



Improving Waste Segregation: A Model Pilot in Windlass River Valley, Dehradun

Project objective

Objective: Improving household waste sorting through neighbourhood change agents, use of society communication channels and visual prompts around waste segregation


Partner:  **WASTE WARRIORS**
REDUCE RE-USE RECYCLE

Intervention details

- 1. Creating active citizens: Recruiting citizens to be change agents (i.e. active citizens) and providing a** changemaker toolkit for them – containing behaviorally informed messages, visuals, and activity ideas. Residents will utilise the toolkit to raise awareness in WhatsApp groups (general and women-focused) and at community events and festivals. The changemaker toolkit contains do's and don'ts, FAQs, week-wise plan for posting behaviourally informed messages and activity ideas (tower level competition and kids activities).
- 2. Communication via Society WhatsApp Groups:** Utilise the MyGate app and resident WhatsApp groups. These platforms will be used to disseminate visually compelling and behaviorally informed messages promoting waste segregation focused on:
 - a. Providing rules of thumb (e.g., "Recycle paper and plastic," "Wet waste = food scraps")
 - b. Inducing a sense of competition
 - c. Appealing to emotions through talking about waste collectors, relatable memes, whatsapp polls, etc.
- 3. Visual prompts:** Stickers with intuitive visuals on waste collection vehicles, dustbins and key society locations (e.g. grocery store entrance,, stationery and vegetable stores, and tower notice boards). Compact stickers provided to be households (that can be stuck on fridge, kitchen walls, etc) provided to each household to serve as a constant visual reminder.

Intervention 1: Creating active citizens/use of changemaker toolkit

8 Hafton ka Jadoo! Waste par kar lo kaboo!



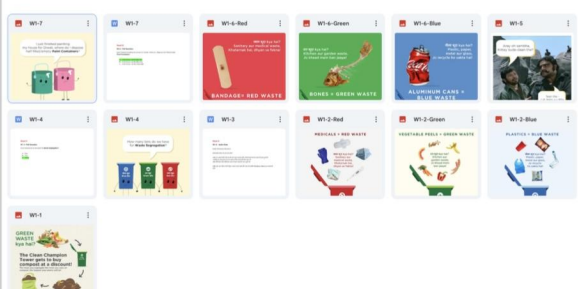
Active Changemaker's Toolkit
A Comprehensive Guide to Attaining 100% Waste Segregation Compliance for Windlass River Valley Residents.

WINDLASS RIVER VALLEY
THE SMART TOWNSHIP

Tag	Digital Deliverables	Content	Date of Release	Platform
WEEK 01		To be shared by Mamta Doundiyal, Ganga 1		
W1-1	Incentive Post - Compost as Award	Image	1st Feb	WhatsApp + MyGate
W1-2	3 Posts - Blue Green Red	3 Images	2nd Feb	WhatsApp
W1-3	Audio Note	Text in word doc	4th Feb	WhatsApp
W1-4	Poll Text + Image	Whatsapp poll + Image	5th Feb	WhatsApp
W1-4	Meme	Image	7th Feb	WhatsApp
W1-6	3 Posts - Blue Green Red	3 Images	9th Feb	WhatsApp
W1-7	Poll Text + Image	Whatsapp poll + Image	11th Feb	WhatsApp

Week 01 deliverables can be accessed [here](#).

Snapshot of the drive:



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7. Resources, Tips and Tricks

Would you like to know what other organisations and communities across India and the world are doing towards waste management?

Saahas is doing some amazing work in the field of Waste Management, and a lot of our resources come from them.
<https://www.saahas.org/>

2 Bin 1 Bag is a very engaging citizen-led approach in Bangalore, started long before Swach Bharat
<https://www.2bin1bag.in/>

Central Pollution Control Board
<https://cpcb.gov.in/>

Alag Karo a neighbourhood segregation initiative mostly in Gurgaon
<https://www.alagkaro.com/index.php/alag-karo/segregation-basics>

Centre for Science and Environment the authority on all things sustainable
<https://www.cseindia.org/>

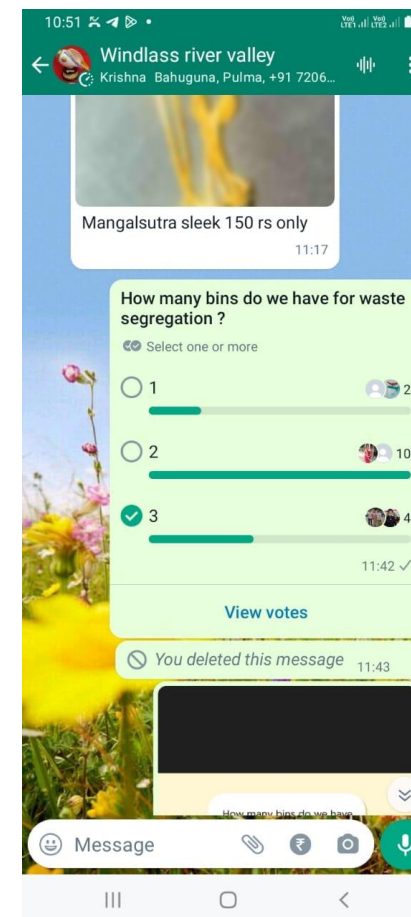
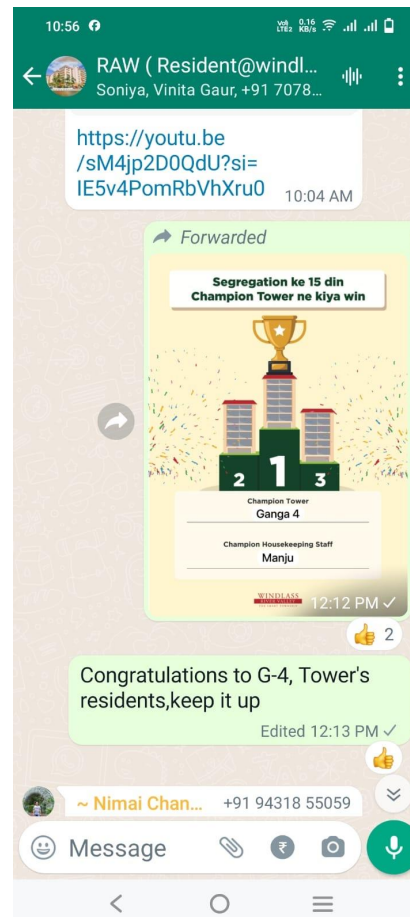
Did you know, there are so many exciting and resourceful art and craft ideas around recycled materials?

