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Graduation report
Integrated Product Design
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From waste to value

A toolbox and usecases for local circular waste processing

CLT H-BUURT

TU Delft

And The People

Gemeente Amsterdam

Community Land Trust H-BUURT

From waste to value

A toolbox and usecases for local circular waste processing

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Finally, I would like to thank my family, friends and roommates for supporting me, helping me, postively distracting me from time to time and putting up with me over the last months.

0 SUMMARY

In the Bijlmer H-Buurt in Amsterdam, a new way of living is being developed, based on co-ownership of the property and collaboration with the neighborhood and municipality. It is called a Community Land Trust (CLT) and for the Netherlands it will be the first. The City of Amsterdam strives to be a fully circular city by 2050, so the CLT has to comply. Waste is a main topic within the circular economy, so the goal of the project is: 'How to enable and show the residents of the CLT Bijlmer that they themselves can create value from waste and by doing so support the (local) circular economy?'. With the following criteria to evaluate the final design: Is it reducing waste locally? Does it create value or products out of the waste? Does it help the community financially or socially? The project started with reviewing the goals and challenges followed by an exploration of the context.
This was sprint 0.

Sprint 1 focused on exploration of opportunities and looking for directions for development. The exploration ended with multiple directions focused on: organic-, plastic-, textile- and bulk waste.

Sprint 2 focused on developing these directions into initial concepts, researching about and with the community. This provided the insight that knowledge on circular opportunities was lacking. At the end of sprint 2, two concepts were selected for development. One concept focused on organic waste, with composting and a vegetable garden at its core. The second concept focused on textile waste and included a sewing atelier and recycling, upcycling and reusing textile waste locally.

Sprint 3 focused on developing these concepts further and provide the community with clearsteps to realise these. The current situation at the CLT community was analysed and the community was involved again. Researching the current situation provided information on operation and plans of the vegetablegarden and sewinggroup used the CLT. These provided starting points for realizing the concepts. Also, some struggles were discovered. The vegetable garden lacked a good compost facility. Also, both initiatives were found to have an individualistic approach.The second session with the CLT community found that both concepts were perceived valuable, but put more focus on details. Also, the lack of knowledge was highlighted again. They required more information on the process and wanted to know what specific products would result from it.

Based on the feedback of sprint 3, sprint 4 was initiated. The goal was to develop specific interventions for the vegetable garden and sewing group focused on the value to the community and product. Also, a solution was develop for the lack of knowledge. So a toolbox with all the knowledge required was created. Consisting of methods to separate waste, ways to create value from waste with and providing the first steps to do so.

Finally, the plans for the solutions for textile waste and organic waste were finalized. These were respectively a clothing swap closet and a compost facility with emphasis on the community.

CONTENT

00 SPRINT 0

Contextualize

Exploring project & defining problems and challenges

This sprint was the kickstart of the project. It focused on getting acquainted with the project, context and challenges. In addition it was about defining goals and determining the right trajectory for the project. So research was done into stakeholders of the project and the problem itself in order to find challenges and opportunities. In addition, research was done into the context of the project, focused on the CLT, the Bijlmer, its residents, waste and circular economy.

CONTENT

1 INTRODUCTION TO PROJECT & GOAL

1.1 Introduction & General goal

This graduation project is about facilitating and encouraging the circular economy on a neighborhood scale, by allowing residents to create social and economical value from waste themselves. The context of the project is the Community Land Trust that will be realized in the Bijlmer H-Buurt in Amsterdam, the Netherlands in the coming years.

The goal of the project is to give the community of the Community Land Trust (CLT) H-Buurt the possibility to separate their waste in and to facilitate recycling it and creating value with it, by transforming it into something new. The final design of this project should be able to reduce waste locally, turn it into something of value for the community and benefit them economically.

The project brief states: *"Enabling the CLT Bijlmer community to create and optimize relevant value for themselves and their surroundings from specific waste streams and making sure they can manage and maintain this process, while supporting the (local) circular economy."*

1.2 Stakeholders

Within this project several stakeholders exist. These are; Gemeente Amsterdam, CLT Bijlmer and the company 'And the People'.

Gemeente Amsterdam is the municipality of Amsterdam and the current owner of the land. They are the ones who will ultimately decide if they want to continue with the plans for the area and thus have a supportive role within the project.

CLT Bijlmer is a non profit initiative driven and owned by the Bijlmer community and its residents with the aim to voice itself for neighborhood developments and to create access to affordable housing and community infrastructure (CLT-Bijlmer, 2020). Currently, it is a community of over 130 people from the H-Buurt, who are working together to create an actual CLT residential building for the community. At the moment the plans are still in development and the community is working together with the City of Amsterdam to realize their plans.

'And the People' is a design agency which focuses on sustainable and inclusive urban development, sustainable consumption and circular economy (And the People, 2020). Their goal is to create lasting impact by facilitating the realization of inclusive urban transitions. Within the CLT project this is also what they do, actively facilitate and bring everyone and everything important to the project together. Within this graduation project 'And the People' is the main contact and client.

1.3 Dissecting the problem

Before an actual solution can be developed, the project and objectives need to be reviewed. This way, potential challenges or opportunities could be recognized and taken into account. The research question, as stated in the project brief, is as follows;

'How to enable and show the residents of the CLT Bijlmer that they themselves can create value from waste and by doing so support the (local) circular economy?'

The core of the project is to create value from waste for a community. Three main topics can be distinguished; waste, circular economy and community. The first challenge recognized within these topics is waste. Only when separating waste, it is possible to actually create value from it in a circular way. The second challenge is about doing something with the waste, so either processing it, recycling it or repurposing it. The challenge is to find out in what ways different waste materials can be valuable. The last topic is the community. In order to make a project about creating value from waste a success, full commitment from a community is required. If the community does not see value in a project or initiative, there is no willingness and nothing will be done.

To make the project a success the goal is to create a solution which reduces waste within the community, turns it into value or creates new products from it, and ultimately financially and socially benefits the community. The final design will be evaluated based on these criteria.

An effective solution should consider and solve all of the above mentioned challenges.

2 Design process

The project started with the project statement and problem definition stated in the introduction and project brief: *"Enabling the CLT Bijlmer community to create and optimize relevant value for themselves and their surroundings from specific waste streams and making sure they can manage and maintain this process, while supporting the (local) circular economy."*

In order to get to a solution, the process had to be cut up into multiple sprints, which all had a different focus.

The initial sprint, sprint 0, was all about getting to grips with the project and the context. It was key to figure out who and what was involved, what challenges would be present and what would have to be done to get the project going.

The first real sprint, sprint 1, focused on exploring opportunities and finding possibilities within circular waste processing. So a lot of examples were looked at and based on criteria which were developed after sprint 0, initial directions were selected.

Sprint 2 focused on developing these directions into concepts. This resulted in six initial concepts, focusing on organic waste, textile waste, plastic waste and bulk waste. These initial concepts were put to the test with the CLT community to see which they valued the most and saw potential in. Eventually, organic waste and textile waste remained.

Sprint 3 focused on developing the chosen concepts further, so they would be able to become feasible. After further development, the concepts were again put to the test with the community and in addition, research was done into the current situation at the community, to make sure the concepts would be fitting. After testing a further discovery was made; a lack of knowledge wass present within the community when it came to circularity and its possibilities. So next to developing the concepts further, another goal became to provide the right information for the community in order for them to be self sufficient when it came to circularity.

Sprint 4 focused on developing solutiong for all directions and providing the necessary guidelines for them to work. Two interventions were thought of which are very simple to realize right now and will be a stepping stone towards a wasteless future for the community. In addition, a platform / toolbox was created with all necessary information to start creating value from waste. By developing interventions and a platform the research question is answered.

After discovering the problems and challenges present in this project, it is time to dive into them, but also provide some more context. This chapter covers the social, technical and physical context of the project in more detail. In addition, relevant principles for the project are explained in more detail.

3.1 CLT

A Community Land Trust, from now on called 'CLT', is a relatively new way of living and residing focused on realizing sustainable and affordable buildings for local communities. In co-creation and co-ownership with (future) apartment dwellers, the local community and financiers and/or the owner of the land, it tries to provide a fairer and more social counterpart to the commercial real estate development (Graduation Opportunity CLT, 2020). The CLT concept originates from the US (Grounded Solutions, 2020) and has been around for a while in other countries as well, but is new in the Netherlands (Cltb.be, 2020).

3.1.1. CLT Model

A CLT works as follows: At the center of it sits a non profit neighborhood association, made up of residents and stakeholders of the area. It uses a model which represents the interests of residents, the neighborhood and the public interests. It encompasses ownership of the ground, real estate and neighborhood facilities, as seen in figure 3.1, to ensure social and sustainable use. (Samenlevingsopbouw.be, 2014) Combined with clauses concerning speculation and buyback arrangements, affordable living for now and the future is guaranteed, allowing current residents to stay in their beloved neighborhoods.

The CLT Model is not set in stone, but rather a set of building blocks which can be adapted to different situations, areas and countries, in order to match regulations and the needs of residents. (CLT Amsterdam, 2020) However, three aspects of the CLT model will always remain the same, which are; Community: self organization, Land: shared ownership and Trust: real estate management. (CLT Bruxelles, 2019)

Currently there are over 240 CLT's in the United States, more than 260 in the UK. For the history of the CLT Model, see Appendix A.

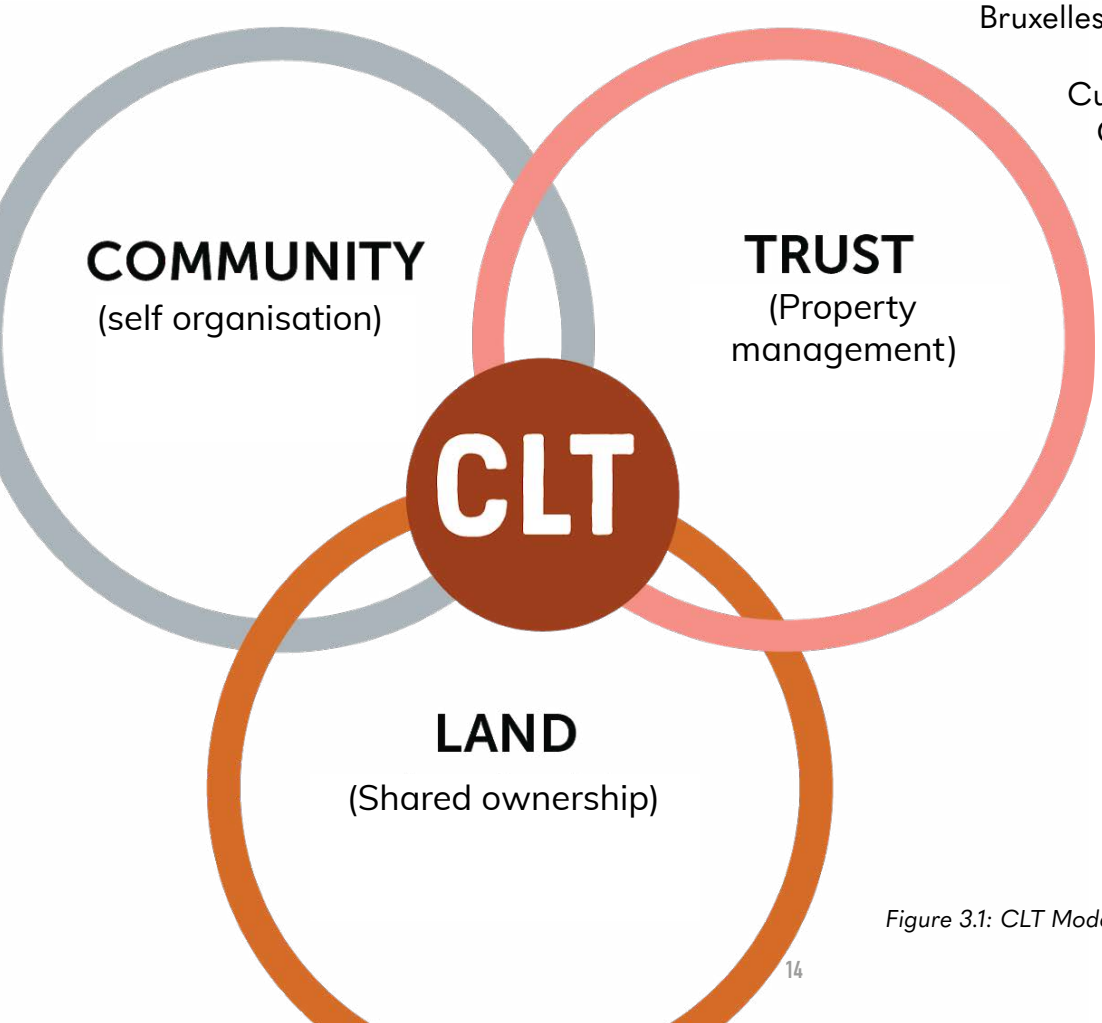


Figure 3.1: CLT Model (CLT H-Buurt, 2020)

3.1.1. CLT Bijlmer

Every CLT is slightly different, as it has to work in a specific environment. The same counts for the CLT plans and community in the making for the H-Buurt. To make it work, research has been conducted into the neighborhood and certain principles are set up, as seen in figure 3.4. These are;

- Affordability for now and future generations
- Connected with the neighborhood
- Permanent control over developments and facilities
- Stimulating autonomy and self-sustainability
- Putting residents in control and giving them a voice and finally connecting CLT with sustainable and circular area development and stimulating innovation related to it (CLT H-Buurt, 2020).

The CLT Bijlmer initiative is initiated and set up by the Maranatha Community Transformation Centre (MCTC), a Christian church organization in the H-Buurt which has been active since 2006, as seen in figure 3.2. Next to being a church, it also provides a helping hand to the community in general, see figure 3.3. This includes, youth training, after school training, spiritual development, free legal advice, music training and seminars (MCTC, 2021).

Figure 3.2: MCTC

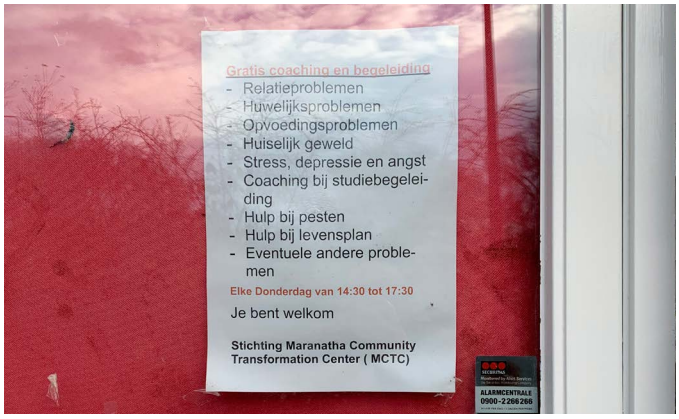


Figure 3.3: MCTC flyer

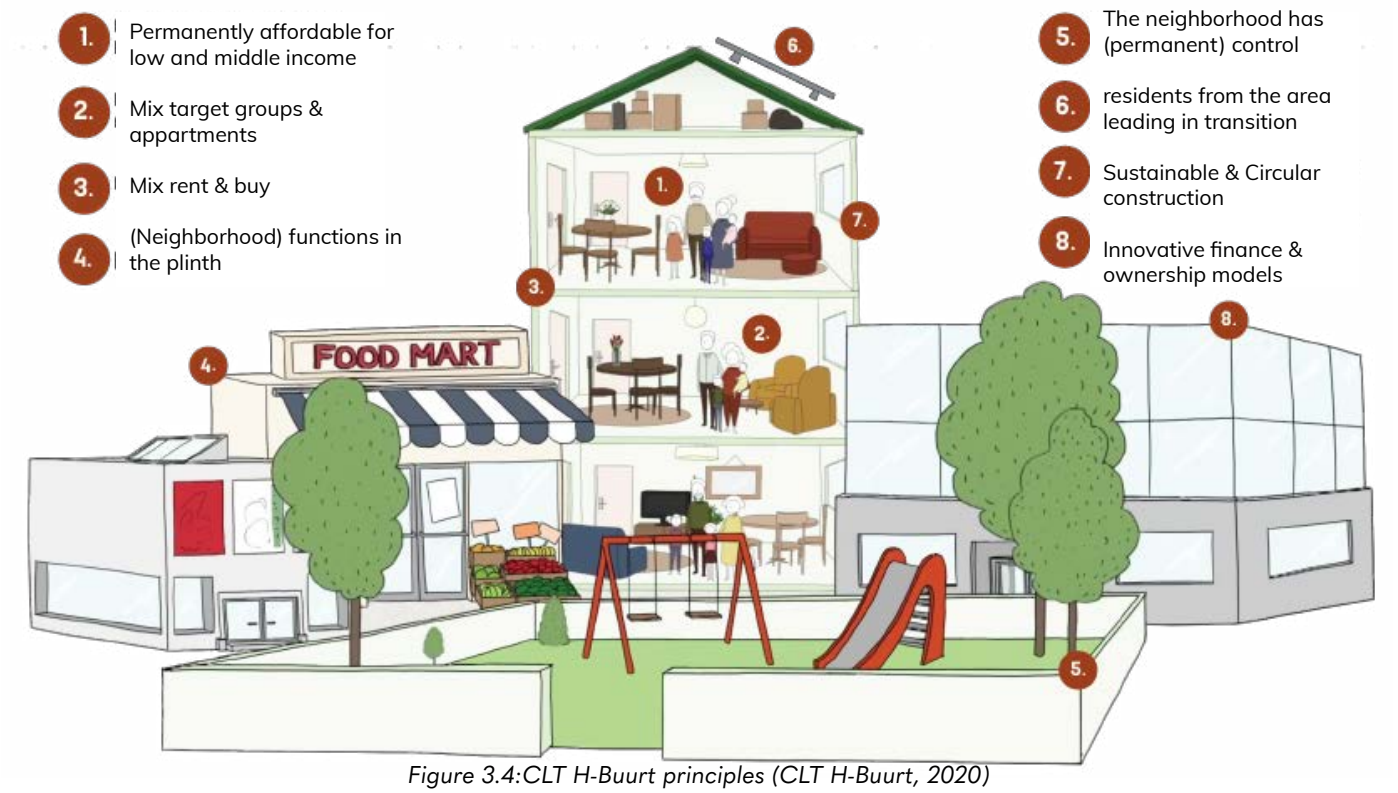


Figure 3.4:CLT H-Buurt principles (CLT H-Buurt, 2020)

3.1 CIRCULAR ECONOMY

3.2.1. Introduction

An important aspect of this project is the Circular Economy. The consumption process has always been a linear process, as consumers buy something, use it and eventually throw it away. This linear process of consuming is commonly used throughout the world (Government of the Netherlands, 2017). It is however unsustainable as natural resources will run out at some point (Esposito et al, 2015) . It is also unnecessary, as a lot of waste still holds value and can be reused in certain ways (World Bank Group, 2017). A lot of people are not aware of this (Waste-Outlet, 2021). The goal for this graduation project is to circulate certain waste streams locally and retain or create value with them, thus contributing to the local circular economy. In addition, the goal of the city of Amsterdam is to become a fully circular city by 2050 (City of Amsterdam, 2020), so the CLT has to contribute to that goal.

3.2.2. What is it?

As mentioned in chapter 3.2.1, a take-make-waste extractive industrial model currently exists around the world. As the name suggests, a circular economy aims to turn those linear processes into circular processes, as seen in figure 3.5. So, waste and pollution become non-existent and value is retained instead of wasted (Ellen MacArthur Foundation, 2017).

3.2.3. Goals City of Amsterdam

As stated, Amsterdam wants to become fully circular by 2050, see figure 3.6. The first goal is to use 50% less primary resources by 2030 and to be 100% circular by 2050. So, by focusing on reusing and repairing locally the city wants to have no more waste and use no primary materials anymore. The City of Amsterdam is focused on three areas of products, materials and resources, which are; food and organic materials, consumer goods and the built environment (City of Amsterdam, 2020).

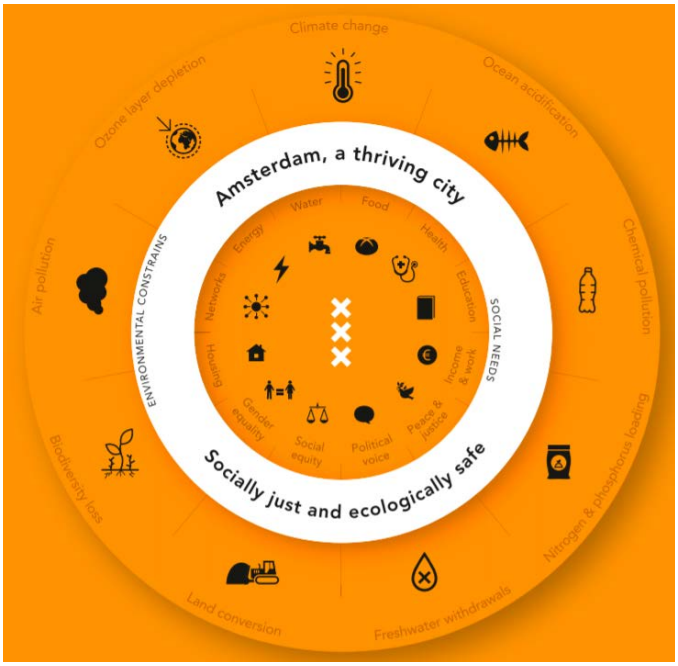


Figure 3.6: Amsterdam City Doughnut (Smartcitiesworld, 2020)

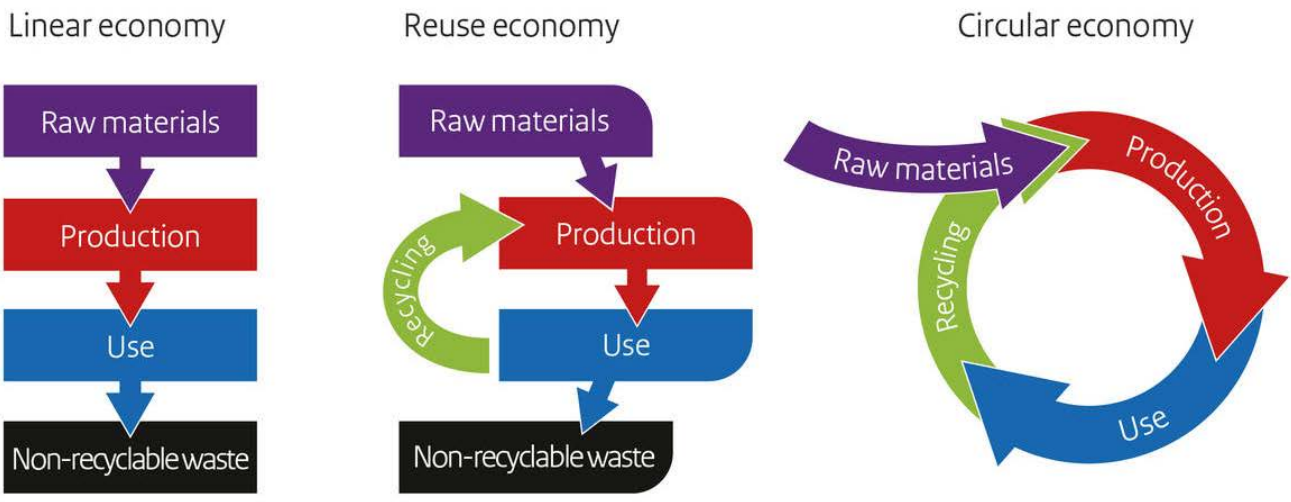


Figure 3.5: From linear economy to circular economy (Government of the Netherlands, 2017)

3.1 BIJLMER H-BUURT

The H-Buurt is a district in the area of the Bijlmer called Bijlmer-Centrum. Bijlmer Centrum consists of the D, F and H-buurt, and is located directly next to train station Amsterdam Bijlmer Arena and shopping area Amsterdamse Poort. The H-Buurt was built in the 60's and 70's and is divided into four neighborhoods, Hoptille (Figure 3.8), Rechte H-Buurt (Figure 3.7), Hakfort/Huigenbos and Huntum (Bijlmermuseum, 2014). The majority of buildings in the H-Buurt are high rise buildings, which are mainly located in Rechte H-Buurt and Hakfort/Huigenbos, but also can be found in Hoptille. Huntum is the exception to the rule, as it mainly consists of brick housing (Metabolic, 2018). For more information and the history of the Bijlmer, see appendix A.

3.3.1. Problems within the neighborhood

The H-Buurt was one of the last areas of the Bijlmer which saw improvements and developments, but recently a lot has been going on to improve living conditions there. (Nul20, 2018) Although this has been happening, a lot of problems still exist. The H-Buurt residents struggle with low income, social exclusion, criminality, lack of good neighborhood facilities and lack of inclusive communities (DSP, 2007). Although these problems exist, the residents are proud of their neighborhood and enjoy living there. It is green, has a lot of open space and is fairly quiet (Gemeente Amsterdam, 2020).

Figure 3.8: H-Buurt Hoptille

Figure 3.7: Part of H-Buurt from above (Gemeente Amsterdam (3), 2019)

3.4 WASTE

As the focus of the project is on waste, an initial inventorisation of the situation was required. So research was performed concerning waste and waste separation in the H-Buurt and in Amsterdam in general.

3.4.1. General

The municipality of Amsterdam offers its residents a lot of options for waste separation in the H-Buurt, as seen in figure 3.9. Residual waste, paper and cardboard, plastic and drink containers, glass and textile can be disposed of separately. In addition, separate areas to dispose of bulky waste, which is collected once a week, are spread across the neighborhood, but it can only be placed there one day before the collection moment (INSERT PICTURES) (Het Parool, 2016).

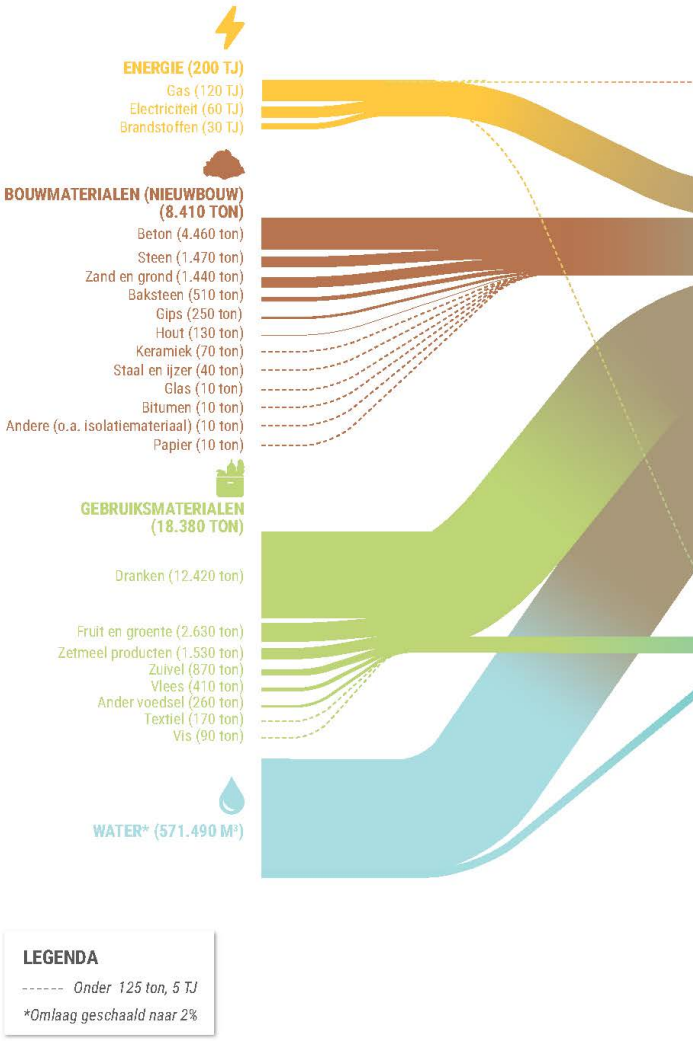
Figure 3.9: Waste separation options H-Buurt

3.4.2. How much

According to the report 'Circulaire gebiedsontwikkeling in de H-Buurt in stadsdeel Amsterdam Zuidoost' by Metabolic from 2018, the amount of waste in the H-Buurt until 2035 will be 7880 tons a year if there is no change in policy. This amount contains 6350 ton of unseparated residual waste, 640 ton of construction waste and the 890 tons that are left are separated waste streams, such as organic, textile, paper, plastic etc. For the full overview see figure 3.10.

3.4.3. Current situation

As previously mentioned, the municipality facilitates the separation of waste by residents by placing underground containers for multiple waste streams. It depends on the residents to separate their waste, so separation at the source. However, looking at the numbers from Metabolic (Metabolic, 2018), which also apply to the rest of Amsterdam it appears that 80% (6350 ton) is unseparated residual waste. This is a problem Amsterdam has been facing for a number of years now. Although the municipality has put a lot of money and effort into solving the problem, for example by placing extra containers and organizing informational campaigns and advertisements it has not made a difference at all (Het Parool, 2019). So it has become apparent that another approach is necessary.



3.4.3. Plans for future

To tackle the problems mentioned in chapter 3.4.3, the municipality of Amsterdam plans to switch from separation at the source to separation after collection by a waste separation machine for some waste streams as this is more effective. In 2021 they are going to stop separately collecting plastic in some neighborhoods, but eventually want to implement this throughout the city (Het Parool, 2020). In addition, the city is introducing separation solutions for organic waste, which will differ per neighborhood, as organic waste accounts for a third of the residual waste and still contains a lot of potential value for recycling (Afval en Grondstoffen, 2020). The municipality has also experimented with a local recycling point, which allowed people to hand in smaller types of bulky waste, such as hard plastics, small wooden products, small electronic equipment and frying oil (Gemeente Amsterdam, 2019). Although the pilot was a success, for now the plan has been discontinued by the municipality due to multiple factors (InZuid, 2020).

