

Sustainable organic waste value chains

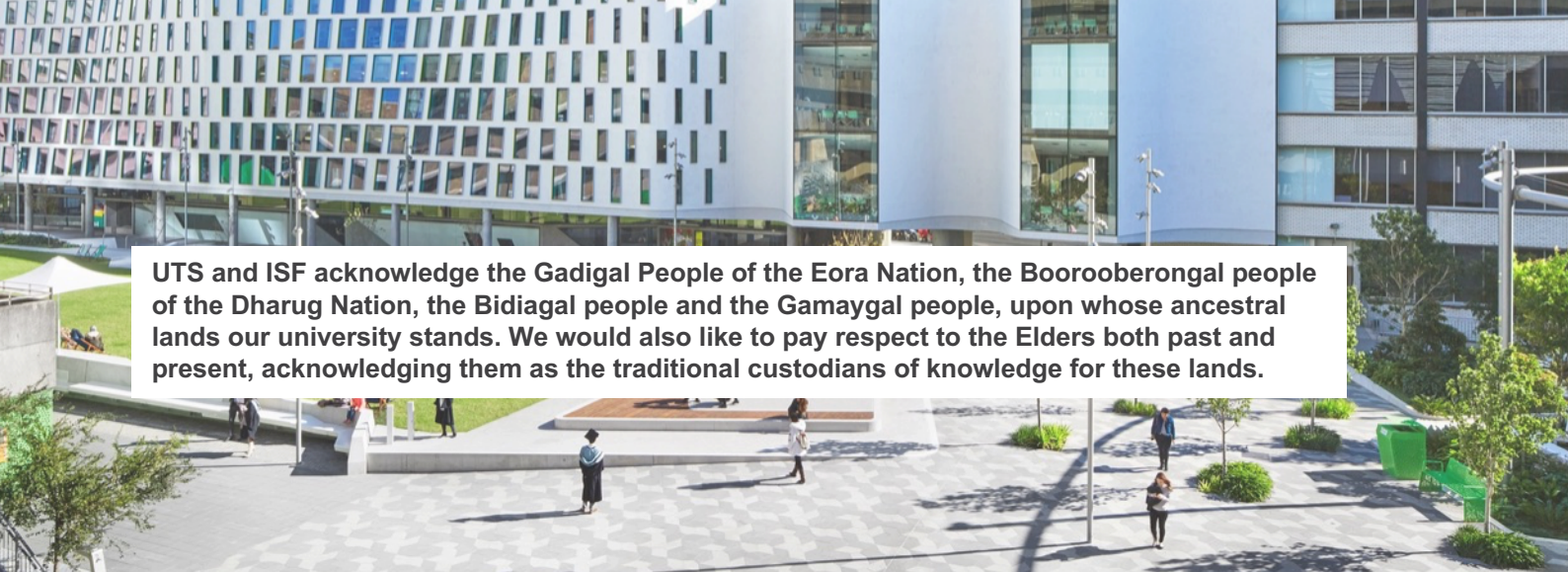
Applied research on waste segregation, home composting and home gardening in Kaduwela Municipal Council, Sri Lanka

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July 2024



UTS and ISF acknowledge the Gadigal People of the Eora Nation, the Boorooberongal people of the Dharug Nation, the Bidiagal people and the Gamaygal people, upon whose ancestral lands our university stands. We would also like to pay respect to the Elders both past and present, acknowledging them as the traditional custodians of knowledge for these lands.

Acknowledgments

This report was written by researchers from the Institute for Sustainable Futures at the University of Technology Sydney (ISF-UTS), with input and review from Janathakshan (GTE) Ltd (JT), Sabaragamuwa University of Sri Lanka (SUSL) and the International Water Management Institute (IWMI). Janathakshan led the organisation of research activities and collection of data.

This research was funded under the Knowledge and Linkages for an Inclusive Economy Grants Program by the Australian Government Department of Foreign Affairs and Trade.

Please cite as: Dominish, E., Samarakoon, D., Ilesinghe, A., Esham, M., Winterford, K., Davila Cisneros, F., Perry, C. and Manipura, A (2024), *Applied research on waste segregation, home composting and home gardening in Kaduwela Municipal Council, Sri Lanka*. Prepared by The Institute for Sustainable Futures, Janathakshan, Sabaragamuwa University of Sri Lanka and the International Water Management Institute.

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Glossary & Acronyms

CSR	Corporate Social Responsibility
DFAT	Department of Foreign Affairs and Trade, Australia
DoA	Department of Agriculture
GOSL	Government of Sri Lanka
HH	Household
IWMI	International Water Management Institute
JICA	Japan International Cooperation Agency
JT	Janathakshan
KMC	Kaduwela Municipal Council
LA	Local Authority
MC	Municipal Council
SUSL	Sabaragamuwa University of Sri Lanka
SWM	Solid municipal waste
WMA	Waste Management Authority
WPC	Western Provincial Council
UTS-ISF	Institute for Sustainable Futures, University of Technology Sydney

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1. Introduction

This report presents the findings of applied research undertaken from February to July 2024 in the Kaduwela Municipal Council (KMC) area in Sri Lanka. This research was undertaken as part of the project ‘*Sustainable Organic Waste Value Chains*’. This project is a partnership between the Institute for Sustainable Futures at the University of Technology Sydney (ISF-UTS), Sabaragamuwa University of Sri Lanka (SUSL), Janathakshan (GTE) Ltd and the International Water Management Institute (IWMI). This project was undertaken from July 2022 to June 2024 and funded through the Knowledge and Linkages for an Inclusive Economy Grants Program by the Australian Government Department of Foreign Affairs and Trade (DFAT). This project was Phase 2, following an earlier project with the same project team in 2018-2021.

Background and purpose of action research

The overall goal of the ‘*Sustainable Organic Waste Value Chains*’ project is “*evidenced-based options for organic waste value chains to enhance sustainable waste management, food production and livelihoods*”. The project was co-designed by the project team and KMC, in an iterative process during the project lifespan.

The applied research component of the project presented in this report emerged from the priority of KMC to help reduce the flow of organic waste reaching their waste treatment plant. Earlier parts of the project investigated how KMC could increase the circularity of organic waste with the municipal council (MC) area through developing organic waste value chains. This included analysis and awareness raising on how to improve the collection, quality and sale waste-derived products such as compost. However, in discussions with KMC in 2023, it emerged that in addition to improving the circularity of organic waste at the MC level, there was a need to increase the segregation and circularity of organic waste at the household level. This includes improving waste segregation, so the MC has lower levels of contamination to manage, and the management of organic waste in the household through home composting and home gardening.

The research supports several complementary goals developed with KMC. The research seeks to:

- Minimise the volumes of household organic waste needed to be collected and treated by KMC at their waste management facilities;
- Improve waste segregation so that KMC has lower levels of contamination to manage, including improving the quality of organic waste which is used as inputs into KMC produced organic waste products, such as compost and/or liquid fertiliser; and
- Improve food security and livelihoods at the household level, through strengthening home composting and home gardening practices.

The applied research activities have tangible benefits to KMC as they can help reduce the scale of the challenges faced by the municipal council (MC) in management of organic waste, as well as support their engagement with citizens. These research findings should also be of benefit to other local authorities (LAs) in Sri Lanka who are face similar challenges in managing organic waste. In addition to the benefits for the council and the environmental benefits, these approaches can have social and economic benefits for households.

Project scope and objectives

The overall goal of the applied research activities is to promote a circular economy for organics at the household level and to minimise the quantity and maximise the quality of source materials entering the waste stream of KMC.

The specific objectives of the research were to:

- Understand what **knowledge and practices** households employ for waste segregation, home composting and home gardening
- Understand **why these practices have been used** and **what has enabled good practice**;
- Understand the **motivations and drivers** for undertaking waste segregation, home composting and home gardening;
- Determine **how to best promote and scale good practices** to expand waste segregation, home composting and home gardening in the KMC area.

The research was undertaken with two cohorts of households:

1. Households who have good practices of waste segregation, home composting and home gardening
2. Households who do not currently practice waste segregation, home composting and home gardening

The details of the selection criteria and methods used for these cohorts are provided in the respective chapters.

2. Overview of local context

The applied research activities support the goals of KMC as well as those of the Provincial Council that it is located within, Western Provincial Council (WPC).

The Western Province is an area on the west coast of Sri Lanka. The WPC is made up of 3 districts (Colombo, Gampaha and Kalutara districts), each of which have zones containing multiple LAs, with a total of 49 LAs.¹ The Western Province makes up 5.6% (3684 km²) of Sri Lanka's geographical area, but it makes up 28.1% of the country's population, with the province's density being five times more than the national average. The Western Province is economically important in Sri Lanka as it produces 38% of the country's GDP. KMC is a MC located in the Colombo District and makes up 4% of the WPC population. The Western Province produces 3732 tons of municipal solid waste (MSW) each day which ultimately accounts for over 60% of Sri Lanka's waste, 48% of which is from households.

Waste management in Kaduwela Municipal Council

KMC collect 60-70 tonnes of waste each day, about 35 tonnes of which is biodegradable (organic waste). The biodegradable waste gets used as organic fertiliser, animal feed and a source of electricity and the reminder gets sent to landfill. KMC have identified challenges with issues such as flooding, plastic contamination, the composition of compost, demand for compost and a lack of skilled labourers.

Western Province Solid Waste Management Master Plan

The Western Province Solid Waste Management Master Plan (hereafter the 'Master Plan') was created to address the challenges presented by increasing amounts of waste generated in the Western Province. The need for the Master Plan was identified in 2017 following a tragedy at the Meethotamulla dumpsite, and the Government of Sri Lanka (GOSL) requested assistance from the Japan International Cooperation Agency (JICA). The Master Plan was developed in coordination with a range of national government agencies, the WPC Waste Management Authority (WMA) and LAs.

The Master Plan is owned and operated by the Waste Management Authority (WMA) and the WPC. It is intended that the solid municipal waste (SWM) Action Plans and Annual Work Programs of LAs in WPC align with the Master Plan². The Master Plan is for a 20-year period (2023-2042), and includes short, medium and long-term scenarios. The scenarios are based on changes including improving collection, reducing waste generation, increasing recycling, and treating waste via composting and thermal recovery.

The Master Plan set targets for 2042, including:

- increasing collection coverage by 81% for the Western Province and 92% for the Colombo District
- reducing the amount of waste by 10% for both the Western Province and the Colombo District
- increasing the recycling ratio by 24% for the Western Province and 23% for the Colombo District
- reducing the disposal ratio by 20% for the Western Province and 21% for the Colombo District.

The Master Plan also includes plans for the construction of more intermediate treatment facilities to reduce the amount of waste going to landfill. This includes expanding thermal recovery facilities and composting facilities. It proposes constructing give more primary transfer stations to reduce the cost of transporting waste. The applied research activities support home composting and improved waste segregation, which supports the goals of the Master Plan to reduce the amount of waste produced by households and increase the recycling ratios.

¹ Note that LAs can be Municipal Councils, Urban Councils or Pradeshiya Sabhas which have decreasing sizes respectively.

² At the time of writing this research report, there was no indication that LAs planning was aligned to the Master Plan.

3. Positive Deviance Survey

Approach

This component of the research took a 'positive deviance approach' to survey households about their practices and motivations for waste segregation, home composting and home gardening. Households were selected because they already undertake these practices, which was identified by the fact they had participated in a home gardening competitions run by KMC. 31 respondents were recruited, 90% who were women.