Here are some ideas:

- <https://www.royalacademy.org.uk/article/family-how-to-vegetable-printing-christmas>
- <https://artfulparent.com/printmaking-with-fruits-and-vegetables/>
- <https://threads.werindia.com/culture/create-interesting-textures-using-vegetable-and-fruit-print/>

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Intervention 2: Communication via Society WhatsApp Groups



Intervention 3: Visual prompts

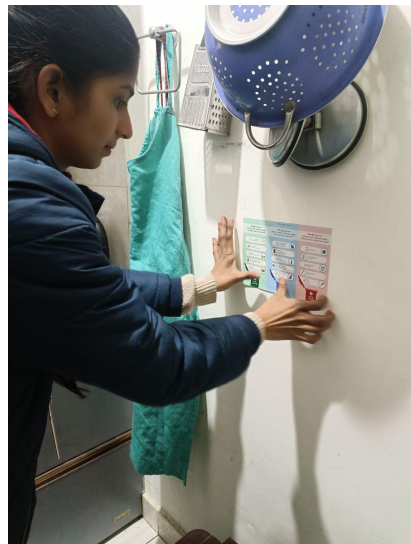
Stickers for households



Posters at key locations



Dustbin stickers



Pilot Design

Week 1	Baseline Data Collection	
Week 2, 3, 4, 5, 6 and 7	Intervention Deployment	Daily Waste Audit
Week 8	Endline Data Collection	
Pilot Reach	400-450 middle to high income households in Windlass River Valley Society, Harrawala, Dehradun	

Key output measures

1. **Survey: Baseline (Week 1) and Endline (Week 8)**
 - a. Knowledge of waste segregation
 - b. Attitude towards waste segregation
 - c. Waste segregation behaviour
 - d. Demographics (age, gender, education, employment, marital status, household structure)
2. **Observational Measure: Daily Waste Audit at Tower Level**

Data Characteristics: Demographics

Variable	Baseline data	Endline data
Sample size	N = 198	N = 191
Tower	Ganga-1 = 26 Ganga-2 = 22 Ganga-3 = 30 Ganga-4 = 23 Alaknanda = 27 Bhagirathi-1 = 17 Bhagirathi-2 = 23 Bhagirathi-3 = 11 Bhagirathi-4 = 12	Ganga-1 = 21 Ganga-2 = 56 Ganga-3 = 17 Ganga-4 = 5 Alaknanda = 24 Bhagirathi-1 = 19 Bhagirathi-2 = 14 Bhagirathi-3 = 21 Bhagirathi-4 = 12
Gender count	Male = 61 Female = 128 Other = 2	Male = 56 Female = 131 Other = 2
Education level	Never attended school = 0 Less than grade 8 = 0 Grade 8 pass = 2 Grade 10 pass = 2 Grade 12 pass = 39 Diploma/Professional Certificate = 20 Graduate degree/Diploma = 79 Master's degree/PhD = 40 Don't know/Can't say = 9	Never attended school = 1 Less than grade 8 = 2 Grade 8 pass = 1 Grade 10 pass = 7 Grade 12 pass = 6 Diploma/Professional Certificate = 10 Graduate degree/Diploma = 77 Master's degree/PhD = 77 Don't know/Can't say = 8

Data Characteristics

Variable	Baseline data	Endline data
Employment	Homemaker: 84 Employed full-time: 47 Employed part-time: 6 Currently laid off/ Unemployed: 20 Looking for work: Retired: 4 Full-time student: 9 Other: 14	Homemaker: 65 Employed full-time: 37 Employed part-time: 9 Currently laid off/ Unemployed: 40 Looking for work: Retired: 2 Full-time student: 14 Other: 7
Marital Status	Unmarried: 15 Married: 168 Divorced/separated: 0 Widowed: 3 Other: 5	Unmarried: 23 Married: 149 Divorced/separated: 3 Widowed: 3 Other: 11
Household Structure	Single-person household: 16 Couple without children: 36 Couple with children: 119 Extended family (multiple generations living together): 20 Roommates/shared housing: 0	Single-person household: 17 Couple without children: 36 Couple with children: 105 Extended family (multiple generations living together): 22 Roommates/shared housing: 9

Knowledge of waste segregation

Variable	Baseline data	Endline data
Mean dry waste knowledge score	3.95/4	3.43/4
Mean wet waste knowledge score	3.71/4	3.70/4
Sorting score	78.80%	79.37%
Attitude towards waste segregation (avg.)	2.5/4	2.8/4

Waste segregation behaviour

Variable	Baseline data	Endline data
Do they segregate waste	Yes: 175 No: 16	Yes: 187 No: 2
Reason for non-segregation	My society does not collect dry and wet waste separately: I/My family members don't know the concept of 'dry' and 'wet' waste: I/My family members find it difficult to remember household waste items go into the 'wet' bin and 'dry' bin: My household help does not understand how to separate 'wet' and 'dry' waste: Other:	My society does not collect dry and wet waste separately: I/My family members don't know the concept of 'dry' and 'wet' waste: I/My family members find it difficult to remember household waste items go into the 'wet' bin and 'dry' bin: My household help does not understand how to separate 'wet' and 'dry' waste: Other:
Disposal method	Hand it over to the housekeeping staff daily when they come to collect waste: 52.36% Drop off waste at designated drop-off points in the society: 50.26% Compost organic waste at home: 6.81% Other: 6.81%	Hand it over to the housekeeping staff daily when they come to collect waste: 97.35% Drop off waste at designated drop-off points in the society: 8.99% Compost organic waste at home: 3.17% Other: 0%

