physical Danger Affects Recycling**
  - Three individuals identified the task of transporting plastic to the center as dangerous, acknowledging the risk of automobile accidents.
  - Safety while collecting is also a concern, with three more collectors identifying the danger to their hands and feet from sharp glass while sorting through waste.

Recommendations: Next Steps

- To address income and economic incentive findings:
  - Increase the buyback amount from Ushs250/kg to Ushs500/kg as in Lira to increase the buyback's competitiveness and incentivize collection from a broader range of incomes.

- To address Awareness Levels
  - Utilize increased radio coverage and in person campaigns to spread awareness of the center using the methods that are currently effective: radio and oral communication. Other methods like social media and tv target communities that generally do not fall in the income range that the center services.

Recommendations: Continued

- To address Access findings:
  - Implement drop-off points around the city to decrease the distance needed to travel to recycle. The increased convenience of location and reduced risk of injury during transportation would address key disincentives found in this study. A pilot may be instrumental in identifying the best ways to manage these locations.

- To address the issue of physical safety while collecting:
  - The center providing/helping to provide safety gloves for their collectors would reduce fear of sorting and help to increase the volume of recycling collected.

Recommendations: Final

Further Research

- **Willingness to pay studies:**
  - These studies will help GLI identify an appropriately competitive market rate for the buyback that will introduce new citizens to be engaged in recycling without overpaying.

- **Increased quantitative research to confirm and deepen these findings:**
  - The qualitative nature and sample size of this study confine its findings somewhat. Quantitative studies done in the same communities should be conducted to further identity correlations between various incentives and demographics and recycling to build on this study and the previous literature in the field.

Thank You

References

- Abdelnaser, O., Abdullah, M., & Hamidi, A. A. (2006). To recycle or not to recycle? A study of household attitude toward recycling of solid wastes in Malaysia: A case study of perlis state. *Environmental Engineering and Management Journal*, *5*(4), 743–756. https://doi.org/10.30638/eemj.2006.060
- Adogu, P. O., Uwakwe, K. A., Egenti, N. B., Okwuoha, A. P., & Nkwocha, I. B. (2015). Assessment of waste management practices among residents of Owerri Municipal Imo State Nigeria. *Journal of Environmental Protection*, *06*(05), 446–456. https://doi.org/10.4236/jep.2015.65043
- Babbie, E. R. (2001). *The practice of Social Research*. Cengage.
- Banga, Margaret (2011) Household Knowledge, Attitudes and Practices in Solid Waste Segregation and Recycling: The Case of Urban Kampala, *Zambia Social Science Journal*, *2*(1), 26-39. Available at: http://scholarship.law.cornell.edu/zssj/vol2/iss1/4
- Bennett, E. M., & Alexandridis, P. (2021). Informing the public and educating students on plastic recycling. *Recycling*, *6*(4), 69. https://doi.org/10.3390/recycling6040069
- Bolaane, B. (2006). Constraints to promoting people centred approaches in recycling. *Habitat International*, *30*(4), 731–740. https://doi.org/10.1016/j.habitatint.2005.10.002
- Conke, L. S. (2018). Barriers to waste recycling development: Evidence from Brazil. *Resources, Conservation and Recycling*, *134*, 129–135. https://doi.org/10.1016/j.resconrec.2018.03.007
- Crociata, A., Agovino, M., & Sacco, P. L. (2015). Recycling waste: Does culture matter? *Journal of Behavioral and Experimental Economics*, *55*, 40–47. https://doi.org/10.1016/j.socec.2015.01.005
- Global Livingston Institute. (2021). *Recycling center*. GLI. Retrieved July 16, 2022, from https://www.globallivingston.org/programs/recycle
- Godfrey, L. (2021). Quantifying economic activity in the informal recycling sector in South Africa. *South African Journal of Science*, *117*(9/10), 138–144. https://doi.org/10.17159/sajs.2021/8921
- González-Torre, P. L., & Adenso-Díaz, B. (2005). Influence of distance on the motivation and frequency of Household Recycling. *Waste Management*, *25*(1), 15–23. https://doi.org/10.1016/j.wasman.2004.08.007
- Kabera, T., Wilson, D. C., & Nishimwe, H. (2019). Benchmarking performance of Solid Waste Management and recycling systems in East Africa: Comparing Kigali Rwanda with other major cities. *Waste Management & Research: The Journal for a Sustainable Circular Economy*, *37*(1_suppl), 58–72. https://doi.org/10.1177/0734242x18819752
- Katusiimeh, M. W., Burger, K., & Mol, A. P. J. (2013). Informal waste collection and its co-existence with the formal waste sector: The case of Kampala, Uganda. *Habitat International*, *38*, 1–9. https://doi.org/10.1016/j.habitatint.2012.09.002
- Khan, F., Ahmed, W., Najmi, A., & Younus, M. (2019). Managing plastic waste disposal by assessing consumers' recycling behavior: The case of a densely populated developing country. *Environmental Science and Pollution Research*, *26*(32), 33054–33066. https://doi.org/10.1007/s11356-019-06411-4
- Khan, O., Daddi, T., Slabbinck, H., Kleinhans, K., Vazquez-Brust, D., & De Meester, S. (2020). Assessing the determinants of intentions and behaviors of organizations towards a circular econo plastics. *Resources, Conservation and Recycling*, *163*. https://doi.org/10.1016/j.resconrec.2020.105069
- Lange, F., Brückner, C., Kröger, B., Beller, J., & Eggert, F. (2014). Wasting ways: Perceived distance to the recycling facilities predicts pro-environmental behavior. *Resources, Con Recycling*, *92*, 246–254. https://doi.org/10.1016/j.resconrec.2014.07.008
- Madinah, N. (2016). Solid Waste Management System: Public-Private Partnership, the Best System for Developing Countries. *International Journal of Engineering*