Key findings

- **Home gardening was the biggest driver for successful waste segregation and home composting among households surveyed.** The most common motivator for segregating waste at home was to be able to compost, and nearly all households were motivated to undertake home composting to use compost in the home garden.
- **Households had many motivations for home gardening. Almost all households listed that their motivations were fresh produce availability at home and that it is a hobby.** Increasing fruit & vegetable prices and avoiding agrochemicals in produce were also significant motivations. The survey found that 35% of households can meet more than 50% of their fruit and vegetable expenses per month with home gardening and 40% meet between 25 and 50% of expenses.
- **Most households have a dedicated member of the household to manage the compost** which is most typically the woman in the household (noted as wife or mother).
- **Households are experienced and proficient at composting.** For example, nearly all households add other elements to improve compost quality, such a glirecedia leaves, ash or cow dung, and half of households use 3 or 4 different elements. Most households use a least two determine if compost is ready to use and almost half of households have been composting for more than 8 years.
- **Most households faced some challenges with home composting**, most commonly rodents / rats and other pests, **and almost all households faced challenges for home gardening**, most commonly pest and plant diseases. There were very few challenges for waste segregation among households.
- **Households are committed to composting despite challenges.** This can be inferred as households continue to compost despite only half of households producing enough compost to meet their gardening needs and only half of households have found solutions to overcome their challenges.
- **Ease of maintenance and low/free cost of bins were key reasons households chose their composting system**, regardless of whether households were given/donated a compost bin and those who made or bought their own. A large proportion of households had a bin donated by KMC or elsewhere.
- **Households are good at experimenting with home gardening and troubleshooting challenges.** This can be inferred as households grow a large number of crops and 80% use 3 or more gardening techniques (beds, pots and grow bags). In addition, almost all households have found solutions to overcome challenges with home composting.
- Households **improve their knowledge on compost and home gardening in similar ways, predominantly from practice and from government officers/services.** To improve knowledge on compost most households get information from agricultural officers and by practice (~80% each). The most common ways households improve their knowledge on home gardening is by practice (~90%), from agrarian services (~ 70%) and from agricultural officers (~ 50%). Waste management programs can also help households improve knowledge (more than half of households have a family member who has participated in a waste management program).
- **Many households are interested in growing organic produce.** Households are only adding natural elements not synthetic fertilizers to improve compost and more than 60% stated that they do not use any chemical fertilisers for home gardening. More than half of households noted that they undertook home gardening to avoid agrochemicals in produce.
- **No household uses the KMC waste app.** This means that while councils may see digital tools as useful for waste management, they may not be necessarily relevant to households.

Implications for Local Authorities (LAs)

- **Composting and home gardening can help LAs manage organic waste and improve waste management more broadly**, which can also help reduce the costs of waste management for LAs.
- **Publicly subsidised technology can help enable composting, but should be complemented with training and capacity building**. As noted above, a large portion of the bins used in the households surveyed were provided by KMC or donated from elsewhere, and low/free cost of bins was a major reason for bin selection.
- **LAs have an important role to play in promoting composting and home gardening**, which can be seen from the impact that donations of bins have had on households. However, LAs also have limited human and financial resources to support promotion of these activities. There are several ways that LAs could increase their promotion activities within their means, such as:
 - Seeking funding from the private sector, such as through Corporate Social Responsibility (CSR) programs;
 - Create a more formalised process for Community Development Officers to link between the LA and other government agencies (such as agrarian services and agricultural officers)
 - Utilise community leaders to be an interface between LAs and the community in a coordinated manner. This approach has been suggested by community leaders in KMC who have an interest in home composting and home gardening.
- **Public promotional programs are important for improving knowledge**. Agrarian services and agricultural officers (funded by provincial and national governments) are important for disseminating technical know-how, and these programs can be expanded and strengthened.
- **Peer-to-peer knowledge exchange activities may help households overcome challenges**. Most households face only one or two challenges, and in most cases other households in the surveys had found solutions to these challenges.
- **Women are an important stakeholder for knowledge exchange as they are typically the key person responsible for composting and home gardening in the household**. There is potential to undertake promotional and awareness raising as well as knowledge exchange through women's organisations.

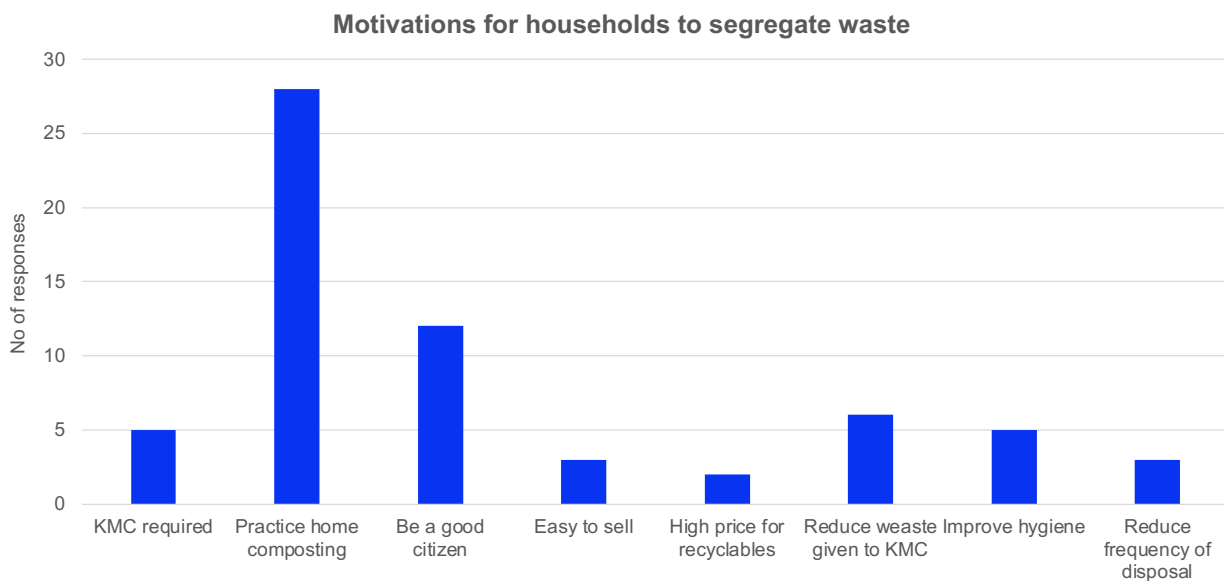
Annex A: Positive Deviance Survey Data

Demographics

- 31 respondents from the Kaduwela area. The majority of respondents were women (28 HH).
- Household size ranges from 2 – 6 members, average of 3.9 people per household (3 HH with 2 members, 17 HH with 3-4 members, 11 HH with 5-6 members; n = 30). No respondents identified that they had household members living with a disability.
- Land area ranges from 10 perches to 150 perches with an average of 37 perches.

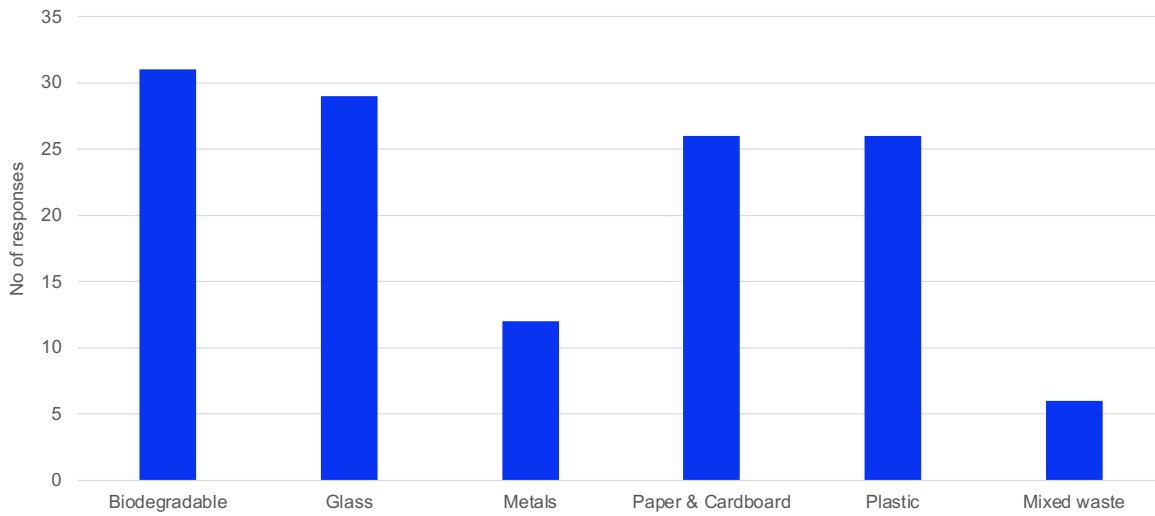
Waste segregation

- **Average household waste generation is 2.4kg per day**, or ~600g per person per day (no major difference across household size).
- **All households agree waste reduction is important** (23 HH strongly agree, 7 HH agree).
- **All households agree waste segregation is important** (21 HH strongly agree, 9 HH agree).
- Approximately **half of households have a family member who has participated in a waste management program** (17 HH have participated, 14 HH have not). Waste training programs were conducted by KMC, school, other government and non-government organisations.
- **The most common motivator for segregating waste at home was to practice home composting** (28 HH) followed by being a good citizen (12 HH).



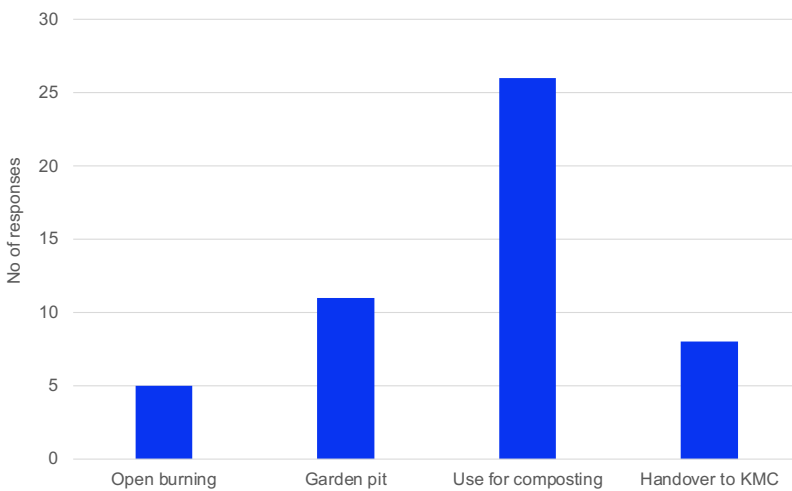
- **100% of households segregate biodegradable waste and almost all segregate glass** (29 HH) and more than 80% segregate papers and cardboard and plastic (26 HH each). Mixed waste is typically contaminated wraps, composite wraps, polythene and wraps such as biscuit packets.

Current segregation practices



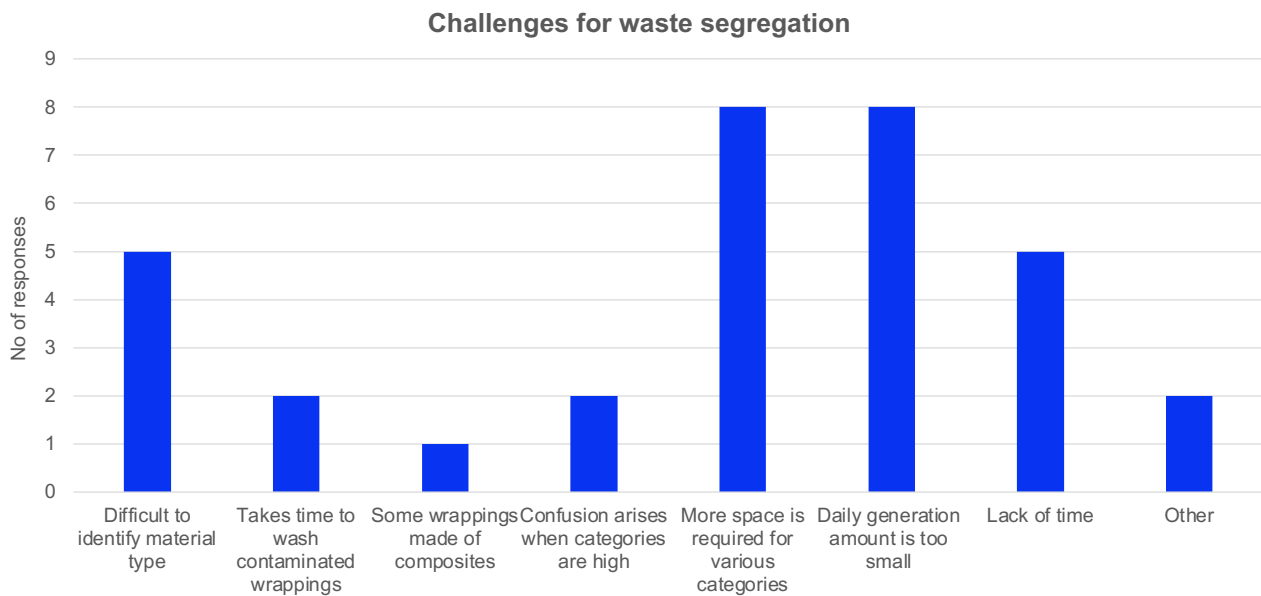
- **More than 80% of households use their biodegradable waste for home composting** (26 HH) and approximately one-third manage with a garden pit (11 HH) or handover to KMC (8 HH). Half of households use more than one method to manage the waste (14 HH gave 2 or 3 responses). Note that respondents could choose more than one response for how they manage biodegradable waste.