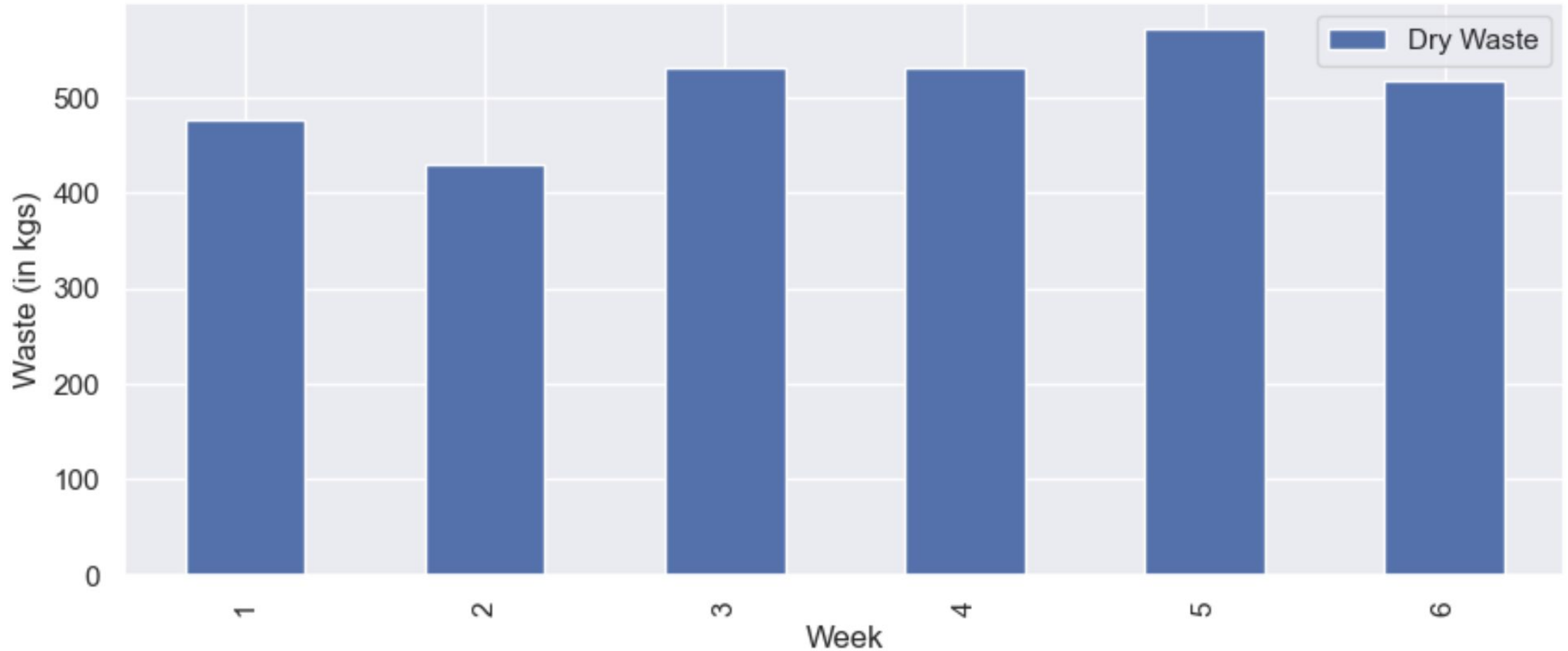
Waste segregation behaviour

Variable	Baseline data	Endline data
Disposal responsibility	Household help only: 35 Family member only: 92 Household help and family member: 64	Household help only: 74 Family member only: 68 Household help and family member: 47
Number of dustbins	One: 16 2 or above: 159	One: 10 2 or above: 177
Do they use differently coloured dustbins	Yes: 135 No: 40	Yes: 151 No: 36
Disposal method for sanitary waste	Mix with dry or wet waste = 44 Dispose in separate bin/hand over separately to waste collector: 147	Mix with dry or wet waste = 20 Dispose in separate bin/hand over separately to waste collector: 169