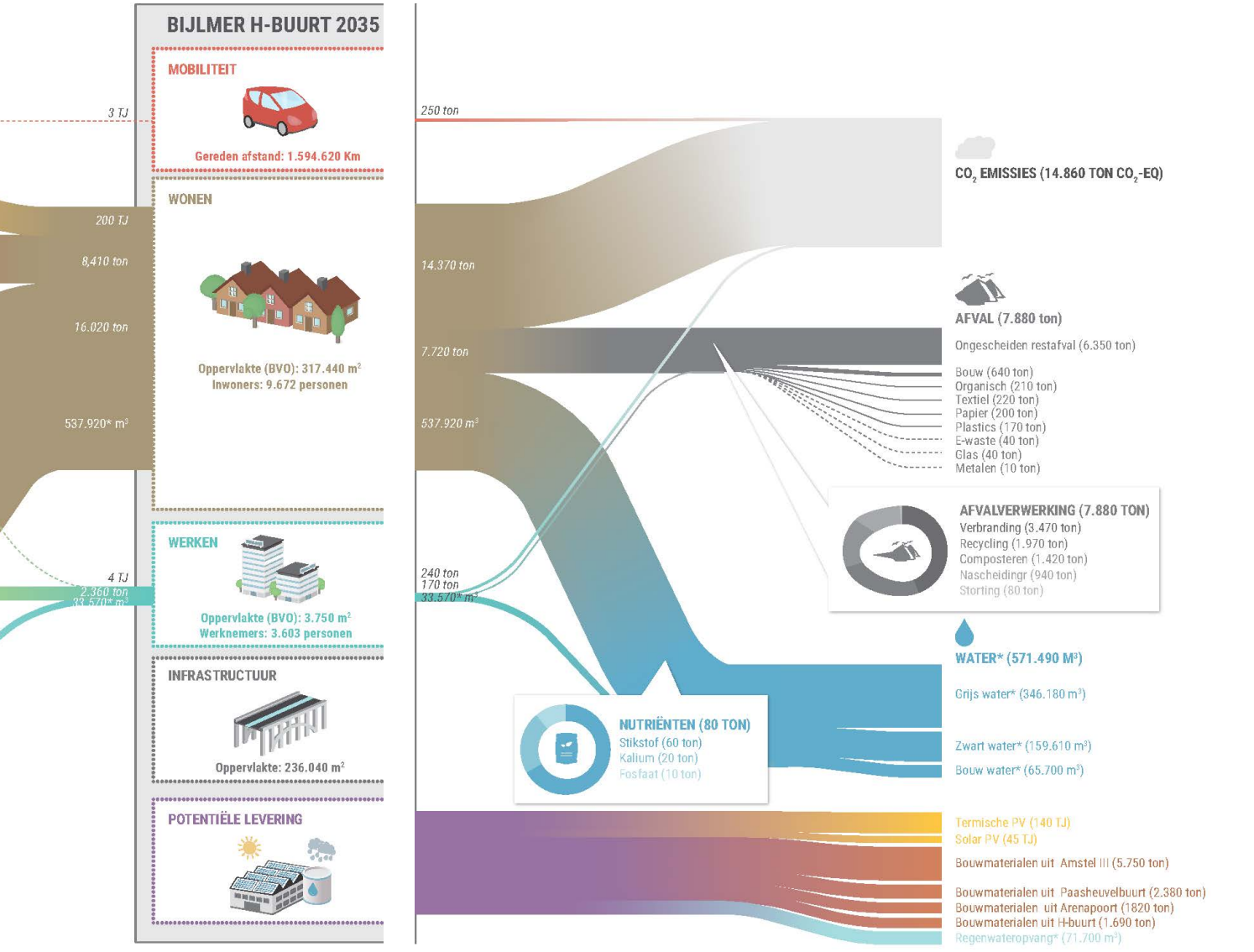


Figure 3.10: Waste streams H-Buurt (Metabolic, 2018)

3.4.5. Waste problems H-Buurt

Next to the waste problems Amsterdam is facing in general, the H-Buurt has some specific problems on top of that. These are; misplacement of bulky waste, a lot of litter in the neighborhood, cardboard and putting waste in places it does not belong (Hakfort en Huigenbos, 2021). Which can also be seen from figure 3.11, 3.12 and 3.13. Waste is sometimes even thrown off balconies (Verwey-Jonker, 2012). To find out more about these specific problems in the H-Buurt, how they are caused and what effect they have on the H-Buurt see appendix A. The main finding is that waste left in the public space can cause people to feel less safe, feel less responsible for their neighborhood and thus spend less time outside. In addition, if there is already waste in public spaces, people tend to add more to it. If the streets are clean, people tend to keep them clean.

Figure 3.12: Waste problem H-Buurt 1

Figure 3.11: Waste problem H-Buurt 2

Figure 3.13: Waste problem H-Buurt 3

Conclusion sprint 0

The goal of this sprint was to get acquainted with the project and context and to find out what challenges and opportunities there are. The three main topics of the project are waste, circular economy and community. The context is an area of Amsterdam which had its problems in the past, but is improving year by year. Of course some problems remain, especially social problems, but these are being worked on. These problems are good to keep in mind when designing solutions.

In terms of waste, there is a lot being done, but still some problems remain, mainly having to do with trash on the streets, which could also provide good directions for the project. To conclude, this sprint has provided background information for the project and has highlighted a number of challenges. It serves as a base to continue with and can be used to base decisions or criteria on.

01 SPRINT 1

Explore

Explore opportunities & find potential directions

CONTENT

After defining the context and challenges of the project it is time to start exploring solutions. This sprint is about exploring the opportunities in terms of waste, waste separation and to find potential directions which could be suitable for the CLT community and communities in general. To do this, research was performed into waste separation in communities and current circular initiatives concerning waste. For this project it is important to find inspiration from other projects, as it will not be about reinventing the wheel, but about adapting it to fit the situation in the H-Buurt.

Exploration

Finding directions

4 INITIAL RESEARCH WASTE SEPARATION

As mentioned in the previous chapter, the City of Amsterdam facilitates waste separation for multiple different types of waste. This does however not mean that everybody separates all of their waste. An important aspect of the solution is facilitating and encouraging waste separation. To learn more about this, research was conducted. Based on the paper from VANG on waste separation in high rise buildings (VANG, 2020) some important things were discovered to improve waste separation and why people are not doing it. The main reasons people did not or not fully separate their waste had to do with lack of space at home, the distance to the container and people not seeing the benefit in it. In addition, some things were discovered to encourage people to start separating. These are, better in home facilitation, shorten distance to the container, setting group goals and giving feedback, showing examples and giving rewards at the end or at the beginning. These methods are taken into consideration when designing the final solution.

5 INITIAL RESEARCH CIRCULAR WASTE SEPARATION

To find suitable solutions for the H-buurt and its residents, it is important to find out what has already been done concerning circularity and waste. In this chapter, the research and exploration of circular initiatives will be explained.

5.1 EXPLORATION

The exploration was done in multiple ways. First of all, three categories were made based on the categorization of the Amsterdam Municipality, which distinguishes three categories; organic waste, consumer waste and waste from the built environment.(City of Amsterdam, 2020) However, some extra categories were distinguished for further specification of materials and to make sure every waste stream is well represented, see figure 5.1. Resulting in seven final categories; Organic waste, consumer products, plastic, metal and paper, built environment and other materials.

To find out what is already out there multiple channels have been used. Namely online desk research, which includes reading books, papers, articles and websites, and also information from the municipality itself regarding the topic and what is already being done in the city. For the full overview of circular waste initiatives that were found see figure 5.1.

In addition, research was performed into similar community initiatives regarding waste, to draw inspiration from.

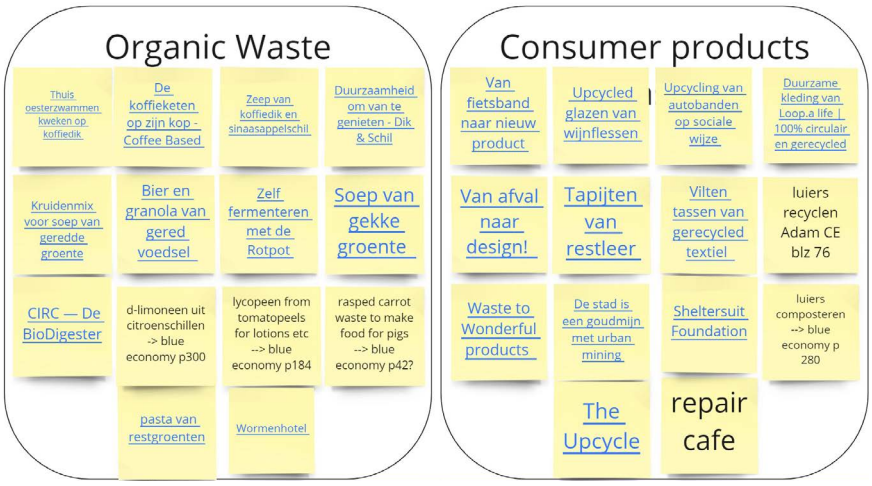


Figure 5.1.1 : Initiative funnel (row 1, part 1)

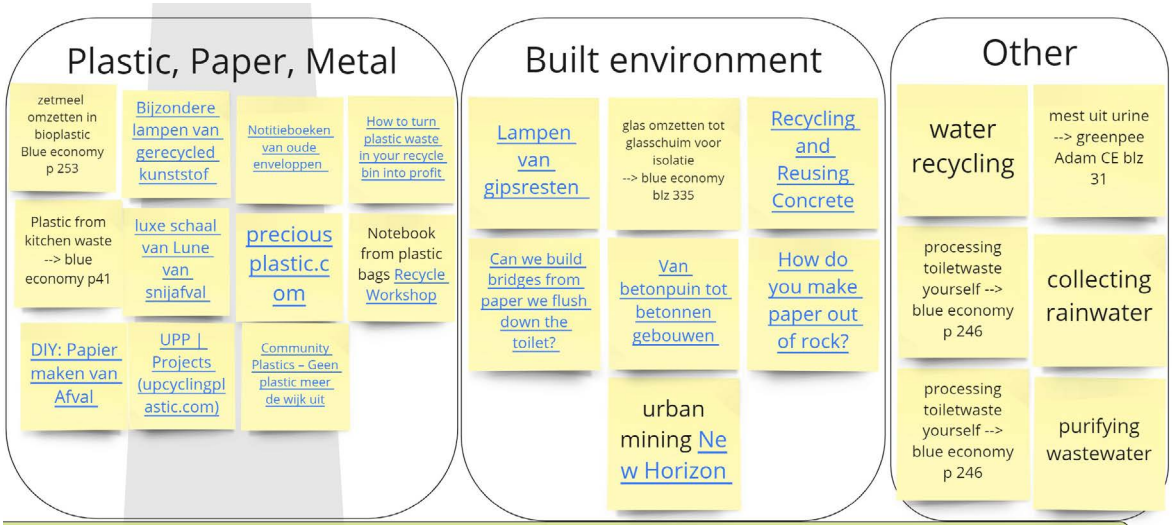


Figure 5.1.2 : Initiative funnel (row 1, part 2)

Afrikaanderwijk Coop

The Afrikaanderwijk is a neighborhood in the south of Rotterdam which has similar traits as the Bijlmer in terms of social problems. On top of that, there is a waste problem caused by a food market in the neighborhood. The problem is that the market produces a lot of waste, especially litter which ends up on the streets and blows into the rest of the neighborhood. Resulting in dirty streets and a less livable neighborhood. This does not invite people to hang out outside or in the neighborhood and lowers the feeling of ownership of the neighborhood residents. To tackle this problem, the Afrikaanderwijk Coop has started an initiative where neighborhood residents who have trouble finding a job can work as garbage collectors at the local market. This way they create a cleaner neighborhood and also a better feeling of ownership among residents, while providing them with a job (Rotterdam Circulair, 2021).

The next step in this project is the creation of a material station (grondstoffenstation), where the garbage from the market can be collected and processed and can even be upcycled (Figure 5.4). Currently, Super-Use Studios is working on the development of said grondstoffenstation (CityLab010, 2018).

Figure 5.2 & 5.3 Afrikaanderwijk SCHOON Coöperatie (Resilient Rotterdam, 2019)

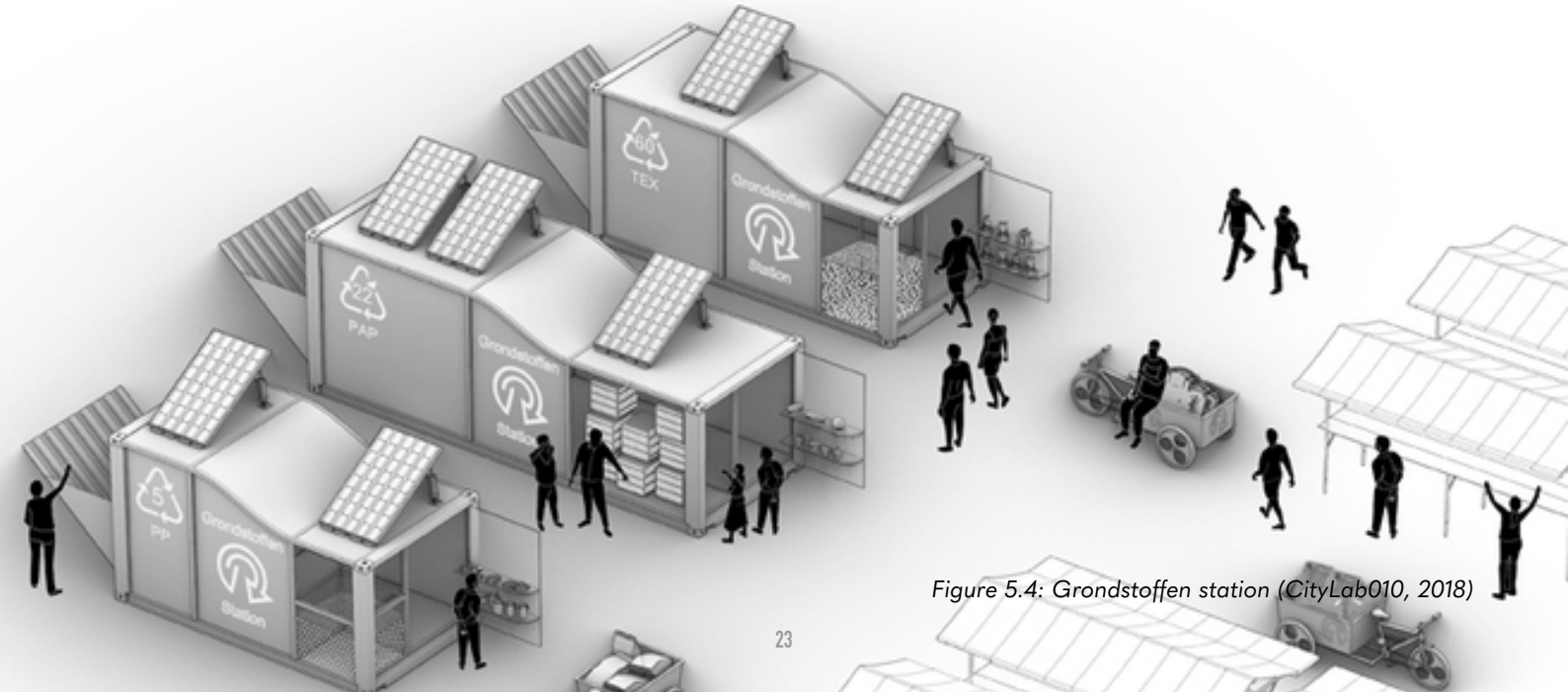


Figure 5.4: Grondstoffen station (CityLab010, 2018)

Gaasperdam Groene Hub Donut Deal

Another best practice is closer to the H-Buurt, namely in Gaasperdam, which is another neighborhood in the Bijlmer. The initiative here is about creating biogas from organic waste. The plan is to build a large biodigester which can process all the organic waste from the neighborhood and turn it into biogas. Ultimately they want to fully convert the neighborhood to biogas and stop being dependent on natural gas. It is a neighborhood initiative which collaborates with the municipality and is installing GFT-E containers in the neighborhood and uses some responsible residents to encourage all the other households to start separating organic waste (Figure 5.6) (Groene Hub, 2020).

Precious Plastic

Precious Plastic is not necessarily a community initiative, rather it is an initiative that helps and guides communities to create value from waste themselves. They explain what exactly is necessary to recycle and repurpose plastic waste with a community and offer you the tools and machines to do so (Figure 5.7). In addition, they provide a platform for the different communities to help each other and benefit from each other's work (Precious Plastic, 2021).

GROENE HUB

Figure 5.5: Logo Groene hub (Groene Hub, 2020)

Figure 5.6: Groene hub (Groene Hub, 2020)

Figure 5.7: Precious plastic (Precious Plastic, 2021)

5.2 SELECTION

Not every initiative found was suitable or approachable for the future residents of the CLT in the H-Buurt. So a selection of the most promising ones had to be made. To do this, a funnel with selection criteria concerning approachability, feasibility, profitability and availability of waste, was set up and executed, see figure 5.8. A selection of five initiatives remained, which could be suitable for the CLT.

The selected initiatives are;

- Organic waste biodigester
- Organic waste wormery
- Plastic upcycling
- Textile upcycling
- Repair cafe

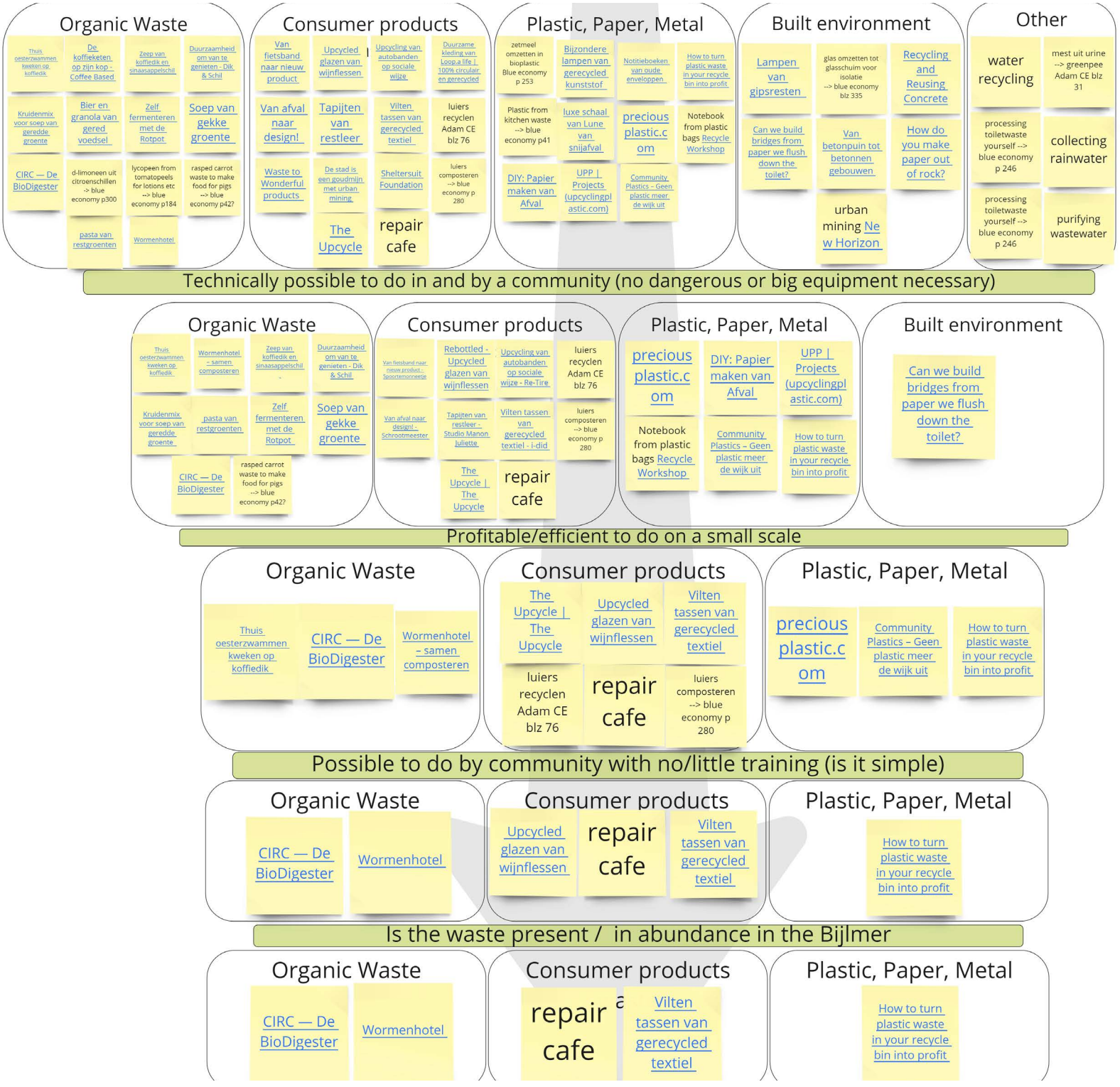


Figure 5.8: Initiative funnel

6 POTENTIAL DIRECTIONS

6.1 INTRODUCTION

After exploring the possibilities and making a selection of initiatives, further development was necessary. So a first iteration on these initiatives has been done. The initiatives have been turned into more general directions, in order to establish a base from which to work from. So each direction contains a specific type of waste and a method to create value from it. In addition, a sixth direction was added to provide a more complete range of what could be achieved.

6.2 DIRECTION 1 - ORGANIC A

6.2.1. What

The first direction identified is focused on organic waste. It uses an organic waste biodigester, which turns the waste into compost and biogas. Which could be used to grow food and to heat houses, see figure 6.1) An initial ideation in diagram form can be seen in figure 6.

6.2.2. Why

This direction was selected based on a number of things; The amount of organic waste present in residual waste, the ease for people to recognize and separate. Also, the biodigester provides a simple and straightforward way to turn organic waste into something of value.

6.3 DIRECTION 3 - ORGANIC B

6.3.1. What

The second direction is also focused on organic waste. Instead of using a biodigester to turn organic waste into compost, a wormery is used (figure 6.2). It uses compost worms to do so. This is another simple way to create something valuable from organic waste. The compost can be used to grow vegetables for example. An initial ideation in diagram form can be seen in figure 6.8.

6.3.2. Why

Basically the same rules apply for this direction as the first. It provides a very easy way to turn organic waste into something of value. It is however a cheaper and more approachable alternative to a biodigester. The biodigester does however have more output.

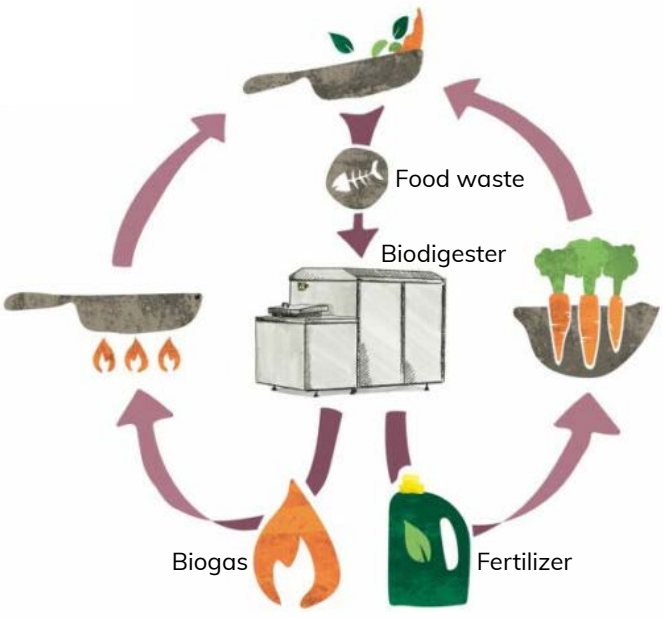


Figure 6.1: Biodigester (Landal, 2021)

Figure 6.2: Wormery (Wormenhotel, 2021)

6.4 DIRECTION 3 - PLASTIC

6.4.1. What

The third direction focuses on plastic waste and is inspired by the precious plastic initiative, see figure 6.3. This direction provides a way for the community to turn their plastic waste into something new and do it together. The idea is that people will hand in their plastic, it gets cleaned, shredded and turned into new products through various production methods. An initial ideation in diagram form can be seen in figure 6.9.

6.4.2. Why

This direction was selected to continue with as it is something the entire community could get involved in. Also, plastic is easy to identify and separate and there is a lot of plastic waste which can be used. In addition, the current problems with plastic worldwide provide a good motivation to do something with it.

Figure 6.3: Shredded plastic (Precious Plastic, 2021)

6.5 DIRECTION 4 - TEXTILE

6.5.1. What

Direction 4 aims at reducing textile waste. It does so by providing collection points which are connected to sewing shops and 2nd hand markets. For textile there are still a lot of options on what to do with it, the throw away clothing could for example also be used to create new clothing, see figure 6.4. An initial ideation in diagram form can be seen in figure 6.10.

6.5.2. Why

There is textile and clothing waste in abundance in the H-Buurt, which is easily recognized, so it is easy to separate. Also, clothing can often have a second life or can be repaired. So doing something with it on a local scale seems very achievable.

Figure 6.4: Textile upcycling - making new and valuable clothing out of old (and invaluable) clothing (Goods Home Design, 2021)

6.6 DIRECTION 5 - BULK WASTE

6.6.1. What

Direction 5 focuses on giving a second life to bulk waste. This waste mostly consists of wood and/ or old furniture. A community woodworking shop would be a good solution to create something new from the wood that is left on the street, see figure 6.5. An initial ideation in diagram form can be seen in figure 6.11.

6.6.2. Why

Although a lot of bulk waste gets left on the streets, it still holds a lot of value. Bulk waste is already an existing problem within the H-Buurt, so not only does it provide value, but it also solves a problem in the neighborhood.

6.7 DIRECTION 6 - UPCYCLE STATION/ REPAIR CAFE

6.7.1. What

The sixth direction provides a way for the community to separate or hand in multiple types of waste at one point, just like the 'grondstoffenstation' example in chapter . It combines a local recycle station with a repair cafe. So, you cannot only hand in your separated waste there, but you can also get products repaired. Amsterdam tested a similar initiative, see figure 6.6. An initial ideation in diagram form can be seen in figure 6.12.

6.7.2. Why

Instead of focusing on just one type of waste, this recycle point can facilitate multiple types of waste and act as a base to build and develop on. More people can get involved this way and there is more control by the community as they decide what to do.