Management of biodegradable waste



- For non-biodegradable waste two-thirds of households handover to KMC (20HH) and one-third sell to private collectors (9 HH), with a small number using other methods including garden pit, burning and handing over to a lorry.

- **Half of households had no challenges with waste segregation** (14 HH). For those with challenges the main challenges were requiring more space for various categories and that the daily generation amount is too small (8 HH each). Other challenges mentioned were that the council does not collect toxic bottles (1 HH).

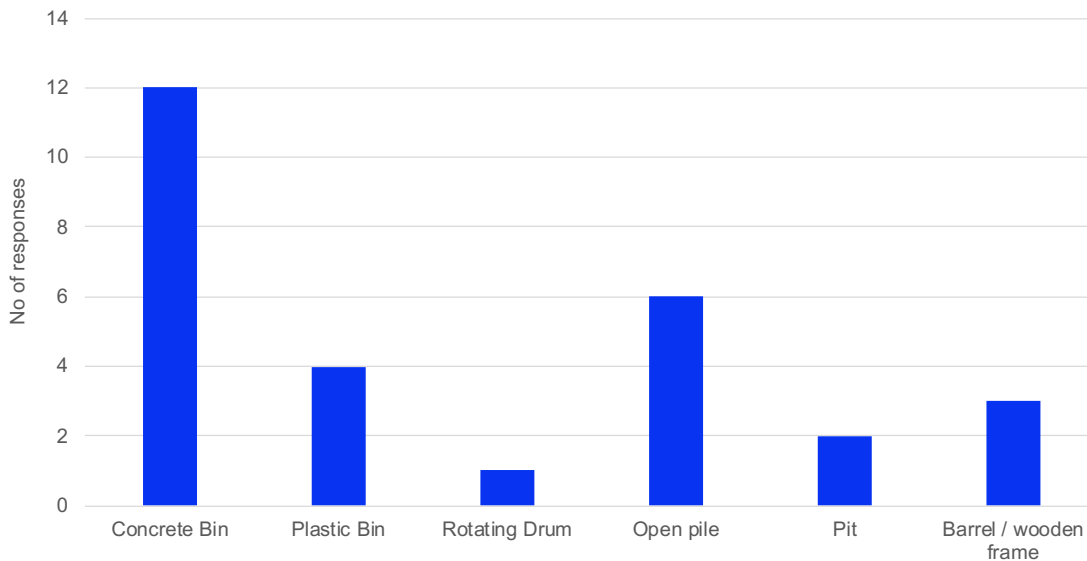


- **Most of the households with challenges had used strategies to overcome these** (10 HH out of 14 HH with challenges).
- **Most households are aware of the KMC collection schedule** (24 HH responded they were aware, 6 HH responded they were not aware). None of the households use the KMC waste app.

Home composting

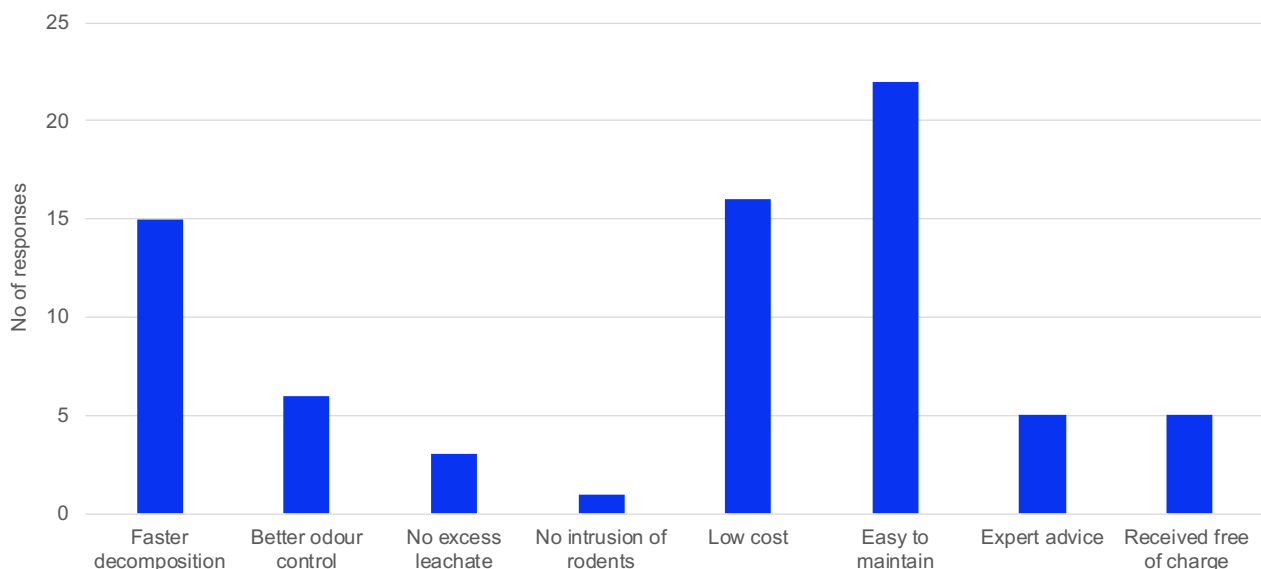
- 29 of the 31 households undertake home composting.
- **Most household decided to undertake home composting to use compost in the home garden (27 HH, ~87%)** and 21 households decided to do composting to manage biodegradable waste at home (23 HH, 75%). Two-thirds of the households selected both of these reasons (21 HH).
- **Compost units were most commonly provided by KMC (11 HH) or made by the households (8 HH).** 3 were bought by households and 2 were donated from other sources. **Concrete bins were the most common composting method (12 HH, ~40%),** however it is important to note that 9 of the 12 concrete bins were donated by KMC and 3 were bought by households. A range of other methods were also used including open pile (6 HH, ~20%).

Current composting method

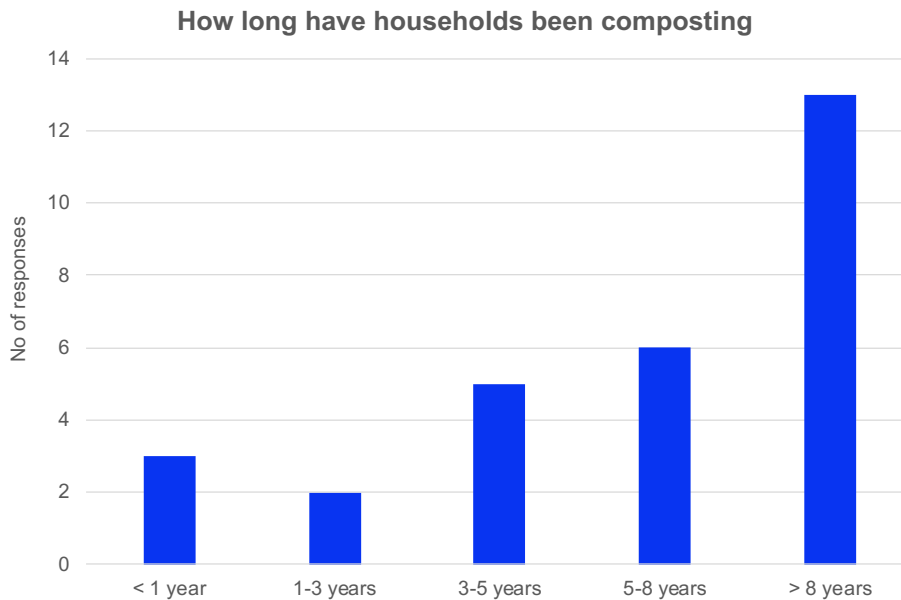


- **Three-quarters of households stated they chose their composting system because it was easy to maintain (22 HH)** and a similar number because it was **low-cost or free of charge (21 HH total)**. There was no significant difference in the responses between households who were given/donated a compost bin and those who made or bought their own.

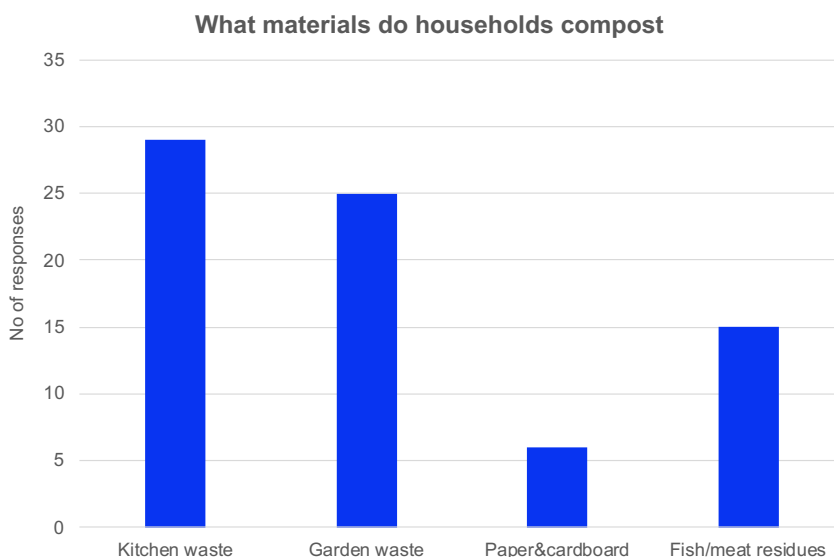
Reasons composting method was selected by households



- **Compost units were most commonly provided by KMC (11 HH) or made by the households (8 HH).** 3 were bought by households and 2 were donated from other sources. For the concrete bins, 9 of the 12 concrete bins were donated by KMC and 3 were bought by households.
- **Almost half of households have been composting at home for more than 8 years (13 HH, ~45%).** Only a small number (5 HH) have been composting for 3 years or less.



- **100% of households compost their kitchen waste, and 85% compost garden waste (25 HH).** Half of households also include fish/meat residues (15 HH).

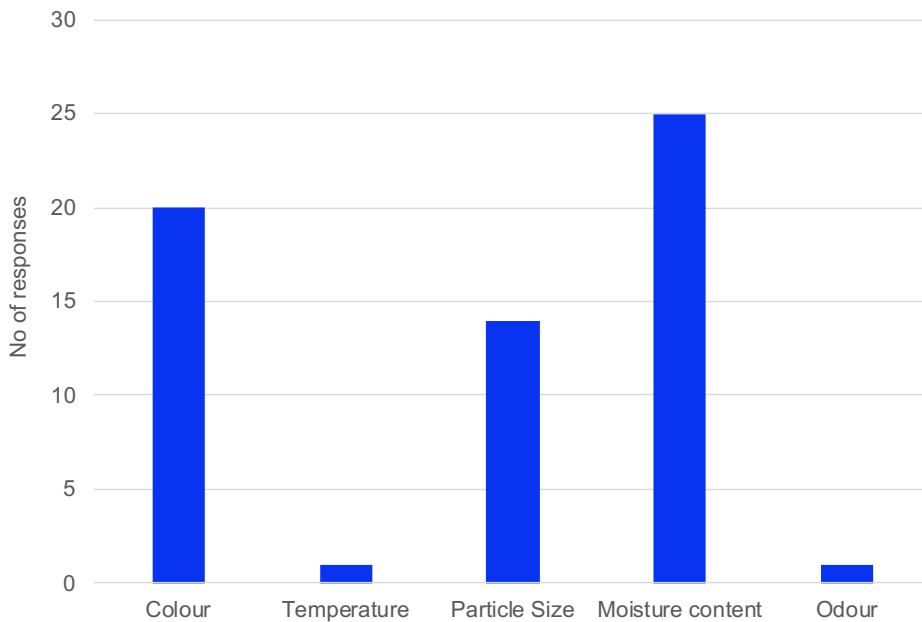


- **Most households have a dedicated member of the household to manage the compost (26 HH, ~90%). It is most common for the woman in the household to manage the unit.** There were 14 responses to this question, 11 were for a woman only (e.g. wife or mother), 1 for man only (e.g. husband) and 5 responses for multiple people.
- **Households typically spent 1 to 2 hours managing compost (12 HH) or less than one hour per week (10 HH).** 4 HH stated they spent 2 to 3 hours and 3 did not give a specific amount of time. There is a wide range for how often households turn the compost, most common is once per week or less (10

HH), one to two times per month (7 HH) and not turning (7 HH), with 2 households doing less than once per month.