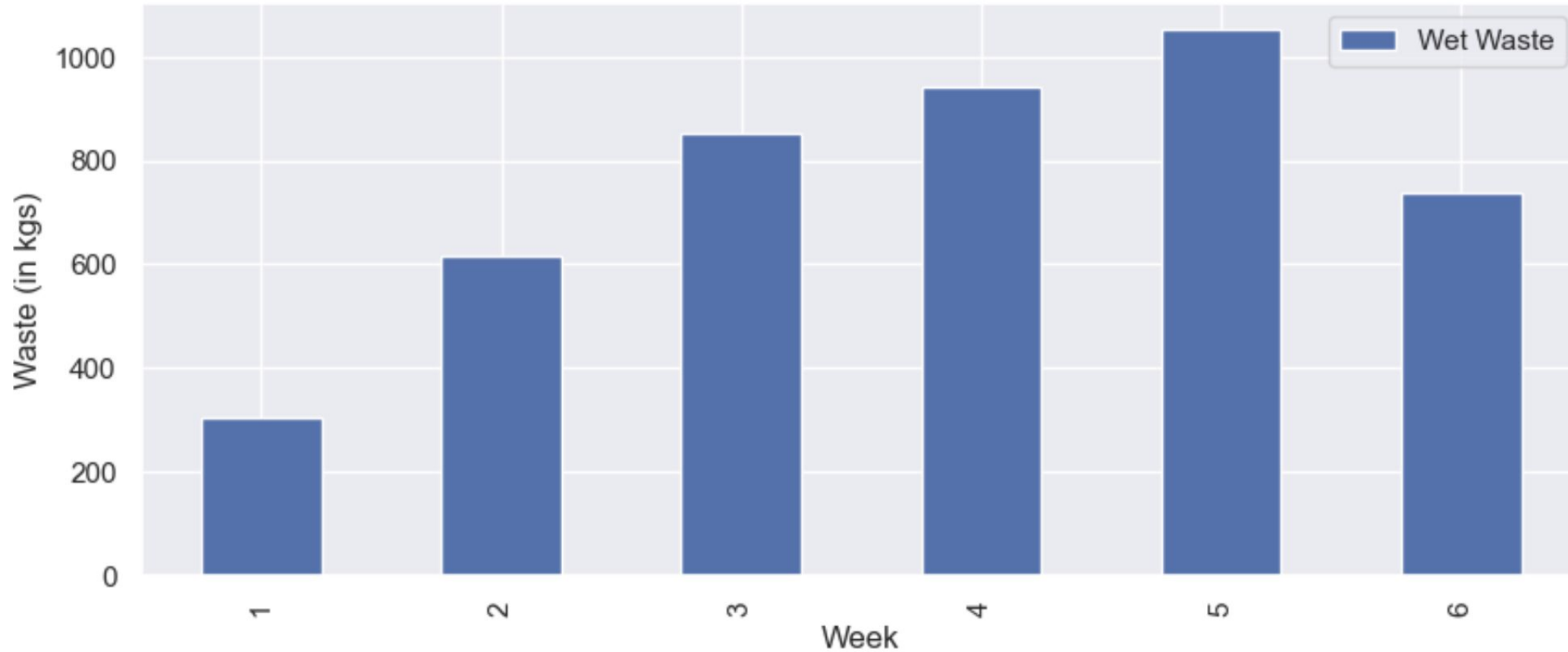
Intervention check

Variable	Endline data
Intervention exposure	Information about waste segregation displayed at key locations within the society (e.g., near the grocery store, vegetable store, and notice boards): 47.09% Weekly updates on waste segregation activities on MyGate: 40.74% Information shared on WhatsApp about waste segregation: 56.08% Participation in waste segregation games or activities during community events (champion tower competition and activities for kids): 39.68% Clearly labelled stickers on society dustbins to help distinguish between dry, wet waste and sanitary/medical waste: 32.80% Fridge stickers distributed to each household to aid segregation of waste: 24.34% I did not notice any specific activities related to waste segregation: 8.47%
Understanding of intervention	I have a better understanding: 172 I have the same understanding: 16 I have a worse understanding: 1
Have respondents noticed improvements in waste segregation practices of neighbours	Yes, I have seen improvements: 157 No, I have not seen any changes: 12 I am not sure: 22

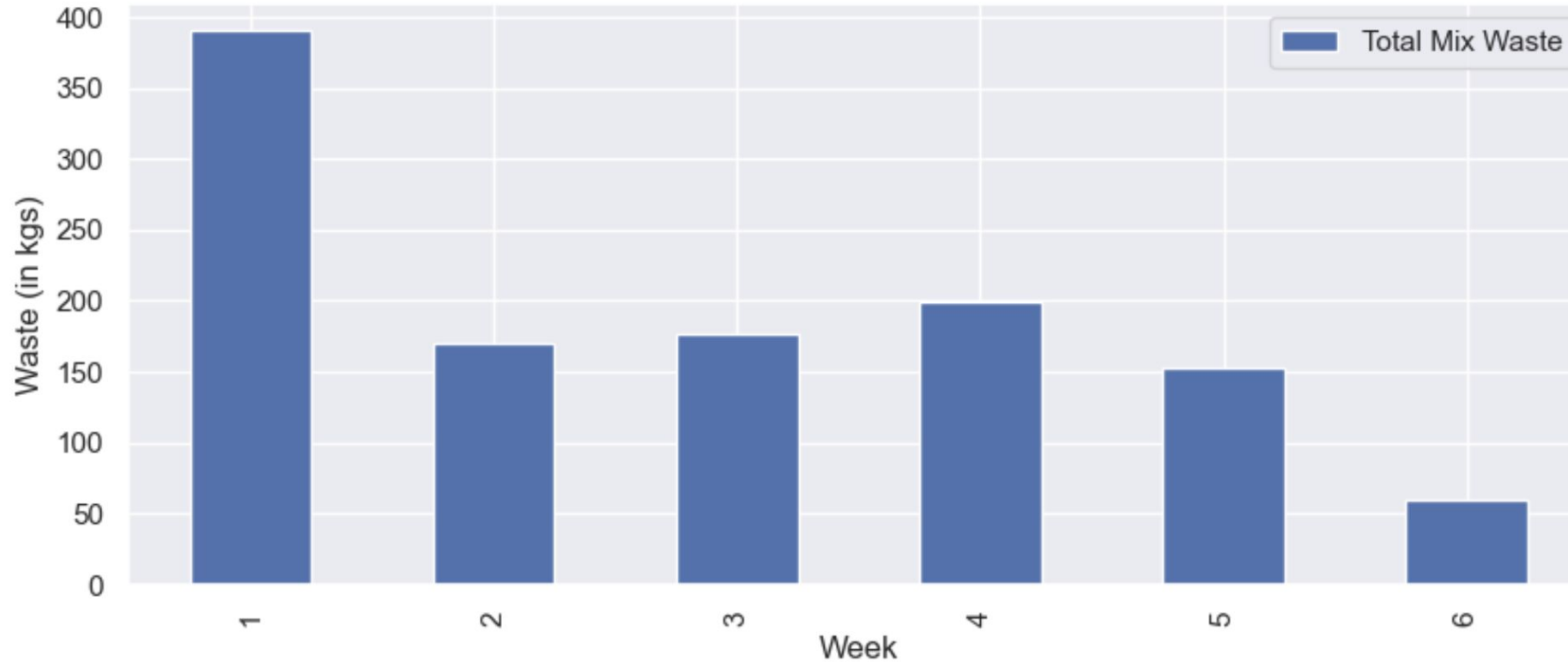
Trend of dry waste audit (after intervention deployment)



Trend of wet waste audit (after intervention deployment)

