

Research Paper

Multi-facet Approach to Recycle Household Bio and Non-Bioresource waste into Wealth: Success Story of a Lady having Zero Waste Lifestyle

Nisha Arya¹ and Sudhanand Prasad Lal^{2*}

¹Department of Family and Community Resource Management, Faculty of Family and Community Science, The Maharaja Sayajirao University of Baroda, Vadodara Gujarat, India

²Department of Agriculture Extension, P.G. College of Agriculture, Dr. Rajendra Prasad Central Agriculture University, Pusa (Bihar), India

*Corresponding author: sudhanand.lal@rpcau.ac.in (ORCID ID: 0000-0002-6288-5276)

Received: 21-8-2022

Revised: 27-11-2022

Accepted: 06-12-2022

ABSTRACT

Zero-waste lifestyle is an environmentally friendly way of living life that strives to decrease the amount of waste generated at the individual level on a daily basis. The aim of the study was to scrutinize household waste management and zero waste lifestyle at an individual level. This study presents the verdicts of a case study on a woman who religiously follows 'zero waste lifestyle'. Dr. (Mrs) Kiran Sinha, a conscientious lady of 52 years old, a well-educated woman, MD (Homeopathy in Paediatrics), who lives at the residential area of RPCAU Pusa, has always attempted to minimize most of the waste generated in her home and convert it into a functional product. Due to her immense and continuous endeavor to convert waste into a resource, only 90-150 grams of waste are generated from her household per day, which involves only dust and litter. Dr. Sinha practices a "Zero Waste Lifestyle" and uses her countless hours to recycle waste and makes everything in her house multifunctional. It is expected that the findings of this research focus on the best practices of a woman towards zero waste lifestyle and to make waste-free and environment-friendly practices at the individual level. The current study is required to continue exploring best practices of households in the relevant fields and to promote their success stories worldwide in various ways.

HIGHLIGHTS

- ① Utilization of biodegradable waste for trench composting.
- ① Adoption of zero waste lifestyle by using 5Rs.
- ① An environmental friendly attitude may reduce overconsumption and waste.
- ① Success story of lady having zero waste lifestyle.

Keywords: Case study, Environment, Household waste management, Recycle, Woman, Zero-waste

Waste is a term that is used to define things which are useless and unworthy things. BSR (2010) defined waste as anything that does not create value. According to Deol 2020, waste generation in India is 0.17 kilogram per capita per day in smaller cities and 0.62 kg per capita per day in large cities. When waste is not stored correctly, collected, and disposed of, it is deemed dangerous to human

health and the environment. Waste has long been regarded as an undesired material with no intrinsic worth, which has affected disposal views (Yoad

How to cite this article: Arya, N. and Lal, S.P. (2022). Multi-facet Approach to Recycle Household Bio and Non-Bioresource waste into Wealth: Success Story of a Lady having Zero Waste Lifestyle. *Int. J. Bioresource Sci.*, 09(02): 101-109.

Source of Support: None; **Conflict of Interest:** None



et al. 2014). The thought of waste as a resource, on the other hand, changes people's perceptions of waste. Instead of seeing waste as worthless trash that must be destroyed, the concept urges people to see garbage as a valuable resource that can be converted into new products to produce revenue. It is vital to achieving good waste management that incorporates not only formal/government entities but also specific acts in order to produce a healthy and better environment. Effective waste management involves 5Rs refuse, reduce, reuse, repurpose, and then recycle. Goodall (2022) defined the zero-waste lifestyle as an environmentally friendly way of living life that strives to decrease the amount of waste generated at the individual level on a daily basis. The fundamental goal of this lifestyle is to send as little waste to landfills and instead purchase single-use things better to prioritize recycling and reusing products to eliminate the clogged landfills and harsh impact on climate. The fundamental goal of zero waste is not merely to keep waste out of landfills but to reimagine the entire cycle of resource removal, consumption, and waste management so that no more resources can be wasted along the way (Smith 2022).

