

Towards Reducing Food Waste in Zimbabwe: A Case of the Small Holder Food Value Chain in Zvishavane District, Zimbabwe.

Viola Matunhu, Patience Matunhu, Precious Matunhu, & Jephias Matunhu

Midlands State University, Zimbabwe

DOI: <https://doi.org/10.51584/IJRIAS.2026.11050175>

Received: 26 December 2025; Accepted: 03 January 2026; Published: 12 June 2026

ABSTRACT

Zimbabwe suffers food and nutrition insecurity due to the effects of climate induced droughts, food waste, and mid-season dry spells. The study was conducted in support of Zimbabwe's Vision 2030, UN SGDs and Africa Agenda 2063, whose general aim is to ensure food security for all people. The study investigated opportunities for reducing food waste in Zvishavane district by applying the Closed-loop Secular Economy theory. Qualitative data was collected through interviews, observation and documents reviews. Data was gathered from fruit and vegetable vendors, smallholder producers in the rural areas, as well as from food scientists at a local university. Findings confirmed high levels of food waste at fruit and vegetable markets, vending points, as well as at smallholder farms. Mangoes, bananas, amarula fruit, Uapaca kirkiana, guava, watermelons, tomatoes, banana, and cabbage were the worst wasted food. The study recommends low-cost methods of preserving food using solar energy. Value addition and value preservation of food could be in the form snacks, bottled fruit juices or processed animal, poultry, and fish feeds.

Key Terms: Food, Waste, Zvishavane, solar energy, innovation

INTRODUCTION

Food insecurity is increasingly becoming a global concern because of climate change, armed conflicts and geopolitics. Globally, 30% to 50% of the food produced for human consumption is wasted (Oelofse and Nahman 2013 and Lipinski et al., 2013). In 2016, about 2 billion people experienced malnourishment (Sharma et al., 2016). Food shortage is more severe in developing countries, where in 2024 over 676 million people (WFP 2025) experienced hunger. With a projected increase of world population to 9.3 billion in 2050, more people will be food insecure (Lipinski et al., 2013) partly because of waste of waste. Schanes et al., (2018) warn that food waste is increasingly becoming an economic (Scoones et al., 2018; FAO, 2022), environmental and social threat (Schrank, Aphinya, Thongsalab, Sawaddee, Chanrattanakorn and Ketkaew 2023) which warrants investigation.

In 2014 sub-Saharan Africa's per capita food waste stood at 120-170 kgs (Papargyropoulo et al., 2014). Zimbabwe is flagged for food insecurity¹ at the same time losing 20% to 30% of its food in storage alone and 40% due to field loses, transportation, handling and processing. Wasted food lodges in landfills (Shabani and Jerie 2023; Al-Rumaihi, McKay, Mackey, Al-Ansari 2020). This study examined food waste (fruits and vegetables) in Zvishavane District with a view to suggest ways of reducing the wastage. The study aligns itself with section 77(b) of the Constitution of Zimbabwe² and the United Nations Sustainable Development Goals (SDGs) especially those targeting poverty reduction, and food security. The study adopted the definition of food waste³ in Adelodun, Kim and Choi (2021).

¹ Food security is a situation when everyone, always has physical and economic access to sufficient safe and nutritious food that meets dietary needs (World Bank 2024).

² Section 77(b) of the Constitution provides that every person has the right to sufficient food at all times.

³ Food waste is food meant for human consumption that is either wasted or lost, for instance produce and raw materials that are lost during the growing, harvesting, transportation and storage stages as well as food leftovers (Adelodu, Kim and Choi 2021).

AIM AND OBJECTIVE OF THE STUDY

The study aims to contribute solutions to food waste in Zvishavane District because wasted food has a financial toll on household income, food and nutrition security in a community that is already food insecure. The specific objective is to establish innovative strategies of either recycling food waste or preserving food value.

THEORETICAL FRAMEWORK

The study is based on the transformative closed-loop circular economy theory⁴ by Walter Stahel. The theory is a departure from the wasteful linear food supply chain theory. Closed-loop circular theory promotes regenerative agricultural practices by minimizing the generation of food waste and losses across the supply chain and encouraging the valorization of waste and by-products (Achillas and Bochtis 2020). The strength of this theory is that it encourages collective efforts by food producers, processors, retailers, and consumers. The theory calls Government⁵, policymakers, researchers, and innovators to play a crucial role in infrastructure development and in crafting supportive policies for successful transformation from linear to circular food systems (FAO 2024) leading to more resilient food supply system for communities that often experience food, nutrition and income insecurity.