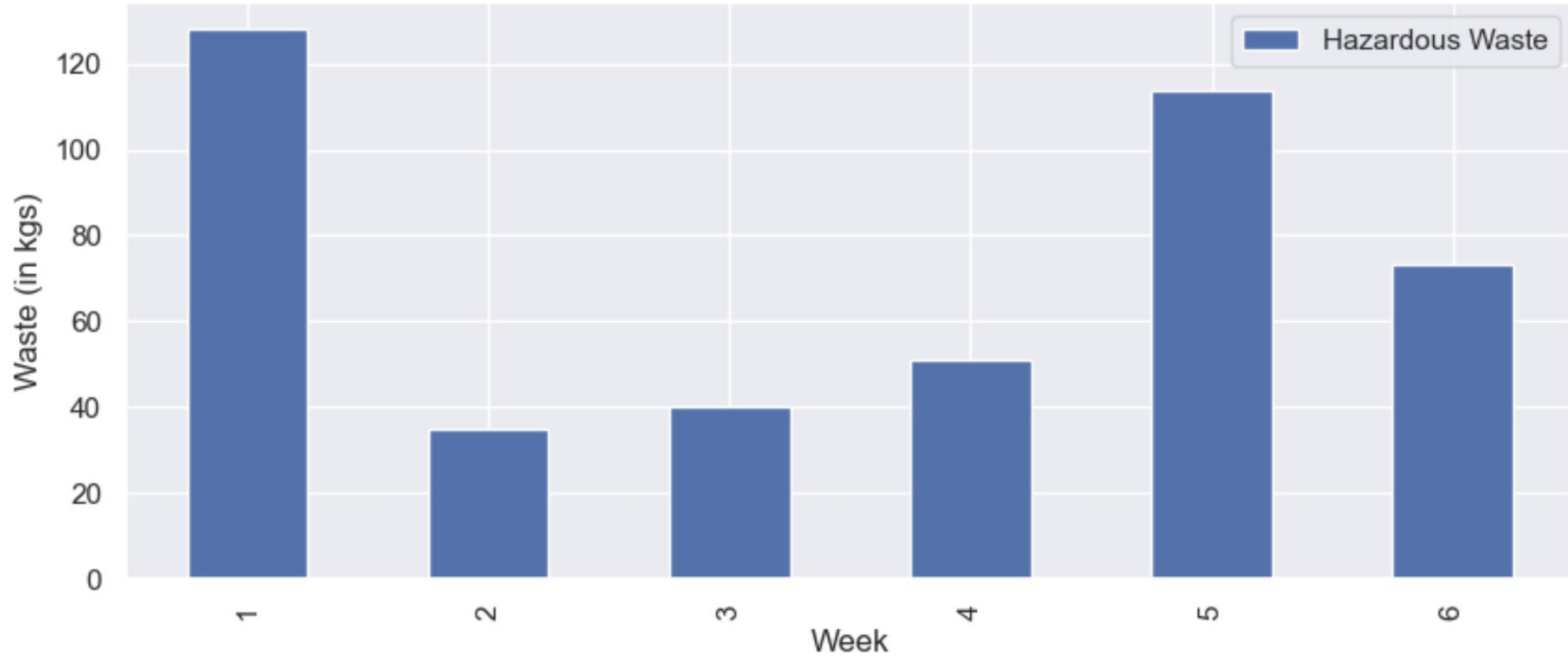


Trend of mixed waste audit (after intervention deployment)



1. There is a spike in week 4, because on one of the days waste was not collected by WW, and there was mismanagement of waste from the housekeeping department.
2. Mixed waste is still being observed because sanitary waste is not collected separately by the housekeeping department during door to door collection. They do not carry a red bin for it.

Trend of hazardous waste audit (after intervention deployment)



Learnings for improvement

1. **Success in Improving Waste Segregation Rates:** The pilot program significantly improved waste segregation rates among residents. This suggests that the intervention approach was effective and resonated with the community.
2. **Need for Consistent Management and Housekeeping Involvement:** Inconsistent support from management and housekeeping led to a spike in mixed waste after the pilot ended as waste was not being audited regularly post week 6. There needs to be a reliable system to ensure ongoing compliance and involvement from these key groups.
3. **Appropriate Staffing for Waste Collection:** The absence of dedicated housekeeping staff for door-to-door waste collection contributed to the problem. A more structured approach is needed, with specific staff assigned to handle dry, wet, and domestic waste dustbins during door-to-door collection to ensure proper segregation and collection. This would also solve the issue of improper disposal of sanitary and hazardous waste when red bin is also taken for collection.
4. **Further educating residents:** Households continue to struggle with the proper disposal of sanitary and hazardous waste. Also, residents who rely on drop off points for waste disposal end up mixing the waste. Further educating residents about proper waste disposal practices might help to reduce this issue.

Learnings for improvement

5. **Effectiveness of Personal Communication over Virtual:** Personal interactions and interventions with residents and housekeeping staff were more effective than only virtual in promoting proper waste segregation practices. This suggests that in-person engagement is crucial for lasting change.
6. **Role of Active Citizens in Project Success:** The involvement of Active Citizens was instrumental in the success of the pilot project. They facilitated effective communication, attracted audiences for related activities, and applied pressure on management to support waste segregation efforts. Their active participation played a crucial role in sustaining project momentum.