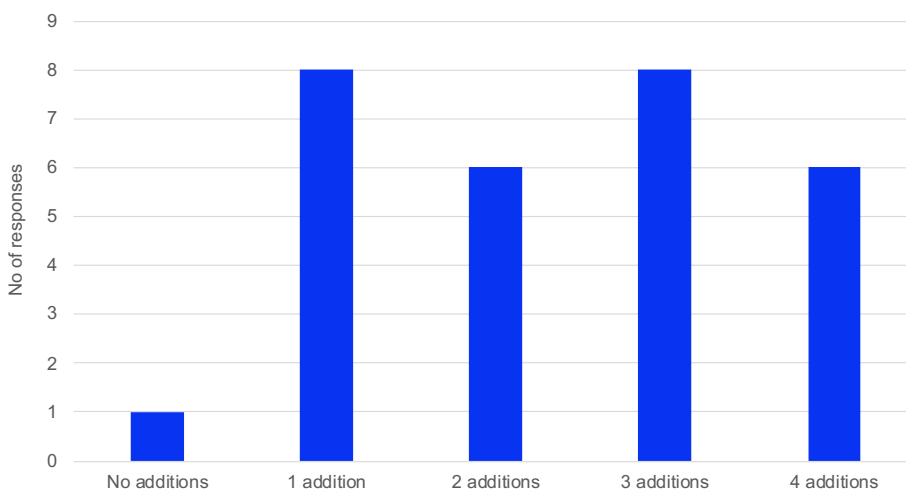
- Households decide compost is ready to use with a variety of methods. **85% of households look at moisture content (25 HH), 70% of households at colour (20 HH) and 50% at particle size (14 HH).** Approximately half of households use 2 methods to determine if ready (14 HH), 30% use 3 or more methods (8 HH) and 25% only use one method (7 HH).

How households decide compost is ready to use



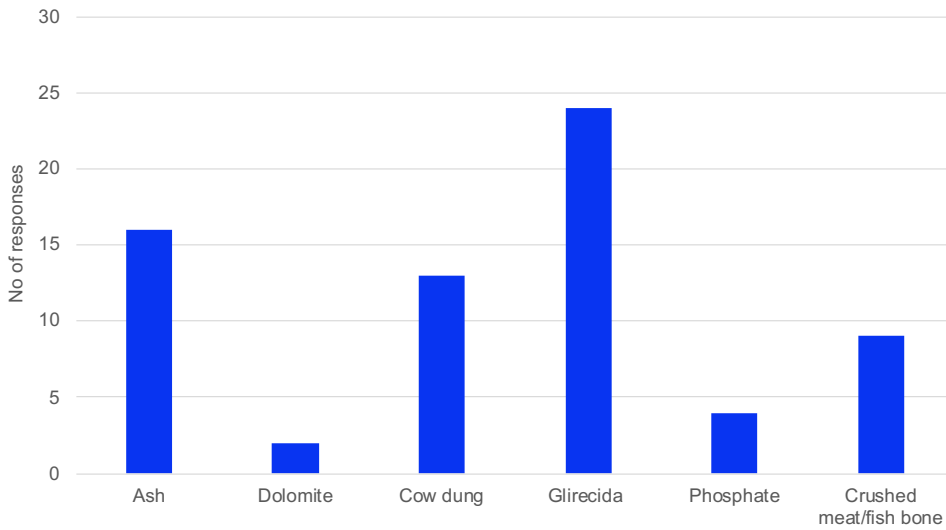
- Just over **half of households produce enough compost to meet their gardening needs** (15 HH, ~54%), and just under half do not produce enough (13 HH, ~46%).
- Almost all households add additional elements to improve compost quality** (28 HH, ~95%). Half of households use 3 or 4 different additions (14 HH, ~48%).

Number of additions to improve compost quality



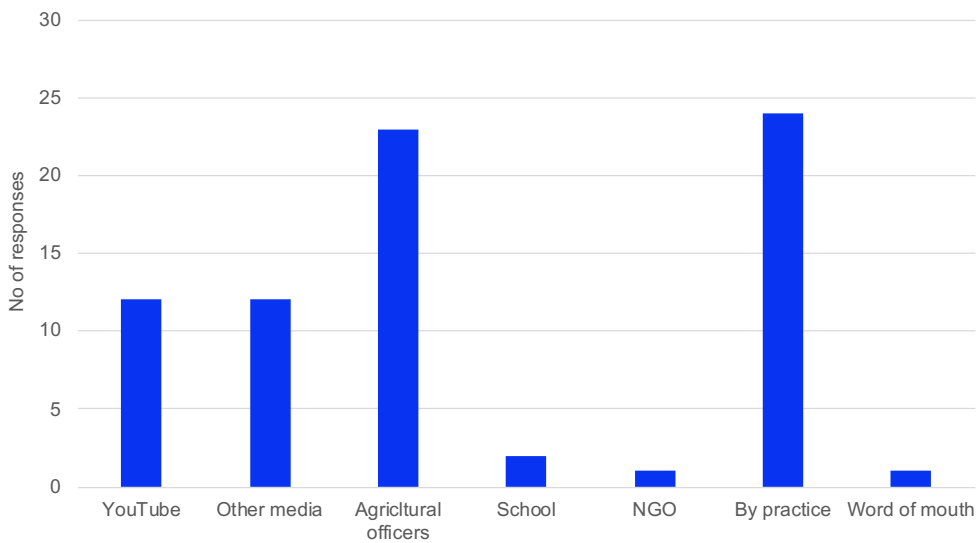
- The most common addition by almost 85% of households is glirecida (24 HH). Approximately half of households add ash (16 HH, ~55%) or cow dung (13 HH, ~45%).

Types of additions to improve compost quality



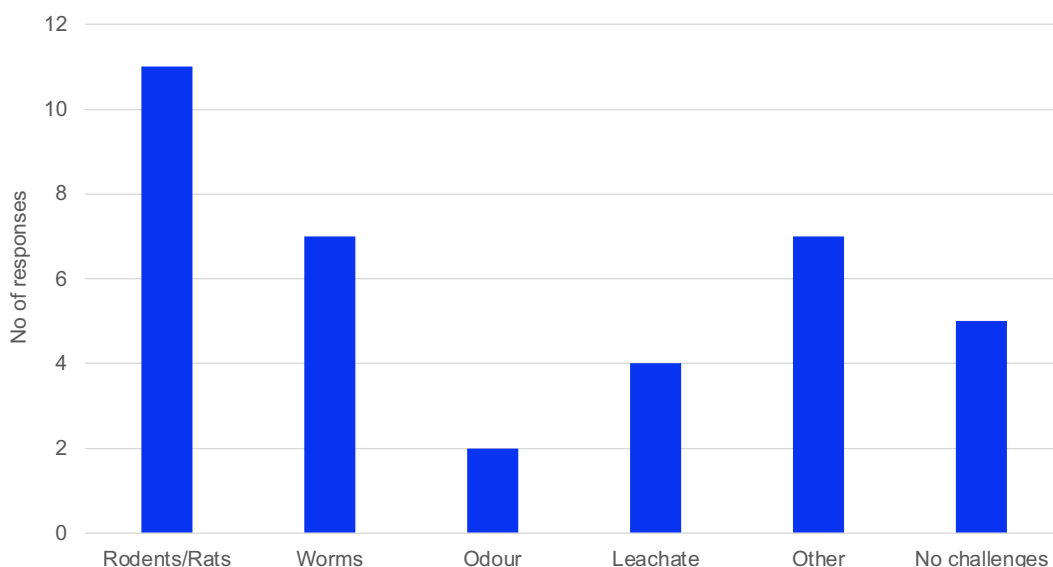
- The **two most common ways households improve their knowledge on compost is by practice (24 HH, 83%) and from agricultural officers (23 HH, 79%)**. Media is also commonly used (YouTube and other media).

How do households improve their knowledge on compost



- **Most households faced some challenges with home composting** (24 HH, ~83%), 7 HH faced no challenges. Rodents / rats was the most common challenge experienced by nearly 40% of households (11 HH). Worms were an issue for one quarter of households (7 HH, ~24%). Other issues faced by households included: other pests (small animals, birds, monitor lizard), fire, not having a bin and compost taking a long time to decompose. There was no significance for the type of compost bin and the number or type of challenges faced.

Challenges for composting

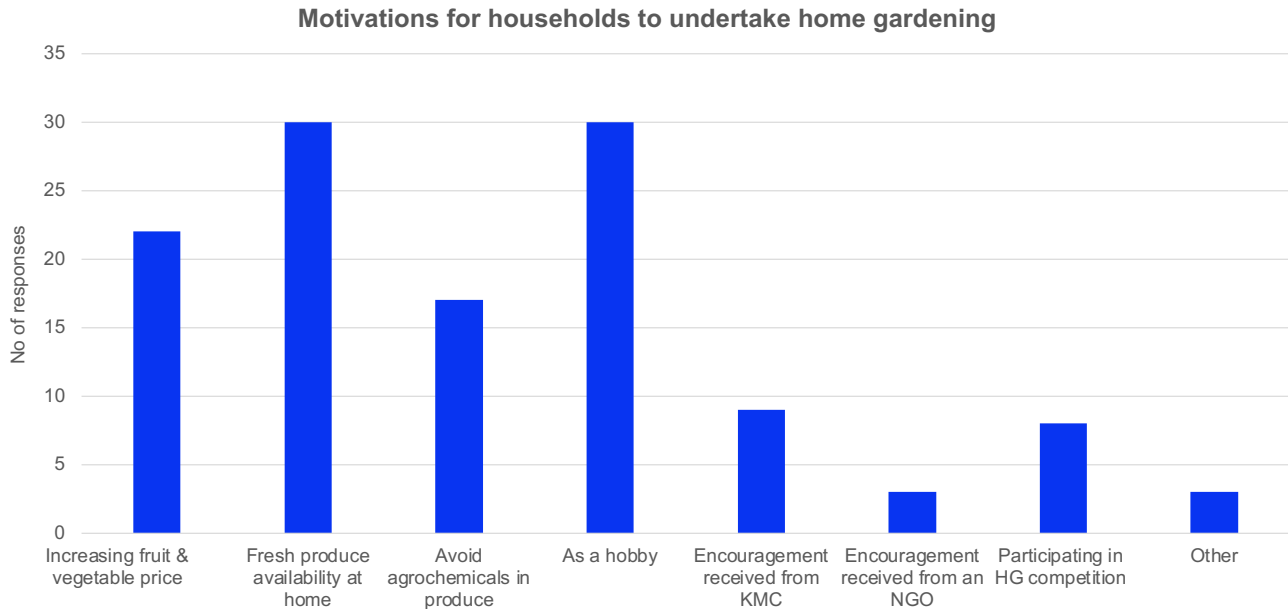


- Approximately half of the households with challenges had used strategies to overcome these, summarised below.