RESEARCH METHOD

This qualitative study was conducted in November of 2025 when fruits and vegetables were in season. A preliminary literature review was undertaken from databases such as Google Scholar, PubMed, Science Direct, African Journal Online, Web of Science, Sage and Scopus. During our literature search, 78 articles were accessed from the databases. The articles were screened using key terms and abstract content of this paper. The process left us with 16 appropriate articles to use in compiling this paper.

Data collected from the databases was corroborated with qualitative data collection processes. Qualitative research methods were preferred because of their descriptive explanations of participants' views over food waste in the District. Saunders 2012, Cresswell and Poth, 2017; Easterby-Smith, Thorpe and Jackson, 2012 recommend the methodology for studies that require descriptive explanations of a phenomenon. Site visits were undertaken to Madhenda dumpsite in Zvishavane urban and other unofficial dumpsites in and around the District. Interviews, observation and focus group discussions were the main data collection instruments. To avoid bias as warned by Yin (2003), we maintained neutrality in reporting. Twenty-six (26) participants were involved in the study as presented below.

Table 1: Participants

Occupation	Male	Female	Total
Vegetable Vendors	06	07	13
Farmers delivering Fruits and Vegetable to the market	03	02	05
Local Health Technicians (Key Informant)	01	01	02
Food Scientist (Key Informant)	01	01	02
Innovator at a local university (Key Informant)	01	00	01
Hoteliers	01	02	03
Total	13	13	26

⁴ The theory advocates 3-Rs that is reduction of food waste, re-using food, and recycling food waste.

⁵ Section 77(b) of the Zimbabwe Constitution provides that the State must take reasonable legislative and other measures, within the limits of the resources available to it, to achieve the progressive realisation of the circular economy of food systems.

Key informants⁶ were purposively nominated on the basis of their knowledge of food waste as well as their involvement in food management in the District.

5.1 Research Ethics.

Ethics such as informed consent; no harm to participants, anonymity, honesty and confidentiality are essential when dealing with human subjects. Informed consent was observed by ensuring that participants willingly participate in the study after they had been de-briefed on the benefits and risks of being involved in the inquiry. The de-brief made reference to Section 77(b) of the Constitution of Zimbabwe, which provides that every person has the right to sufficient food; and the State must take reasonable legislative and other measures, within the limits of the resources available to it, to achieve the progressive realisation of this right.

Interviews were conducted at the vendors’ stalls. For key informants, interviews were conducted in safe locations and at time slots mutually convenient to them and the researchers. The participants were identified by codes rather than real names. Anonymity and confidentiality of the participants was observed at every stage of the research process.

PRESENTATION OF FINDINGS AND DISCUSSION

6.1 Most Common Food Being wasted

Interviews and site visits established the following categories of food (fruits and vegetables) being wasted at different sites within Zvishavane District.

Table 2:: Most Discarded Food

Area	Vegetables				Fruits						
	Cabb	Pota	Toma	WatM	Ban	Guav	Mang	Peac	Mazh	Sum	Amar
Fruit and Vegetable Markets	X	X	X	X	X	X	X	X	X		
Official Dumpsites	X	X	X	X	X	X	X	X	X		
Streets					X		X	X	X		
Peri Urban Plots	X		X	X		X	X	X			
Rural Areas	X		X			X	X		X	X	X
Schools						X	X				

Key

- Amar Amarula
- Bana Bananas
- Cabb Cabbage
- Guav Guavas
- Mang Mangoes
- Mazh Mashanje (*Uapaca Kirkiana*)
- Peac Peaches
- Pota Potatoes

⁶ Key informants are often influential, higher income, better informed and or learned people (Patton 1990)

Toma	Tomatoes
Sum	Suma (<i>Diospyros mespiliformis</i> fruit)
WatM	Watermelons

Discarded fruits and vegetables were identified at fruit and vegetable vending sites located in and out of the urban area. Most informal vending sites were at public places such as schools, hospitals, bus stops, shops, streets and beer halls. The type of fruits discarded were a factor of the research timing. The study was conducted in November when fruit such as mangoes, amarula fruit, guavas, bananas, watermelons and mazhange (*Uapaca kirkiana* /wild loquat/sugar plum) were in season. During this time small holder producers and vendors fail to manage (Ilakovac, Voca, Pezo, Cerjak 2020) the food, only to be food insecure when the same is off season.