Overall recommendation

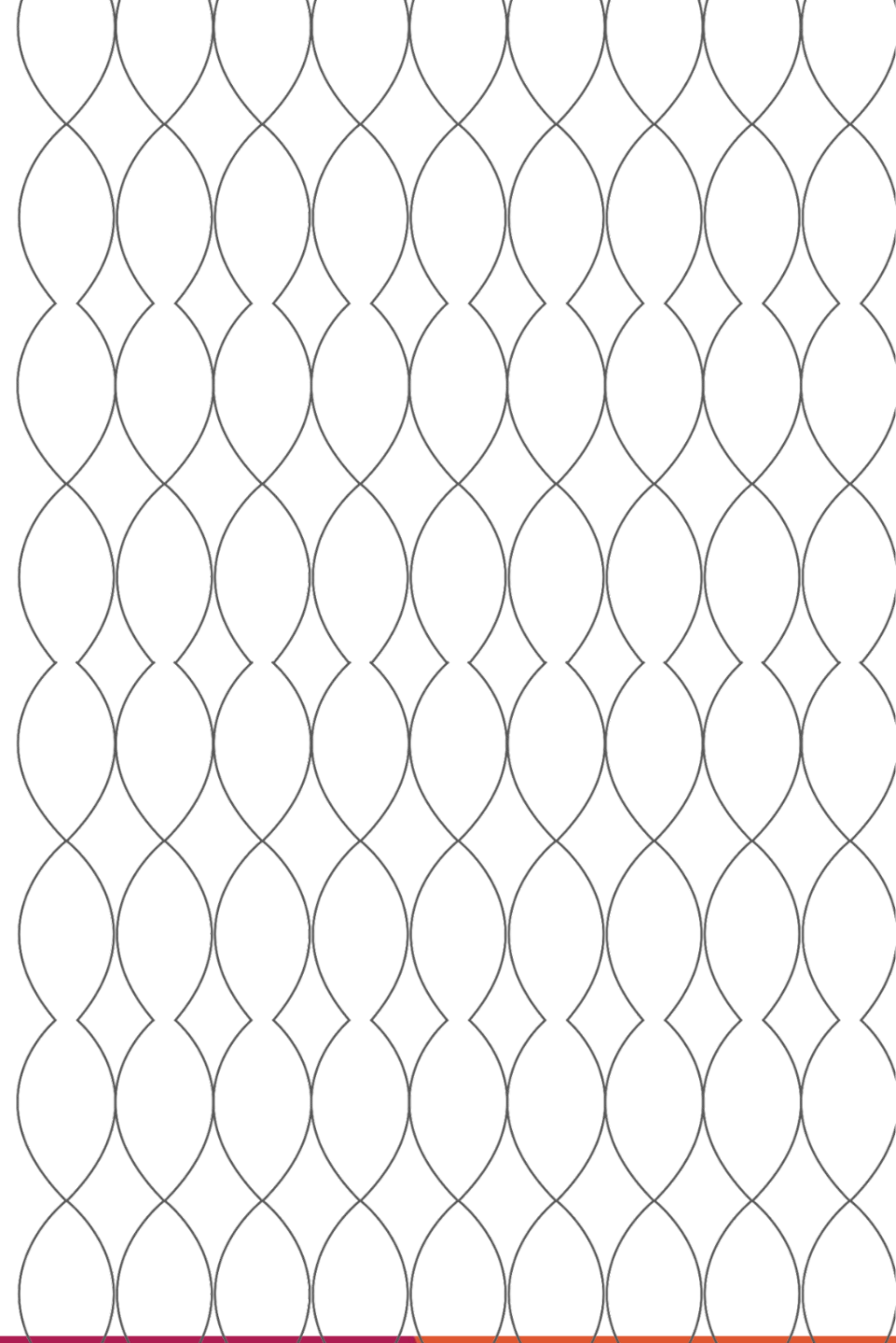
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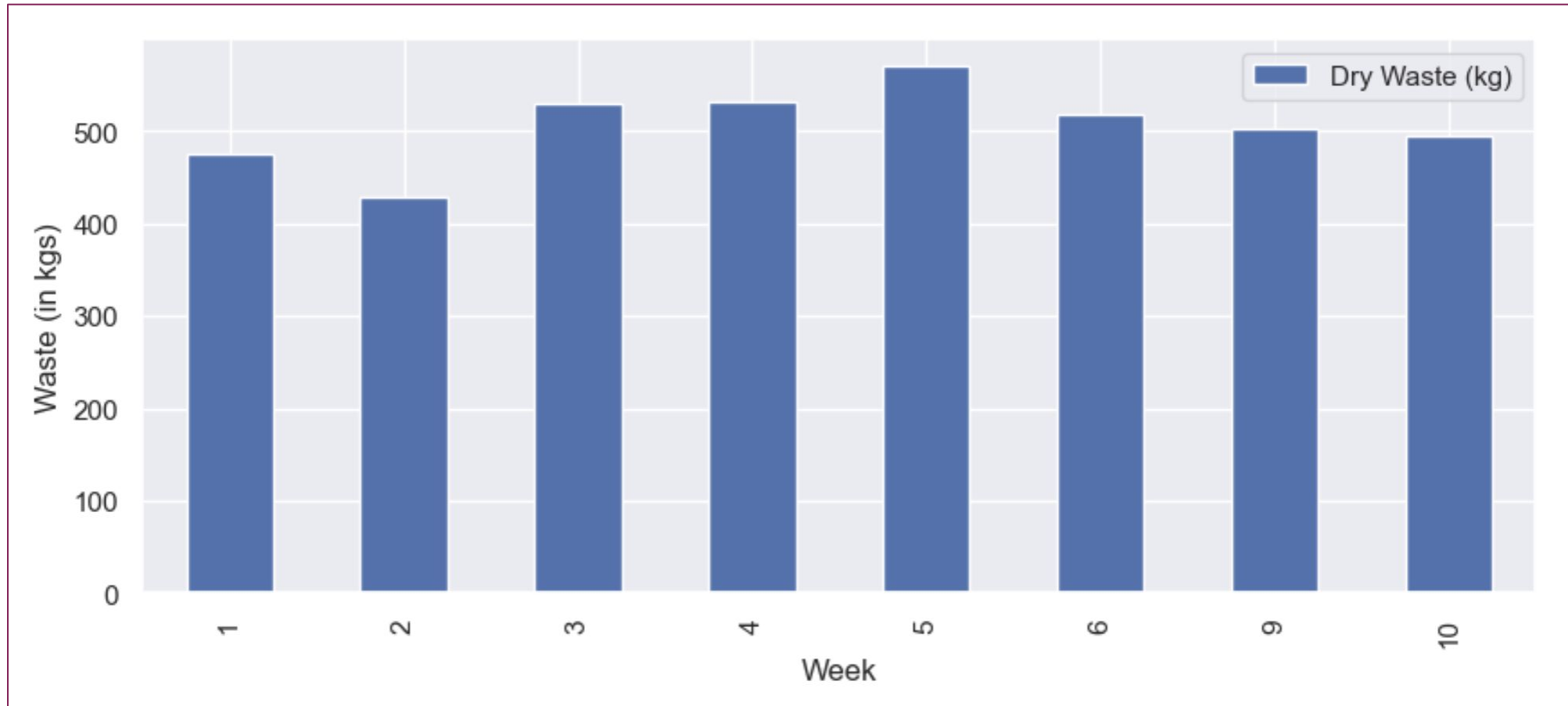
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UNIVERSITY