Figure 6.5: Woodworking workshop

Figure 6.6: Recycle point (Gemeente Amsterdam, 2019)

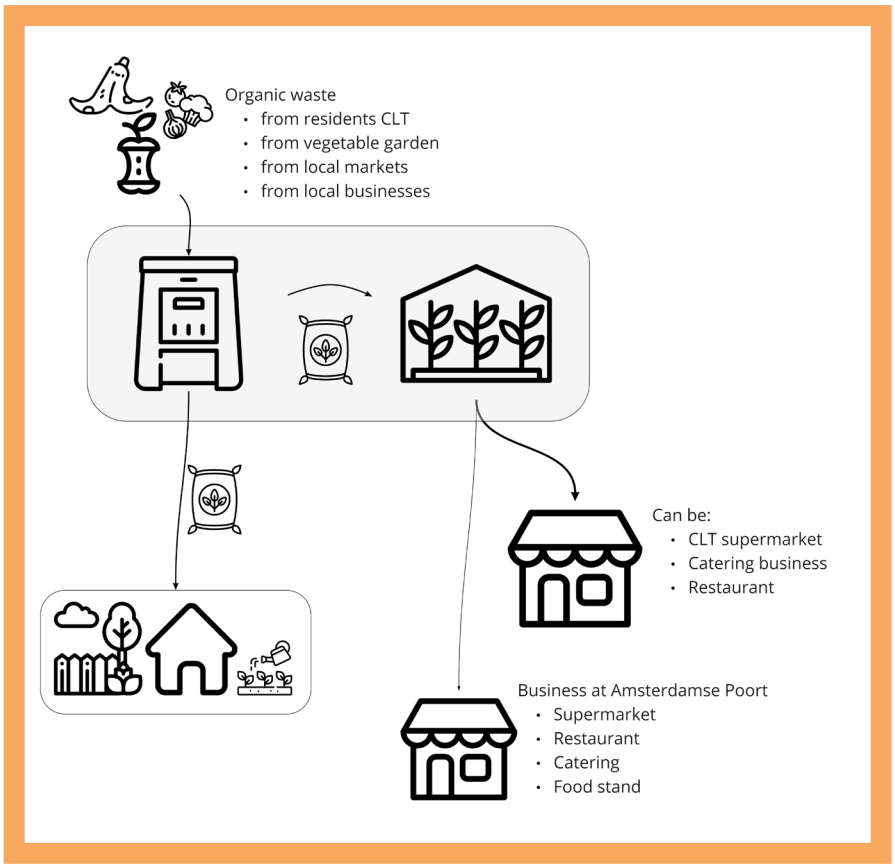


Figure 6.7: Initial ideation Biodigester

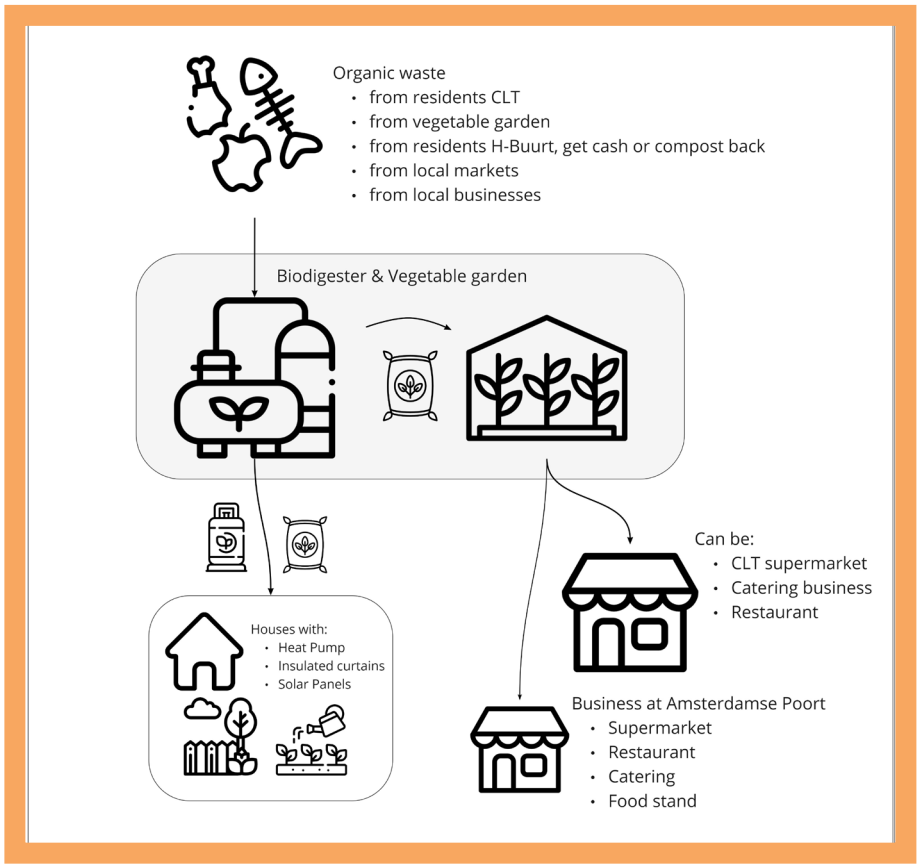


Figure 6.8: Initial ideation Wormery

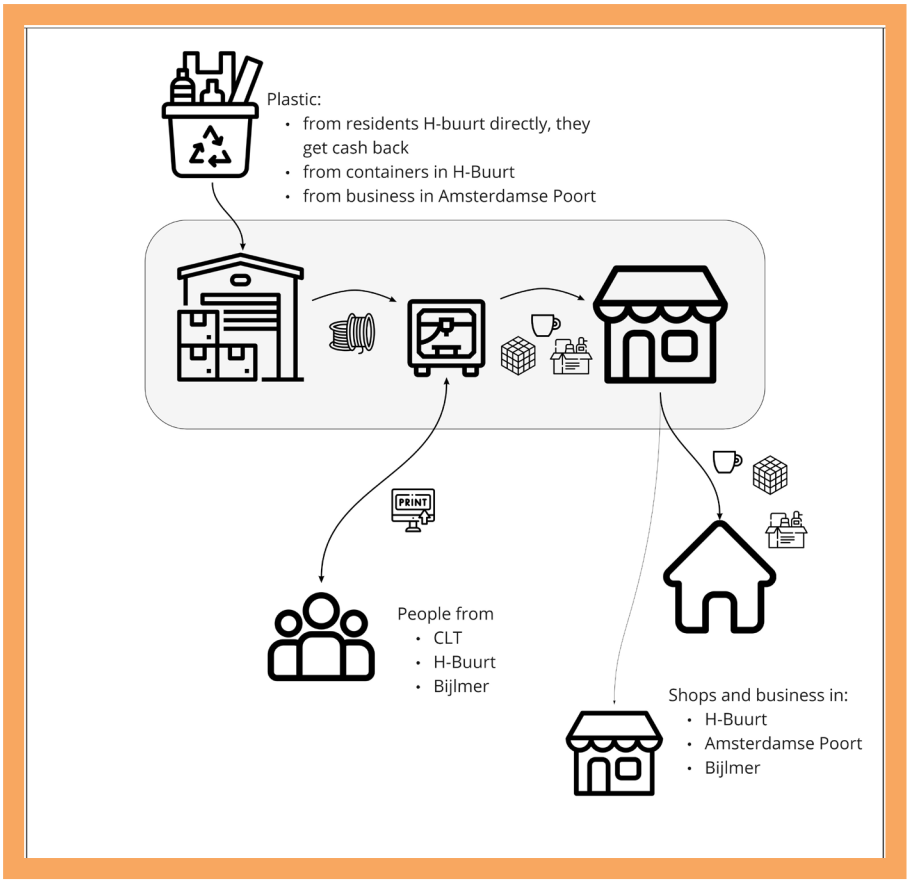


Figure 6.9: Initial ideation Plastic

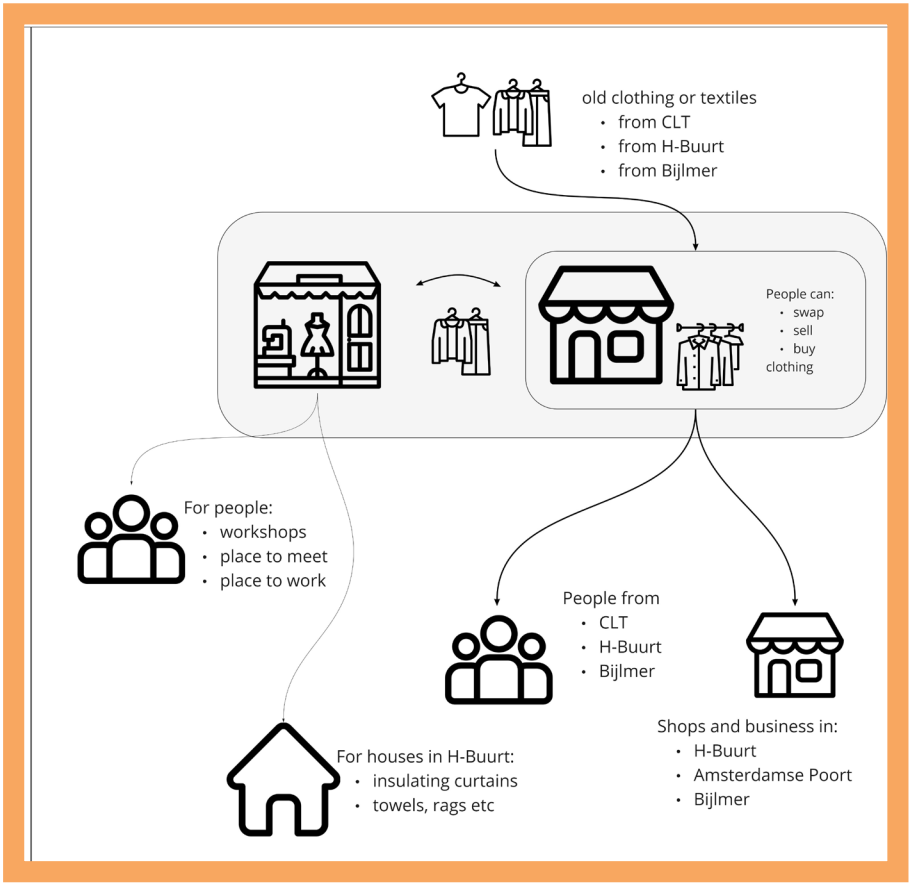


Figure 6.10: Initial ideation Textile

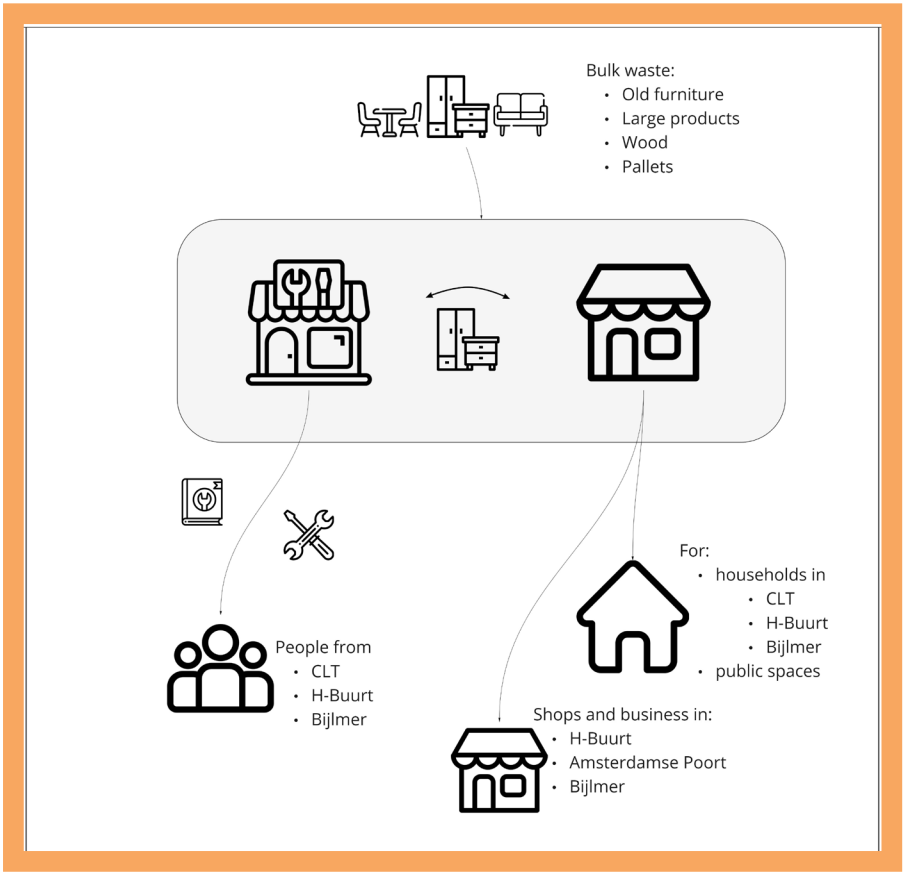


Figure 6.11: Initial ideation Bulk waste

Figure 6.12: Initial ideation Recycle station

Conclusion Sprint 1

Sprint 1 focused on exploring opportunities and finding initial directions for the challenges described in sprint 0. So, finding out what circular initiatives concerning waste and community are already out there and could suit the CLT community. From this exploration a list was made and based on criteria derived from sprint 0, six potential directions were selected. In addition, some good examples of projects which had a lot in common with this project were found to learn and draw inspiration from.

02 SPRINT 2

Create & Decide

Deep dive H-Buurt, initial concepts & Validate with community

CONTENT

Sprint 1 was concluded by providing six potential directions of development in terms of waste and process to create value from it. This provides a good starting point for sprint two, as the focus is on developing these directions into full concept ecosystems. The second goal of this sprint is to dive deeper into the H-Buurt and its residents, especially the CLT community. In addition, to further get to know the CLT community and validate the directions created so far, a session is set up with the community to test and present the concepts. This will provide the basis for sprint 3.

Conceptualise

Deep dive

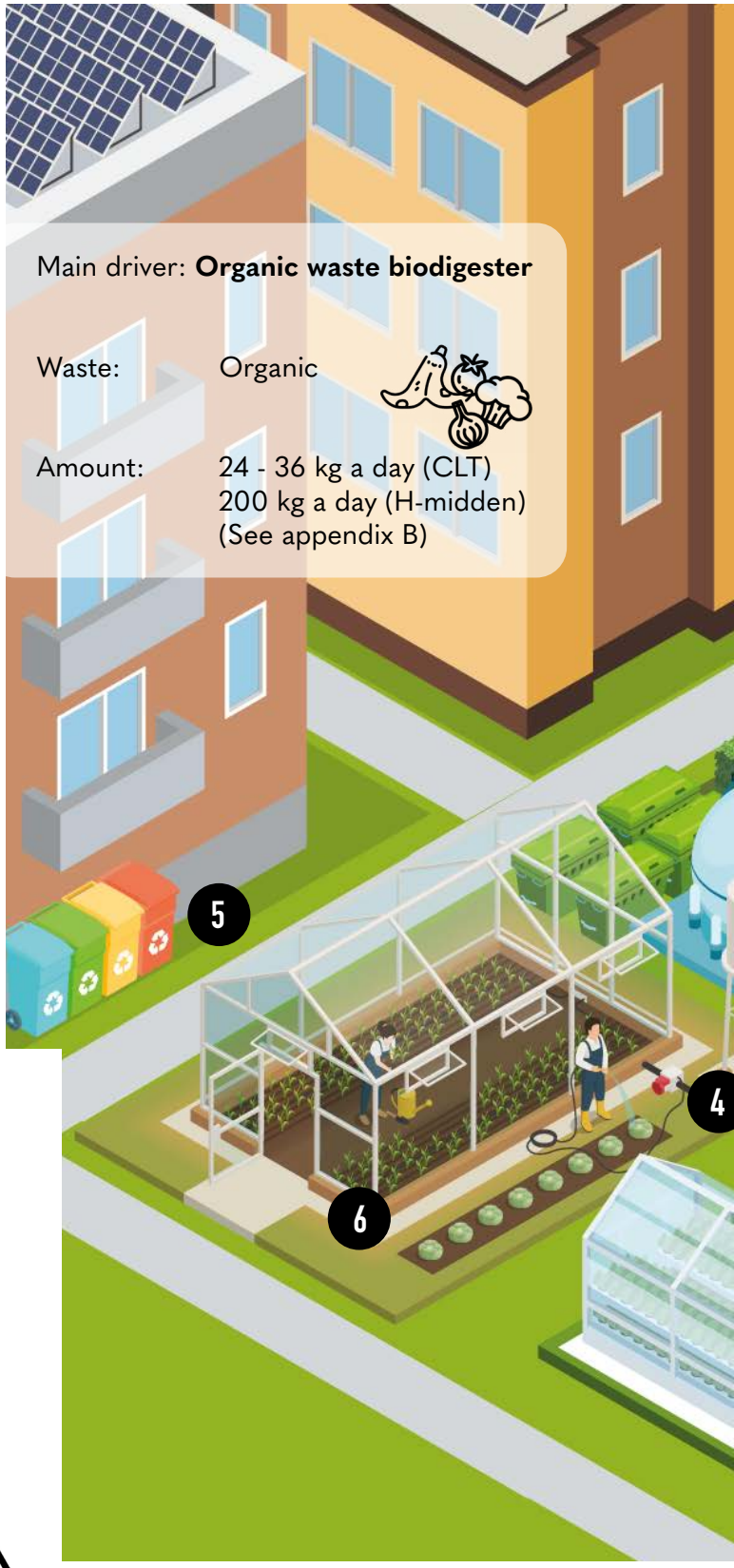
Validate

7 INITIAL CONCEPTS

Based on the directions presented in Chapter 6 initial concepts were developed. Initially, the current situations regarding the waste a concept focused on was examined. The focus of the development of the directions was on creating ecosystems which could create value from waste for and by the community. This was done by adding different elements to the initial directions and creating a process based on the elements added. This way a lot of opportunities and different levels of complexity of a concept could be explored. The exploration was achieved through brainstorming and ideation. For the waste calculations per concept see Appendix B

7.1 CONCEPT 1 – ORGANIC WASTE BIODIGESTER

Every year, the average Dutch person throws away roughly 140kg of organic waste (Milieu Centraal, 2018). Which is almost half of all the waste someone throws away in a year. While in a lot of cities and municipalities the possibility exists to separately throw away organic waste (CBS, 2019), this is not the case in most parts of Amsterdam including the Bijlmer (Het Parool (2), 2016). Although Amsterdam is planning to facilitate this in the future (Het Parool (2), 2020), there is currently no solution and a lot of material and money is going to the collection and deconstruction of waste. Residents pay a lot more for garbage disposal when organic waste must be separated(HVC, 2019), as they have a lot more garbage and they do not get the benefit of reusing/ recycling the organic waste themselves. So the following concept resulted.
This concept has an organic waste Biodigester at its core, combined with a greenhouse which contains a community vegetable garden and a professional vegetable farm. The biodigester transforms organic and food waste into biogas and high grade plant compost. Both the biogas and the compost can be used in the greenhouse. The biogas can be used to provide energy to the greenhouse, whereas the compost is used for growing fruit, vegetables and herbs, see figure 7.1 for the full ecosystem. The visual on this page show a representation of the concept with extra elements.



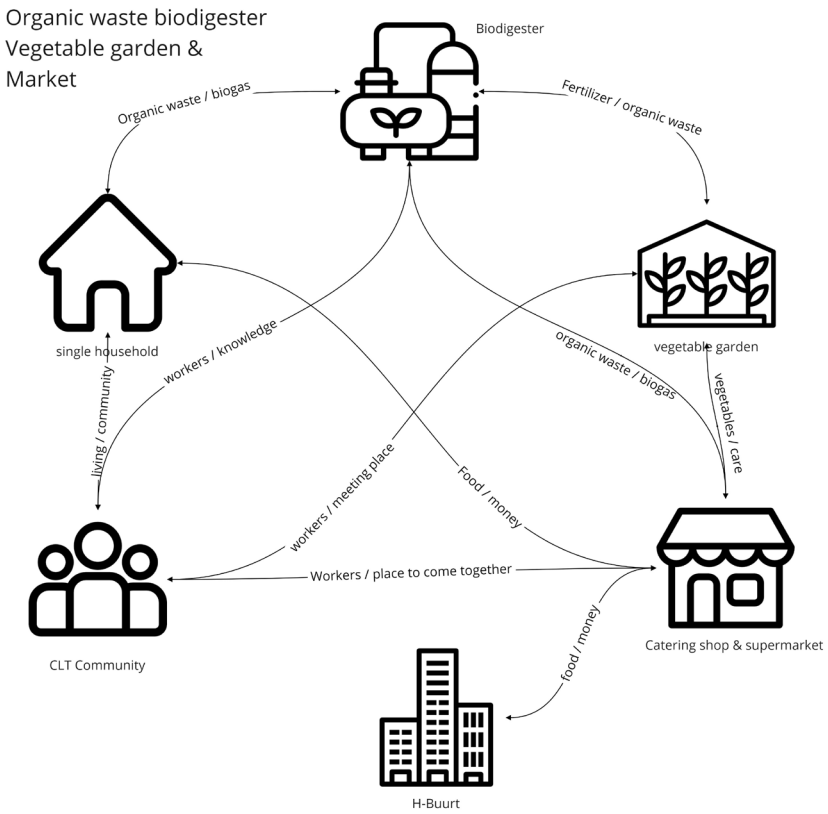


Figure 7.1: Biodigester ecosystem

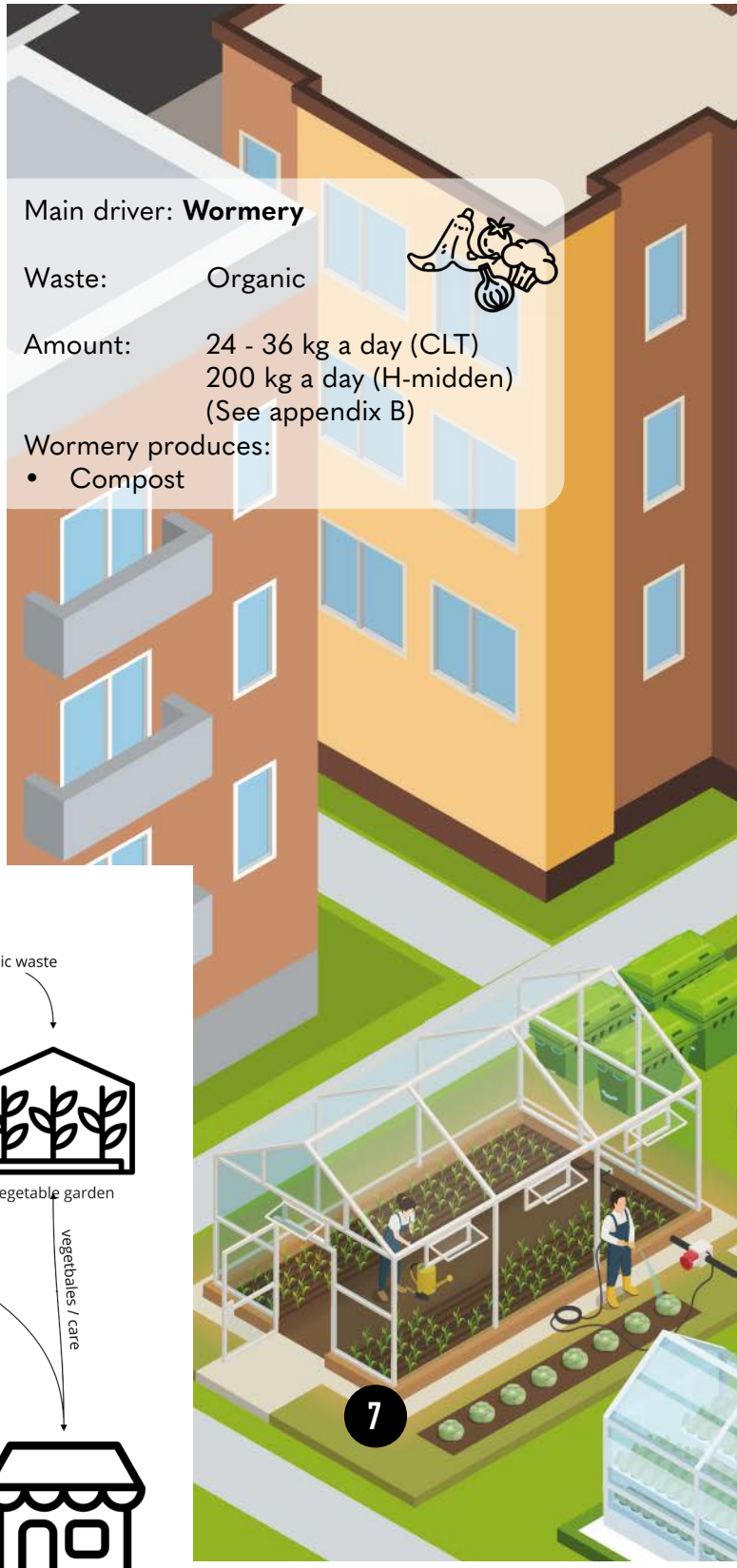
Elements of system:
1. Biodigester
2. Solar panels
3. Windmill
4. Water collection
5. Waste separation

Community:
6. Vegetable garden
7. Planthotel
8. Hydroponics
9. Farmers market
10. Flowershop
11. Vegetable shop
12. Outdoor Kitchen
13. Restaurant

7.2 CONCEPT 2 - WORMERY

The second concept is also focused on organic waste, so it solves the same problems as the first concept, but in a different way.

The basis of this concept is a network of wormeries or wormhotels, which turns organic waste into strong plant fertilizer using compost worms. The wormery is combined with a green house which houses a common vegetable garden and a professional vegetable farm. The main wormery will be located at the CLT but there will be multiple smaller wormeries spread across the H-Buurt. The fertilizer created in the wormeries gets diluted with water and is used in the greenhouse. For the full ecosystem, see figure 7.2. Also, the visual on the right shows a representation of what the concept could look like, with extra elements added.



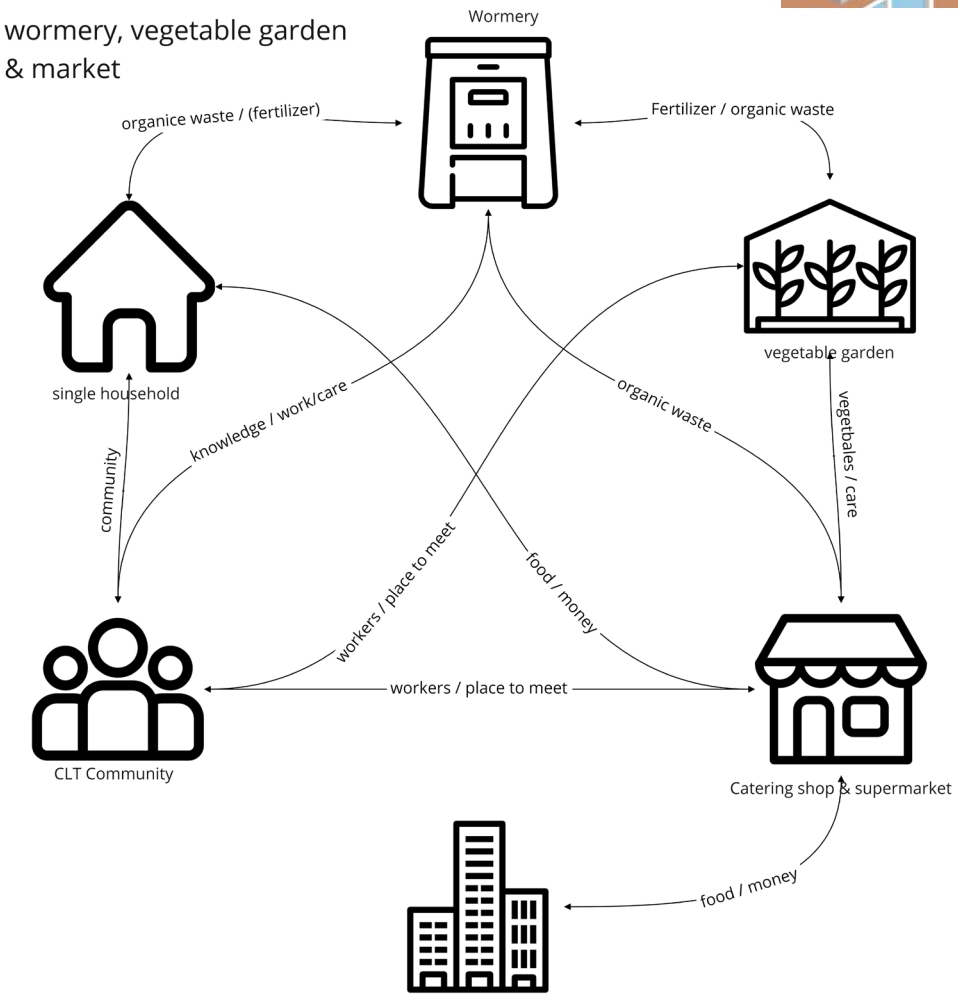
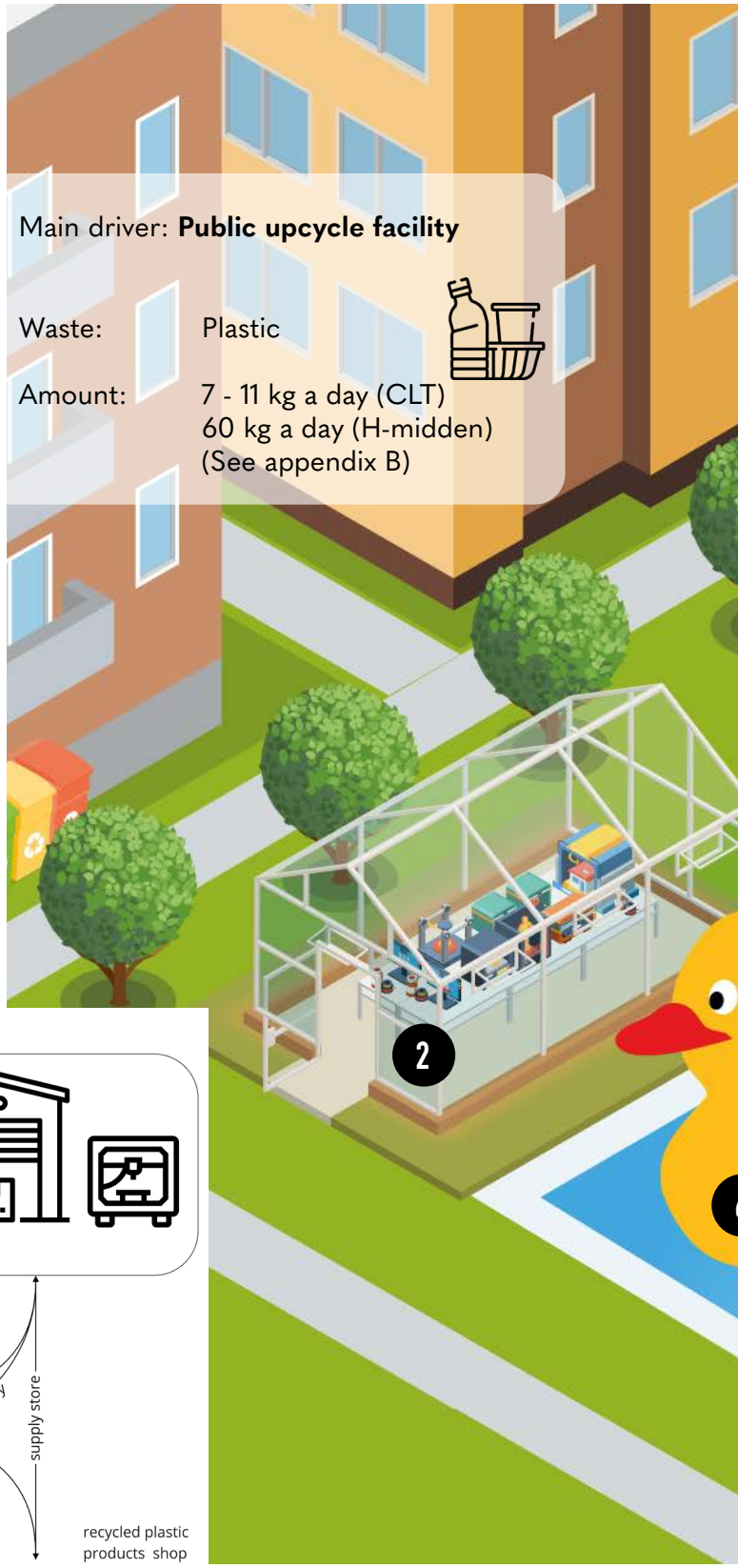


Figure 7.2: Wormery ecosystem

7.3 CONCEPT 2 - PLASTIC UPCYCLING

Every year the average Dutch person throws away roughly 24 kilograms of plastic of which roughly 65% or 16 kilograms has been separated. A lot of plastic products or solutions are only used once before they are thrown away. Resulting in a lot of plastic waste worldwide, of which a lot ends up in the oceans (NRDC, 2020). For a number of years municipalities have been facilitating separate collection of plastic waste which is also the case for Amsterdam There is however one problem; a lot of people do separate their plastic waste to a certain extent, but there are also still a lot of people who do not. (Het Parool, 2015). The issue here is that people do not see that there is still value in plastic after it has been used, which they can use to their advantage. (The Conversation, 2021). So to enable value creation from plastic waste the following concept has been developed.