In terms of the close-loop circular economy theory, discarded fruits and vegetables have redeemable food and medicinal value. For instance, *Uapaca Kirkiana* pulp contains pectin, a compound that helps lower blood cholesterol. The fruit contains significant levels of iron (for red blood cell formation), potassium (for heart and blood pressure control), and copper as well as high levels of vitamin A and C⁷. Value adding *Uapaca Kirkiana* pulp could ensure a constant supply of cheaper nutrition for Zvishavane residents who suffer HIV-related immunity challenges. As a matter of fact, in Midlands Province, Zvishavane District has the highest HIV incidence rate of 0.31% and the highest HIV prevalence rate of 16.37% (National Aids Council 2025). *Kirkiana* fruit residue could also be used to fortify fish, poultry and animal feed.

The most wasted vegetables in District were tomatoes and cabbage because during peak harvest season supply exceeded local demand. Smallholder farmers and vendors with no way of storing and preserving the vegetables tend to dump them anyhow. Dumping fruits and vegetables was since Marlet was saturated and prices had plummeted to levels that did not meet producer and transportation costs. This study argues that discarding produce does not only contribute to environmental pollution, it tantamount to discarding nutrients and income. Participant FWP 15, a disabled female trader at Mandava Fruit and Vegetable market shared, *'our situation is worsened by the fact that Zvishavane lacks entrepreneurs who can add value to surplus fruits and vegetables.'*

This study argues that value preservation restores is undisputable. Tomatoes could be turned into tomato sauce or tomatoes powder while cabbage could be boiled, dried, flavoured and canned then sold as cabbage soup. Excess fruits and vegetables could be dried and processed into animal feed. Amarula fruit, mazhange and watermelons could be processed into wine. Fresh mazhanje have a street value of USD1.00 per Kg while its juice could fetch much more per unit measure. The study established that some rural communities in the district process amarula fruit into a traditional wine called mukumbi. However, the same is undervalued; a litre of mukumbi is being sold for USD1.00 yet its equivalent (Amaula Cream Liqueur) has a local retail value of USD15.50 per 750ml while international prices of the same product average USD25.00. Excess amarula fruit could also be processed into skin creams. SAPR supermarkets sell amarula fruit cream for 14.50USD per 750ml.

Interviews with local suppliers (farmers) and vegetable vendors showed that tomatoes and cabbages were being mass produced and that they were highly perishable. High temperatures promote high wastage of perishable fruits and vegetables especially for farmers and traders who are not mechanised and modernised. Traditional vegetables such as nyevhe⁸ (*cleome gynandra*) were rarely wasted because of their high demand on the vegetable market. Interviewee FWP12 revealed, 'In Zimbabwe, traditional vegetables like nyeve and blackjack have a high market demand because of their positive publicity on social media and print media' During an interview with a food scientist, it emerged that traditional vegetables like blackjack (*Bidens Pilosa*) contains active compounds, such as flavonoids, terpenes, and phenolic acids, which help reduce inflammation in individuals suffering from conditions like rheumatoid arthritis or osteoarthritis.

⁷ Vitamins A and C boost human immunity, skin and eye health (www.google.com/search?q=mazhnajr+seeds).

⁸ This is a highly nutritious, seasonal wild leafy vegetable widely consumed in Zimbabwe., it grows naturally during the rainy season, often found in rural fields and gardens where it requires minimal care (www.google.com/search?q=munyovhi+vegetable&sca_esv).

During an interview with vegetable vendors at Mandava Market, it emerged Nyeve was on high demand and in short supply. It also emerged that the vegetable fetched more money when sold as mufushwa (boiled and sun-dried vegetable). Such is the case with nyeve and blackjack. These vegetables grow naturally during summer, and their value addition is less costly.

6.2 Reducing Food Wastage

The importance of reducing food wastage is underscored in section 77(b) of the Constitution of Zimbabwe. This Section provides that every person always has the right to sufficient food. Thus, instead of discarding them, mazhanje could be used to make jam and juice. Interviews with food specialist (FWP02) indicated thus, 'the fruit is very rich in vitamin C, and essential minerals like potassium, calcium, and phosphorus.' Further enquiries with a local innovator revealed that the fruit could be dried and served as snacks (FWP24) or processed into fish and animal feed.