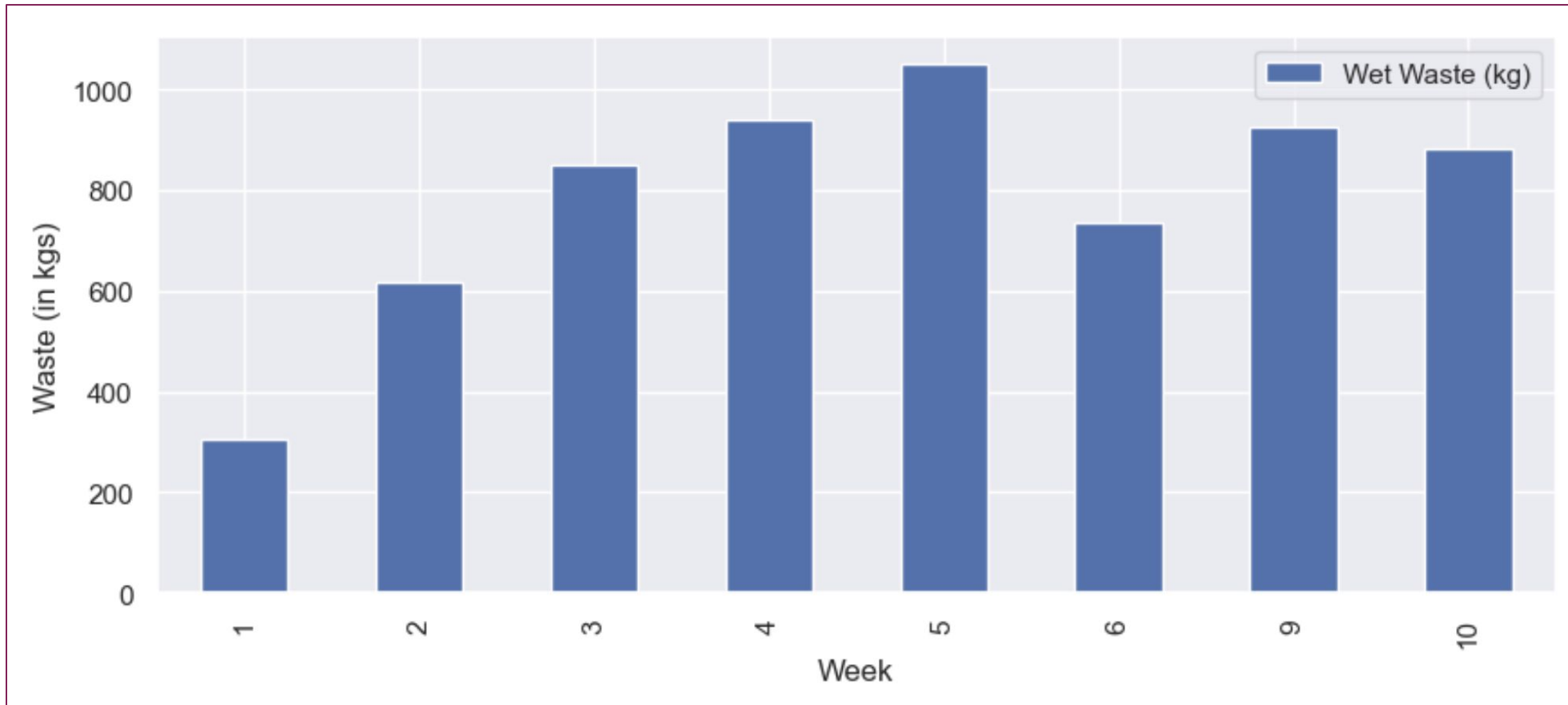
Centre for
Social and
Behaviour
Change



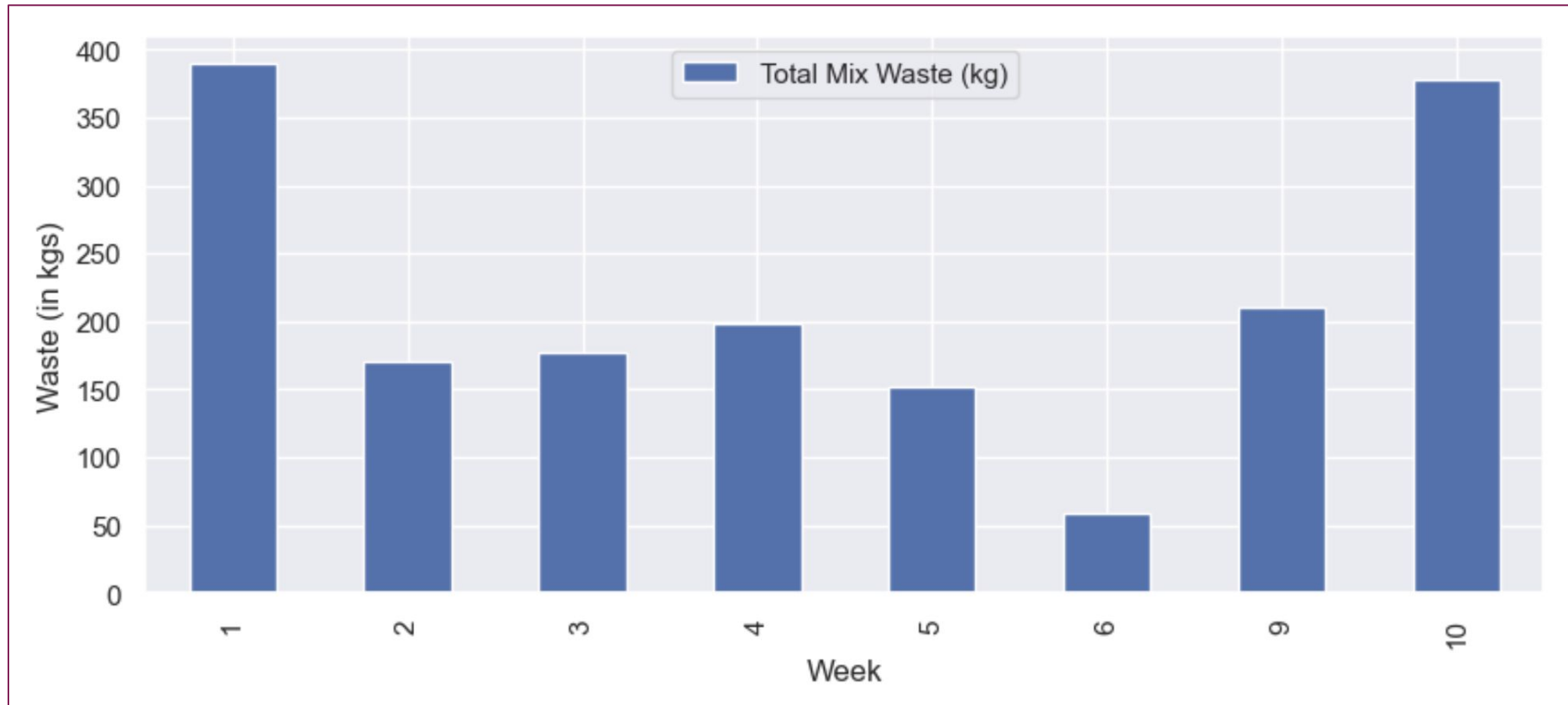
Backup - Trend of dry waste audit during + after pilot