- *Research and Applications*, *6*(4), 57–67. https://doi.org/https://kyuspace.kyu.ac.ug/bitstream/handle/20.500.12504/497/Nabukeera%20Madinah.pdf?sequence=1&isAllowed=y
- Mekonnen, G. B., dos Muchangos, L. S., Ito, L., & Tokai, A. (2022). Analyzing key drivers for a sustainable waste management system in Ethiopia: An interpretive structural modeling approach. *Environmental Challenges*, *8*, 100556. https://doi.org/10.1016/j.envc.2022.100556
- Muisa Zikali, N., Chingoto, R. M., Utete, B., & Kunedzimwe, F. (2022). Household solid waste handling practices and recycling value for integrated solid waste management in a developing city in Zimbabwe. *Scientific African*, *16*. https://doi.org/10.1016/j.sciaf.2022.e01150
- Orcher, L. T. (2014). Chapters Ten and Twenty. In *Conducting research: Social and behavioral science methods* (pp. 83–188). essay, Routledge.
- *Projects*. Planet Buyback. (2021). Retrieved July 10, 2022, from https://www.planetbuyback.com/projects/
- Temple, A. J. (2021, May 13). *Plastic bottle recycling in Uganda*. GLI. Retrieved July 16, 2022, from https://www.globallivingston.org/dir/research/plastic-bottle-recycling-in-uganda
- Troschinetz, A. M., & Mihelcic, J. R. (2009). Sustainable recycling of municipal solid waste in developing countries. *Waste Management*, *29*(2), 915–923. https://doi.org/10.1016/j.wasman.2008.04.016
- Uganda Bureau of Statistics. (2017, April). *National Housing and Population Census 2014*. UBOS. Retrieved September 18, 2022, from https://www.ubos.org/wp-content/uploads/publications/2014CensusProfiles/KABALE.pdf
- Uganda Revenue Authority. (2022). *Taxation handbook - ura*. Uganda Revenue Authority. Retrieved September 1, 2022, from https://www.ura.go.ug/resources/webuploads/INLB/Taxation%20Handbook%204th%20Edition%202022_10.02.2022.pdf
- United Nations Environment. (2018). *The challenge Africa is currently recycling*. unep.org. Retrieved July 12, 2022, from https://wedocs.unep.org/bitstream/handle/20.500.11822/30975/Africa_WMO_Poster.pdf
- Van Leeuwen, J. (2021). *Listen. Think. Act.* Gli. Retrieved August 28, 2022, from https://www.globallivingston.org/mission/#mission-header-story-section
- Viljoen, J., Blaauw, D., & Schenck, C. (2019). The opportunities and value-adding activities of buy-back centres in South Africa's recycling industry: A value chain analysis. *Local Economy: The Journal of the Local Economy Policy Unit*, *34*(3), 294–315. https://doi.org/10.1177/0269094219851491
- Wansi, B.-I. (2022, July 1). *Uganda: Coca-Cola and 3 start-ups join forces against plastic waste in Kampala*. Afrik 21. Retrieved July 15, 2022, from https://www.afrik21.africa/en/uganda-coca-cola-and-3-start-ups-join-forces-against-plastic-waste-in-kampala/
- World Bank. (2021). *Urban population (% of total population) - Uganda*. data.worldbank. Retrieved August 14, 2022, from https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=UG