A food specialist (FWP11) indicated that, just like banana, mangoes can be processed into syrup, alcohol or dried into snacks. She also shared, 'mangoes seeds can be processed into animal feed'. Mango seeds contain essential nutrients, such as protein, healthy fats, fiber, antioxidants, and essential minerals like calcium, magnesium, and potassium (www.shreevaliagro.com/health-benefits-of-mango-seeds).

According to Kanonhuhwa and Chirisa (2021), wasting these fruits is a waste of resources that can be used to feed hungry people where food insecurity is a serious challenge. Zvishavane District had the highest food insecurity level of 42.2%. In 2016, 50% households were food insecure (ZimVac 2016). Therefore, instead of wasting food should be minimized for purposes of improving food supply during peak periods of food shortage. Research Participant FWP03 noted that Food Banks play a crucial role in redistributing surplus food, ensuring access to nutritious diets for the community.

6.3 Possible Strategies of Minimising Food Wastage

The first step would be educating farmers, fruit and vegetable vendors about the economics of food waste. Confucius and Nelson Mandela asserted that education is one of the most powerful tools in changing people's habits. Technical tips would include wrapping food especially greens in a paper towel in a plastic container and tomatoes on kitchen table. Refrigeration is an alternative way of preserving food, however this cannot be afforded by poor households. A low-cost refrigerator costs USD420.00 and solar system installation to drive the gadget could cost no less than USD634.00 inclusive of labour cost. Hydro electric power is much more expensive besides its supply being affected by power cuts/load shading.

Interviews with participants indicated that Indirect solar drying food is a competent method of preserving food for use during lean agricultural seasons. The advantage of this method is that it uses a transparent cover which reduces product contamination, protecting food from rain, dew, and debris. The method is cost-effective because. Zvishavane is characterized by high temperatures during the day (interview with FWP 24).

Interviews with vegetable and fruit vendors at Mandava Market in Zvishavane urban revealed that direct solar drying was being used to preserve vegetables although it exposed the food to houseflies, fungi, dust, and debris. The vendors and food producers were willing to invest in new technology. However, their average income levels were too low to cover the associated costs. A local engineer (FWP 22) estimated the cost of a standard solar drier at 4 000.00USD. The vendors could enter into cooperative ventures and benefit from Government's drive towards rural industrialization. They could also take advantage of the experts who are available in the tertiary education sector (interview with FWP 07). It is mandatory for the sector to implement Heritage based Education 5.0. Research, Community Engagement, Innovation and Industrialization are some of the pillars of Education 5.0.

In an interview, a food scientist indicated that excess fruits and vegetables could be processed into meal fortifiers for malnourished people or skin creams. These products could enhance income levels of people in the fruit and vegetable value chain however, such processes are capital heavy (interview with FWP13) and are controlled by the Zimbabwe Medicines and Allied Substances Control Act, Chapter 15:03.

CONCLUSION AND RECOMMENDATIONS

This study was conducted in support of the SDGs on poverty reduction and food security as well as in terms of Section 77(b) of the Constitution of Zimbabwe. The study concludes that solar dried fruits and vegetables can be monetised and that fruits and vegetables that are being discarded have residue nutrition and skin care properties. Reducing food waste has an economic, health and nutritional benefits. There are several options to reduce food wastage in the town. Mazhanje could be dried and pound into as sweet powder. The same could also be processed into jam or traditional wine. Watermelons could be processed into juices, and their seeds into roasted snacks while bananas could be dried and sold as unique snacks. Vegetable could be dried and consumed as mufushwa powder. The same powder could be used to fortify porridge for malnourished children. Thus, food waste provides an essential opportunity for entrepreneurs to invest in value of addition of food waste. Overall, excess fruits and vegetables can be processed into animal feed. Tertiary educations emphasise on innovation and industrialisation prompts innovators to invest in this sector for food and income security.