In a report of Banega Swasth India by Karelia and Bhaskar (2017), it was stated that Sahar Mansoor, 26 years old lady from Bangluru, vowed to adopt a zero waste lifestyle in 2015. She switched from plastic-free products to green products. It was revealed that only 500 grams of waste had been generated, which she had gathered in her 'waste jar'. She strongly supported generating the least amount of wastepossible, from personal care products to a zero-waste closet to a zero-waste work environment. In 2018, on a webpage of National Geography, Leahy described Kethrine Kallog from US, who was one of the millennials and bloggers who adopted zero waste lifestyle, which entails rethinking usual behavior and thinking beyond the box. She blogs for sharing ideas and support and has 2 stores dedicated to the thriving community to make their waste-free lifestyle easy. Leahy (2018) also mentioned the Williamson family, whose idea was to be less wasteful in every element of life. Their main goal was to spend less, consume less, and waste less to live a waste-free lifestyle. Purchasing in bulk saves time, fuel, and money and reduces the amount of plastic used in packaging bags.

According to the article blog of "Zero Waste" (2021) acknowledged the, Kamikatsu a town in Japan, one of the well-known zero-waste communities, was declared zero-waste in 2003 and has never looked back. According to the article. To have the most significant impact, the zero-waste system must work for everyone on both large and small scales. Zero-waste lifestyle in response to climate change can be adopted by communities of all sizes and economic profiles worldwide. Each has its own goals and zero-waste solutions, proving that there is no one-size-fits-all answer to sustainability and that everybody can improve managing resources and waste, protect natural resources, and reduce greenhouse gas emissions.

With this framework, the aim of conducting the present study was to scrutinize household waste management and zero waste lifestyle at an individual level. This study presents the findings of a case study of a woman named Dr. (Mrs) Kiran Sinha, a conscientious lady 52 years old, a well-educated woman, MD (Homeopathy in Paediatrics), who lives at the residential area of RPCAU Pusa, who religiously follows 'zero waste lifestyle'. She practice managing waste at the individual level. Her wish is to manage, organize and arrange all type of waste in her household. The purpose of mentioning Dr. Kiran Sinha in the present study is to bring out her accomplishments and to endorse her prodigious work. This study on Dr. Kiran's household would also inspire other people, either men or women, to come forward and step headlong to promote such endeavors so they can be discernible in society for their splendid aptitude.

Objective of the study: To scrutinize household waste management and zero waste lifestyle at an individual level.

METHODOLOGY

Study Location

The subject of the study named, Dr. (Mrs) Kiran Sinha, a conscientious lady 53 years old, a well-educated woman, MD (Homeopathy in Paediatrics), who lives in the residential area of RPCAU Pusa, Samastipur Bihar (25°59'19.1"N and 85°40'40.2"E) with her spouse Dr. Dhruv Kumar Sinha. Dr. Kiran Sinha is a homeopathic health practitioner,



while Dr. D.K. Sinha is a Professor, Agricultural Economics RPCAU Pusa, Samastipur, Bihar. Dr. Kiran belongs to the high-income group family where she don't need to show miser behavior. During the investigation, it was observed that she is a lady living zero waste lifestyle. She uses the ₹ 5 of refuse, reduces, reuses, repurposes, recycles the products and manages waste at her level.

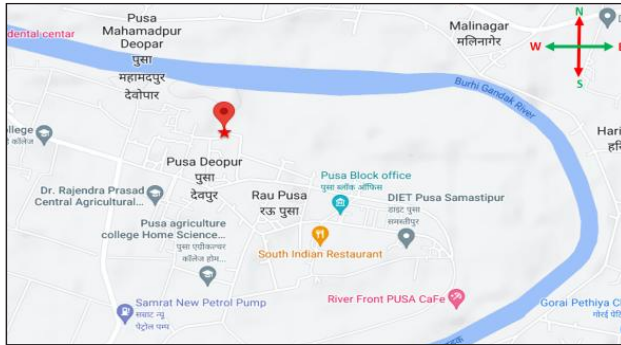


Fig. 1: Map showing the location of the study (Courtesy : Google map)

Data Collection

The study is focused on a lady following zero waste lifestyle. This research used a descriptive research design to explore and analyze the multi-facet approach of the subject to live zero waste lifestyle. Descriptive research aids in analyzing qualitative data of actual events that occur now and in the past and impact the future (Abebe and Casa, 2020).