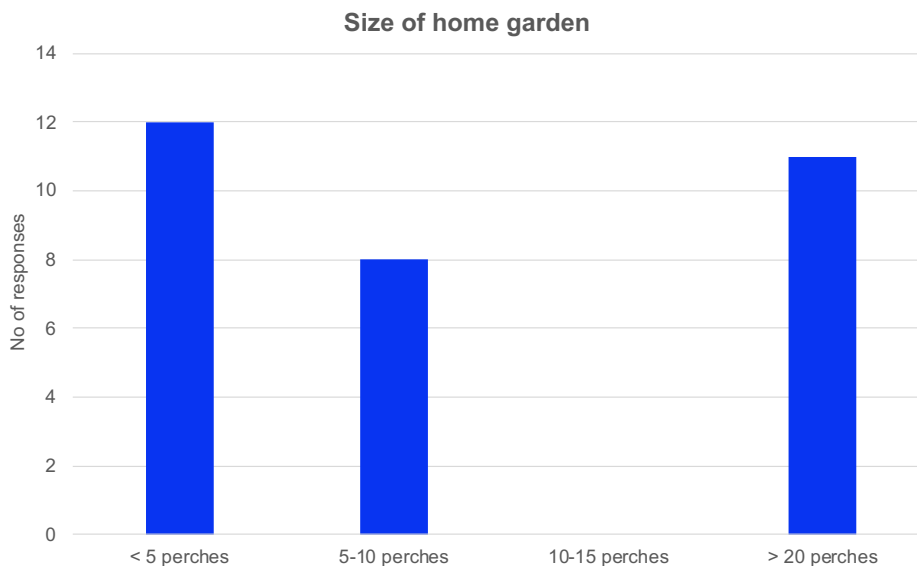
Challenge	Strategies to overcome this (number of responses)
Rodents / Rats	Use traditional techniques (2); Concrete barriers to avoid digging (1); Open the lid of the bin for a while (1); No solution / action taken (2)
Worms	Add some ash / ash and leaf (2); Expand extra knowledge about this (1); Don't put fish and meat (1)
Odour	Keep away from the house
Leachate	Keep away from the house (1); No solution / action taken (1)
Other	For small animals: make a small space (1); For fire: add some phosphate (1); For rain: cover the compost (1); For monitor lizard: No solution / action taken (1)

Home gardening

- 31 of the 31 households undertake home gardening.
- **Almost all households listed the same two reasons as their motivation for home gardening: fresh produce availability at home and that it is a hobby (30 HH, ~97%).** Increasing fruit & vegetable prices (22 HH, ~71%) and avoiding agrochemicals in produce (17 HH, ~55%) were also significant motivations.

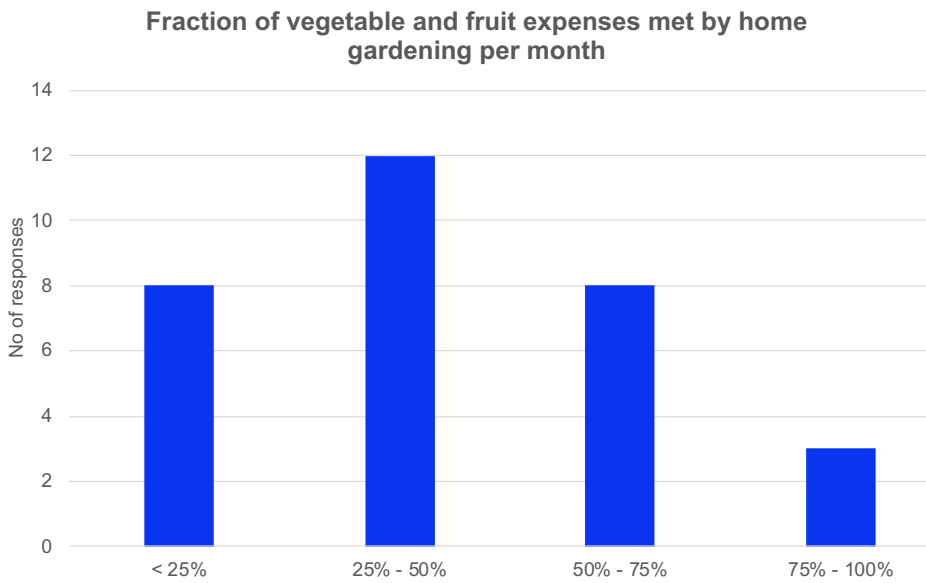


- Size of home garden was most commonly less than 5 perches (12 HH) followed by greater than 20 perches (11 HH).

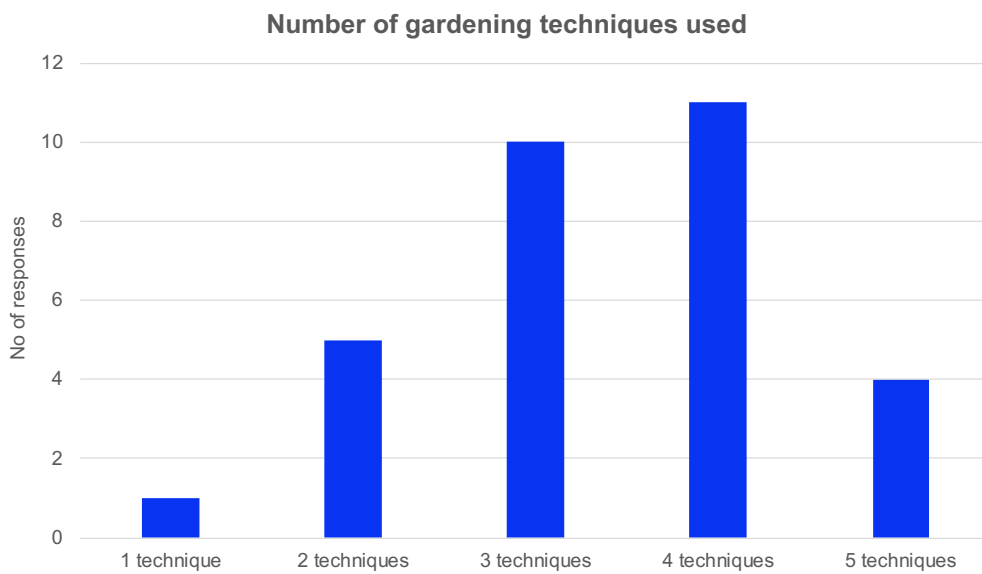


- **Households grow a large number of crops**, including vegetables, leaves, spices and fruits. Each household grows between 5 and 16 types of crops. Compost is used on almost all the noted crops (98%).

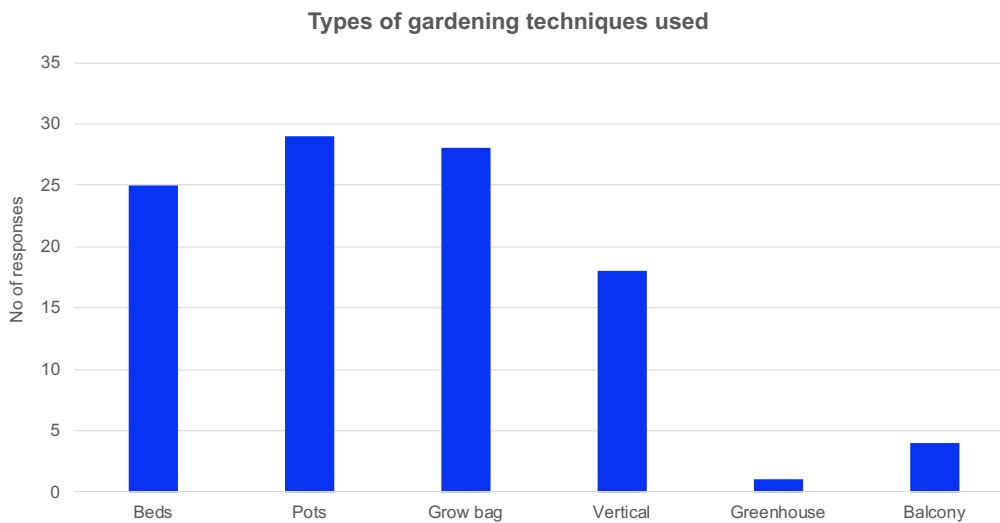
- **35% of households can meet more than 50% of their fruit and vegetable expenses per month with home gardening (11 HH), and three-quarters meet more than 25% of expenses (23 HH, 75%).**



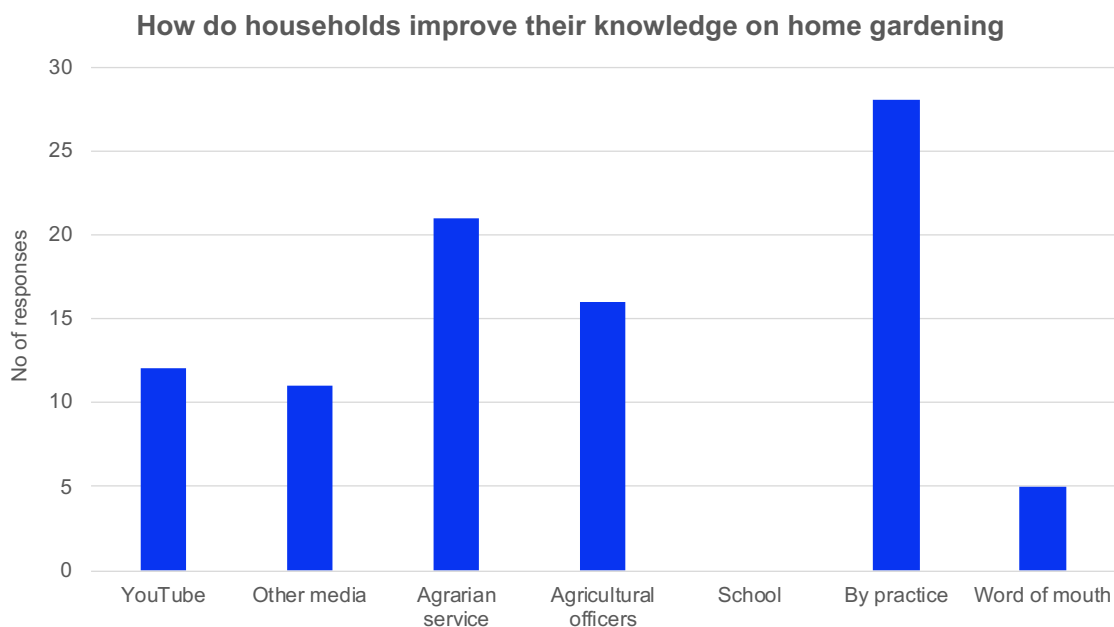
- **80% of households use 3 or more gardening techniques (25 HH) and 95% use two or more.**



- **Beds, pots and grow bags were all commonly used.** 95% of households use pots, 90% grow bags and 81% beds.

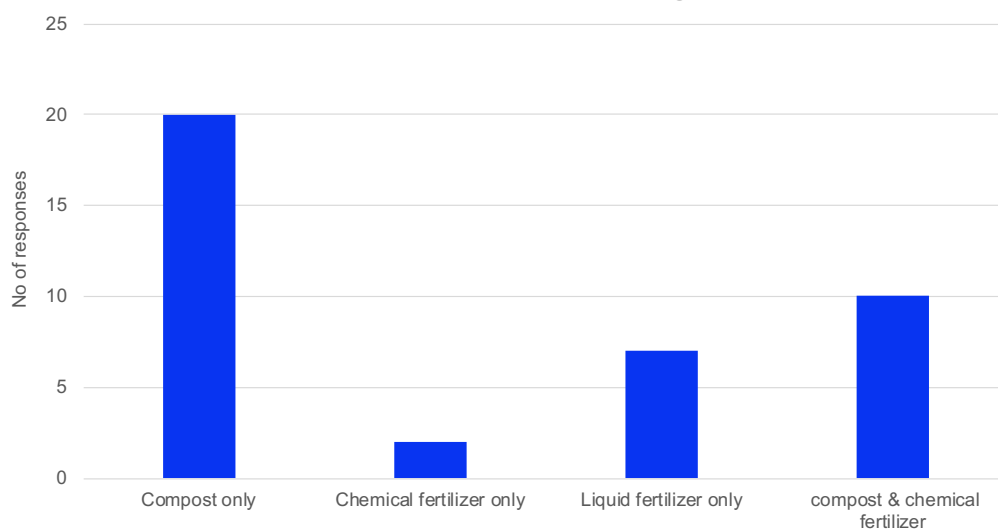


- Half of households apply compost twice per month or more, and half apply compost once per month (14 HH each response).
- The most common ways households improve their knowledge on home gardening is by practice (28 HH, 90%), from agrarian services (21 HH, 68%) and from agricultural officers (16 HH, 52%). Media is also commonly used (YouTube and other media).