REFERENCE LIST

1. Achillas, C., and D. Bochtis. 2020. "Toward a Green, Closed-Loop, Circular Bioeconomy: Boosting the Performance Efficiency of Circular Business Models." *Sustainability* 12, no. 23: 1–6. <https://doi.org/10.3390/SU122310142>.
2. Adelodun B, Kim SH, Choi KS. (2021). Assessment of food waste generation and composition among Korean households using novel sampling and statistical approaches. *Waste Manage.* (122)71–80.
3. Al-Rumaihi A, McKay G, Mackey HR, Al-Ansari T. (2020) Environmental impact assessment of food waste management using two composting techniques. *Sustainability.* 12(4):1595.
4. Cresswell, J. W., and Poth, C. N. 2017. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. 4th Ed. London: Sage.
5. Constitution of Zimbabwe Amendment (No. 20) Act, 2013 (77)(b).
6. Easterby-Smith, M, Thorpe, R. and Jackson, P. 2012. *Management Research*. London: Sage.
7. Food and Agriculture Organisation of the United Nations (FAO), (2024). Closing the Loop: Building a Zero-waste Food System. In www.fao/FAO-regional-office-for-europe-and-central-asia Accessed on 23 February 2026.
8. Food and Agriculture Organization of the United Nations (FAO). (2022). Zimbabwe: Humanitarian response plan 2022. FAO.
9. Ilakovac B, Voca N, Pezo L, Cerjak M. (2020). Quantification and determination of household food waste and its relation to socio-demographic characteristics in Croatia. *Waste Manage.*102:231–40.
10. Kanonhuhwa TN, Chirisa I. (2021). Food waste in urban Zimbabwe: Options for food recycling. In *Environmental Resilience: Food and the City—Zimbabwe*. 87–102. Singapore: Springer Singapore
11. Lipinski, B., Hanson, C., Lomax, J., Kitinoja, L., Waite, R. and Searchinger, T., 2013. Reducing food loss and waste. World Resources Institute Working Paper, pp.1-40.
12. NAC, (2025). HIV Infections on the Rise in Zvishavane Due to Condom Rejection. In www.stateofthenation.co.zw/2025/08/09/hiv-infections-on-the-rise-in-zvishavane-due-to-condom-rejection Retrieved on 20 April 2026.
13. Oelofse SH, Nahman A. Estimating the magnitude of food waste generated in South Africa. *Waste Manag Res.* 31(1)80–86.
14. Papargyropoulou, E., Lozano, R., Steinberger, J.K., Wright, N. and bin Ujang, Z., 2014. The food waste hierarchy as a framework for the management of food surplus and food waste. *Journal of Cleaner Production*, 76, pp.106-115.
15. Schanes, K., Dobernick, K. and Gözet, B., 2018. Food waste matters-A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production*, 182, pp.978-991.
16. Scoones, I., Mavedzenge, B., Murimbarimba, F., & Sukume, C. (2018). Labour after land reform: The precarious livelihoods of former farmworkers in Zimbabwe. *Development and Change*, 49(3), 805–835.
17. Shabani, T, Jerie, S, and Shabani T (2023) Applicability of the Life Cycle Assessment Model in Solid Waste Management in Zimbabwe, Volume 3, pages 2233–2253, (2023)
18. Sharma, P., Dwivedi, S. and Singh, D., 2016. Global poverty, hunger, and malnutrition: a situational analysis. In *Biofortification of food crops* (pp. 19-30). Springer, New Delhi.

19. Schrank, J., Aphinya, H., Thongsalab, S., Sawaddee, N., Chanrattanagorn, K., and Ketkaew, C. (2023). Factors of Food Waste Reduction Underlying the Extended Theory of Planned Behavior: A Study of Consumer Behavior towards the Intention to Reduce Food Waste, *Resources* 12(8) 93/
20. Yin, R. 2003. *Case Study Research: Design and Methods*. Thousand Oaks, Calif.
21. www.google.com/search?q=munyovhi+vegetable&sc_esv=7b4 Accessed on 11 December 2025
22. www.google.com/search?q=mazhnajr+seeds Accessed on 10 December 2025
23. www.shreevaliagro.com/health-benefits-of-mango-seeds Accessed on 28 November 2025
24. www.google.com/search?q=applying+circu%3Bar+economy+REDUCING+FOOD+WASTE Accessed on 12 December 2025
25. Zimbabwe Vulnerability Assessment Committee (ZimVAC), Rural Livelihoods Assessment (2016) Food and Nutrition Council (FNC) at SIRDC, Hatcliffe, Harare, Zimbabwe.