The core of this concept is a plastic recycling facility. The residents bring their plastic and get a certain amount of money per kg. Then the plastic is recycled through a number of steps and remade into new products, which are sold in a shop attached to the facility.



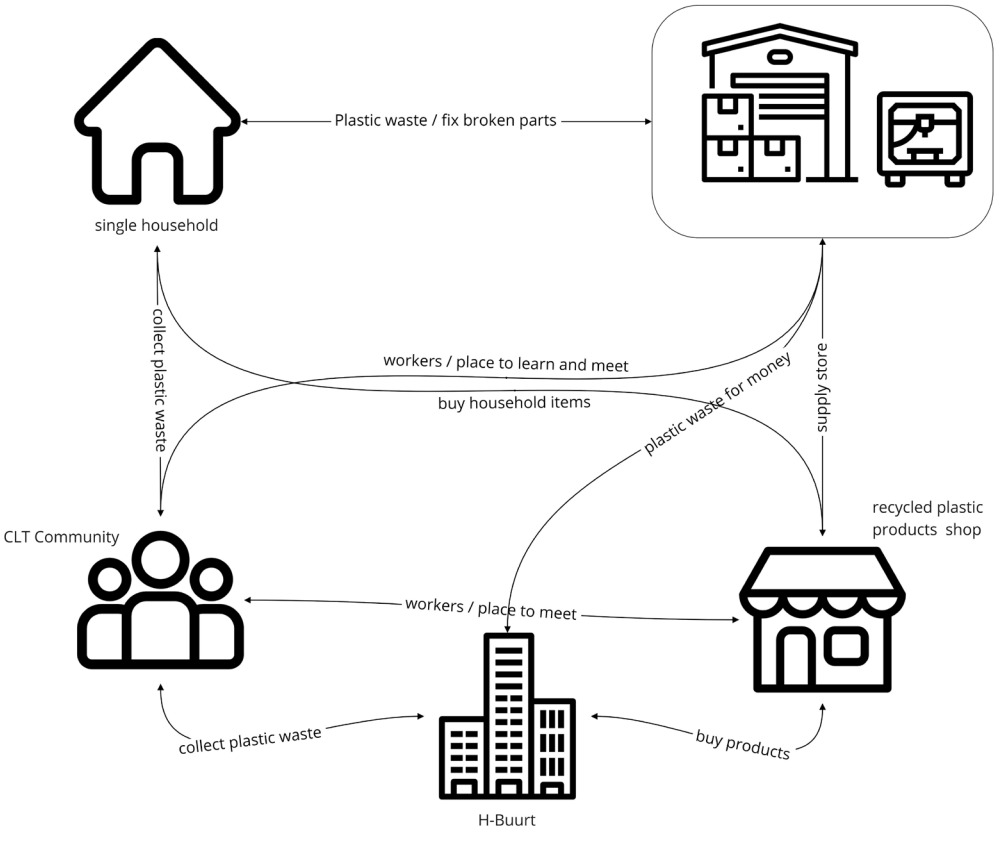
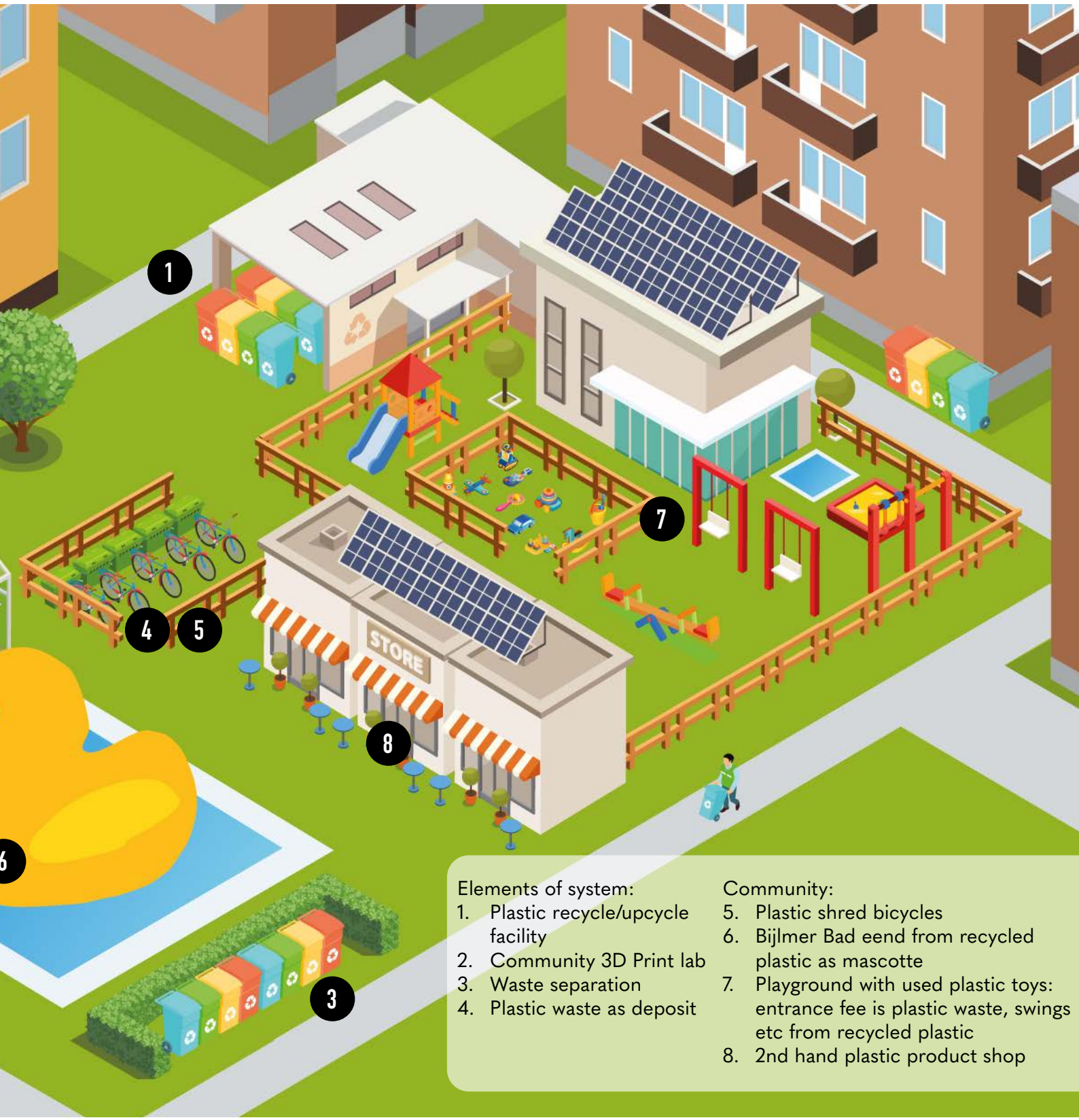


Figure 7.3: Plastic ecosystem



Elements of system:
1. Plastic recycle/upcycle facility
2. Community 3D Print lab
3. Waste separation
4. Plastic waste as deposit

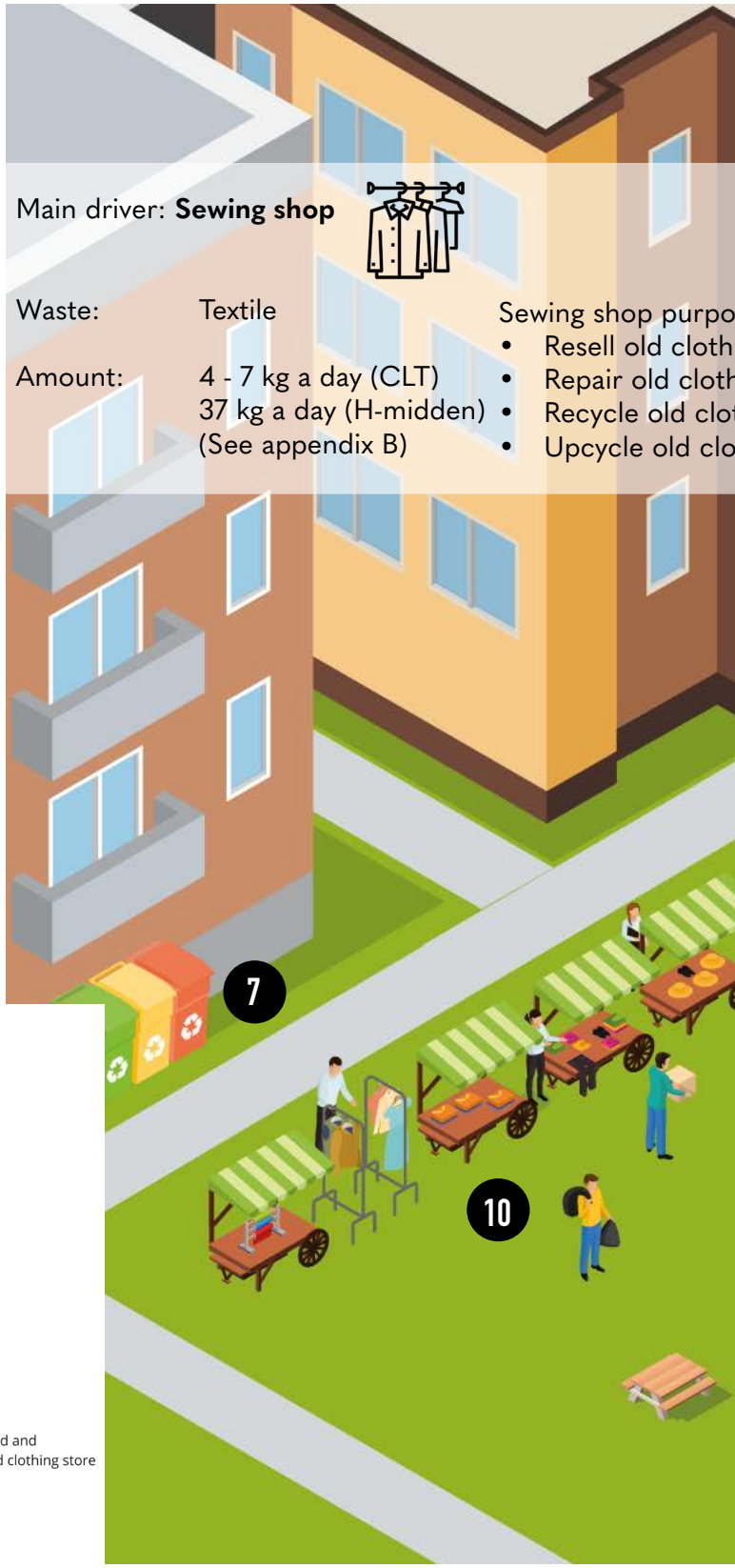
Community:
5. Plastic shred bicycles
6. Bijlmer Bad eend from recycled plastic as mascotte
7. Playground with used plastic toys: entrance fee is plastic waste, swings etc from recycled plastic
8. 2nd hand plastic product shop

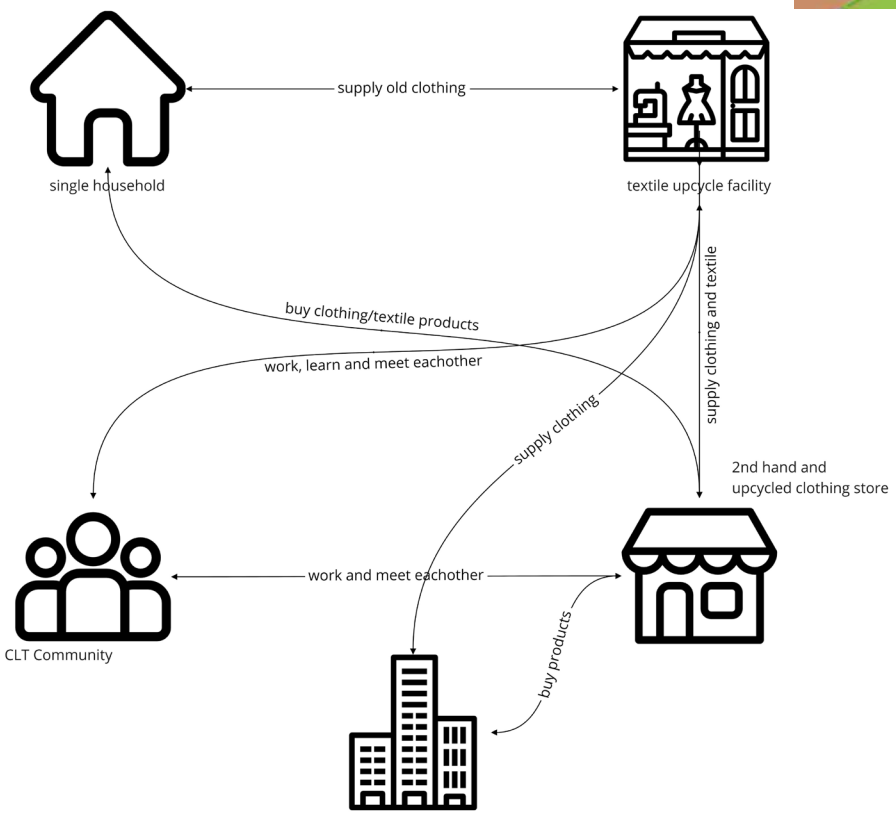
After the residents deliver their plastic waste, the plastic is cleaned, different types and colors are separated and ultimately shredded. The shredded plastic, called granulate, is used to make filament for 3D printers or can directly be used to make simple plastic products. The facility also has 3D printers, so residents of the community are able to make things and even sell them for profit. For the full ecosystem see figure 7.3. Also, a full visual representation with all options and possibilities for the concept can be found on this page.

7.4 CONCEPT 4 - TEXTILE UPCYLCING

Next to plastic, textile waste is also separately collected in the H-Buurt. Every person throws away roughly 18 Kilogram of textile a year. (Milieu Centraal, 2018). Although a lot of textile will be reused or recycled in some way, more than half is burned or landfilled (Wanderful Stream, 2020). This is a shame, as a lot of the clothing and textile can still be used, repaired or upcycled (CBI, 2020). Especially local use could be very helpful. Roughly 30% of people in the H-Buurt live in absolute poverty (Gemeente Amsterdam (2), 2020), so they are not able to buy clothing they might need and making sure useful clothing stays within the community could be very helpful.

This concept focuses on clothing and textile. The textile upcycle facility is a place where you can hand in old clothing, which then either gets repaired, recycled into new textile or put into the second hand shop and swap shop. So the residents are able to save money when buying clothing. In addition, a sewing atelier is present, clothing gets repaired and made here, but it also serves as a place where people from the community can come together and learn how to sow. The full ecosystem can be seen in figure 7.4. Also, a visual representation, with all the elements and extra opportunities can be found on this page.





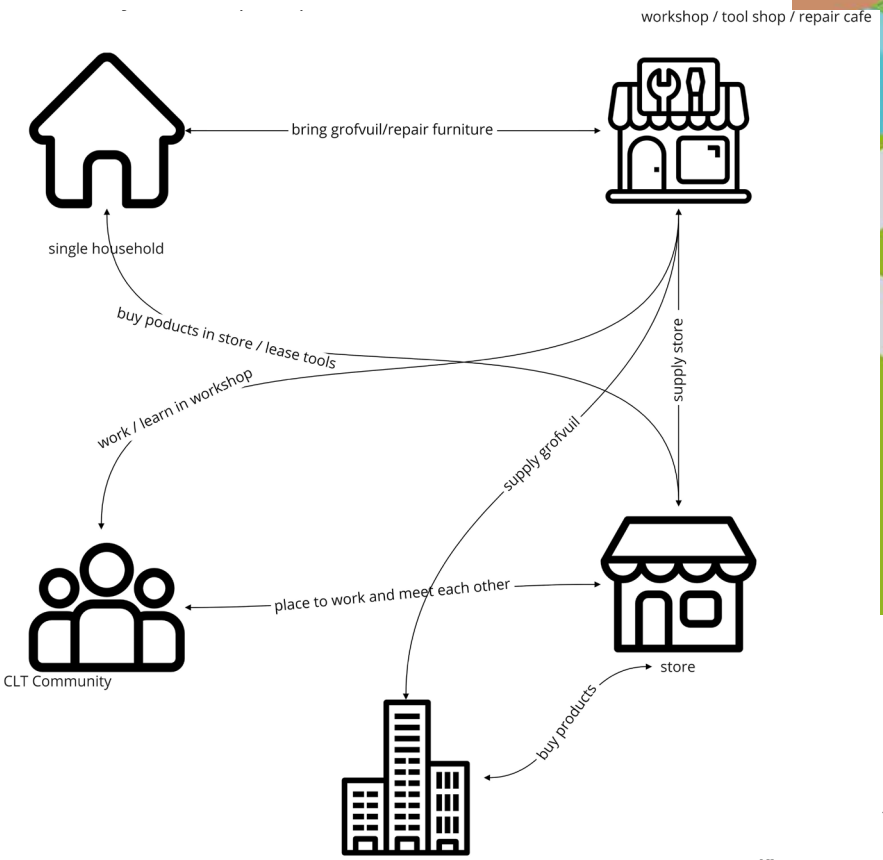
7.4: Textile upcycling system


Elements of system:
1. Sewing shop
2. Repair shop
3. Recycle/Upcycle Facility
4. 2nd hand shop
5. Clothing rental
6. Bijlmer Fashion label
7. Waste separation
Community:
8. Laundry shop
9. Dry cleaning
10. 2nd hand market
11. Swap shop
12. Textile market
13. Sport outfits & facility
14. Workers clothing for businesses
STORE
FASHION
LAUNDRY
1
2
3
4
5
6
8
9
13

7.5 CONCEPT 5 - WOODWORKING WORKSHOP

One of the problems in the H-Buurt is the amount of bulky waste, such as broken furniture or large products, which are put on the streets at inappropriate times and places. . Although communication around bulky waste placement and collection in the H-Buurt is very clear , it still happens often (Het Parool, 2016). Every year the average Amsterdam resident produces roughly 68kg of bulky waste (CBS Statline, 2020). So in order to do something useful with the bulky waste found in the neighborhood, the concept of a community workshop, to repair or reuse the bulky waste, has been developed.

The core of this concept is a community workshop with a woodworking facility with tools and machines to make and repair furniture. Bulk waste from the H-Buurt is collected, disassembled or repaired and put up for sale. In addition, the workshop provides the residents with a place to work on their own projects, repair their furniture and store their tools. Sharing tools is also possible through a leasing system. The community workshop provides the residents with a cheaper and more sustainable option to buy furniture for their house, but it can also be used to supply schools or other businesses in the neighborhood with furniture (Figure 7.5). A visual representation, with all the elements and extra opportunities can be found on this page.

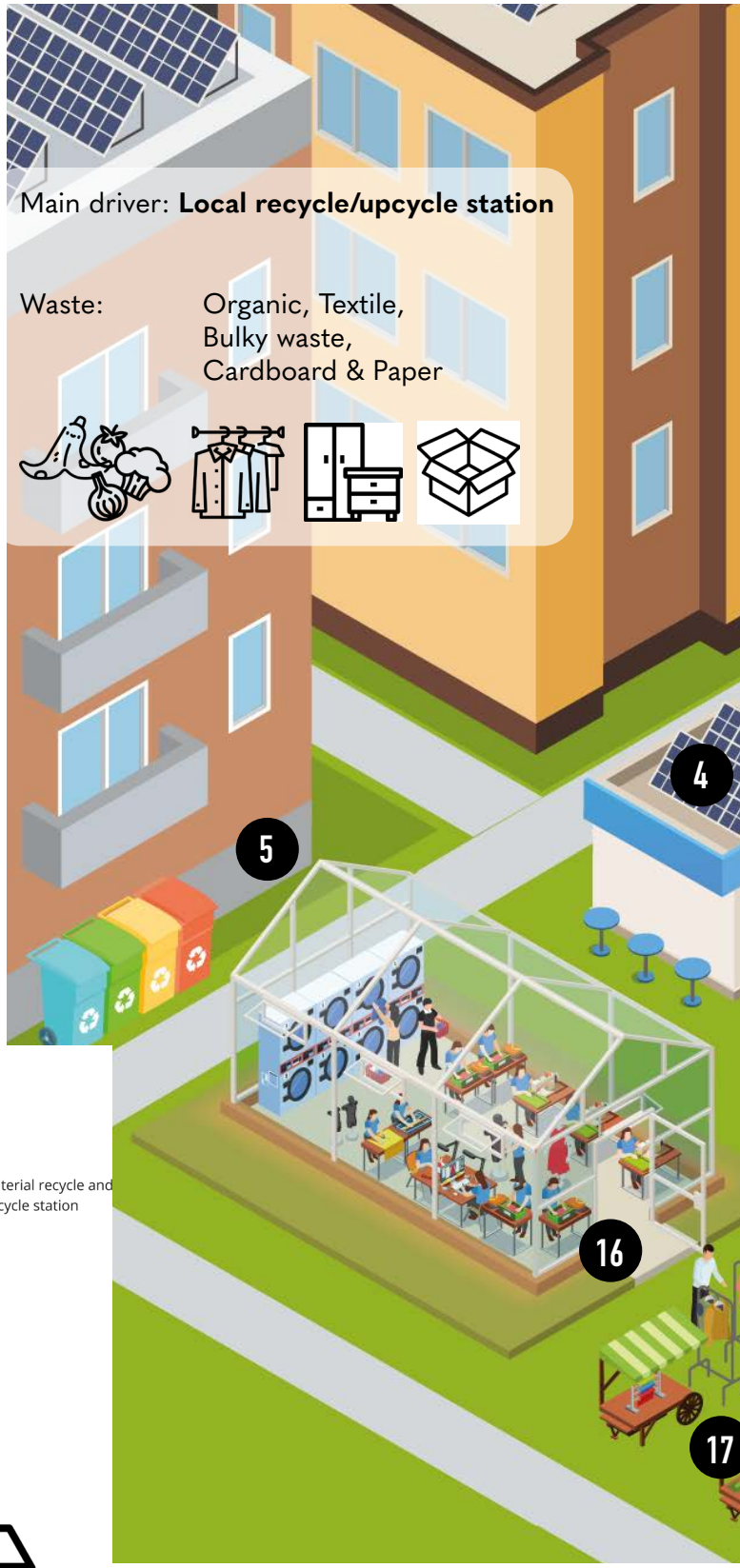


7.5: Woodworking workshop system


Elements of system:
1. Woodworking shop
2. Toolshop
3. Tool lease service
4. Furniture Rental to: Houses, Schools, Businesses
5. 2nd hand/vintage shop
6. Bulky waste collection service
7. Outdoor furniture fabrication
Community (made from recycled wood):
8. Treehouses
9. Playground
10. Skatepark
11. Outdoor Furniture
12. Bijlmer Burning Man
STORE

7.6 CONCEPT 6 - UPCYCLE STATION

Although the municipality of Amsterdam provides the opportunity to separate different waste streams, the majority of waste ends up in the residual waste containers (Metabolic, 2018). In order for the City of Amsterdam to achieve the goal to become fully circular in 2050 , they have to make sure all waste material is separated in order to use it as a resource again. The problem here is either that people do not see the value of waste separation, are not able to separate waste or don't have knowledge and ownership of what happens to their waste once it leaves their house (Milieu Centraal (2), 2021). In order to combat this problem, make the processing of waste more visible and promote separation of waste, a local recycle and upcycle station concept has been developed.
The core of this concept is a recycle and upcycle station where multiple waste streams can be collected, recycled, upcycled and reused. The upcycle station consists of a waste separation area, where residents can hand in and separate their waste, a 2nd hand shop, a biodigester for organic waste and a woodworking shop. The rest of the waste that is collected gets picked up by the garbage disposal services for recycling. Figure 7.6 shows the basic ecosystem. A full visual representation of the concept with extra opportunities can be found on this page.



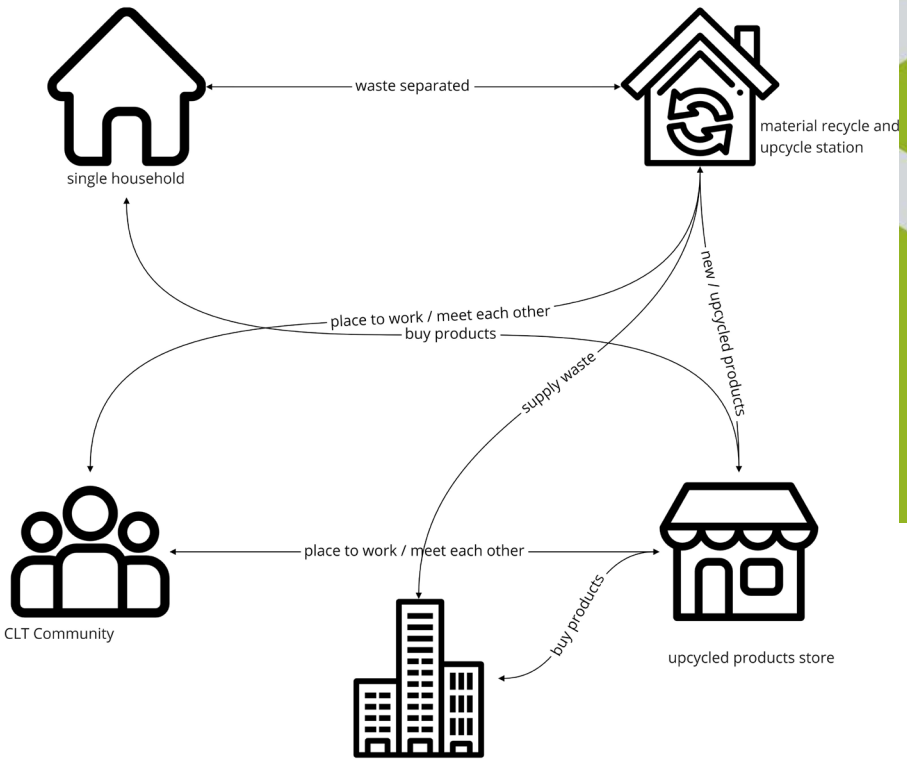


Figure 7.6: Upcycle station system

Elements of system:
1. Recycle/Upcycle station
2. 2nd hand store
3. Biodigester
4. Solar panels
5. Waste separation

Community:
6. Vegetable garden
7. Vegetable shop
8. Farmers market
9. Restaurant
10. Outdoor kitchen
11. Woodworking shop
12. Tool lease service
13. Furniture rental
14. Skatepark
15. Playground
16. Sewing and laundry shop
17. 2nd hand clothing market

8 H-BUURT & CLT COMMUNITY DEEP DIVE

8.1 INTRODUCTION

A basic understanding of the H-Buurt and its residents was obtained during sprint 0 (see Chapter 3). This chapter covers more research into the H-Buurt, its residents, communities and the CLT community in order to create a full image of the current situation. In addition, a target audience is chosen, to create a specific focus for the project.

Figure 8.1: Resident H-Buurt

8.2 GOALS

The general goal of this chapter, as stated, is to create a better understanding of the H-Buurt and especially of its residents. To be more specific, questions are set up to guide the research process. The questions are as follows;

- Who lives in the H-Buurt?
- Which cultures are present?
- How do they live their lives?
- What communities are present?
- What are the needs and wishes of the residents?
- What are their struggles?
- Who are the people of the CLT?
- What is their culture and background?
- What are their needs and wishes?
- What is the general stance towards circularity and sharing?

8.3 SET-UP

In order to be able to answer these questions, research was performed. Starting with desk research, which included reading papers and articles, looking at videos and listening to podcasts. In addition, other projects taking place in the neighborhood were studied and neighborhood communities were explored. After the research, the findings were collected and based on the findings personas and a possible scenario were created.

In addition to the desk research, the research and findings of other graduate students working for CLT were taken into account. This includes research by Elvira Kok (Strategic Product Design, TU Delft), who did interviews with CLT members focusing on sharing and circularity concepts and research by Irosha Driessen (Master of social work, Hogeschool Utrecht), who did intake interviews with a large part of the CLT community.

8.4 DESK RESEARCH

The desk research covers the topics: residents and demographics, Problems in the neighborhood (social & physical), Needs and wishes of the residents and the plans of the municipality for the area and the projects and initiatives currently taking place. The elaborated text and extensive results can be found in Appendix A.

8.5 RESULTS SUMMARIZED

So far the performed research has provided a good view of the H-Buurt and its residents on surface level. The main problems are social problems concerning, health, poverty and loneliness and the physical problems mainly having to do with facilities and public space. On the positive side, the municipality is putting more effort and resources in the development of the H-Buurt. Also, there are multiple social initiatives currently active in the H-Buurt aiming to help the residents.