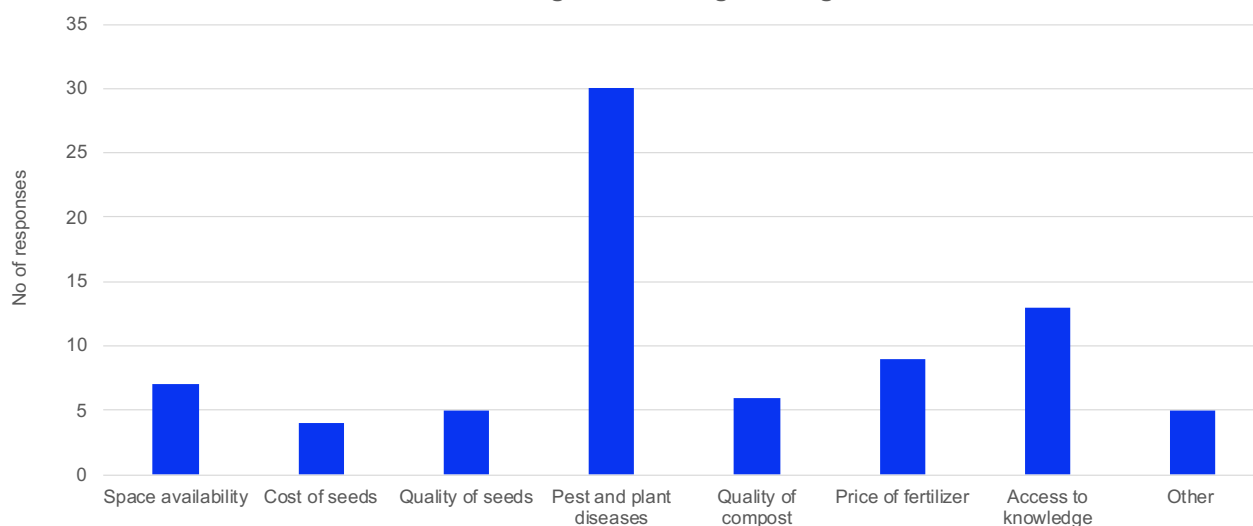
- **40% of households use only compost on their garden,** with no chemical or liquid fertilisers (13 HH). A similar number use both compost and chemical fertiliser (12 HH), and 22% use compost with liquid fertiliser (7 HH).

What do households use in their garden



- **Pest and plant diseases was a challenge for almost all households (30 HH, 97%).** Other responses included deer, monkeys, porcupine and fruit flies and challenging to make seeds.

Challenges for home gardening



- Almost all households with challenges had found strategies to overcome these.

Challenge	Strategies to overcome this (number of responses)
Space availability	Use other methods such as vertical structures, pots, bags (5)
Cost of seeds	Buy plants (1)
Quality of seeds	Buy plants (3)
Pest and plant diseases	Use traditional techniques (8); Use onion peel / garlic (6); Use natural techniques (2); New / alternative techniques (2); Take training / awareness programs (2); Put ash / ash and leaves (2); Consult agri officers (2); No action / solution (2); Use polythin bags and put plant under sunlight (1); Margosa mix spray (1); Potasium Palmanikkam (1)
Quality of compost	Improve compost quality (3); Get instructions on compost (1); Add phosphate (1)
Price of fertilizer	Make compost (4); Use a pelletizer (2); Make fertilizer (1)
Access to knowledge	Expand knowledge (5); Take seminars (3); Consult agri officers (2)
Other	No action (1)

4. Trials of waste segregation, home composting and home gardening

Approach

This component of the research took an action research approach with households who have limited experience with waste segregation, home composting and home gardening. The research focused on understanding changes in both practices and perceptions following the intervention of provision of technology for composting and home gardening to households, alongside a training session. Households were selected in collaboration with KMC as they are situated on a waste management collection route with poorer rates of source segregation compared to others in the LA. 20 respondents were recruited.

The research had the following steps:

- Baseline survey followed by a half day training session on waste segregation, home composting and home gardening (led by Janathakshan)
- Distribution of compost bins and seeds to households
- Surveys at week 2, 3, 4 and 8

Key findings

- **Provision of technology and training has helped encourage waste segregation, home composting and home gardening.**
 - 100% of households are composting kitchen waste at home by the end of the trial. **By the end of the trial period, 100% of households were regularly using the compost bin** and 18/20 households noted that they were using the compost bin in a way where they felt they could identify and manage challenges.
 - **Home gardening is more challenging for households.** By the end of the trial all had begun the process, just under half were home gardening in a way where they felt they could identify and manage challenges.³
 - **Training undertaken as part of this project was key to success of the trials.** In the final survey at Week 8, 19/20 households noted that they how to compost and 12/20 households noted that they how to home garden because of the training undertaken as part of this project.
- **Knowledge on how to undertake home composting and home gardening is the major barrier for households, rather than knowledge of benefits.** The majority of households already want to compost and see the benefits, but only 5/20 households agree that they know how to compost at the baseline survey, which increases to 100% by Week 2 following training undertaken as part of the trial, and 100% strongly agreeing by Week 3. Similarly for home gardening only 8/20 households agree that they know how to home garden at the baseline, which increases to 100% strongly agreeing by Week 3.

Implications for Local Authorities (LAs)

- **Practical training on waste segregation, home composting and home gardening, along with provision of resources, is effective in shifting practices** and can reduce the amount of organic waste being collected by LAs. It is key that training focuses on how these activities can be undertaken (vs awareness raising of the benefits) as this is the major barrier for households. Training can be targeted to specific cohorts based on challenges faced by households.

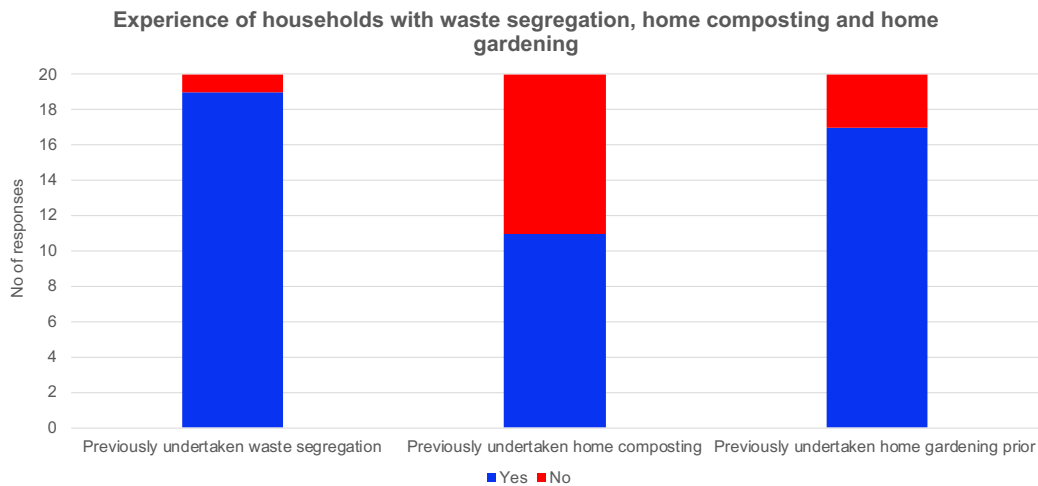
³ Note that bad flooding during the trial period would have likely had an impact on home gardening practices, and rain was noted as a challenge for many households.

- **Combining training on home composting and home gardening is complementary** and supports better waste segregation at the household level, as households have a pathway to utilise organic waste. Given that it is complementary to undertake composting and home gardening training together, this can be designed by collaboration between government departments, for example agricultural officers and community development officers from LAs.
- **Training that specifically targets women can be effective**, given their importance as household members responsible for putting training into practice within the household and motivators within the community.
- **There is a need for ongoing / long-term support for encouraging home gardening, which is more challenging than waste segregation and composting.** Timing of training should also consider the climatic conditions and avoid beginning in challenging monsoon weather.

Annex B: Trials of waste segregation, home composting and home gardening Survey Data

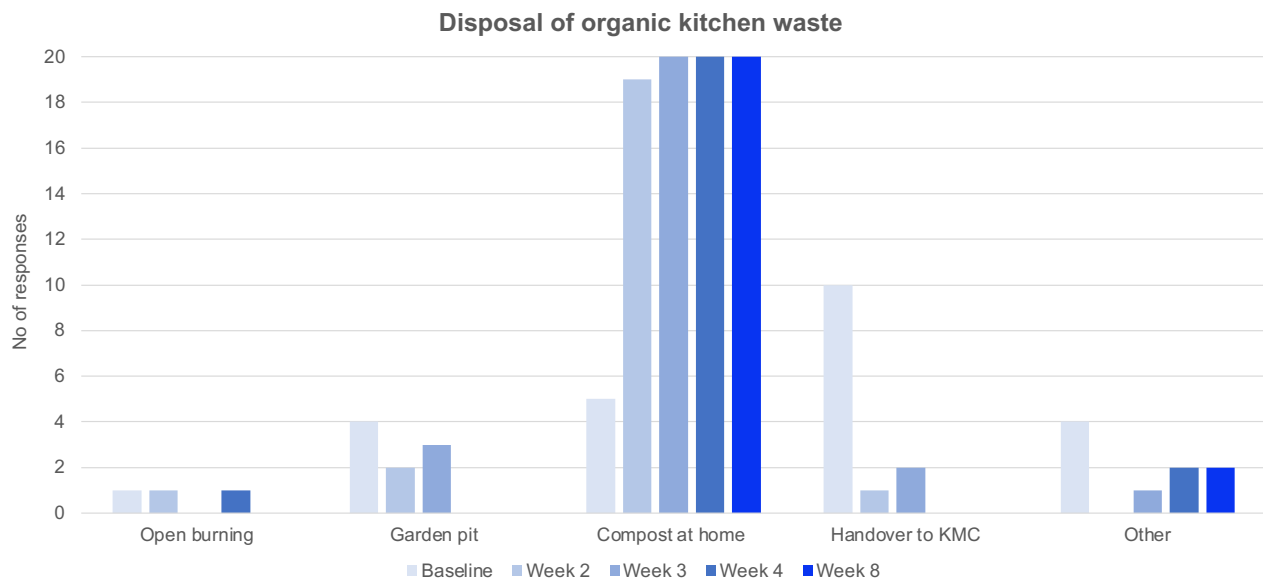
Demographics of the survey

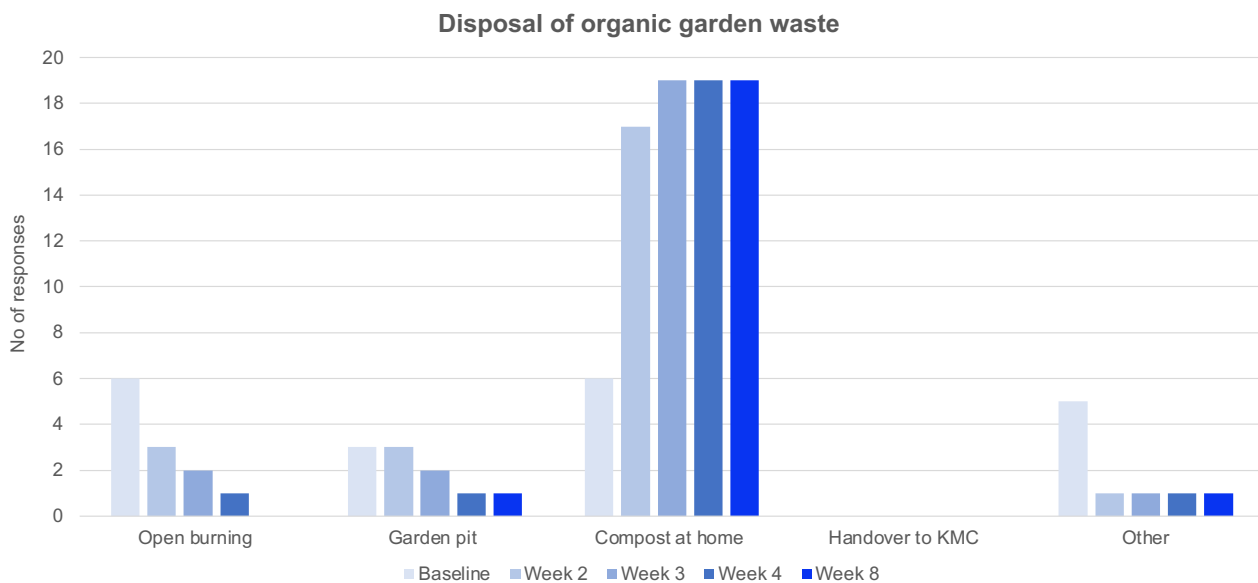
- 20 respondents from the Kaduwela area.
- Household size ranges from 1 – 6 members, average of 4.2 people per household (2 HH with 1-2 members, 8 HH with 3-4 members, 10 HH with 5-6 members; n = 20)
- The majority of households have undertaken waste segregation (19 HH) and home gardening (17 HH), but only half of households have experience with home composting (11 HH).



