

COMAD | MDS 004



# “Garbage doesn’t have to be a dirty thing”

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## Introduction

Waste Impact Trust is a NGO founded by Ms. Gayitri Handanahal who has served for 13 years in the social sector under diverse areas such as skill development among BPL Self Help Groups, Safe drinking water with the Naandi Foundation. For the last four years she has been working in Solid Waste Management. She conceptualized and coordinated a programme namely, “Reimagine Waste” as a series of Waste Hackathons in collaboration with the Centre for Product Design and Manufacturing (CPDM) at the Indian Institute of Science (IISc). These hackathons have specific themes on waste and are supported by corporates and institutions through 4-day events and the post hackathon activities. Hackathons provide a platform for creativity to find low cost, high impact solutions for day to day problems of waste management using technology. The unique aspect of these hackathons is that the vulnerable communities are part of the hacking teams and contribute to solutions from conception to prototyping to creating business plans.

## Description of solid waste

Both biodegradable and non-biodegradable wastes are targeted. In the pilot project conducted with ‘Trixie’ at Nayandahalli- plastic waste wires of various diameters having aluminum or copper inner wires are targeted. ‘Waste Samaritan’ the other pilot targets all types of house hold waste.

## Mode of collection/transportation/processing

“Reimagine Waste”-a series of Waste Hackathons conducted in Bangalore in collaboration with CPDM at the IISc campus facilitated the process of co-creation of, innovative solutions in solid waste management.

**REIMAGINE Waste 1-** The Waste Picker- was conducted in April 2016 for four days. Activities included, immersion, problem pitching, hack-team formation, solution

Crystallisation, prototype making, business plan making and solution pitching. Among the 36 solutions emanating from the hackathon “Waste Samaritan” has developed a system to enforce source segregation at house hold levels and a machine by ‘Trixie’ group to separate the plastic covering on the waste wires and extract metal in a safe and productive manner.

**REIMAGINE Waste 2-** The Street Food Vendor- was conducted in collaboration with CPDM, IISc in August 2017. 175 participants had taken part including 26 Pourakarmikas, 15 waste collectors and 7 street vendors. 3 teams are on the verge of piloting their solutions.

Out of some 32 teams hacking during the Reimagine Waste-1, on issues faced by waste pickers on a day to day basis were discussed - 2 teams are on the verge of becoming startups as social enterprises. One of them - ‘Waste Samaritan’ created an app with 3 interfaces- 1. The collector 2. The citizen and 3. The back end analytics. A QR code ensures each house is geo-tagged on a central database. Pourakarmikas will record their attendance at every house by scanning the code and rate its level of waste segregation. This also ensures that no house is missed. At the citizen’s end, the app helps track the local waste collector. The second team Trixie developed a simple tool for peeling plastic and extracting metal from waste wires. The first bench prototype developed during the Reimagine waste hackathon was ready by the 45 day challenge. The next 3 prototypes were delivered by the fabricator ‘Surya Industries’ on the 20th of January 2017. There were some glitches which were taken care of. All four prototypes are now in use. After a few days of house trials, they were taken up for field trials from the 28th January 2017 onwards. The prototypes are undergoing much iteration based on the feedback from end users.



45 day challenge



As raw material comes in different size ranges

# Impact

Team "Waste Samaritan" consists of Wisvesh B S who works for Infosys and Krishna a DWCC manager conducted a pilot at Domlur with 152 households and the results worth to emulate in other areas. Initially the citizens were not willing to segregate the waste, as per the statement of waste collectors in the piloting team. Only 1 to 4 houses in a line were segregating the waste. The mobile app, rates the segregation of each household on a 5-point scale. The fact that this data can be monitored on a dash board at



the BBMP or RWA control room increases the motivation to segregate better. There is a visible improvement in the quality of segregation and awareness among the citizens.

A pilot was conducted with 'Trixie' at Nayandahalli to evaluate the tool and the difference it could make to the lives of wire strippers. In total observation time of 23 days - five family members (all women and some of them were part of the hacking team) contributed wire stripping work.

## Adoption of this method

There was a visible improvement in the quality of segregation and awareness among the citizenry through "Waste Samaritan" venture. Proposals have been given to 4 wards and we hope they will be adopting this system. Self Help Groups are being formed to take up 'Trixie' as an enterprise.

## Economic aspects

For the Trixie project, the raw material - waste wires-are bought at anything between Rs.35 and Rs.80/kg from various sheds/dealers/homes in the locality. The price paid depends on the quality of the material and the need of work at home. Once the wires are stripped, the metal is sold between Rs.200 and Rs.300/kg depending on the kind of metal and quality of metal. The stripped plastic fetches about Rs.14 to Rs.18 depending on the quality. In the total observation time of 16 days it was found that the average productivity per person with 'Trixie' will be 3 times greater than that when the same is done manually. The productivity is likely to increase with iterations on the machine design and refining of the process. The earnings can increase to about 4 times what they are making now.

## Conclusion

The success of Reimagine Waste may signify the coming of age of social hackathons in the city. We are now planning Reimagine Waste - 3 in the month of August 2018 in collaboration with CPDM-IISc under theme 'Water and Waste'. Our ultimate goals are to reduce non-recyclable waste to < 20%, transform 80% of waste we produced into value, create opportunities for up-valuing waste, create more scalable and equitable businesses and finally to create a smarter and cleaner future for Indian cities.