Based on the findings, a possible scenario for a young resident of the H-Buurt is set up, along with a set of personas. This summarizes the research results and has been made to provide a better understanding of the target group. These can be found in Appendix A.

8.6 RESEARCH OTHER STUDENTS

As mentioned, a couple of other students are also involved in the CLT project, and are doing graduation assignments. One of the things they have been doing is intake interviews with members of the church and the CLT community. The goal of these interviews is to get to know the people in the community, and to find out what their needs and wishes are.

8.6.1. Intake interviews by Irosha

Irosha is a student of social anthropology, her focus is on creating a good community within the CLT. So, among other things, she has done intake interviews with members of the CLT. The goal of these interviews was to get to know them better, see what knowledge, expertise and talent was present within the community, but also to find out what their needs and wishes are for the community and neighborhood. In total she spoke to 27 people, from all different ages, within the range of <17 to people older than 50 years old.

Expertise in neighborhood

The interviews of Irosha proved to be very insightful. The main takeaway was; a lot of people are willing and open to help or do something within the community. In addition, a lot of people are interested in doing something with food, are interested in clothing and fashion or want to organize events. Also, a lot of people are just interested in helping others or helping the community forward in general. So, not only is the community willing to do something, the basis to actually do it is there as well. For all of the intake interview data, see appendix A.

Wishes and needs

Next to information about the people that are part of the community, their wishes and needs were listed and clustered in the intake data. After everything was clustered, four main needs were found. These are;

- Better living conditions,
- More focus on community,
- More guidelines and inclusivity
- Better neighborhood facilities.

For the full list and explanation of the main needs and wishes see appendix A.

8.6.2. Interviews by Elvira

Elvira recently graduated from the study of strategic product design, her project focused on creating a toolkit for active participation of residents in a CLT. Part of her research was also doing interviews with members of the community. The focus of these interviews was on presenting circular use-cases and getting feedback on those. These use cases include a community garden, shared washing machines and tools, lease facade and modular buildings.

From the interviews it became clear that people are interested in circular initiatives and are willing to share things with the community. One thing people would see as an issue with sharing things is trust. From past experiences some people do not easily trust others, as they say that people are selfish and won't leave anything for the community. In addition, they would want to see that these initiatives become places for people to come together and strengthen the community.

8.6.3. Interview with Moses

Moses Alagbe is the priest and leader of the MCTC. He has been there for over 15 years so he knows a lot about the community and about the problems in the H-Buurt. To get to know more and validate the research done so far, an interview with Moses was done, see figure 8.2.
Similar questions were asked to Moses as discussed in chapter . To summarize the interview; Moses validated what was found in the research so far. Getting to know Moses actually provided a way to get in contact with the community itself. As through Moses, an appointment was made to do a test to validate the selected directions with the community after a church service.

Figure 8.2: CLT members in the vegetable garden (Moses Alagbe on te left) (Amsterdam Donut Coalitie, 2021)

8.7 OVERALL FINDINGS

Based on the research done by the other students and the interview with Moses, some conclusions can be made. The intake interviews provided the information that there is a willingness and interest to do something with food, clothing and organizing events within the CLT community. In addition, it was discovered that there is a need for housing, community, support and neighborhood facilities. Lastly, the community sees value in sharing and doing things together.

8.8 CLT COMMUNITY

The CLT community mostly consists of people who also attend the church service at the MCTC. There are a lot of different cultures present in the community, just as there are a lot of different cultures in the H-Buurt. Although these different cultures exist, the people come together through Christianity. Most of these people have a non-western background and mostly come from countries in South America such as Suriname, but countries from sub Saharan Africa are also well represented. To overcome the language barrier, the church service is done in English.

8.9 TARGET GROUP

The initial goal of the project was to facilitate a solution for circular waste processing for the CLT Community. However, during the research the focus widened to also include the entire H-Buurt. Although the research has provided a lot of good results to base development of a solution on, there are also some difficulties in such a wide focus. The research so far has pointed out that there are a lot of different cultures present in the H-Buurt, which makes it quite difficult to create a solution which suits everyone. In addition, within the time period of the project it is challenging to talk to a good representation of the H-Buurt residents, also taking the current measures regarding Covid-19 into account. So, the focus needs to be narrowed down in order to create something of value and achieve the goals set for the project.

The narrowed down goal of this project is to focus primarily on the CLT Community, instead of the whole H-buurt, as was initially also the goal. This is done in order to create a solution and achieve the goals of the project. However, the aim is that the solution would still be of value to the entire H-Buurt in the long term. See figure 8.3.

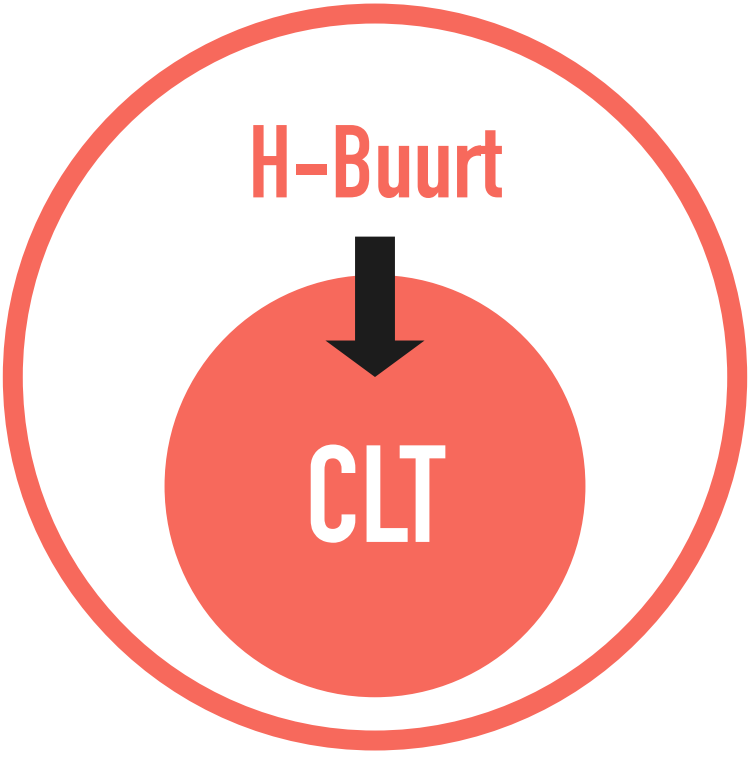


Figure 8.3: Focus shift from H-Buurt to CLT

9 FIELD TEST & VALIDATION

After initial research and concept development, it is time to start involving the community more. It is important to find out the actual value to the residents, as ultimately, only when they will see value in a concept, it will work. A test was developed to get the opinions and vision of the community on waste, waste separation and re-using/recycling.

9.1 GOALS

The goals of the test were as follows; find out what is most important to the residents in terms of waste, recycling and waste separation. In order to be able to set up criteria for concept selection or ultimately be able to choose a promising concept to develop further.

9.2 SET-UP

To get to know what the preferences and habits of the H-Buurt community were, some main topics for questions were set up. These were the following; waste separation, which waste material is perceived to be of value and which circular waste concept is perceived to be valuable to the community. The questions were based on the waste types and concepts developed so far. To make it more straightforward, only one organic waste concept was used and the upcycle station was also not included.

An interactive test was set up. The test set-up is as follows; a question and multiple answers are (visually) presented to the participants, using a printed board (see appendix D). To answer the question, the participant grabs a bottle related to the question (1 to 3) and puts it in a garbage bin related to the answer (A to E)(see figure 9.1). Ultimately this will determine what is most valuable to the participants. In addition to getting quantitative results, the test also facilitates a way to talk to the participants about what their preferences and habits are.

The test is executed after a church service at the Maranatha Community Transformation Center (MCTC) in the H-Buurt. This is where the idea for the CLT H-Buurt originates and is run from. Most of the members of the church are also members of the CLT community. So the majority of the target audience is represented by doing the test this way. The test happened outside of the church as it needed to be executed at 1,5 m distance. Doing the test after the church service allows for an efficient and convenient way to reach a lot of people from the community in a relatively short time.

The full test setup can be found in appendix C, the eventual props used during the test can be found in Appendix D.

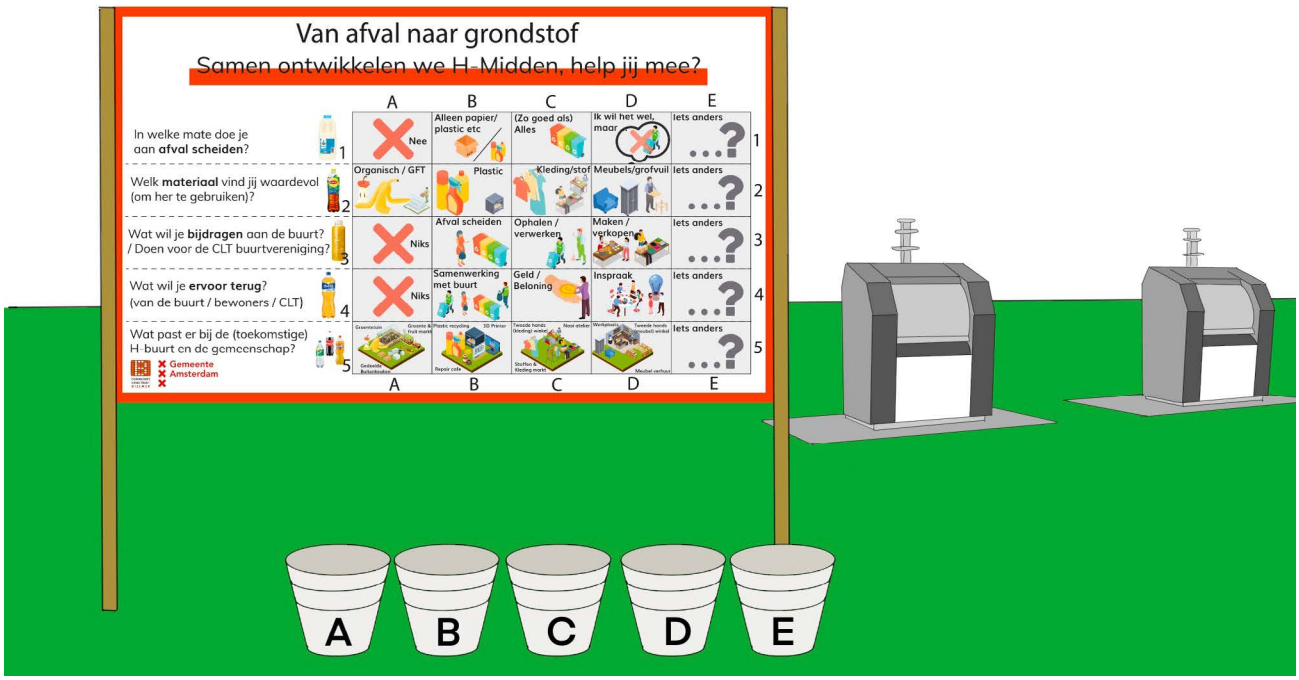


Figure 9.1: Test set-up

9.3 EXECUTION

On the day of the test it went differently than planned, but nonetheless there were some good conclusions and results. Moses, the leader of the church, got people to gather outside in order to do the test. This is where the decision was made to turn it into a group session instead of doing it one person at a time. In addition, while presenting the questions and answers to the group of people, it more or less became a discussion on the topics represented by the questions and answers. A lot of explanation was necessary to get the ideas, concepts and opportunities across, but once explained, the people engaged in conversation and also started to come up with ideas or examples which could be suitable in the neighborhood and what they would like to participate in, see figure 9.2 and 9.3. Due to the cold, people did not want to stick around for a long time so the test was cut short after the questions were answered and the discussion was over.

Figure 9.3: Field test 1.1

Figure 9.3: Field test 1.2

9.4 RESULTS

During the test it became clear what the biggest obstacles were for waste separation, which types of waste the community saw the most potential in and ultimately which concepts were the favorites and would suit the neighborhood best. In addition, some other valuable discoveries were made.

9.4.1. Waste separation

First of all, when asked about separating waste, it became clear that a large part of participants are already doing so with some types of waste. Mainly cardboard, glass and plastic. Although, when asked what the participants see as barriers to separating waste some interesting answers were given. Space, distance to a container and smell are the three main barriers of the participants. First of all, some people do not have enough space in their houses to have multiple garbage bins in their homes. Second of all, people find the distance to the outside containers for specific types of waste too long, because they do not want to walk far in order to be able to separate waste. Last of all, dirty smells are an issue for people who separated organic waste.

When doing research on barriers for waste separation, specifically for highrise buildings, similar reasons were mentioned (VANG, 2020).

9.4.2. Type of waste & concepts

When asked which types of waste and concepts concerning these types of waste would be valuable and suit the community and neighborhood, the participants were quite certain. Both organic waste and textile waste are seen as most valuable, while plastic waste and bulk waste are seen as not valuable at all. Interestingly, both of these concepts already have a certain foundation within the community. There is a shared vegetable garden (H-Midden Amsterdam, 2020) next to the MCTC and there is a sewing group as well (CIP, 2019). So, the main takeaway here is; build on what already exists or is recognized in the community. The people already know the vegetable garden and sewing group and see it as something of value, so it is important to build on this and develop it further.

9.4.3. Other insights

What also became apparent during the discussion has to do with the knowledge necessary to set up or maintain these types of initiatives. A lot of the things presented were new to the participants. They simply do not know what is possible when it comes to waste separation or never thought about it before. An aspect of the solution should concern learning about circular initiatives or at least opening the eyes of the community to the possibilities with waste and the value still present in it.

Conclusion Sprint 2

Sprint 2 focused on developing concepts based on the directions selected in sprint 1. It also focused on diving deeper into the H-Buurt, CLT and its residents. In addition, a test was done with the community to see what they value and narrow down the options. So six rich concepts were developed which explored and presented a lot of opportunities per type of waste. From the deepdive the main takeaways were the following: there is willingness within the community to undertake something with food, clothing and organizing events. In addition, they are open to doing something with the circular economy. Finally, from the test the main takeaways are that the community sees value in organic and textile waste, but that there is also a lack of knowledge on what is possible. In addition, some main hurdles for waste separation were discovered.

03 SPRINT 3

Develop & Test

Concept development, current situation CLT & validate with community 2

CONTENT

The trajectory and takeaways of sprint 2 serve as a basis for sprint 3. The goal is to go one step further in development of the organic and textile waste concepts, based on the feedback from the session at MCTC (see chapter 9). In addition, more research into the community and the current situation at the vegetable garden and sewing group was done, to help concept development. Lastly, another session at the MCTC was organized, based on the first session. Based on the feedback of this session, the fourth sprint is initiated.

10 CONCEPT DEVELOPMENT

The previously conducted research in combination with the session at the MCTC provides a good base to continue development of a solution. The biggest takeaways being; the CLT members have the need for;

- Company
- Inclusive community
- Support
- Perspective for youth
- Good neighborhood facilities or events

In terms of waste and recycling the biggest takeaways are the following; organic and textile waste are seen as most valuable and initiatives related to both are already present, transparency and providing the right information and education is key, as a lot of knowledge on the subject is lacking.

Based on this information the choice was made to develop the concepts related to organic and textile waste further, with the focus on building on what is already present in the community and making the process related to the concept as simple and transparent as possible.

In addition, a business model, organizational model, residents perspective, opportunities for the concepts and projections for what could be done in the near future (2 years) and what could be done in the far future (10 years) are also covered.

10.1 CRITERIA

To guide the development process of the concepts, criteria for near future and far future are set up. The criteria are based on the results of the research and validation session (see chapter).

Near future
The solution has to:
- Continue on what exist within the community
- Have an educative function
- Appeal to younger and older generations
- Be easy and cheap to implement in the current situation (minimal resources)

Far Future
The solution has to:
- Bring the community, cultures and generations together
- Create opportunities and jobs for the younger generations in the H-Buurt
- Be a place for inspiration, education & role models
- Be sustainable for the community

The concept for organic waste consists of 4 different elements. Namely a compost area, a vegetable garden, a food stand for farm vegetables and fruit and an event related to food and meals.

10.2 ORGANIC WASTE

10.2.1. Elements & Process

So it builds on the vegetable garden that is now in use at the MCTC, but puts the focus on the community using a specific organizational model and a different purpose for the vegetable garden, which allows everyone to take part and benefit. In addition, a specific compost area and a food stand are added. The concept is based on a guide from Wageningen University Research on how to set up a neighborhood vegetable garden (WUR, 2014).

Compost area: the compost area consists of organic waste containers and a compost pile. By enabling residents to throw away their organic waste in the container first, the compost pile can be managed better in order to create good compost in a short time.

Vegetable garden: this is the heart of the concept, the compost from the compost area is used here to grow plants and fertilize the soil. The vegetable garden is set up with different areas for specific purposes. The area close to and including the greenhouse is for seeding and initial growth of the plants. The plant beds are used to grow the plants further per species, until they are ready to harvest.

Farm food stand: After harvesting this is where the food gets sold to the community. In addition, the community is also able to get food by handing in a certain amount of organic waste or by helping out in the garden.

Lastly, a food or catering stand; this is where part of the food from the vegetable garden goes to. This food stand can be used as a social gathering place for the community and a place where larger events like a neighborhood barbecue could be organized.

A visual representation of the process and elements is seen in figure 10.1.

Figure 10.1: Organic waste concept

10.2.2. Business Model

Although making money is not the main objective for the concept, a business model is made, see figure 10.2. Instead of highlighting money, it is about value streams. In the centre of the business model is the vegetable garden and composter. In order to create value with it, the community needs to put in work, time and effort. In return, they get food, knowledge on farming, community and some form of control over the farm. On the other side, the food is used for the MCTC, neighborhood events and a food stand or catering business. On this side the money is made, especially through the food stand. Of course, in return the vegetable garden receives the organic waste from the above mentioned instances, so it can create compost from it again.
The expenses are the following; waste containers, garden equipment, parts for a small DIY greenhouse, seeds, water, soil. Although these expenses might be a lot for the community right now, they are specifically there to increase yield and allow the community to sell more vegetables and earn back the investments.

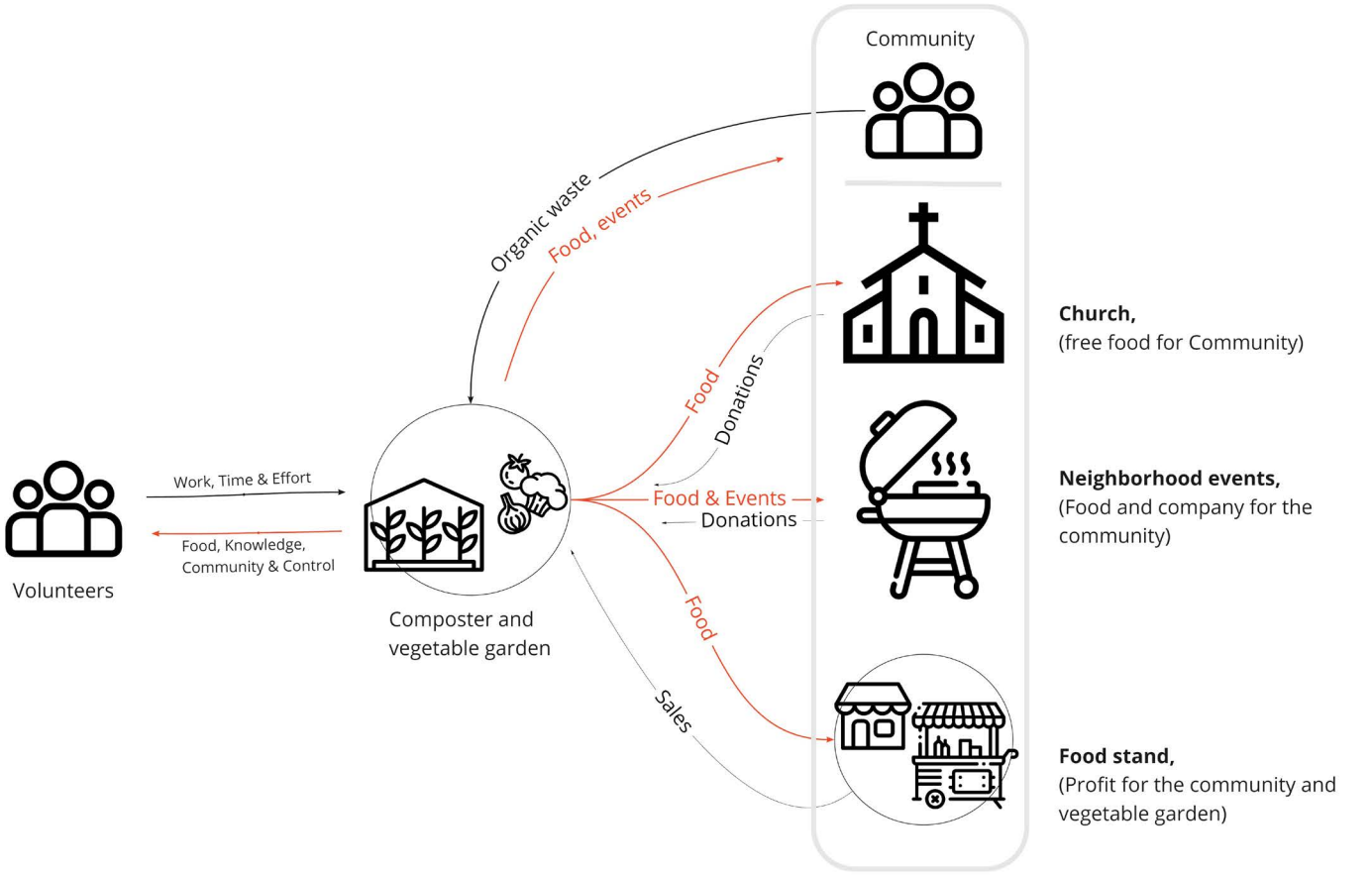


Figure 10.2: Business model organic waste concept

10.2.3. Organizational Model

Next to a business model, an organizational model was designed in order to further optimize and structure the way the vegetable garden functions., as seen in figure 10.3. The way it works is the following; a core gardening group is responsible for running the garden and are assisted by a group of volunteers from the community. The core group is responsible for making a cultivation plan, organizing weekly gardening events, organizing workshops and creating and managing tasks for the volunteers. In addition, there are different committees volunteers who can join in order to for example organize events, focus on composting and growing, seeding and sprouting, making food and the financial side of things, along with development of the garden. By doing it this way, in addition to running an efficient garden, it also allows for the community to get very involved with the garden as well.

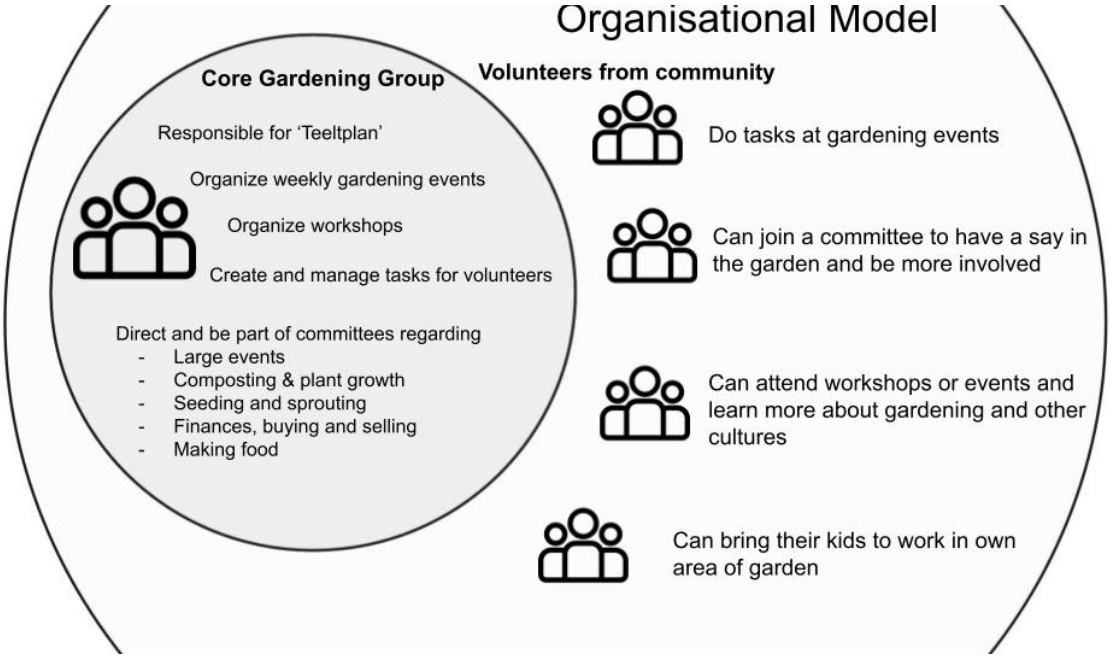


Figure 10.3: Organizational model organic waste concept

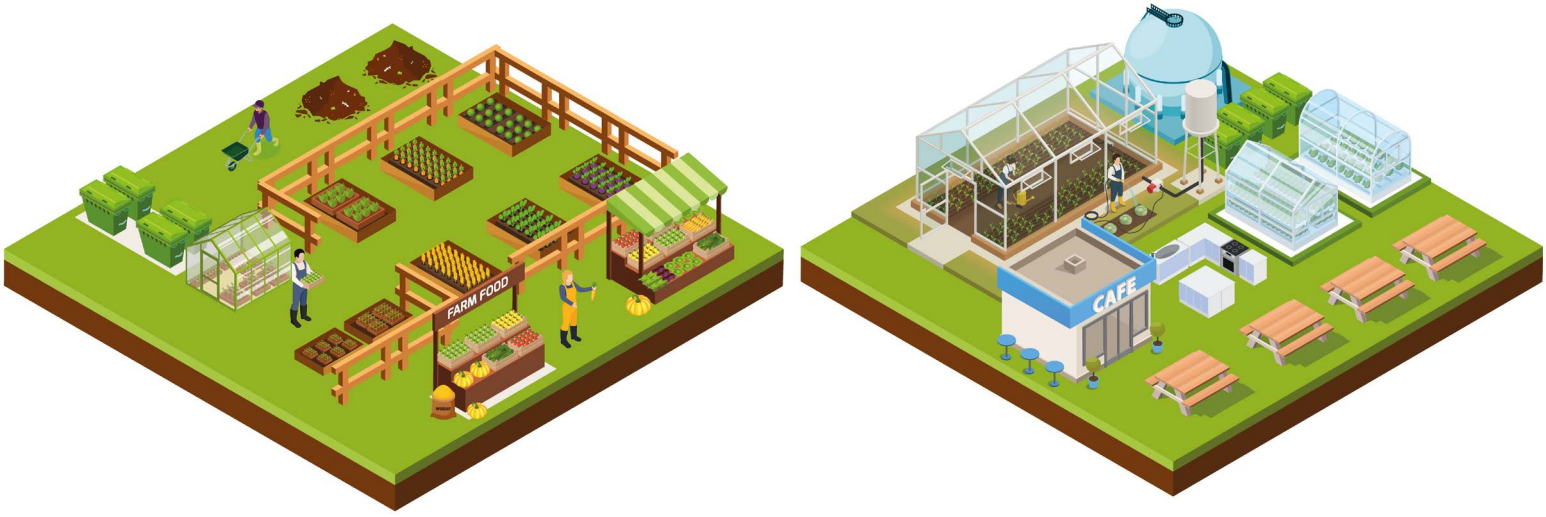


Figure 10.4: Organic waste concept now (left) & future (right)

10.2.4. Now & Future

The presented concept could be realized within two years. But what if all of the elements of the concepts are developed further, what will it look like in 10 years? As seen from figure 10.4, every element of the concept has been upgraded. The compost area has now become a biodigester. Which produces compost and biogas from organic waste. The vegetable garden has been transformed into a greenhouse, with hydroponics, aquaponics, vertical farming and water collection. The farm food stand has been transformed into a full size farmers market , which also sells honey from the beehive at the farm. Lastly, the food and catering stand has been upgraded to an actual cafe and meeting point for the community.

Naturally, this also affects the business model, higher investments mean more expenses and potential risks. But eventually, these investments will pay itself back and will add more value to the community in the long term. The biodigester allows the community to process more waste, benefit from the gas it produces and maybe even sell fertilizer, as too much is produced to all be used by the vegetable garden (See appendix B). In addition, by using a greenhouse and vegetable store, vegetables can be produced and sold year round, which also makes sure the investment is paid back quicker.

10.3 TEXTILE

10.3.1. Elements & Process

The concept focusing on textile waste consists of multiple elements working together, see figure 10.5. These elements are as follows; a clothing collection and selling point, a thrift shop, a second hand clothing swap market and a sewing atelier. The concept is based on the current situation regarding the sewing group at the CLT community and current trends in the clothing recycling sector.

Clothing collection point: This is where the process starts, people from the community come here to sell or deposit their old clothing. The collection point buys the clothing, with prices based on a fixed price per type of item.

Thrift store: The clothing collected at the collection point is then washed and sorted. The clothing is put on sale in the shop and sold for a slight profit. To cut costs and be able to manage the process, the store is only open on the weekends. Clothing collected at the collection point is sold the next weekend it is open. Another possibility of the thrift shop is to lease clothing to the community.

The store also organizes second hand clothing markets and clothing swap events. This enables the store to sell more of their inventory, but also allows the community to sell directly to each other or even swap clothing.

The last element of this concept is the sewing atelier, which already exists (see chapter). This is where broken clothing is repaired, or upcycled into new clothing. This is also a place where the community can follow workshops on sewing and eventually be able to repair the clothing themselves.