Waste segregation – practices

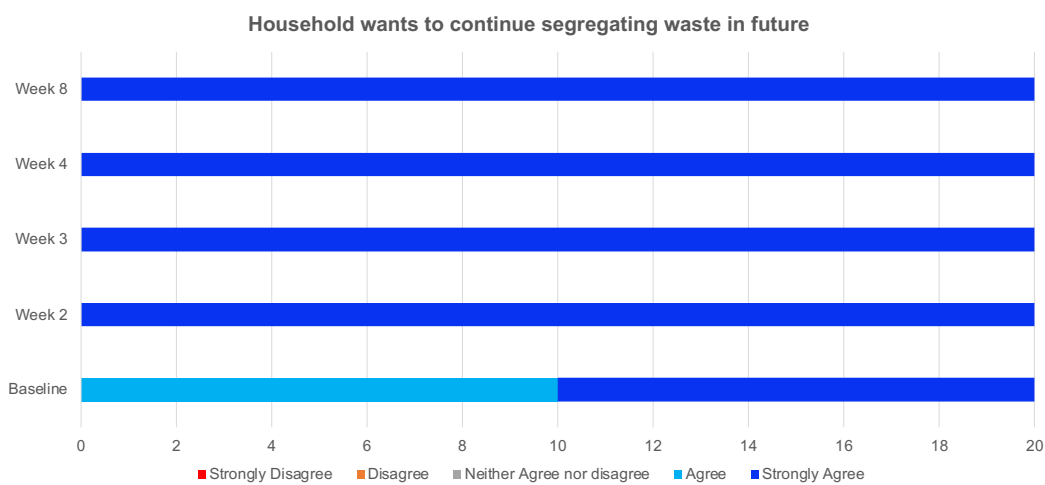
- The number of households disposing of organic kitchen waste to compost has increased from 5 HH to 19 HH by the first monitoring survey at Week 2, predominantly shifting waste from KMC. Disposal of organic garden waste has increased from 6 HH to 19 HH. By week 3 and until the end of the trial period **100% of households are composting kitchen waste at home**, and 19/20 households are composting garden waste. The 'other' responses for disposal of organic waste were for animal feed or directly onto plants/gardens.



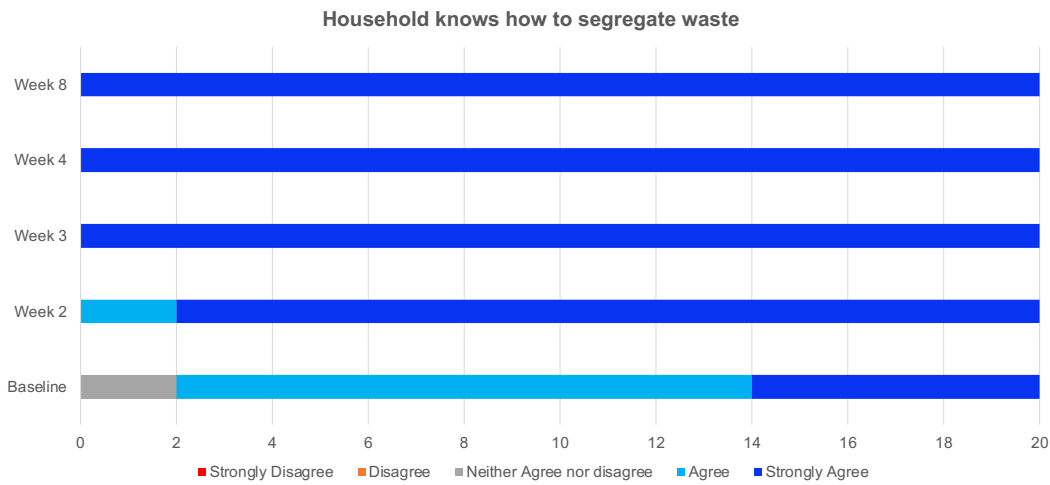


Waste segregation – perceptions

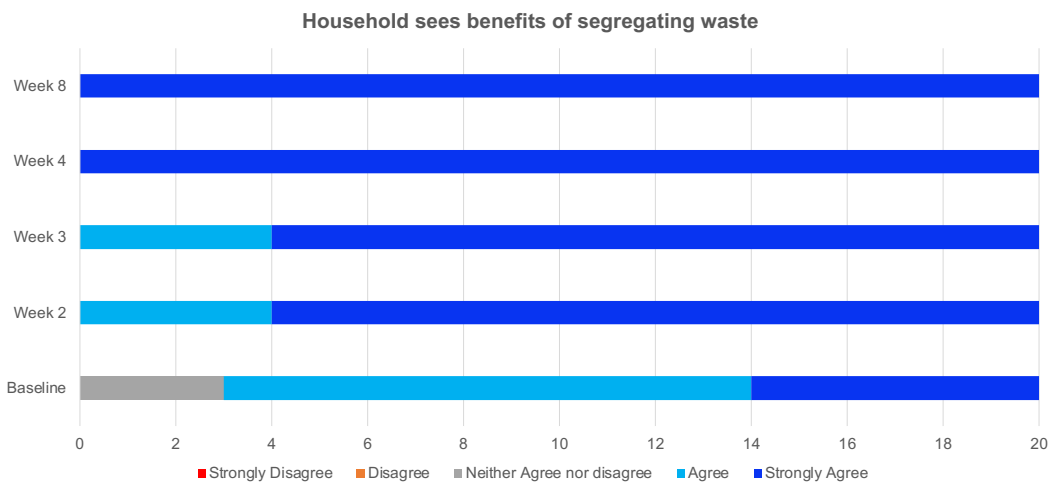
- All households agreed at the baseline that they want to segregate waste (10 agree, 10 strongly agree) and from the first monitoring survey at week 2 all households strongly agreed.



- Only 6/20 households strongly agreed that they know to segregate waste at the baseline and which increased to all households by Week 3.

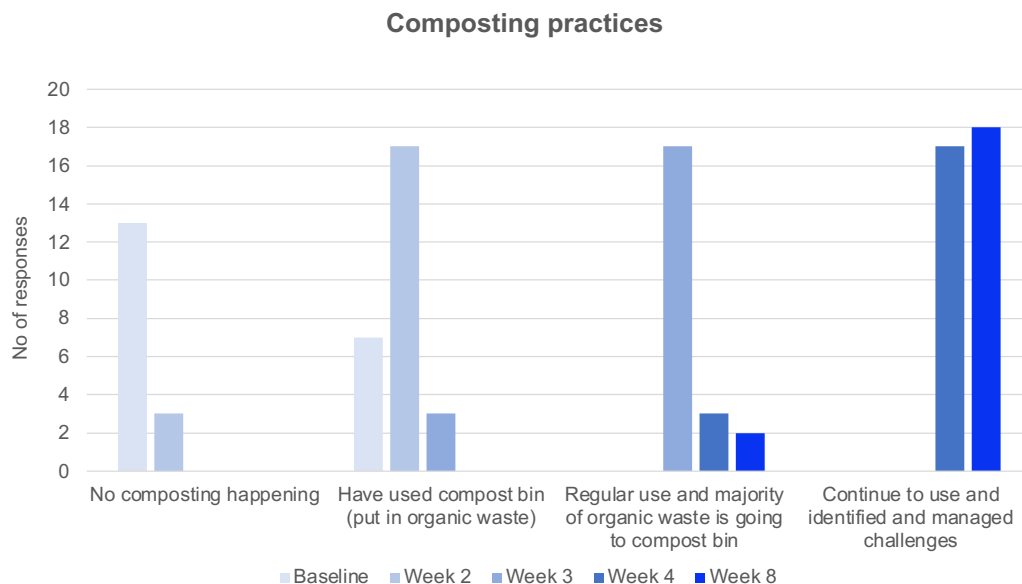


- Only 6/20 households strongly agreed that they see the benefits of segregating waste at the baseline and which increased to all households by Week 4.



Composting – practices

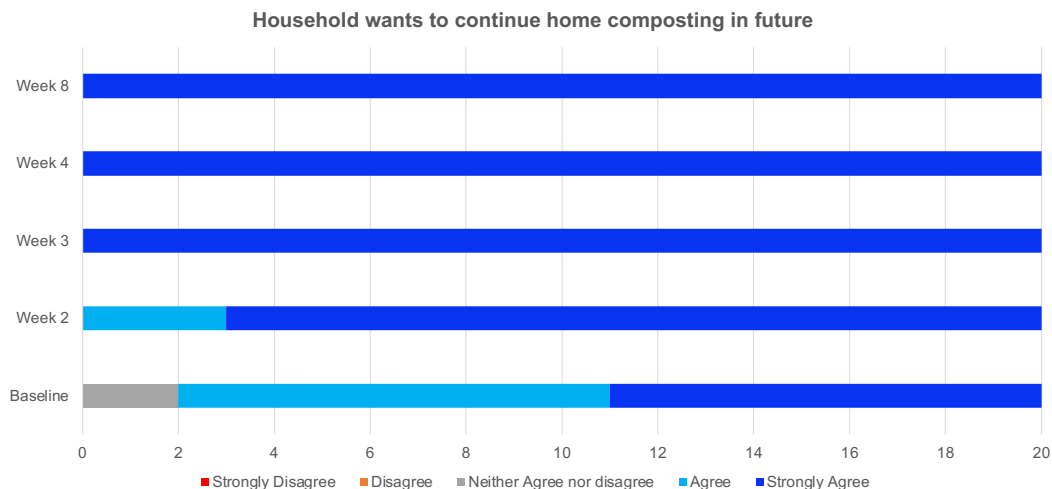
- At the baseline 7 of the 20 households were attempting composting at home (although many noted they did not have an adequate bin) and by the 2 week monitoring visit 17 of the 20 households had begun composting. **By the end of the trial period, 100% of households were regularly using the compost bin** and 18/20 households noted that they were using the compost bin in a way where they felt they could identify and manage challenges.



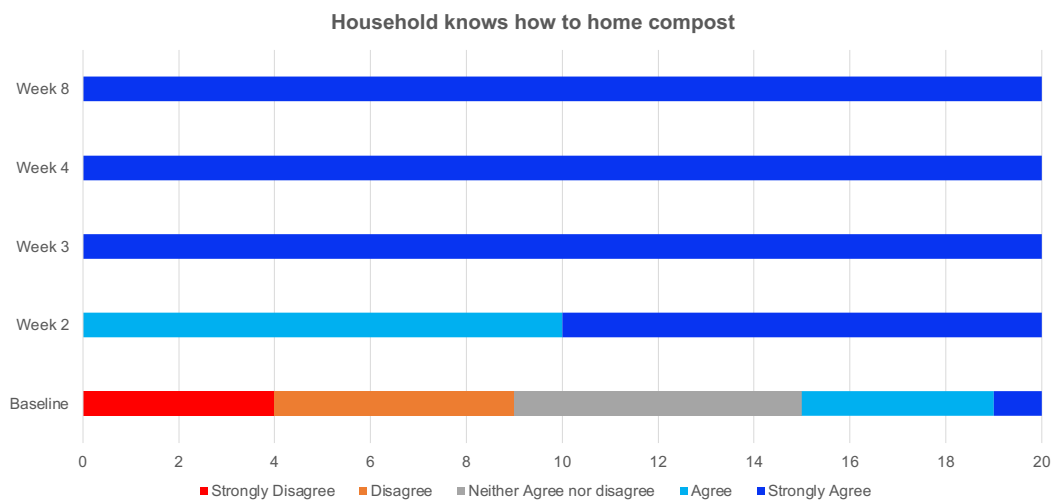
- At the baseline, households noted they undertook practices for the following reasons:
 - Don't have adequate knowledge about composting
 - Don't have a compost bin
 - Don't have adequate space
- In the final survey at Week 8, households noted they undertook practices for the following reasons:
 - To produce compost
 - Because they have gained knowledge and experience
- Throughout the trial period, around one-quarter of households faced challenges with rodents/rats and 2-3 households each survey mentioned challenges with iguanas or porcupines. Households used strategies for the rodents/rats issue including not using coconut or meat in the compost bin, using natural sprays and traditional methods.
- By the end of the trial period, 19/20 households noted they had a dedicated member of the household responsible for managing the compost unit. 10 households noted it was a female member of the household and 9 noted it was a male member.