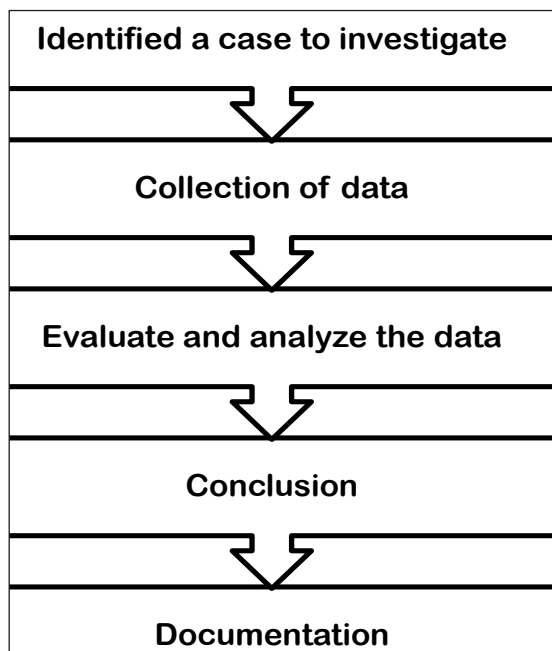


Fig. 2: Steps of the case study

The primary data was collected through observation, semi-structured interview schedule, and a case study method to collect the data to figure out the way and how the subject used to manage their waste at an individual level. Respondents were encouraged to respond to the questions without following the sequence of questions in semi-structured interviews (Quandeel and Jehom, 2020). Dr. (Mrs.) Kiran Sinha's success story was thoroughly examined using the case study method. The data was collected from July 2020 to May 2021. The methodology used in this research was similar adopted from the case study recently conducted by Lal and Jha (2018). In order to do a case study, the study follows five steps (Ray and Mondal, 2011; Lal and Jha 2018).

RESULTS AND DISCUSSION

This section entails information gathered by the researcher during interviews and observations with the case study's subject, Dr. Kiran Sinha. It also includes a discussion of the study's conclusions and data.

Demographic Profile of Subjects

The following case study is centered on the success story of a single person rather than a family, community, institution, or organization. Table 1 provides an outline of the subject's profile based on the findings.

Table 1: Profile of the subject under the case study

Nation	India
State	Bihar
District	Samastipur
Block	Pusa
City/ Village	Residential area of Pusa
Subject of the case study	Dr. (Mrs.) Kiran Sinha
Present Age	53 years
Birth Date	
Qualification	MD Homeopathy in Health Padietrics
Occupation	Homeopathic health practitioner
Years of Residence	20 years
Spouse	Dr. Dhruv Kumar Sinha
Children	2 +2 (Son and daughter in-law and daughter and son in-law)
Family type	Small
Live with	With her Spouse

Waste Generation at Subject's Household

She has always attempted to minimize most of the waste generated in her home and convert it into a functional product. It was found that her house produced only 90-150 grams of waste per day. The composition of waste generated at her household is divided into biodegradable waste and non-biodegradable waste shown in table 2. She revealed that she needed more time to plan and execute and a spirited willingness to be resourceful. The investigation discovered that being a zero-waste person was extremely challenging. Still, her activities and successes were always focused on reducing, recycling, and reusing garbage to the greatest possible extent.

Table 2: Composition of waste generated at the subject's residence

Biodegradable waste	Non- biodegradable waste
Fruits and vegetable peels	Paper
Food waste and scarps	Plastic bottles
Unfiltered water	Tetra packs
Tea leftover	Old cloth
Water after washing fruits and vegetables	Plastic and paper wrappers
Garden waste (includes leaves and flowers etc.)	Cans
	Sack/ bags

Managing food scarps and waste water

The investigation reveals that Dr. Kiran Sinha never wastes food and never ever have food leftovers in her dining. From the kitchen, organic waste like food scraps, peels, seeds, leftover (if any), and other waste from the vegetables, fruits, and green waste from the preparation of food. Here her endeavor focused on collecting all the green waste and dumping it into the dig she made to make composting. It was also revealed that Dr. Kiran uses the dishwater, impure water that comes with the filtration of water, and leftover water from washing vegetables, fruits, etc., to irrigate her lovely kitchen garden. She has also concerned about the environment. She was particularly fond of organic farming; thus, she was against using chemical fertilizers like urea to help plants grow. Thus, she practices making compost by herself, as shown in fig 4. She digs up a hole in her garden and dumps all

her solid biodegradable waste into it. Composting is a long process; she revealed that composting requires 1.5-3 months to make in summer and more than 2-6 months in winter.

Therefore, she made an alternative method to use food waste. As she loved to grow plants in her garden and self-made pots, she dug up the hole around the plants and buried the waste in the dig, as shown in Fig 5. She believed that burying the waste in the garden helps produce nutrient-rich humus and aids with plant growth without waiting for long months of composting. The investigator discovered that this composting, burying the waste directly into the garden called "Trench Composting".