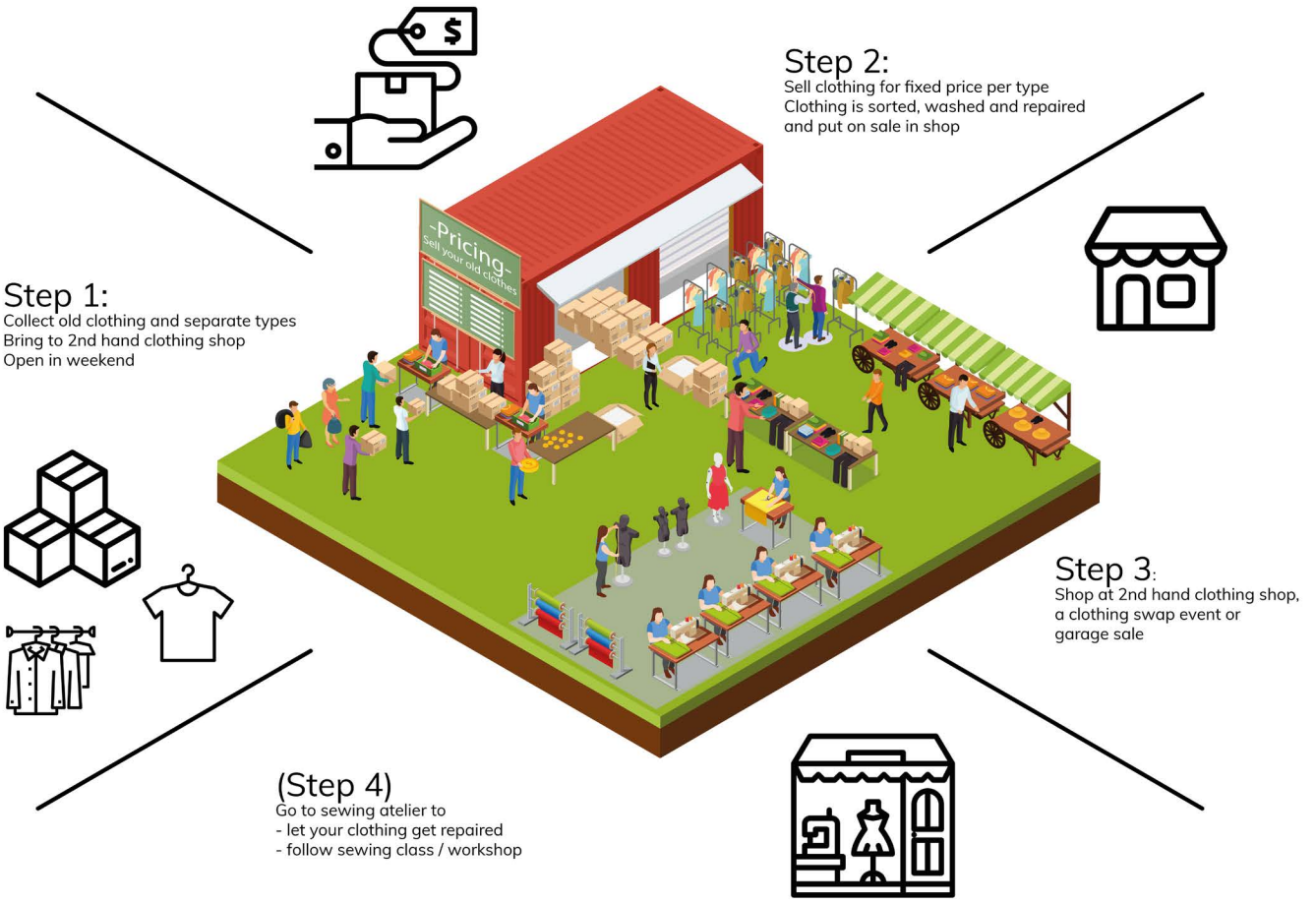


Figure 10.5: Textile concept

10.3.2. Business Model

The business model for the textile concepts is the following; the clothing collected at the collection point and made or repaired at the sewing atelier is sold or leased to the community through the thrift shop, a simple online store and through the clothing market (figure 10.6). The way the thrift store gets its clothing is by buying old or disused clothing from the community through its collection point. By organizing clothing markets and swap events, the thrift store can also earn some money by selling tickets.

Expenses are the following; location, washing facilities for the clothing, storage space, managing and maintaining the store, personnel. For this concept, a little more capital is required to set things up. Although the possibility is there to start at a space in the MCTC building.

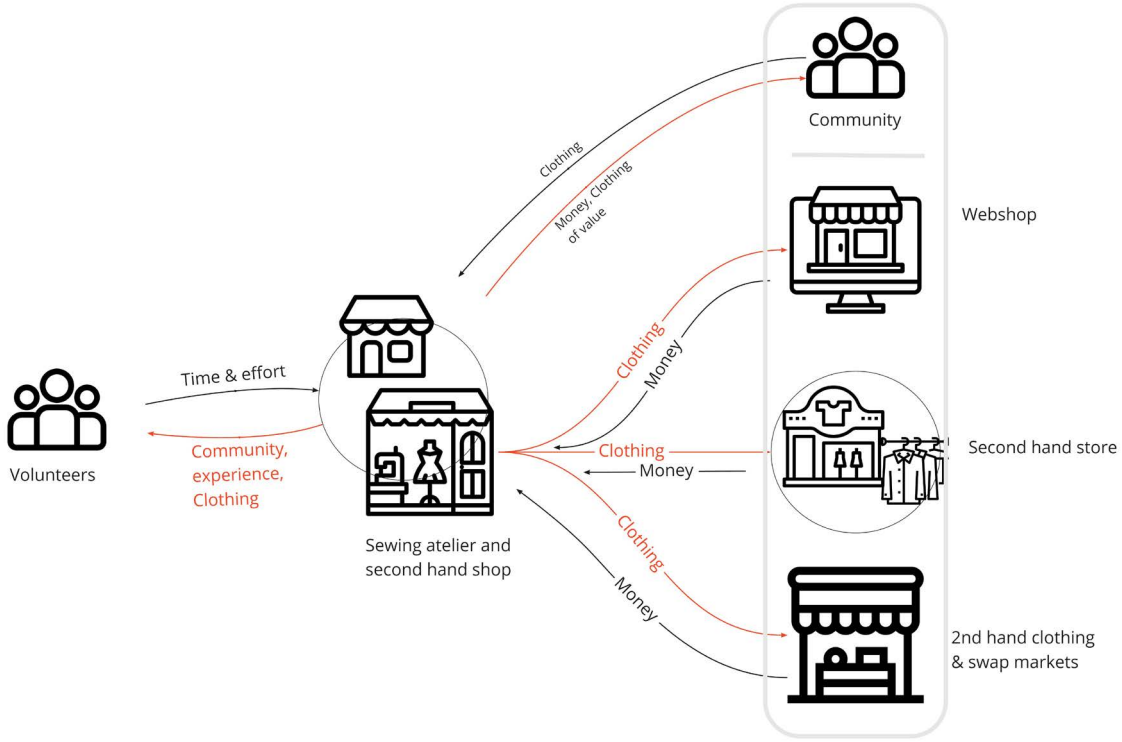


Figure 10.6: Business model textile concept

10.3.3. Organizational Model

The organisational model for this concept is split into two parts, the thrift store and the sewing atelier (figure 10.7). For the thrift store at least 4 people are required. Tasks differ between weekends and throughout the week, as the shop is only open on the weekends.

On the weekends, two of the people are needed for buying clothing at the collection point, and two people are necessary to manage the selling of clothing. All of the people also have the task of managing the shop while it's open, helping customers, tidying up and that sort of stuff.

Throughout the week, there is a different set of tasks. The main task is to wash and sort out the clothing, put prices on everything and make the store ready for the next weekend. In addition, 2 people are responsible for managing the social media accounts, in order to promote the sale of the following weekend and upcoming events. The other two people are in charge of organizing the clothing markets and swap events.

The sewing atelier is organized independently of the thrift store and is led by a core group of people. These are in charge of repairing clothing, organizing workshops and creating new clothing from old clothing.

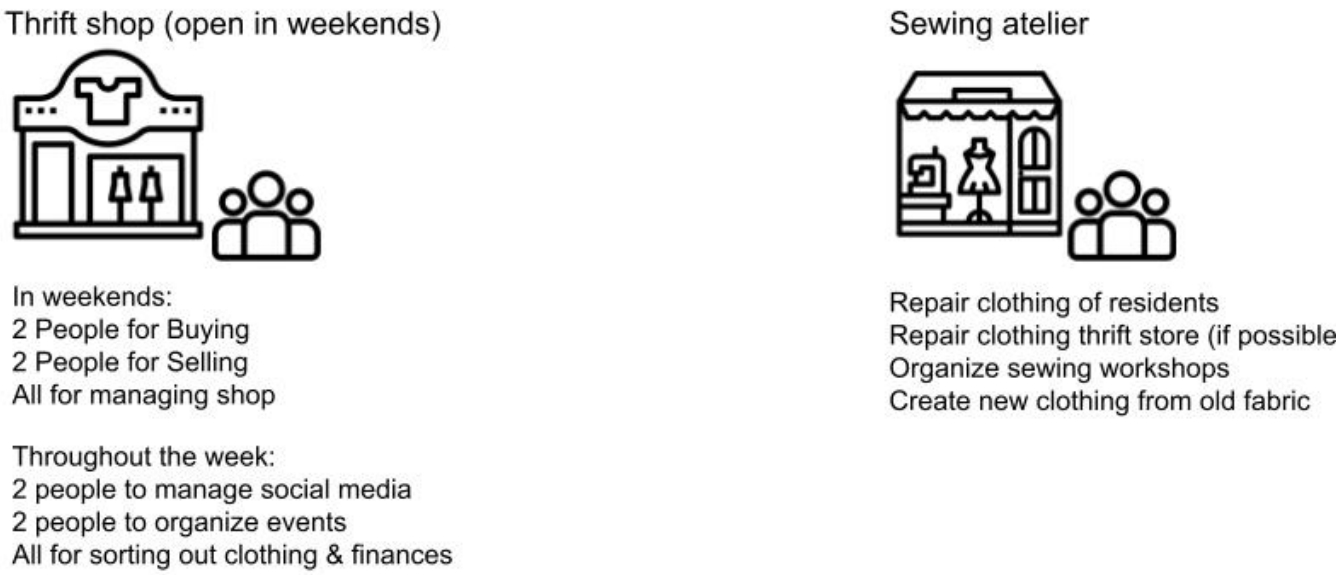


Figure 10.7: Organizational model textile concept

10.2.4. Now & Future

The current concept for 2 years does not differ a lot from the 10 year version. The only major upgrade is that instead of a temporary location it is now a fixed store, so no more container shop.

In addition, a fully functional online shop is added. Also, a shared laundry space is added to the concept and the sewing atelier has received an update.

Figure 10.8: Textile concept now (left) & future (right)

11 RESEARCH CURRENT SITUATION

Currently there is already a functioning vegetable garden (figure 11.1) and a sewing group present at the MCTC and CLT community. Within the project it is unknown how they operate exactly and who is involved. The goal is to find out what the current situation is, so; who is responsible and how the two initiatives are operated. In addition it is important to know what their plans and ideas for the future are and to find out where there is room for improvement. Finally, how the concepts would fit in or add to the current situation.

11.1 SET-UP

In order to do this, interviews were set up with the people responsible for the vegetable garden and the sewing group. For the vegetable garden a call/interview was done with Ingrid Ogbuli, she is the person mainly responsible for the garden. For the sewing group, the same was done, but with Theresa.

11.2 RESULTS

11.2.1. Vegetable garden

The vegetable garden started two years ago. Currently 20 people are involved and they all have their own plant bed of 1,5m x 3m, which they are responsible for. In addition, there is a planting common area.

The main reason people all have their own plant bed is because everyone has a different schedule and likes to work on the garden in their own time. Ingrid thinks that creating a garden which would be fully shared with everyone would not work right now, as working on the garden at the same time and managing expectations might be difficult. At the moment, the common area that is present is not maintained well and the people don't feel responsible for it. This results in the fact that they will not put as much effort in the common area as in their own garden.

The main reason why these people participate in the garden is because it is their hobby. Most people like to work in their garden and grow plants, flowers or herbs and spices. There is a small group which actually uses the garden for its harvest. Ingrid, the person who oversees the garden, is one of those. She does not buy any vegetables from May/June onwards until the end of the growing season. To do this, she spends roughly 1 to 2 hours a week working in her garden. but as with the others from the vegetable garden, she does not see it as work, but mainly a hobby with some nice benefits.

Figure 11.1: Current vegetable garden 1

Figure 11.2: Current vegetable garden 2

When asking Ingrid about plans or ideas for the future, she mentions the following things; first of all they have looked into providing people with meals and giving food to the foodbank. The main issue however is that this food has to come from the common area, which is not well managed at the moment. As a first step, they are now planting mint plants, so people can get fresh mint tea. If the common area turns out to be a succes they might consider having a larger common area in the future, to grow more vegetables. In addition, they would like to do open days and introduction days.

When asked about what they are struggling with, composting is mentioned. Looking at the garden it seems like there is a composting pile, but this is actually just a garbage pile, see figure 11.3. There was once the idea to start a composting pile, but it ended up in the current situation. The main reason it happened is because people do not have the knowledge on how to make and manage a composting pile correctly. In addition, managing the common area is a struggle, as people feel less responsible for it than their own garden like mentioned above.

Figure 11.3: Current compost pile

Figure 11.4: Banner at vegetable garden

11.2.2. Sewing group

The sewing group is a group of 5 women who come together every Monday evening to sew together. They mainly focus on making clothing from scratch, so they buy new textiles at the market and use those to make their clothing. The people in the sewing group are able to save some money on clothing, instead of buying it they make it themselves. In addition, the sewing group is not only about making clothing, it is also a nice way for people from the community to get together and meet each other. As mentioned in the chapter , a lot of people in the H-Buurt are suffering from loneliness, so the sewing group actually serves multiple purposes. This could be a potential opportunity to solve this problem.

When asked about ideas for the future the following was mentioned; their first priority is to start up again, as the COVID-19 pandemic has brought everything to a halt. As soon as everything is going smoothly again, the idea is to look into some kind of clothing collection point for the community. Where people can hand in old clothing, which can be repaired or upcycled by the sewing group.

Lastly, an idea for the sewing group was presented to Theresa, in order to get her feedback. The idea can be seen in figure , it is a collection point for old and damaged clothing, but is also a clothing exchange cabinet, so clothing which is still good but not used anymore, can be made available for the rest of the community. Theresa said the following about this idea; 'it would be wonderful and very beneficial to have something like this at the MCTC and which can be used by the sewing group!' One of the challenges for this idea however is the following; how to get people to hand in clothing at the exchange cabinet/collection point instead of throwing it in the existing textile waste bins in the H-Buurt.

11.3 TAKE AWAYS

The main takeaway from these interviews is that there already is a lot happening within the CLT Community. There is already a foundation to build on which makes it easier to develop a fitting solution. Before these interviews, the focus has been on creating a vision for the future, albeit a close future and a far future, but both are still far away from the current situation. This means another step has to be made, connecting the vision to the current situation and creating a stepping stone in the right direction. The focus shifts from a strategy for the future to a solution for the now, but which provides the right direction to go in for the future.

Another takeaway is that both the vegetable garden and the sewing group have a rather individualistic approach. Although both are set up and run by the community, it is mainly focused on the individual. The people from the vegetable garden each have their own plant bed and the people from the sewing group mainly make clothing for themselves. One of the main goals of the CLT is to put the community at the forefront, which is not happening now. So the question is; how to shift the focus from the individual to the community with the existing situation, or at least get more people involved and positively affected by these initiatives?

11.4. OPPORTUNITIES & INTIAL IDEAS

Although there are still challenges ahead, as mentioned previously, a lot of opportunity for development has come out of these calls. For the vegetable garden, the opportunity lies with improving the composting situation and connecting that to the community in some way. Also, improving the common area and getting the community more involved. For the sewing group, the opportunity lies in getting the community involved more with clothing in general and also with the sewing group. By for example providing clothing or setting up an initiative to repare or exchange clothing, so the community can benefit from the clothing instead of it being thrown away.

12 SECOND FIELD TEST & VALIDATION

After the calls with Theresa and Ingrid, it was time to get the community involved once again. To get their feedback on the visions and some initial ideas, another session, similar to the first session at the MCTC was organized. Once again this took place after a church service on a Sunday, in order to reach a good amount of people.

12.1 GOALS

The goals of this session were the following; to present the concepts, visions and ideas to implement and get feedback from the community on what they value the most. In addition, to find out what is necessary for them in order to make it work and get people involved. Lastly, it was important to get to know what they would like to add to the concepts in terms of ideas. In addition, it was important to find out what barriers or objections there might be in order to implement such a solution in the future, specifically for the solutions and interventions presented, but also just in general.

12.2 SET-UP

The setup for the second session at the MCTC was more straightforward then the first one. Whereas the first revolved around a game, this was mainly about presenting the concepts and ideas and starting a conversation. For both organic waste and textile waste, two presentation boards with visuals were made to show the ideas and concepts. For both, the visuals consisted of a visual which showed the concepts from the new concept development chapter and the process and elements involved. In addition, a set of questions was made to ask the community and start a conversation.

12.3 ORGANIC WASTE

12.3.1. Concept vision

The main focus of what was presented for the organic waste concepts was on the elements and the process around it. Which is described extensively in chapter 10. It starts with composting organic waste, then uses the compost to grow vegetables, fruit and herbs with, followed by selling the food at a food stand and using it with community events such as a neighborhood barbecue.

12.3.2. Concrete intervention

The concrete intervention here is focused on composting, as this was something the vegetable garden still struggles with, as mentioned by Ingrid. Two ideas for composting organic waste were presented. The first idea is a change to the current way of 'composting' where different types of organic waste are collected separately. Such that there are facilities to collect green organic waste, such as fruit & vegetables, green leafs and branches and brown organic waste (which are twigs, old leaves and wood). In addition, there would still be dedicated areas for compost piles, but with clear instructions on how to build a good compost pile and how to maintain it in order to get good compost.

12.4 TEXTILE

12.4.1. Concept vision

The second option presented was a wormery, where organic waste is transformed into compost by compost worms. A wormery requires less effort and maintenance than a compost pile, but also takes a lot longer to get results, such as described in.

Similar to the organic waste concept, for the textile concept the elements and process were presented based on the concept from chapter . So it starts with the community selling their old clothing for money, which is then cleaned and resold through a thrift store and second hand clothing events. In addition, the sewing group gets involved with repairing and making clothes as well.

12.4.2. Concrete intervention

The concrete intervention presented has also been described in a previous chapter . The intervention presented is a clothing exchange cabinet along with a collection point for damaged clothing. The exchange cabinet and collection point would be placed in or on the terrain of the MCTC.

12.4.3. Questions

To get the discussion going, some questions were set up beforehand. The main questions concerned if the community sees value and potential in the concept and would actually want to use the interventions or get involved with the initiatives. In general, it was important to get to know their thoughts, objections, expectations and what the community would want in return. Also, what would be a valuable addition to the ideas and interventions and if the community would think these ideas would work in the neighborhood.

12.4.4. Execution

Overall, the session went quite well, there were a lot more people present than during the first session and a lot of good input was given. What also helped was the weather being very nice. See figure 12.1 and 12.2 for an impression.

Props used during the session can be found in Appendix D.

Figure 12.1: Field test 2.1

Figure 12.2: Field test 2.2

12.4.5. Results

In terms of results, the session was not as decisive as the first session. Still both organic waste and textile waste were valued equally by the community, and they did not want to choose between both. But other than that, everything surrounding the concepts, criteria and the waste types got sharpened.

In general, the community feels that there needs to be more transparency concerning waste. What exactly is done with it and what it results in are very important to show, so the community really sees its value. The community is currently unaware of what happens to their waste, what value it still has and feels less responsible for it.

In addition to making it clear what exactly happens to the waste, the same counts for the value being created by waste being separated by the community. For the community, it needs to be directly clear what the reward/incentive is for separating and handing in their waste. The community wants a tangible reward with clear value to them and a direct relation to the waste they handed in.

What also stood out during the session and also became clear in the previous session, is the lack of knowledge and know-how about recycling waste present in the community. So, the solution needs to have clear rules and explanations in order to make it work. Also, understandable and easy to use tools and instructions need to be present for the same reason.

Zooming in on the feedback on the specific concepts the following was said; for organic waste, it is not clear to most people how to make compost themselves or what to do with their organic waste. Some people do already separate it but are not aware of what happened to it. For the textile concept, it is important that hygiene is taken into account regarding the clothing exchange cabinet, so clear rules need to be present for that. Also, what was brought up by the community and is seen as very valuable, was the exchange of children's clothing. The main reason being; children grow very fast and a lot of money was spent on new clothing, but by being able to exchange clothing it would save them money. In addition, it was stressed by the community that good rules need to be in place for the clothing collection and exchange, so that there would be separate facilities for both and to make it very clear what would happen to both. So a separate area next to the clothing exchange cabinet needs to be made for clothing collection for the sewing group.

12.4.6. Take aways

From this session, the main takeaways are; the recycling process should be as transparent as possible, making sure the community knows what happens with their waste and what they get in return. In addition, the community has to be provided with the right tools and instructions to do the job. Also, as the community brought up the need for clear rules, there might be a lack of trust, which backs the findings from chapter 8.6. So clear rules need to be in place to manage expectations

Another thing to note, which has also been pointed out in the last chapter, is the debate concerning individual interest and common interest. Separating and depositing waste is something an individual within the community needs to do themselves, while ultimately the waste has to be used to benefit the CLT community as a whole. There is an imbalance there which needs to be addressed, because the individual needs the right incentive, which is tangible and valuable for them as well in order to keep separating their waste, as mentioned previously. The challenge here is to create an incentive which is both beneficial to the community as well as to the individual, so that they keep separating waste.

The final takeaway of the session is the importance of providing the community with the right knowledge and showing them what is possible. From both sessions it became apparent that a lack of knowledge on these topics exists within the community. So just making sure the interventions are well explained and are easy to use, might not be enough. To be able to learn about, develop and maintain these projects and interventions themselves, a more all encompassing solution is required. One that shows which opportunities are there and provides the right information to realize and maintain it themselves. So, next to further development of the interventions presented at the session, a more all encompassing solution will be developed focused on providing the right information in the right way.

Sprint 3 Conclusion

Sprint 3 focused on developing the chosen directions by the community further. For this, concepts and visions for a close future and a far future were developed. In addition, more research was done into the current situation concerning the initiatives at the CLT. Finally, with the concepts developed and info on the current situation another session with the CLT community was carried out. In general it was found that the main struggle with the vegetable garden has to do with composting and with the sewing group it is about getting the community involved more.

So this will be taken into account for the next sprint. The session with the community provided the takeaway that both concepts were valued, but the lack of knowledge remained. So for the next sprint it was key to keep developing the solutions further, while tackling the struggles in the current situation and trying to connect the two. In addition, a solution for the lack of knowledge should be developed. Finally, some more light needed to be shed on waste separation within the community and incentives, as this also came forward in the session.

04 SPRINT 4

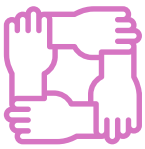
Evolve & Finalize

Concrete interventions, waste separation for community & toolbox

CONTENT

After the last sprint the directions of the project were further specified. For organic and textile waste the main focus was on developing solutions which would connect the visions presented in chapter 10 with the current situation described in chapter 11. In addition, through sprint 3, it became clear some more light needed to be shed on waste separation. Specifically on its products and incentives to do so and on how to create value to the community through waste separation. Finally, through both of the sessions with the CLT community it became clear that there was a lack of knowledge when it came to circularity, waste and what was possible. So a more general solution providing the right knowledge in an approachable way was necessary. This would make sure the right knowledge was present in the community and they would be able to start up circular initiatives themselves. So sprint 4 focused on developing solutions for textile and organic waste and the lack of knowledge within the community. Next to developing these solutions, implementation plans were made to make sure these could find its way to the community. Also waste separation is explored further on the topics mentioned earlier.

Develop concrete intervention



Waste separation for community

Create final solution

As soon as the concepts and visions for organic and textile waste were developed (Chapter 10), the current situation at the CLT was researched (Chapter 11), and more feedback from the community was gathered, it was time to develop interventions. These would get the CLT community on the right track towards the presented concept visions. The criteria for these interventions were that they had to be simple solutions which could be made possible right now, which were achievable without a lot of resources and planning.

13.1 STARTING POINT

For both waste directions, organic and textile, an intervention was developed. Both interventions were continuations of the ones described in chapter 12, see figure 13.1 and 13.2. The intervention for organic waste was based on the current situation at the vegetable garden with regards to compost and the vision presented in chapter 10 and connecting that to the community. For textile waste, the intervention was based on the last session with the CLT community and the vision presented in chapter 10 and focused on collecting, repairing and exchanging clothing.

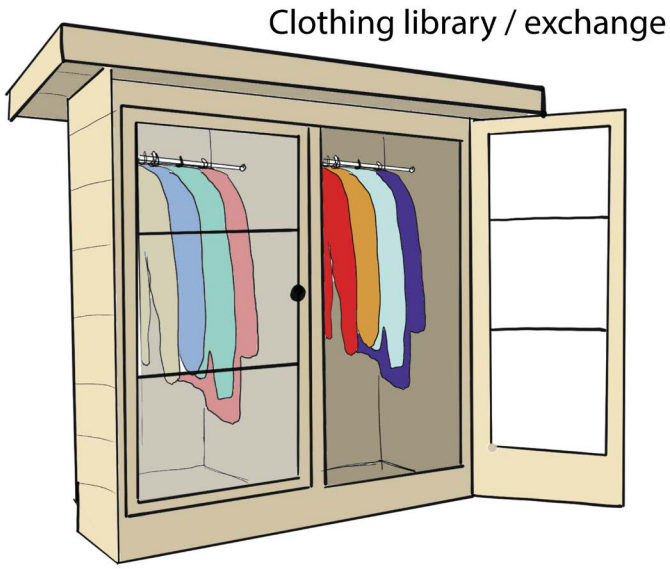


Figure 13.1: Clothing library concept

Figure 13.2: Composting attributes

13.2 ORGANIC WASTE

As there was already a vegetable garden which is being used at the CLT, part of the organic waste concept vision was already fulfilled. One crucial element was still missing however, a good composting system, making the vegetable garden circular. This also became apparent during the interview with Ingrid Alagbe (chapter 11). The wish to start composting was there, but no one knew how to do it exactly. Also, the right facilities to do it were not present. So regarding composting, it was mainly about providing the right facilities and good instructions. What also became apparent during the process was that there was no clear connection between composting and the community, so the solution also had to be able to bring the community together through compost.

So naturally the solution was to design a facility which would enable the community to make compost easily. A good compost pile consists of layers of different types of organic waste stacked on top of each other. These are so called 'green' organic waste and 'brown' organic waste, but can also be categorized using the terms wet and dry organic waste respectively. Green waste mostly consists of grass cuttings, manure, fresh kitchen waste such as fruit and vegetable cuttings and fresh green garden waste. Brown organic waste includes dry leaves and twigs, straw, wood cuttings and saw dust. (Velt, 2015)

To make sure all different types of organic waste are separated and stored correctly, a place with multiple containers or bins would have to be made, as can be seen in figure 13.3. In addition, a dedicated area for the compost pile had to be created, which can also be seen in the figure. On top of that, clear instructions of which type of waste needed to go where and how to compost were necessary, to make everything go correctly. So figure 13.4 shows what that could look like.