Backup - Trend of wet waste audit during + after pilot

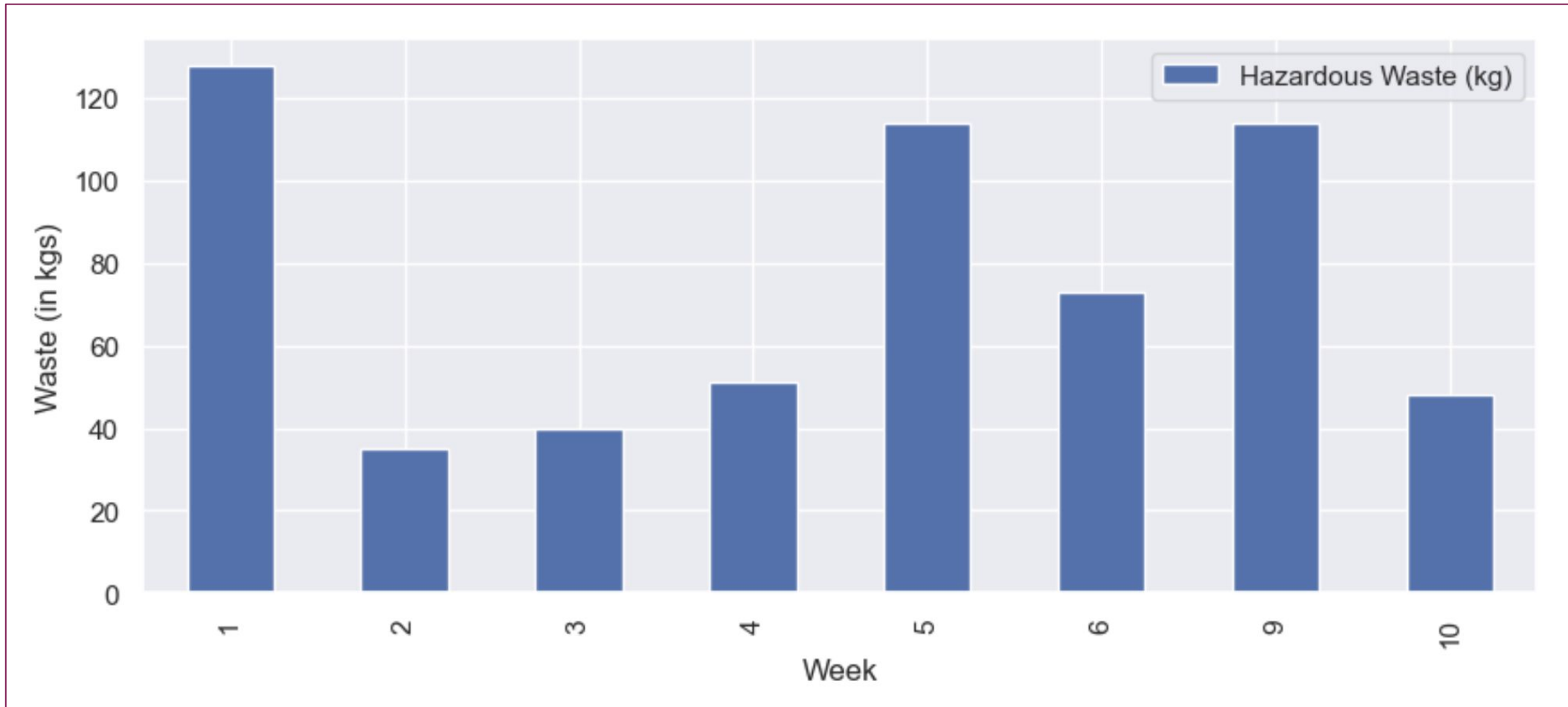


Backup - Trend of mixed waste audit during + after pilot



1. Week 9 and 10 includes data of two weeks after the pilot ended. Since WW was not monitoring waste everyday, there was negligence from the housekeeping department in collecting waste; i.e. not taking two dustbins for door to door collection.

Backup - Trend of hazardous waste audit during + after pilot



Data on waste collection (in kgs)

week	Dry Waste (kg)	Wet Waste (kg)	Total Mix Waste (kg)	Hazardous Waste (kg)	Total
1	476	304.0	390	128.0	1298.0
2	429	617.0	170	35.0	1251.0
3	530	852.0	177	40.0	1559.0
4	531	941.0	199	51.0	1722.0
5	571	1052.0	152	114.0	1889.0
6	518	737.0	59	73.0	1387.0
9	503	926.0	210	114.0	1753.0
10	494	882.0	378	48.0	1802.0