Venderlindon (2019), an organic garden expert, stated that "Trench composting' composting' is an easy method of composting by using kitchen and garden trash also, including weeds buried in the garden soil, which involves no major effort as well as can improve the soil with one month. Kitchen waste and food waste are added directly to the soil and naturally provide nourishment to plants exactly where they need it, at the root zone. Moreover, it is unnoticeable and emits no odor.

Dr. Kiran Sinha also uses the water after cleaning vegetables and fruits, also the filter waste water from RO filters. She believed that wastewater also consists good amount of minerals that can also be helpful in water the house plants and in the garden. After filtering the tap water, the waste water contains a high amount of TDS (Total dissolved solid). TDS material includes carbonate, bicarbonate, chloride, sulphate, phosphate, nitrate, calcium, magnesium, sodium, organic ions, and other ions that are not healthy for human consumption but are necessary for soil fertility and plant growth.

Organic farming

She adored growing vegetables, flowers, grains, and foliage plants in her garden and containers. She grew vegetables such as sponge gourd, eggplant, and cucumber, as well as fruits such as pomegranate and grapes, along with pulses and spices such as lentils, grams, soybean, turmeric, and coriander. She had also grown flowers such as roses, marigolds, and jasmine. This activity demonstrated that she enjoyed feeding the plants and using them without adding chemical fertilizer to the soil. In this manner, she ultimately utilized organic farming to grow



Fig. 3: Waste generated from the garden and kitchen used to make compost



Fig. 4: Dr. Kiran Sinha digging pit for composting



Fig. 5: Using waste water to watering plants



Adding food craps to the soil

Mulching

Fig. 6: Trench Composting Method



Fig. 7: Pulses, Spices and dried flowers



Fig. 8: Fruits: Grapes and Pomegranate



Fig. 9: Vegetables: Cucumber and Sponge Gourd

plants in her garden and pots.

Management of Non-biodegradable waste

Non-biodegradable waste, such as polypropylene sacks, e-commerce and other packaging bags, tin containers, plastic bags, and so on. Kiran Sinha also recycles and reuses such waste. She always buys in bulk to limit the number of plastics in her home. However, in this day and age, plastic cannot be avoided. Plastics shake hands in the shape of product wrappers, carry bags, shampoo bottles, gum bottles, sags, washing soap containers, and detergent packaging. It is very and delightful to witness that she converted every plastic bag and container i.e., surf excel wrapper, rice and wheat flour bags, cement bags, shampoo bottle, and dishwasher case, into a plant bag and pot, as shown in Fig 10. Hence, zero waste necessitates reconsidering how waste had traditionally been seen as rubbish, but Dr. Kiran Sinha recognizes even useless materials like plastic wrappers as treasured resources rather than stuff to be discarded.

Bio-philic interiors

As was mentioned, she treasured growing plants. This shows her in love of nature. Biophilic design is an approach to make interiors connect the building environment to nature. Foliage in containers, sprawling plants from the ceiling, and a herbaceous garden helps to make a biophilic interior. People invest lots of money to create biophilic designs for their interiors. But remarkably, Dr. Kiran Sinha made it possible with zero investment of money. She recycled and reused make the purposeful containers for the plants i.e. snake plant, money plant, etc. as shown in Fig 11, and madethem multi-functional as well. By this she made her house green, decorative, beautiful, and healthy interiors.

MUSHROOM CULTIVATION

Dr. Kiran Sinha collected some more waste like a transparent polypropylene bag and some rice straws, and tried to grow mushrooms by herself at home only. She hardly discarded things. Hence, she found a transparent plastic bag in the packaging of equipment she bought some days ago. Extraordinarily, she succeeded in growing mushrooms at home without adding extra exertion and struggles on materials and methods, as shown