Composting – perceptions

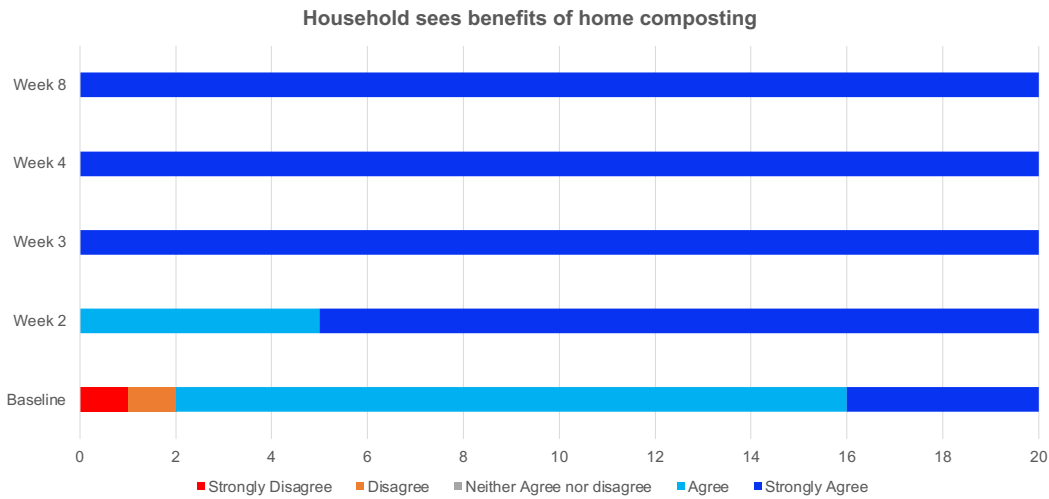
- 18/20 households agreed at the baseline that they want to continue composting (9 agree, 9 strongly agree) and at the 3 week survey all households strongly agree.



- Only 5/20 households agree that they know how to compost at the baseline, which increases to 100% by Week 2 and 100% strongly agreeing by Week 3. In the final survey at Week 8, 19/20 households noted that they how to compost because of the training undertaken as part of this project, and 1/20 noting it was by practice.

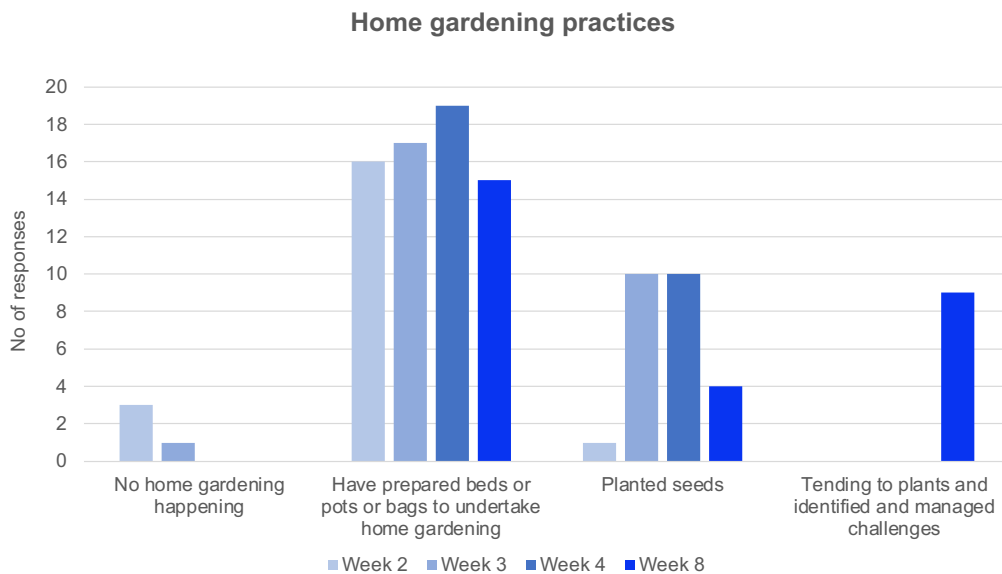


- 18/20 households agreed at the baseline that they see the benefits of composting and by the Week 3 survey all households strongly agree. In the final survey at Week 8, households noted following benefits:
 - Creating a quality compost/fertiliser
 - Compost can be used for home gardening
 - Saving money on fertiliser (with one noting they can earn money through selling it)



Home gardening – practices

- By the Week 2 monitoring visit 17 of the 20 households had begun home gardening by preparing beds, pots or bags, which increased to all households by Week 4. By the end of the trial period half the households had planted seeds. However, only 9/20 households had reached a level of home gardening where they noted they were tending to plants and identifying and managing challenges.⁴

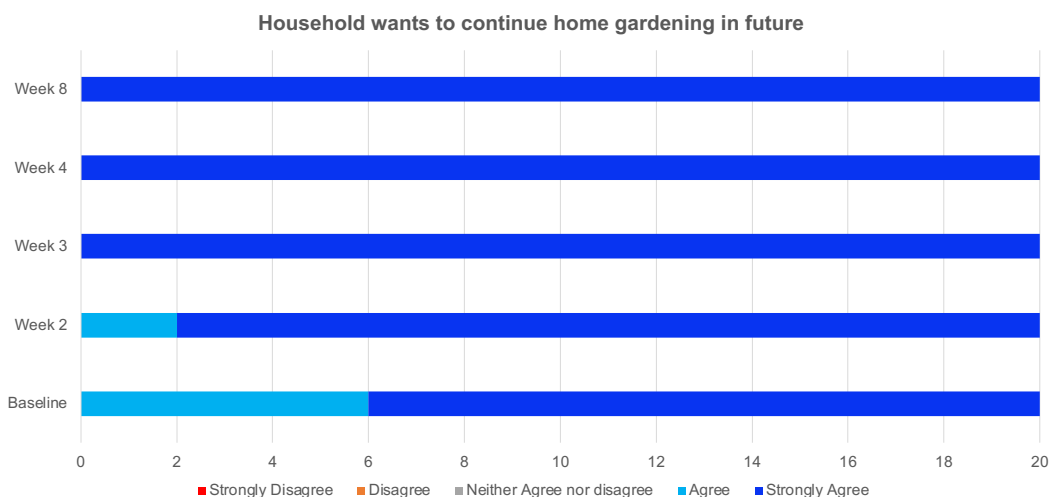


⁴ Note at the baseline 11 of the 20 households had were already undertaking some home gardening but they have responded to the survey about their new practices.

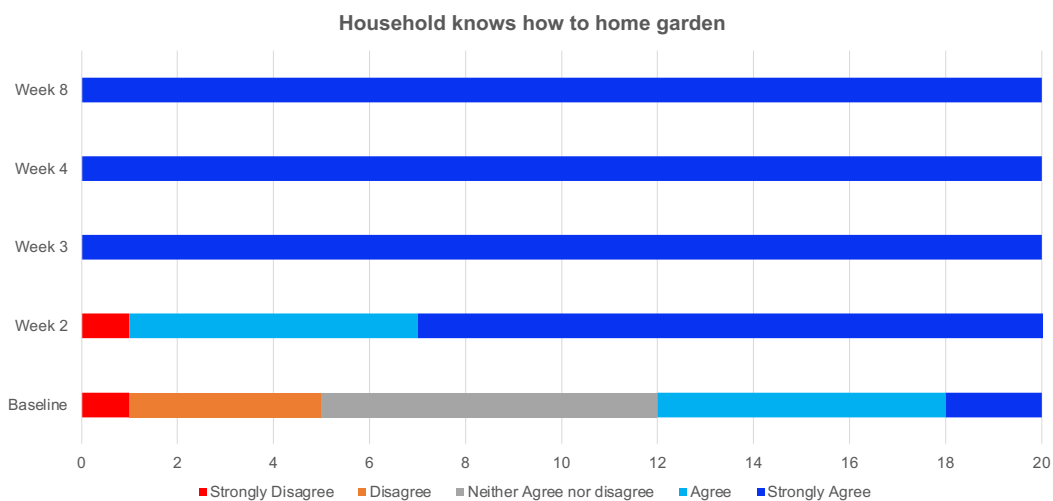
- At the baseline, households noted they undertook practices for the following reasons:
 - For those who do some home gardening: as a hobby, to save money on groceries, to create income, to use for home consumption, because they have experience and knowledge, inspired by neighbours
 - For those who do not currently do home gardening: don't have adequate space, don't have adequate knowledge / training, issues with climate and pests
- In the final survey at Week 8, households noted they undertook practices for the same reasons given above for those who do home gardening, and in addition because of knowledge and inspiration from the training session.
- Throughout the trial period, households faced the following challenges:
 - Space availability (3-6 responses per survey)
 - Quality of seeds (1-2 responses per survey)
 - Pest and plant disease (8-11 responses per survey)
 - Quality of compost (1-4 responses per survey)
 - Price of fertiliser (4-6 responses per survey)
 - Rain (10-12 responses per survey)
- Households used strategies to overcome these challenges including using pots or bags for planting, and using natural sprays and traditional methods.
- By the end of the trial period, all households noted they had a dedicated member of the household responsible for home gardening. 8 households noted it was a female member of the household and 12 noted it was a male member.

Home gardening – perceptions

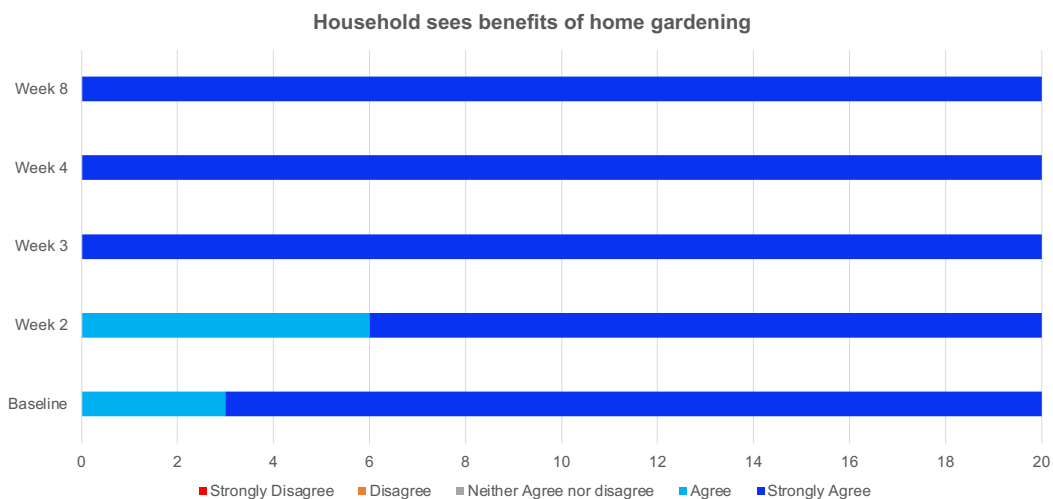
- All households agreed at the baseline that they want to continue home gardening (6 agree, 14 strongly agree) and by Week 3 all households strongly agreed.



- Only 8/20 households agree that they know how to home garden at the baseline, which increases to 19/20 households by Week 2 and 100% strongly agreeing by Week 3. In the final survey at Week 8, 12/20 households noted that they how to home garden because of the training undertaken as part of this project, and 6/20 noting it was by practice.



- All households agreed at the baseline that they see the benefits of home gardening and by the Week 3 survey all households strongly agree. In the final survey at Week 8, households noted following benefits:
 - To get fresh fruit and vegetables
 - To save money
 - To generate income





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