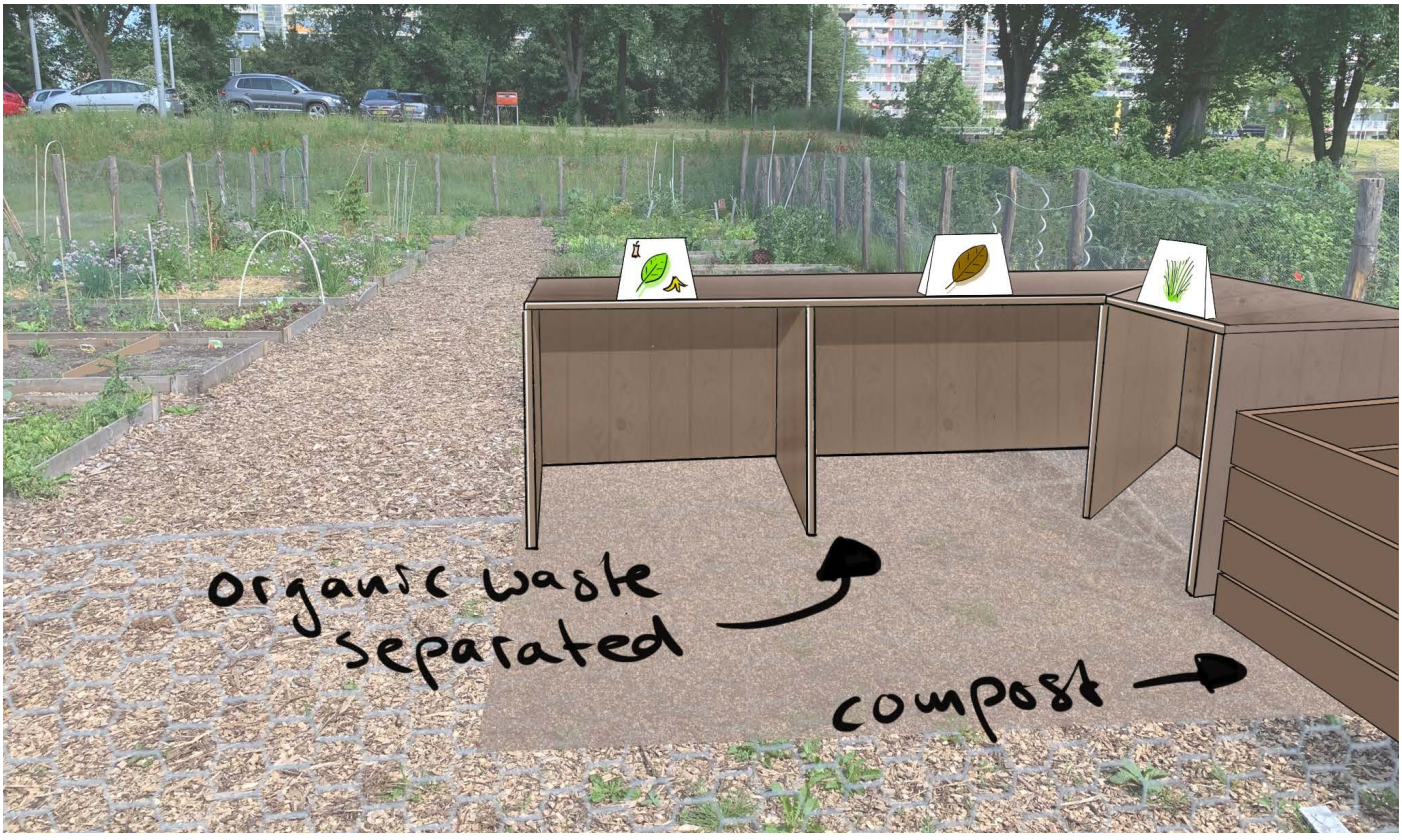


Figure 13.3: Plan for compost facility at vegetable garden

13.2.1 How to make compost

The pile of compost must be built up in layers of the described types of organic waste, green and brown, until it is about 1m3 in size, then it needs to be covered. It needs to be regularly checked if the pile is moist enough, by grabbing a handful of compost and squeezing it, if some water drops come out it is wet enough, if not add some water to the pile. After about a month, the pile needs to be tossed, so everything on the inside needs to get on the outside and the other way around. Afterwards, it needs to be covered again and within 4 months, if the conditions are right, good compost is made. Instructions describing how to do it visually and step by step can be seen in figure 13.4.

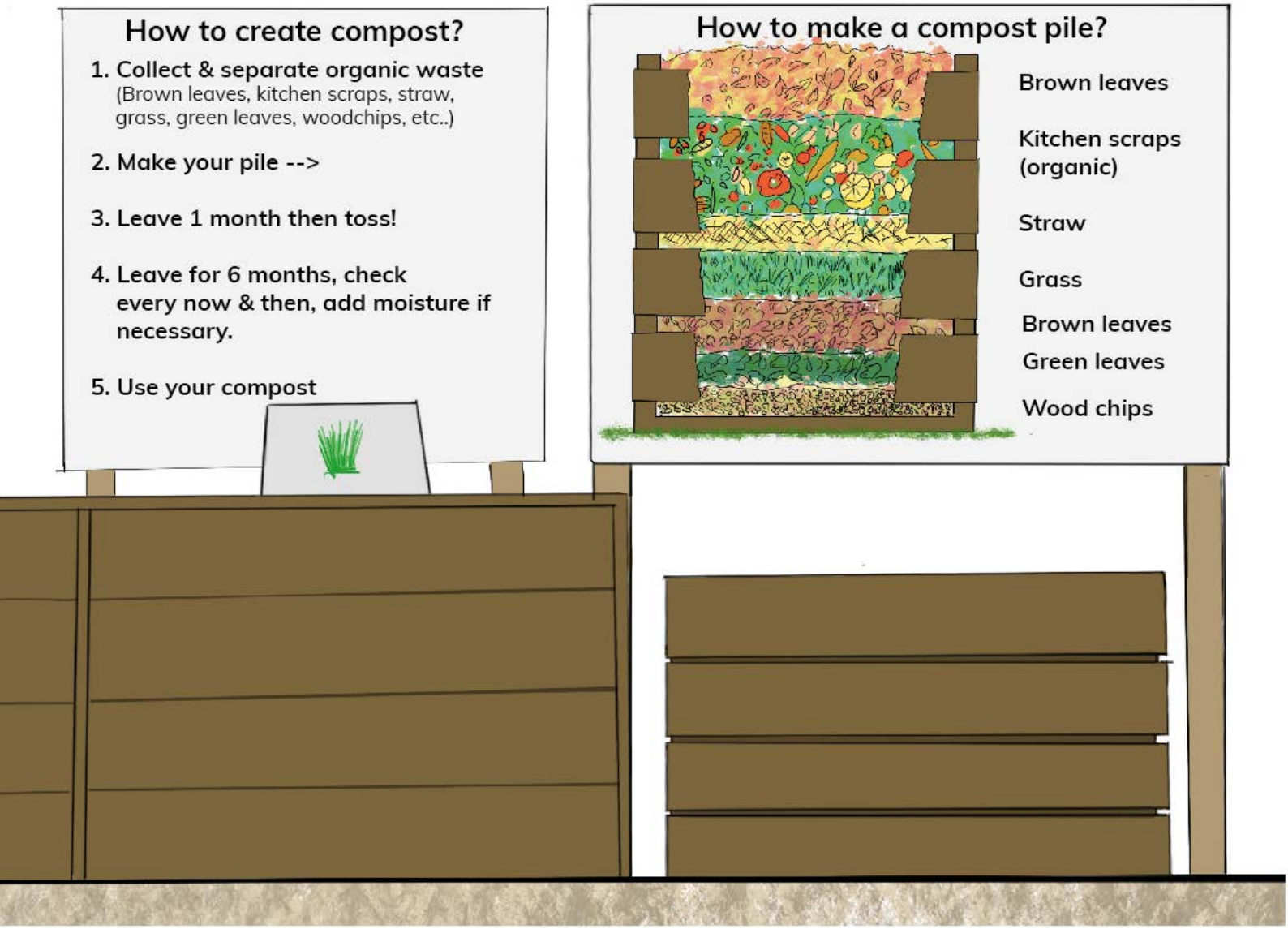


Figure 13.4: Instructions on how to compost and make the pile.

13.2.2. Social composting

In order to also benefit the wider community, the compost facility needed to be more versatile and not just focus on making compost. As the product of the facility is just compost, which is not directly valuable to the community as a whole, another approach was necessary. It needed to be a place for the community to come together, for young and old generations to learn and get inspired and provide direct value to the community in that way. Multiple solutions were thought of when tackling this problem. First of all, the facility could be a place where composting, circularity, sustainability and recycling workshops could take place, see figure 13.5. So the facility could really become a symbol and inspiration for the circular economy within the community and be the kickstarter for it within the CLT. Secondly, a more physical solution was to add a picnic table with potting bench and cold frame, so that more of the community could use the garden. The picnic table just to hang out at the garden, the potting bench so that people are able to repot plants there and maybe put them in the garden and the cold frame so the rest of the community could try growing cuttings (stekjes) from bigger plants and use the compost while doing so. Examples of these sollutions can be seen in figure 13.6 and 13.7.

Figure 13.6: a potting bench

Figure 13.5: Composting workshop (the compost doctor, 2021)

Figure 13.7: a vertical cold frame

13.2.3 Implementation plan

In order to actually get this facility created, some steps still need to be taken by the CLT community. First of all, the plan needs to be presented to the vegetable garden work group. Then at the end of the presentation, a composting workshop and visit to a local vegetable garden with a compost facility needs to be organized. This is meant to provide the right information to the community and to inspire them. Second of all, after the visits and workshops, the initial plans need to be made specific and a design and plan need to be made for the compost facility at the vegetable garden. In addition, the instructions for the banners need to be visualized. Third of all, the garden needs to be prepared for the facility and the facility needs to be built. Then an opening event and instruction needs to be organized in order to start composting.

13.3 TEXTILE

Based on the concept vision from chapter 10 and the idea of an exchange cabinet presented at the second session with the CLT community, this intervention was developed. The idea was also presented to the sewing group, which saw it as a good addition to their current activities. Through the input of the community it became clear that a couple of things had to be added to make the idea into a success. Hygiene was important for the community and clear rules and expectations about how the cabinet would be used as well. In addition, the focus needed to be on children's clothing and adult clothing.

The solution which would provide a form of circularity regarding clothing waste for the CLT community and would get them on the path towards the vision described in chapter 10 is the following. A public clothing swap closet located at the MCTC building. Here the community can bring old clothing to empty their personal closets and put clothing they do not use anymore, instead of throwing it away. The closet is compartmentalized based on common clothing sizes and has place for kids clothing as well. A visual representation of the closet can be seen in figure 13.8.

In addition to the cabinet, a sign or banner explaining the rules of using the cabinet is necessary, which can also be seen in figure 13.8. The rules which are displayed now are the following:

- Only:
    - hand in clean and undamaged clothing
    - take what you need
- Giving clothing to the closet is appreciated

These rules are not set in stone but have to be determined together with the community in order to make it work well and without friction.

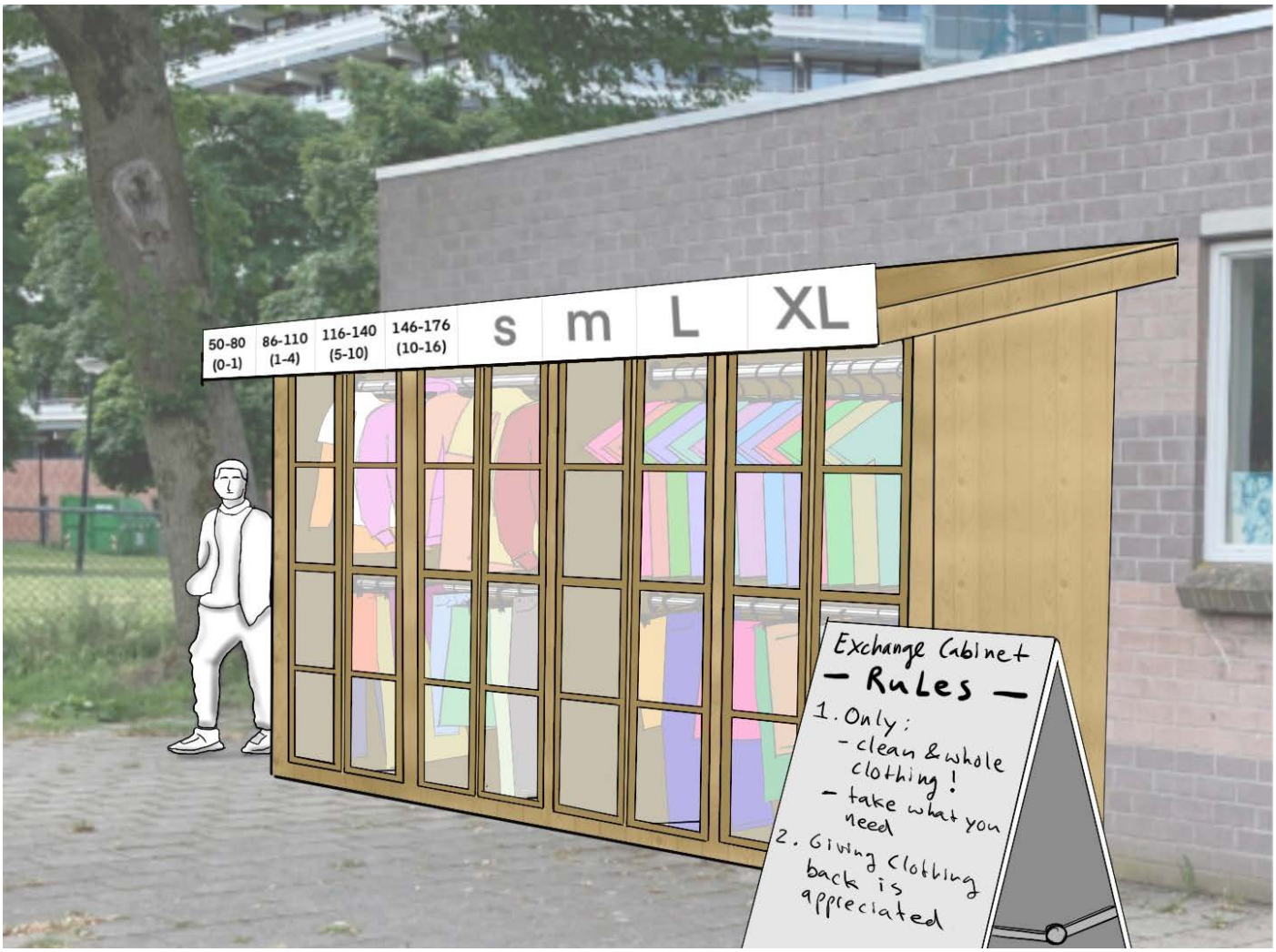


Figure 13.8: Plan for public clothing swap closet at MCTC

13.3.1 Possibilities with closet & sewing group

The public clothing swap closet can function independently from the sewing group, but as its origins lie there and they can benefit each other, the possibilities of collaboration have been explored. First of all, there would be the possibility of creating new children's clothing out of old adult clothing, see figure 13.9. This can be put in the exchange closet for the community to use. In addition, clothing from the closet could be repaired by the sewing group or the sewing group could even make clothing specifically for the closet. Also, the closet can serve as a good way to promote the sewing group and get more people on board, and with more people, more can be done. Finally, the closet could be a place to advertise and initiate sewing workshops (figure 13.10) for and with the community, so they themselves could be able to make new clothing out of old clothing. In addition, similar to the compost facility, the closet could become a symbol of circularity within the community and get more people interested in it if they see its value.

13.3.2 Implementation plan

In order to get the clothing exchange closet a reality the following steps need to be taken. First of all, present the current plans to the community and sewing group and ask for their feedback. Then with the feedback, finalize the plans and create the rules. Second of all, buy a closet at a kringloopwinkel and put the closet in a room at the MCTC. Create sections in the closet in order to cater for the different types of clothes and sizes. It is wise to start with a small cabinet and then add more closet space to it as soon as there is more clothing and the closet gets more popular. Also, if it turns out to not be a success, it does not take up a lot of space. Third of all, to create awareness around the closet and already have some clothing in there, organize a clothing collection event. Finally an opening event can be organized to officially open the closet, explain the rules and get people to exchange clothing. In addition, to increase its usage, advertise the cabinet through flyers and stickers at the MCTC or even at clothing containers in the H-Buurt.

Figure 13.9: Upcycle adults clothing into kids clothing

Figure 13.10: sewing workshop

14 WASTE SEPARATION

Waste separation is an important part of circularly processing waste. From the previous sprints it became clear that waste separation is mostly done on an individual level and the incentives to do so are also focused on the individual. However, as this project has a community focus, that waste separation also adds value to the community in some way. To find out what is possible and potentially find solutions, an exploration and design process was conducted. This consisted of two parts, one part focused on which products and incentives could be directly related to waste separation for the individual and for the community, with regards to the interventions mentioned in chapter 13. The second part focused on finding solutions for social waste separations in general. Specifically looking at how to bridge the gap between individual waste separation incentives and adding value to the community.

14.1 Interventions

First the focus went to the interventions. For both directions a list was made ranking the different products and types of incentives. From these lists it became clear that the most direct products from the interventions are more suited to the individual than the community. As these incentives were also more easily realized and more tangible for the individual. Because it could be a simple transaction between handing in waste and getting something in return. So perhaps the focus needs to be on the individual first before the focus can go to value and incentives for the community. The lists and further findings can be found in appendix E, while the next chapter focuses on social waste separation.

14.1.1 Conclusions

Based on the findings of the exploration on incentives that was done, the following conclusions can be made. First of all, more exploration of incentives is necessary based on the community and social waste separation, as a gap between individually separating waste and value to the community exists.

Second of all, as there are so many individual incentives present with both the organic and textile waste it might be best to focus on

Figure 14.1: Waste separation

that first before moving to the community. By focusing on the individual first, it ensures that people will be more aware of the value of waste separation, and will be more open to do it themselves. Most likely, it will increase the number of people that separate waste and create a better understanding of the process. This might be necessary in order for people to see the value it could have to the community and will make it easier to get it going, as more people are actively separating.

14.2 Social waste separation

A gap between individual separating of waste and adding value to the community was found. To find a solution for this problem, a new design process was initiated. Where the following questions needed to be answered; how to make people separate their waste individually, while it benefits the community? How to find the right balance between individual incentives and community incentives? This initiated a new trajectory and process for the project focused on social waste separation.

To start with, ideation was done specifically on bridging the gap, social incentives for both the organic and textile waste directions, potential means and goals for social waste separation and how all of the above could be combined to create a solution. Eventually two potential solutions were found and developed to some extent. But due to time constraints they have not been developed further or implemented in the final solutions of the project. Some further development is necessary and the solutions need to be validated. The process and solutions can be found in Appendix E.

14.2.1 next steps

While both solutions to social waste separation look promising, it is not yet clear if they would work. So the logical next steps of the process would be to create MVP's of the solutions and do pilots or test them in some way. However, due to time constraints in the project and it not being the main focus of the project, the decision was made to not continue with this for now, but leave it as is. The other results of the ideation are shared in the list below, to add to the solutions and in order to be considered in a later stage as well.

Figure 14.2: Social waste separation

15 FROM WASTE TO VALUE TOOLBOX

During the sessions with the CLT community described in chapter 9 and 12, it became clear that more was necessary than just the solutions for organic and textile waste. The sessions highlighted the lack of knowledge concerning the opportunities and possibilities with using waste for the circular economy within the community. This was a problem, as a basic understanding of the possibilities would allow for more participation and faster integration of circular initiatives within the community. In addition, having the knowledge of what is possible and can be done is very empowering and makes sure the community can operate by itself. So in order for the interventions and visions to work and give the community more options for the future, the information needed to be accessible and usable. That is why a platform (Figure 15.1), covering all the necessary information concerning creating value from waste has been developed. This chapter shows how the platform works and what elements it consists of.

15.1 Platform / Toolbox

The platform has been built using Notion, which is an all-in-one platform and workspace for teams and can be used in a lot of different ways, which makes it very flexible and easy to work with. Besides being easy to work with, it provides a good structure for presenting information and is accessible through the internet. Notion is also already used by the CLT H-Buurt with their community platform. This platform explains everything related to the CLT and also functions as a place where the community can come together to organize things. The CLT Platform can be found here: CLT-H Members Platform

So by using Notion for the platform for creating value from waste, it can also be easily integrated in the existing platform.

The from waste to value toolbox can be found here: From waste to value | CLT H-Buurt

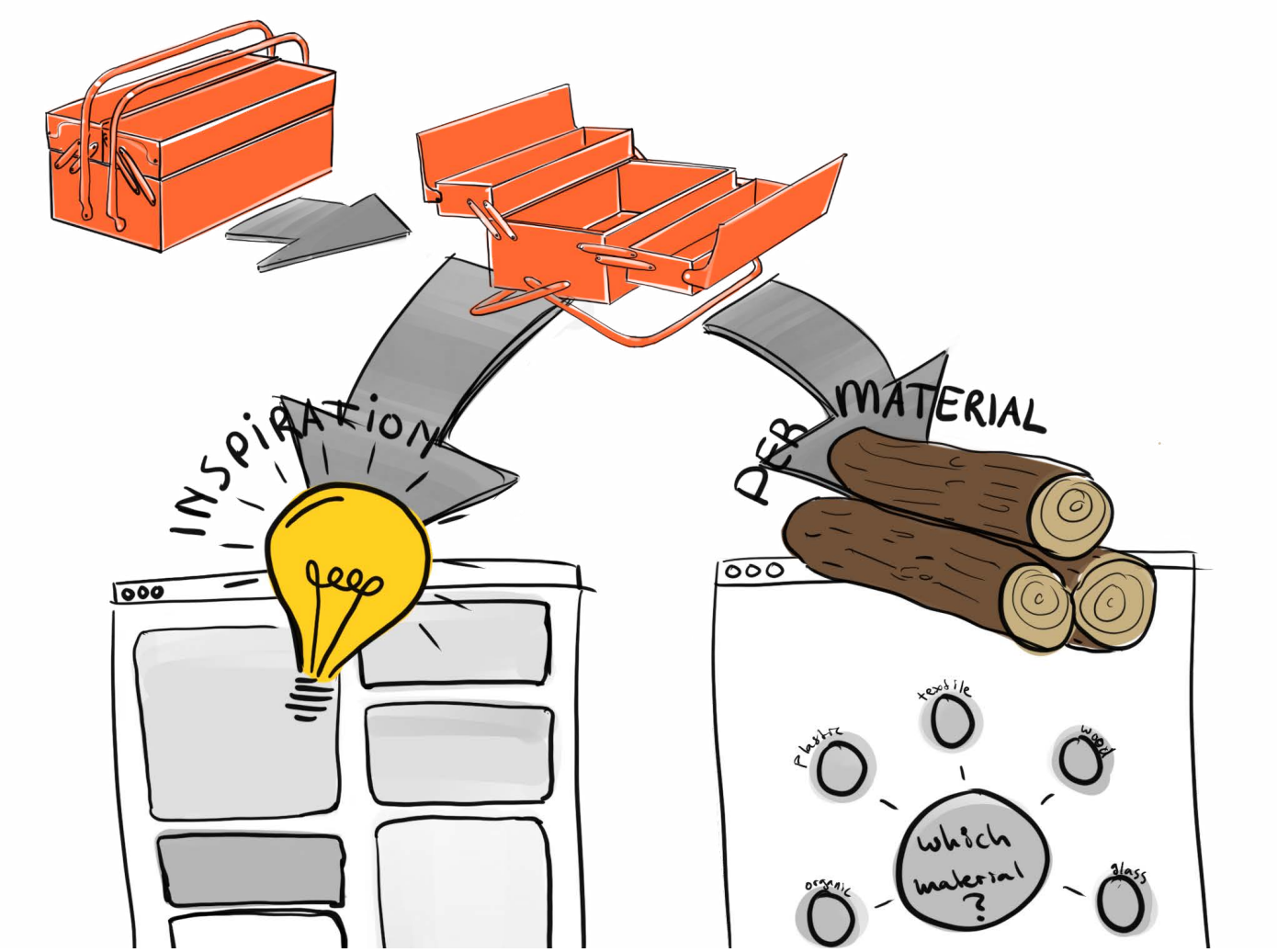


Figure 15.2 Homepage of the platform

15.1.1 How it works

When arriving on the platform, the homepage is shown. This page is home to all elements which have to do with creating value from waste and provide easy access to them. It does so in a very visual way to make it easy for the user to understand (Figure 15.2). The homepage covers the topics; waste separation, what to do with your waste, CLT community and inspiration. It also provides quick access to information on how to get started with an initiative and current CLT Projects. Lastly the homepage functions as a visual summary of all the steps and elements necessary to create value from waste. At the bottom of the page, a visual which explains the entire process is shown (Figure 15.3).

All elements shown on the homepage link to their own specific pages. These pages provide all the information necessary in a structured way with a clear overview. The most important thing on every page is that everything is very understandable and can be found and browsed easily.

15.2 Elements

Based on the goals of the graduation project, the information gathered during the initial exploration of chapter 5 and the process which followed, the content of the platform was decided. The first element focuses on waste separation, as waste separation is crucial in order to create value from waste. The second element focuses on creating value from waste and shows the possibilities per type of waste. The third element of the platform has to do with the community, as they are key in successfully creating value. The final element focuses on inspiration and shows what is possible and done locally in a more laid back way, so the user does not have to browse everything and can get an idea of what to do. As seen in figure 15.2 all elements can be found on the homepage.


Community
Land Trust
H-BUURT

Figure 15.3 From waste to value process

15.2.1 Waste separation

Only when waste is separated correctly and the waste is isolated, it can be used to create value. So this page focuses on waste separation. It offers solutions for homes and provides ways to separate waste together with the community. For in home, the focus is on space saving and presenting smart storage solutions per waste type. For the community, the focus is on events and workshops concerning recycling and separating (Figure 15.4).

Link to page

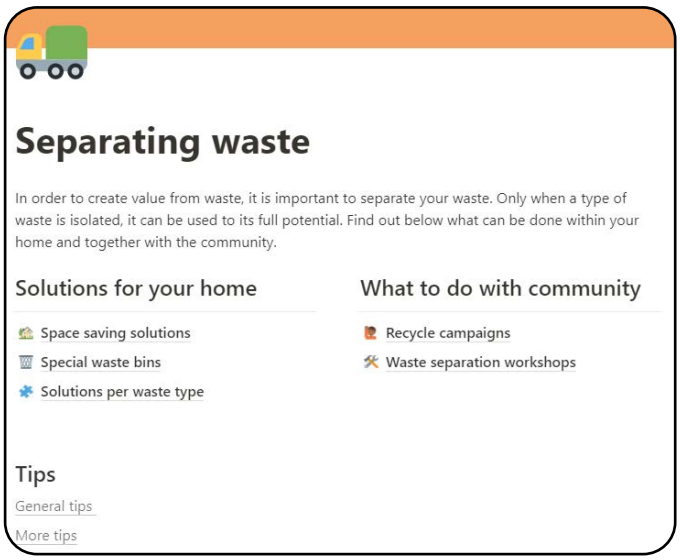


Figure 15.4 Snippet of waste separation page

15.2.2 From waste to value

This page is the core of the platform, this is where all of the information about creating value from waste is located. First of all, an introduction and some overall steps for creating value from waste are presented, which give the user a basic understanding of how to get started. Second of all, per type of waste, some options are given on what can be done best. These options lead to pages explaining what is possible and provide information on what it is and how it works. Finally, at the bottom of the page and every other page it links to, a link to an extensive guide on how to get started is located (Figure 15.5). The ininitial structure of this page was initially made through post its, see appendix F.

Link to page

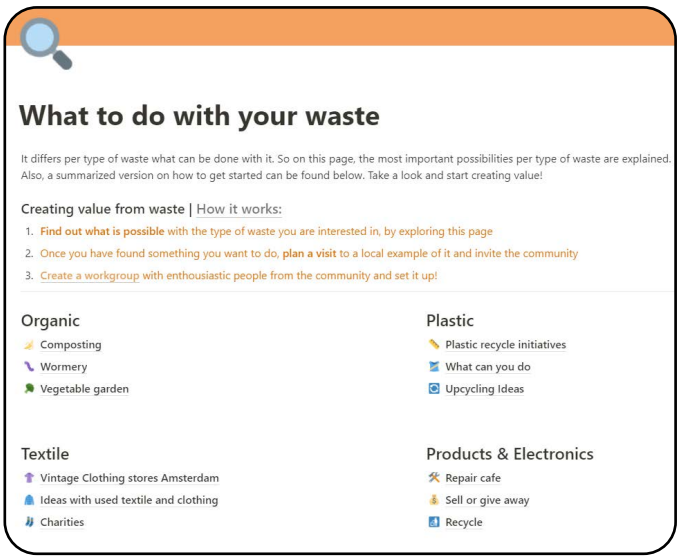


Figure 15.5 Snippet of from waste to value page

15.2.3 Community

As the CLT community plays a central part in the project, they are also represented with their own page. This way, it is very easy to find out what is going on in terms of projects, events and workgroups. It also directly connects back to the CLT members platform, so this page functions as the home of the community and their initiatives and provides the means to kickstart new projects or join existing projects. (Figure 15.6)

Within the CLT Projects & Plans for the future the current CLT projects are presented along with the interventions presented in this report. Each intervention has its own page, explaining what it is, how it works and what is necessary to realize it. Also, a link to a page showcasing this project is shared at the bottom of the page.

Link to page

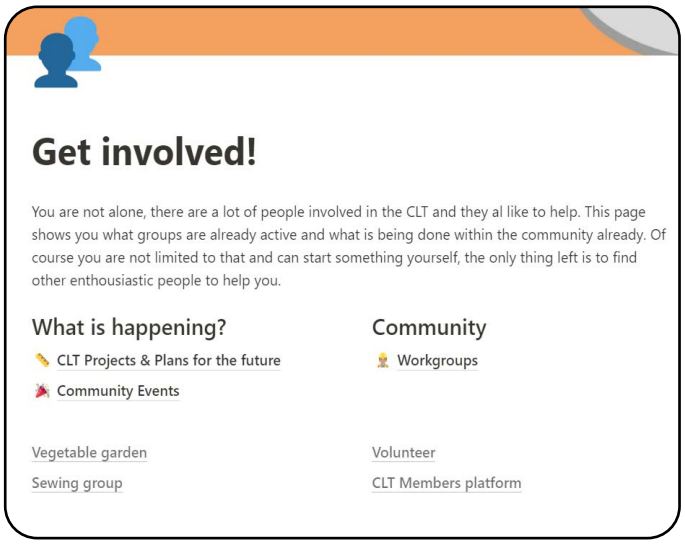


Figure 15.6 Snippet of from community page

15.2.4 Inspiration

The final element of the toolbox is the inspiration page. It provides more information on local initiatives, presents a guide on how to get started with a circular waste project and shows relevant news. The goal of this page is to provide information in a more direct way than the other pages. It provides direct access to other initiatives locally. This way, the matter is brought closer to home, making it more tangible and easier to experience first hand.
To make sure the platform is used correctly and the community is successful in starting up circular waste initiatives, detailed steps are provided (Figure 15.7). Starting with getting inspired and finding, so they want to learn more. Next, creating a workgroup is covered. Followed by planning a visit to see how it is done elsewhere, to experience it first hand. Having the right knowledge, it is time to get the initiative going.