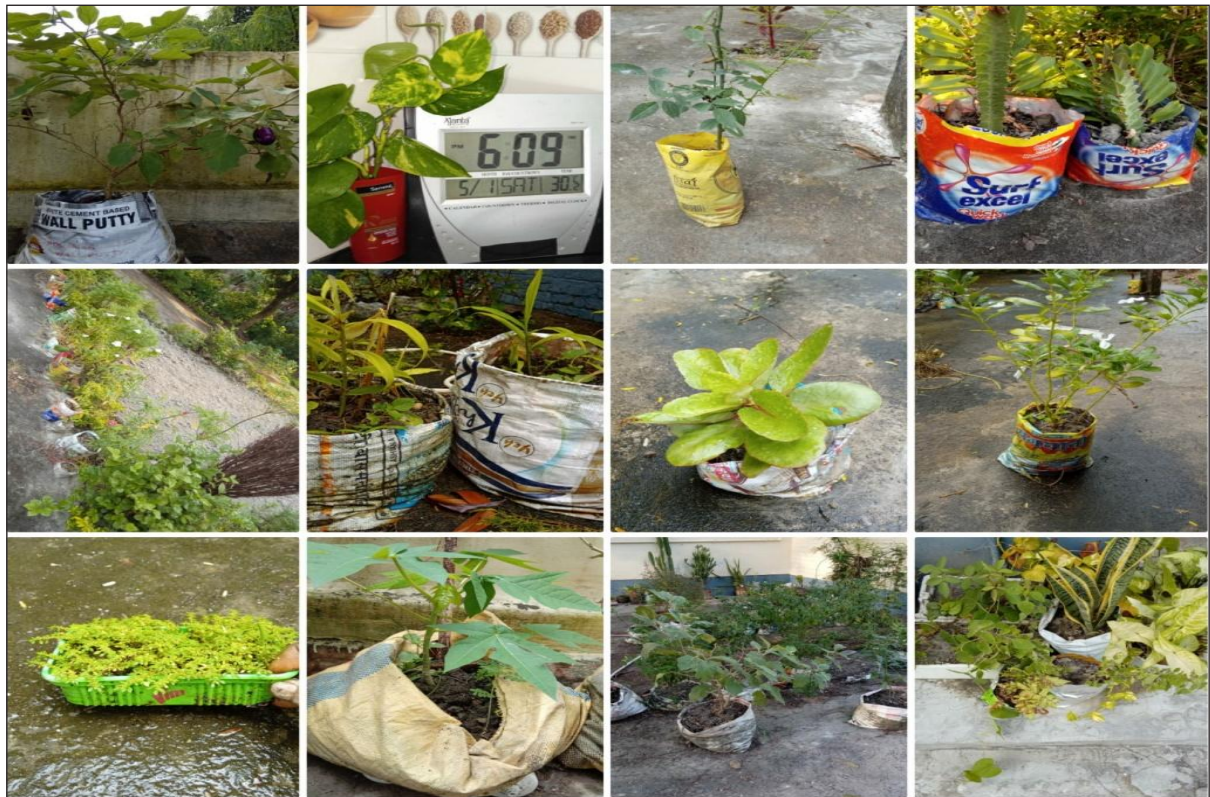


Fig. 10: Reuse and Recycle of plastics bags or sacs for planting



Fig. 11: Biophilic Interiors at Subject's Home



Fig. 12: Mushroom cultivation at household level

in Fig. 12. She made an effort grew mushrooms at the minimum cost.

Overall, her attempt to go to zero waste, as the findings reveal, took an ample amount of time and planning. But her philosophy and design framework promotes not only reuse, recycling the waste but also, and perhaps more importantly, the entire life-cycle of products and processes. According to the findings, it was pragmatic from the mentioned activities Dr. Kiran Sinha utilized her precious time to utilize waste at home. Through this, she uses every thing in her home and makes it multifunctional. She believed that nothing is futile, not even household waste we just need to recognize what stuff can be worthwhile. Dr. Kiran Sinha is a vibrant and dynamic lady. Her endless, priceless, and selfless endeavors toward the recycling and management of waste amusingly at the household level are very galvanized. She remarkably set an example for her responsibility in waste management. She adopted a zero waste lifestyle that not only benefited herself and her family but also minimized the environmental impact via the 5 R(s) of refusing, reducing, reusing, recycling and re-purposing.

CONCLUSION

Zero waste is a change in mindset. It is a holistic approach to dealing with the flow of consumption of products. It can be concluded that moving towards

a waste-free lifestyle can be intimidating, but as Dr. Kiran Sinha demonstrated, it is not as complicated as it appears. She proved that managing waste requires collective actions rather than individual efforts. Therefore, Dr. Sinha house was witnessed as 'Zero waste' because no organic waste originated from her home, and only 90-150 grams of waste in a day is generated from her home. Dr. Kiran Sinha irrigates her beautiful kitchen garden using dishwater, dirty water, and water left over from washing vegetables, fruits, etc. She grows plants in polypropylene sacks, e-commerce and other packing bags, tin containers, and plastic bags. She was particularly fond of organic farming. Thus, she was against using chemical fertilizers like urea to help plants grow and made her own compost to nourish plants. She decorates her home and makes Biophilic Interiors without spending lots of money. She manages the waste and helps to reduce the impact of waste on the water by composting and trench composting, recycles the kitchen waste and plastics products, reuses the wastewater, and makes the products multi-functional and purposeful. This is how Dr. Sinha practices a "Zero Waste Lifestyle" and uses her countless hours to recycle waste and making everything in her house multifunctional, and helps to make a healthy environment.

IMPLICATION

The present research focused on the best practices



towards zero waste lifestyle and environment-friendly practices at the individual level. Also promotes Biophilic interiors, allowing people to connect with nature without spending ample money. Men or women like Dr. Kiran Sinha should be highlighted by accomplishing for their tremendous efforts to manage waste at their own level through more case studies. Motivates homemakers to practice zero waste lifestyle and reuse-recycle at the household level. Living a zero-waste lifestyle will encourage individuals to be more environmentally conscious and will also assist in avoiding overconsumption and waste. This study promotes the zero waste lifestyle, which is ethical, economical, and functional, that guides people in modifying their behaviors and activities to simulate natural and renewable cycles, in which all wasted products are planned for becoming resources to make them usable for others. The current study is necessary to continue investigating household best practices related to industries and to publicize their success stories in many ways worldwide.

REFERENCES

- Abebe, W. and Kasa, A. 2020. Constraints to Women Participating in Public Works for Improving Income-Generating Activities in Selected Districts Vis-a-vis Productive Safety Net Program of Ethiopia. *Glob. Soc. Welf.*, 8: 181–185.
- Deol, T. 2020. PM calls for week-long garbage-free country, but India is the world's highest waste-generator. *The Print*. Available at <https://theprint.in/india/pm-calls-for-week-long-garbage-free-country-but-india-is-the-worlds-highest-waste-generator/478889/>
- Fahy, F. and Davies, A. 2007. Home improvements: Household waste minimization and action research. *Resourc. Conserv. Recycl.*, 52(1): 13–27.
- Goodall, J. 2021. How to Go Zero Waste: Inside the Zero-Waste Lifestyle, Masterclass. Retrieved from <https://www.masterclass.com/articles/zero-waste-lifestyle-explained#learn-more>
- Karelia, G. and Bhaskar, S. 2017. Yes, It Is Possible To Lead A Zero Waste Lifestyle. Take A Cue From This 26-Year Old Bengaluru Woman, Swatch India NDTV. Retrieved April 30, 2022, from <https://swachhindia.ndtv.com/yes-possible-lead-zero-waste-lifestyle-take-cue-26-year-old-bengaluru-woman-9386/>
- Lal, S.P. and Jha, S.K. 2018. Illustrating the way to harmony amid wildlife and agriculture near sivalik mountain range of northern India: an empirical. *Int. J. Avian. and Wildlife Biol.*, 3(2): 152–157.
- Leahy, S. 2021. How Zero-Waste People Make Only a Jar of Trash a Year. Science. Retrieved from <https://www.nationalgeographic.com/science/article/zero-waste-families-plastic-culture>
- Qandeel, A. and Jehom, W.J. 2020. Patterns of Living Environment among Itinerant Elderly Community in Malaysia. *Glob. Soc. Welf.*, 7: 383–393.
- Ray, G.L. and Mondal, S. 2011. Research Methods in Social Sciences and Extension Education. 3rd revised and enlarged edn, Kalyani Publishers, pp. 30.
- Runeson, P. and Höst, M. 2008. Guidelines for conducting and reporting case study research in software engineering. *Empirical Software Engineering*, 14(2): 131–164.
- Smith, L. 2021. Zero-Waste living: what is it, and why is it important? Retrieved from <https://lochtree.com/blogs/blog/the-importance-and-benefits-of-practicing-zero-waste-living>
- Venderlinden, C. 2019. Why you should Compost in Trenches. *The Spruce: make your best home*. Retrieved from <https://www.thespruce.com/why-you-should-compost-in-trenches-2539479#:~:text=Trench%20composting%20is%20a%20way,about%20anywhere%20in%20your%20garden>
- Yoda, R.M., Chirawurah, D. and Adongo, P.B. 2014. Domestic waste disposal practice and perceptions of private sector waste management in urban Accra. *BMC Public Health*, 14: 697.
- Zero Waste, 2021. Zero Waste Communities across the Globe. Retrieved from <https://www.zerowaste.com/blog/zero-waste-communities-across-the-globe/>