Link to page

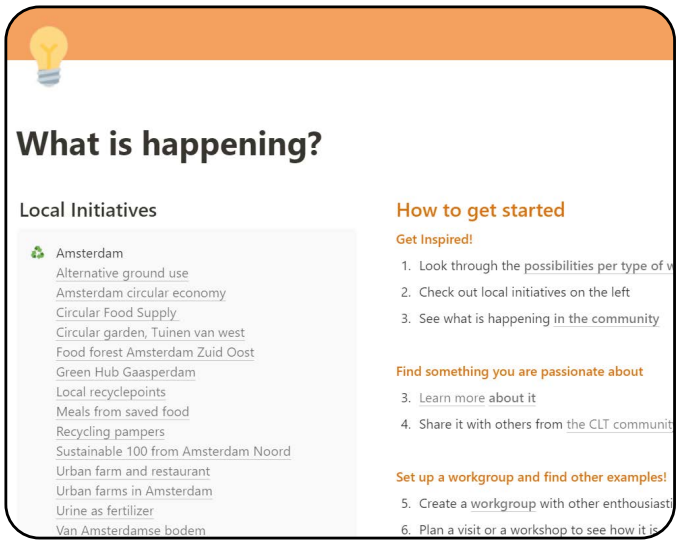


Figure 15.7 Snippet of from inspiration page

15.3 Style

The look and feel of the platform has also been taught about carefully. The goal was to make a platform which is easy to use with information which is easy to understand. In addition, it should be approachable, so that people would actually want to use it. Also, the connection to the CLT and that people play a central role should shine through. So to make it easy to understand, it was chosen to make the main pages of the platform as visual as possible and to really add to the text. The text has been made as simple and descriptive as possible, so everything can be easily understood. Finally, through the use of color and people being central in most of the visuals, the connection to the CLT community shines through.

15.4 Next steps

In order to get the platform in use a couple of things need to happen. First of all, it needs to be added to the already existing CLT Members platform. Second of all, to get it out there that the information is readily available, the word needs to be spread. This can be done in multiple ways. First of all, it can be shown at a CLT Members meeting and at the end of a church service. Second of all, it can be added to the instruction video explaining the CLT Members platform. In addition, it could be advertised on the social media channels and website of the CLT H-Buurt. Next to this, an area within the MCTC / CLT building could be dedicated to an installation with a version of the platform running on a tablet, while also providing information and inspiration through a screen. This will guarantee some visitors to the platform, but no guarantee of active use of it.

Ideally, in order to get the platform actively used, a work group within the community should be brought to life which initiates projects based on the information available in the platform. The creation of such a workgroup should be initiated by the CLT H-Buurt Board and And the People.

15.5 Recommendations

Although the platform can be used in its current state and provides the right information to the community, some recommendations can be made to improve it and its engagement in the future. The main problems to tackle for the future are the following; making sure the community will use the platform, making sure they see value in it and keep returning to the platform. In addition, it is important that all generations will have access to it and have a connection to it. So that children can start learning about the circular economy from a young age and have a connection to it.

In order to tackle these problems, the recommendations are the following. First of all, the platform needs to be as accessible as possible and provide great interaction with its users. So an application needs to be built with the current platform as an example. To tackle the problems concerning engagement with the platform and reaching a lot of generations, the app needs to be gamified and needs to become an actual platform with social features so the community can come together on it and learn from each other. Both gamification and the social aspect will provide the right stimuli for the users to keep using the app and keep actively contributing and adding to the local circular economy. The app should be able to track your progress and allow you to do what is right for your situation. It is also important to keep the app fun and engaging, otherwise it will be used less, especially by younger generations.

Gamification works like this: the principle uses game design elements and principles to motivate and engage users. By offering rewards and an element of competition for example. Gamification is widely used nowadays, specifically as a tool to teach people new things and in education (Athand, 2019).

Conclusion sprint 4

This sprint moved towards actual solutions for the problems described in earlier sprints. It presented solutions for organic and textile waste which could be implemented and realized right now and do not require a lot of resources. In addition, it explored social waste separation and how to realize it. Lastly, a solution for the lack of knowledge about circular waste initiatives within the CLT community was presented. This resulted in the plans for the clothing swap closet and compost facility to become ready to be executed and a platform with all the information necessary to be available for the community. Although the interventions are not realized already and the platform is not used yet, everything is done for it to be used and executed. In addition, some recommendations and next steps are provided to improve them.

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CONCLUSION

CONTENT

16 CONCLUSION

The main goal of this project was to find out how to enable and show the residents of the CLT H-Buurt that they themselves can create value from waste and by doing so support the (local) circular economy. This research question was answered in multiple ways. First of all, a process of exploration and validation with the community led to two very realizable solutions for organic and textile waste, which would reduce waste, transform it into something of value and benefit them financially and socially. Second of all, based on the research and design process, a platform was created which would enable the community to easily start a circular waste initiative themselves, with any type of waste. It does this by providing the right information and guidance and functions as a place for the community to come together. These solutions were realized through multiple sprints.

The goal of sprint 0 was to get acquainted with the project and context and to find out what challenges and opportunities there are. The context research provided good background information about the area and residents. The main issues have to do with social problems, although there are some problems with waste on the streets as well. This provided good information for the rest of the project and base criteria on further along.

Sprint 1 focused on exploring opportunities and finding initial directions for the challenges described in sprint 0. So, finding out what circular initiatives concerning waste and community are already out there and could suit the CLT community. Based on criteria derived from sprint 0, six potential directions were selected and provided the base of development for the next sprint.

Sprint 2 focused on developing concepts based on the directions selected in sprint 1. It also focused on diving deeper into the H-Buurt, CLT and its residents. In addition, a test was done with the community to see what they value and narrow down the options. Six rich concepts were developed. After testing the concepts with the community, two concepts remained, organic and textile waste. In addition, both already have a base within the CLT, namely a vegetable garden and sewing group is present there. In addition it was found that there is a lack of knowledge on the possibilities with circularity and waste. So the focus on the next sprint was on developing the two concepts further.

Sprint 3 focused on developing the chosen directions further. For this, concepts and visions for now and the future were developed. In addition, more research was done into the H-Buurt and CLT. Finally, with the concepts developed and research results another session with the CLT community was carried out. The session with the community provided the takeaway that both concepts were valued, but the lack of knowledge remained. So for the next sprint it was key to keep developing solutions which are realizable and add to the current situation further, but also focus on a solution which tackled the lack of knowledge.

Sprint 4 focused on developing interventions based on the concepts for organic and textile waste. A compost facility and clothing swap closet were thought of and steps towards realization were made. In addition, a platform was created which made the information about creating value from waste approachable for the community. In addition, an exploration based on social waste separation was done. To conclude, sprint 4 provided the answers and examples to the research question, by showing two very realizable solutions for value creation from waste for and by a community, while the platform provided the information to continue with circular projects in the future and empowered the community to do so.

17 REFLECTION

Finally, an answer is given to the criteria set at the beginning of the project. First of all, do these solutions reduce waste? Yes they do, to certain extents. The compost facility does so in a very direct way by providing a place to throw away organic waste, from the community, the MCTC and the garden.
The clothing swap closet also reduces waste, by providing a place to put old clothing instead of it being thrown away.
Finally, the platform / toolbox does so in a more indirect way. It teaches about waste and waste separation in the hope that people are less wasteful.

Do the solutions create value from waste?
This question can also be answered positively. The compost facility turns organic waste into compost which is very valuable to the vegetable garden, which in turn provides value to the community. The clothing swap closet is able to give clothing a second life and thus providing value to its second owners and the community. The platform does so more indirectly and just provides the information to do so.

Lastly, do the solutions help the community financially or socially? The compost facility financially does so by providing compost, which creates a better soil with more nutrients for the plants. So less money can be spent buying food. It does so socially, by making it a place for the community to learn, get inspired and meet each other there. The clothing swap closet does so financially by providing the community the opportunity to save money on clothing. Socially it does so by providing events and workshops on textile waste, through the sewing group. The platform does so again, but in an indirect way, by just providing the right knowledge and tools to do so.

17. 1 What is missing

Of course not everything went perfectly, in an ideal situation, the developed solutions for organic and textile waste would be realized and tested as well. Right now the proof that they and the platform actually work is not there. The only validation that is present is that these are the solutions that solve the problems and challenges found during the project. So providing solutions for value creation from organic and textile waste and solving the lack of knowledge issue.

17. 2 Personal reflection

The project in general had its ups and downs, eventually good solutions were developed, but not without struggle. In hindsight it would have been a lot better to involve the community from the beginning, have more sessions and actually start a pilot with an intervention. Unfortunately it took too long before the awareness came that the project was much more about social design than initially expected. The sessions that were done with the community were very valuable however, but one or two more would probably have been very valuable. Unfortunately that is not how it went and due to time constraints it was not possible to extend the project.

The restrictions due to COVID-19 were not of any help either, a graduation project is already very focused on the individual, having to work from home only emphasized that. Usually, there is always the possibility to get quick feedback on things and discuss ideas or plans in an informal way, but in these times and with limited time for meetings, not everything can be discussed as detailed and some crucial steps or ideas can be missed from both sides. Although the project did not go as smoothly as hoped, there are still things to be proud of and a lot of lessons have been learned, which is almost as valuable in the long term.

18 RECOMMENDATIONS

For the organic and textile waste interventions, the next steps should be executed and the solutions realized. For both it is recommended to create rules, manage expectations, set goals and to organize events to create awareness and bring the community together

The platform should be added to the already existing CLT Members platform so it is accessible to them. In addition, the platform should be promoted and explained to them during a CLT members meeting. For the promotion, the developed interventions should be used as an example of what is possible with the platform.

To increase engagement with the platform, possibilities into gamification should be explored, as it proves to be a promising way to learn things in a fun and easy way, which is what the platform also strives to do.

Another option to make sure the platform is used is to get some enthusiastic people from the community together who are interested in circularity. They could start a workgroup focused on putting the platform to practise and creating more initiatives such as the ones developed during this project.

To create more awareness around circularity, it is recommended to organize more workshops which focus on the topic. For example a workshop could be focused on how to create value from certain types of plastic waste or how to create new clothing out of old clothing. The purpose would be to get the ball rolling and open the eyes of the community.

The final recommendation is to just do it. Making plans and developing solutions is one thing, but actually going out there and making something which adds value is another. It also is more effective and provides quicker results and insights.

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Appendix

Appendix P - Project Brief

DESIGN FOR our future

TU Delft

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT
Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME
Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy".
Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !

family name	Kruimer 4634
initials	S. P. given name Sjoerd
student number	4368312
street & no.	
zipcode & city	
country	
phone	
email	

Your master programme (only select the options that apply to you):

IDE master(s):	★ IPD ( ) DfI ( ) SPD
2nd non-IDE master:	
individual programme:	- - (give date of approval)
honours programme:	( ) Honours Programme Master
specialisation / annotation:	( ) Medisign
	( ) Tech. in Sustainable Design
	( ) Entrepeneurship

SUPERVISORY TEAM **
Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair	Henk Kuipers	dept. / section:	HCD AED
** mentor	Frans Tamminau	dept. / section:	HCD DCC
2nd mentor	Joris Kramer		
	organisation: And the People		
	city: Amsterdam	country:	The Netherlands

comments (optional)

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

Second mentor only applies in case the assignment is hosted by an external organisation.

Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

TU Delft

Procedural Checks - IDE Master Graduation

APPROVAL PROJECT BRIEF
To be filled in by the chair of the supervisory team.

chair Henk Kuipers date 21 - 12 - 2020 signature Hkuipers Digitally signed by Hkuipers Date: 2020.12.21 12:59:07 +01'00'

CHECK STUDY PROGRESS
To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair.
The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: 30 EC
Of which, taking the conditional requirements into account, can be part of the exam programme 30 EC
List of electives obtained before the third semester without approval of the BoE

★ YES all 1st year master courses passed
○ NO missing 1st year master courses are:

name J. J. de Bruin, SPA-IO date 05 - 01 - 2021 signature J. J. de Bruin, SPA Digitally signed by J. J. de Bruin, SPA Date: 2021.01.05 09:24:03 +01'00'

FORMAL APPROVAL GRADUATION PROJECT
To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **.
Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: ★ APPROVED ○ NOT APPROVED
Procedure: ★ APPROVED ○ NOT APPROVED

- typo in title (should be management)

comments

name Monique von Morgen date 19 - 01 - 2021 signature

Personal Project Brief - IDE Master Graduation

TU Delft

Circular waste manegement in a Community Land Trust in the Bijlmer — project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 18 - 12 - 2020 — 28 - 06 - 2021 end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

Community Land Trust (CLT) is about realizing sustainable and affordable buildings for local communities. In co-creation and co-ownership with (future) apartment dwellers, the local community and financiers and/or the owner of the land, it tries to provide a fairer and more social counterpart to the commercial real estate development (Graduation Opportunity CLT, 2020). The CLT concept originated in the US (Grounded Solutions, 2020) and has also been around for a while in other countries, but is new for the Netherlands. (Cltb.be, 2020).

In the past two years, research has been conducted into the possibilities and opportunities concerning the implementation of a CLT in Amsterdam (CLT Whitepaper, 2020). The research concludes it is possible to set up a CLT in the Bijlmer. Figure 1 shows, among other things, the roadmap towards the first CLT in the Netherlands and figure 2 shows what principles the CLT will be based on.

The Community Land Trust project is a collaboration between the company 'And the People', Gemeente Amsterdam and CLT Bijlmer, as figure 1 also shows. It strives to combine principles of the circular economy with those of a CLT in order to develop the first CLT in the Netherlands and the first Circular CLT in the world.
Gemeente Amsterdam is the municipality of Amsterdam and the current owner of the land. They are the ones who will ultimately decide if they want to continue with the plans for the area and thus have a supportive role within the project.
'And the People' is a design agency which focuses on sustainable and inclusive urban development, sustainable consumption and circular economy (And the People, 2020). Their goal is to create lasting impact by facilitating the realization of inclusive urban transitions. Within the CLT project this is also exactly what they do, they actively facilitate and bring everyone and everything important to the project together. Within this graduation project 'And the People' is the main contact and client.
CLT Bijlmer is a non profit initiative driven and owned by the Bijlmer community and its residents with the aim to voice itself for neighborhood developments and to create access to affordable housing and community infrastructure (CLT-Bijlmer, 2020).
Opportunities for the project include: The municipality of Amsterdam strives to be a fully circular city in 2050. Amsterdam focuses on three areas in order to achieve this; food and organic waste streams, consumergoods and the built environment. Within these areas there are over 200 circular initiatives (Amsterdam, 2020). So making the CLT in the Bijlmer circular is the logical way to go for Amsterdam, in order to achieve their 2050 target.

There will be four graduate students working on this project simultaneously, see figure 2. Two students are from the MSc MADE, Metropolitan Analysis Design and Engineering (MSc Made, 2020). The other two are from IDE, one SPD graduate and myself the IPD graduate. Within the project we will be able to contribute to each other's work by, for example, doing research together.

Limitations of the project include the following; a CLT is not a very well known term in the Netherlands and thus receives some resistance from authorities and lawmakers to get everything explained and sorted. In addition, as there are a lot of different stakeholders involved in the project, it is going to be a challenge to get everyone on the same page in terms of finalizing what the final result will look like.

The sources of this text can be found below the motivation and personal ambitions chapter

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Personal Project Brief - IDE Master Graduation

TU Delft

introduction (continued): space for images

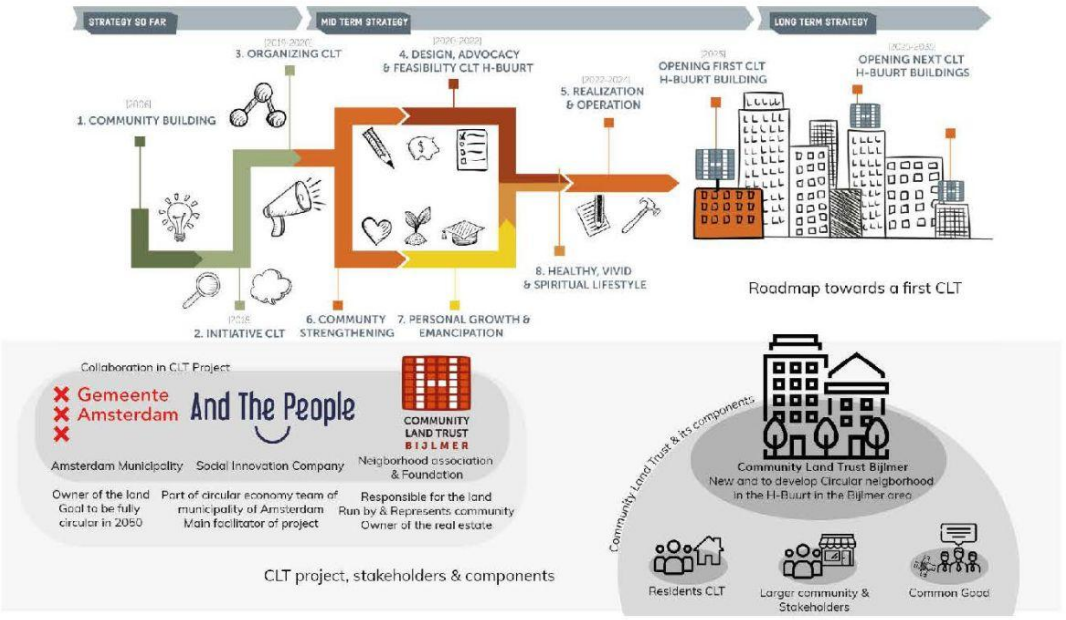

image / figure 1: Roadmap to first Circular CLT in NL & project overview (cltbijlmer.nl)

Name	Master Education	Topic Graduation Project
Sjoerd Kruimer	Integrated Product Design	Local circular waste management in and for the CLT
Elvira Kok	Strategic Product Design	Open-source toolkit Connecting CLT to the doughnut economy
Jikke de Lange	AMS MADE	Sharing economy and facilities in combination with CLT
Jelle Burger	AMS MADE	Matching current CE built environment initiatives with CLT

image / figure 2: Graduates/topics for the project & Principles specified for the Bijlmer CLT (cltbijlmer.nl)

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Personal Project Brief - IDE Master Graduation

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Circularity is about making sure as much value as possible is retained in a process or is used elsewhere, so making these processes circular in stead of linear and making sure as little value is lost in materials and products as possible between lifecycles. Within this challenge there are a lot of directions to go in. The direction I am most interested in is focused on maximizing the value of materials that normally go to waste within a neighborhood or building. So finding ways to re-use 'waste' material to benefit the neighborhood.

Within the CLT project, the focus is on the community/residents to lead in the transition (figure 2, point 6), so it is key to involve them in the circular process. The most important thing is to make sure the community sees value in circularity and is able to do something with it, as they have to ultimately execute the processes. It involves people's behavior and attitude towards waste, which requires a change in order to become circular. The challenge here is that the community has to be made aware of what they can achieve together when it comes to creating value from waste.

And for IPD it should be emphasized that the members of the community must be enabled to apply their circular plans.

The project has to be in line with the principles shown in figure 2. The principles closest related to the project are 4 and 6. 4 translates to: (neighborhood) functions at the front, these functions are about stimulating collectivity and giving residents control over the neighborhood. It relates to creating value from waste by the community.
6 translates to: residents of the CLT leading the transition (6) which relates to changing people's behaviour towards waste.

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

Enabling the CLT Bijlmer community to create and optimize relevant value for themselves and their surroundings from specific waste streams and making sure they can manage and maintain this process, while supporting the (local) circular economy.

Within the project of developing a Community Land Trust (CLT) combined with the principles of the circular economy, my goal is to create an overview of the current situation and culture regarding waste in the Bijlmer, followed by finding and showing ways in which the community is able to create value from identified waste streams.
Ultimately I want to find and isolate a specific type of waste within the Bijlmer with the intention to circulate it as close to home as possible and also show this in the form of a business case.
Research question:
- How to enable and show the residents of the CLT Bijlmer that they themselves can create value from waste and by doing so support the (local) circular economy?

Subquestions
o Which waste streams will be present?
o How will these waste streams be recycled most efficiently?
o How to show and involve the CLT community that they can create social and economic value from waste?

Initials & Name S.P. Kruimer 4634 Student number 4368312

Title of Project Circular waste manegement in a Community Land Trust in the Bijlmer

Personal Project Brief - IDE Master Graduation

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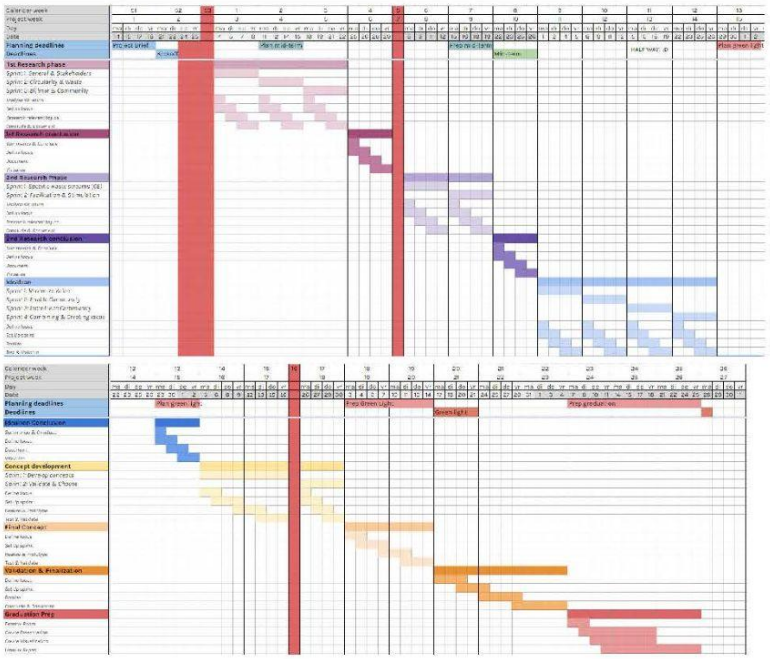
PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 18 - 12 - 2020 28 - 6 - 2021 end date



My plan is to work on my graduation project for four days a week, as I will be working on my start-up company on the fifth day. This means the running time of my graduation project will be 25 weeks, in order to come to the 100 working days. The planning I made involves the kick-off, midterm, green light and graduation, which are alle adjusted to fit in to a 25 week planning. The planning also includes some short breaks, one around christmas, one in February as this is a scheduled TU Delft break, which I like to use and one between the midterm and green light, to break up this period. also included, in general, the main phases of my process broken down in sprints. These are; a general and specific research, ideation, concept development, final concept and validation and finalization. As mentioned, every phase is broken up in sprints, which follow a specific structure, resulting in a more iterative process.

To succesfully do the project the following things have to be undertaken; an overview of the current situation has to be created. Which means; identifying current waste streams, looking where they end up and how they are recycled. Also, researching what attitude there currently is towards waste in the Bijlmer and what opportunities or barriers towards a more circular lifestyle and maximizing value from waste there are. In addition, it is key to research what initiatives are already present concerning the topic and which waste streams are the most valuable to reuse in general and for the community, while always keeping in mind that they have to be able to manage and maintain it. Also, it is very important to find out what the best way is to stimulate and enable the community into executing and maintaining the circular processes and making sure they see it as something valuable. Only then the project will actually be a success.

Initials & Name S.P. Kruimer 4634 Student number 4368312

Title of Project Circular waste manegement in a Community Land Trust in the Bijlmer

Personal Project Brief - IDE Master Graduation

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MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

I have always had an interest in the urban and built environment, but did not have lot of experience actually designing something for it. In addition, I always have extra motivation to learn and to work when it comes to topics which are relatively new to me, it provides me the opportunity to really dig deep. So I felt like my graduation project was a good opportunity to take on a project with a focus like this one and try to learn as much about it as possible about the topic and the project, in order to contribute in the best way possible. It is always very meaningful to contribute to projects in which relatively new concepts with a lot of potential are introduced. Not only will this be the first Community Land Trust in the Netherlands, it will also be the first Community Land Trust in the world which is developed with the principles of the circular economy at its core. In addition, with the current trends concerning the housing market, with prices skyrocketing in densely populated areas, resulting in current residents not being able to afford housing anymore, a Community Land Trust is even more relevant and might even provide a solution for the problem.

With this project I do not only want to learn about circularity and contribute for the Community Land Trust. I would also like to use some of my strategic and business skills to identify opportunities for the residents of the CLT in which the residents themselves can help stimulate the local economy.

Sources Introduction:

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Grounded Solutions. (2020). Retrieved 24 November 2020, from https://groundedsolutions.org/tools-for-success/resource-library/community-land-trust-model-and-movement

MSc MADE. (2020). Retrieved 24 November 2020, from https://www.ams-institute.org/education/msc-made-program/

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Appendix A - Context & Research

1. History of the CLT

As mentioned in chapter 3.1, the CLT model originated in the US, where the first CLT was created in 1969 to provide long-term opportunities for economic and residential independence for African-Americans in the rural south (National CLT Network, 2020). The model really started to flourish in the 1990's due to favorable legislation and funding opportunities combined with a lot of experience from CLT's already present. In the years that followed, the CLT model was picked up in the UK, followed shortly after by Belgium, France, Italy and Australia.

2. Bijlmer and history of Bijlmer

The Bijlmer, the neighborhood the H-Buurt is a part of, is a large area in the south east of Amsterdam. It was built between 1960 and 1970 due to a housing shortage in Amsterdam and to prepare for the future. (Bijlmermuseum, 2014) The neighborhood was designed as a very modern and green neighborhood of the future, with lots of greenery, space for the individual, but also for the community. The Bijlmer was supposed to be the city of the future, its design based on the principles of CIAM (Mingle, 2018).

CIAM, which was the international congress of modern architecture, a platform which existed from 1928 to 1959. (COST, 2018). It had a lot of influence on modern architecture, mainly through the idea of 'the functional city'. (Ruimte en Wonen, 2015) A functional city separates city functions, transport, work, living and recreating are all separated from each other, in order to combat the congested old style cities. The Bijlmer was built as the perfect interpretation of this idea and became a symbol of modernist architecture. (Mingle, 2018) But not long after its completion, the first problems started to arise.

The Bijlmer became the first neighborhood in the Netherlands which was labeled a ‘ghetto’ or a bad neighborhood to be in. It was meant for middle class people from Amsterdam but became home to people with a migration background and low incomes. (NOS, 2017)

Nowadays the Bijlmer has improved a lot, a lot of old buildings have been demolished and there have been a lot of improvements. It still has the stigma of being a bad neighborhood, but among its residents it has become one of the more popular places in Amsterdam to live. (Sociale Vraagstykken, 2019)

3. **More information on specific waste problems H-Buurt**

There have been problems with bulky waste for quite some time in Amsterdam (Algemeen Dagblad, 2020). People often put it in the wrong place, place it at the wrong time or just dump it on the streets. A lot of bulky waste in a neighborhood results in it being a lot less

livable, hospitable and inviting.(Movisie, 2020) In addition, people will have a less feeling of ownership of their neighborhood, resulting in even more trash. Although Amsterdam has put a lot of effort into improving the situation, by providing a lot of dedicated places for it and giving a lot of information about what exactly has to happen with bulky waste, the situation has not improved. (Het Parool, 2016)

Next to bulky waste, litter is a big problem. There is a lot of litter in the streets of the H-Buurt, plastic bags, plastic and glass bottles, styrofoam, food packaging, broken products, old clothing and other stuff. This problem is recognized and often addressed by neighborhood representatives, but it seems that people do not listen. (Hakfort en Huigenbos, 2021). The problem with litter on the street is not just about contamination of the area and the soil, it als negatively affects ownership and responsibility of the neighborhood and living environment, resulting in less social cohesion. (Ahmad, 2021)

Lastly, cardboard is a problem, especially cardboard packaging of products. The problem with it is that when people go to throw it away, it often does not fit into the opening of the underground containers.(de Volkskrant, 2020) So they leave the ones that do not fit next to it. Also resulting in similar problems as listed above, namely less ownership of the living environment and neighborhood and less social cohesion. In addition, it inspires other people to do the same, which only adds to the problem.

4. Deepdive H-Buurt

Residents and demographics

The Bijlmer is a place where people from more than 130 different cultures and backgrounds live together, the H-Buurt is no different (Iamsterdam, 2021). Of the roughly fifty thousand people living in the Bijlmer, 7500 call the H-Buurt home. (Metabolic, 2018) Most of these people have a non-western migration background of which the majority, about 30%, has a Surinamese background (DSP, 2007). In the H-Buurt, roughly 80% of housing is classified as social rent (Metabolic, 2018) and the average household size is 1,9 people per household (KadastraleKaart, 2021). This relatively low number, compared to the Dutch average, can be explained by the percentage of single person households, which is roughly 60% (KadastraleKaart, 2021). The average income is around €23k a year (Metabolic, 2018), roughly half of the residents have a low education level and around 40% had a mid level education (Metabolic, 2018). Roughly 20% of the residents do not have a job and receive government benefits (uitkering). (CBS, 2021) There are relatively a lot of young people living in the H-Buurt, kids up to 15 years old represent 17% of the population. In addition, the age groups 15 to 25 years old and 25 to 45 years old represent 19 and 31% respectively. (AlleCijfers.nl, 2021)

Problems in neighborhood

Since the beginning, Bijlmer has been a neighborhood with a lot of problems. It was labeled as the first ‘ghetto’ in the Netherlands (Bijlmermuseum, 2014). Although the Bijlmer is doing a lot better nowadays than in the past, there are still a lot of problems in some places. The Bijlmer has undergone a lot of improvements over the years, but unfortunately due to the

economic crisis in 2008 it was left out. (NUL20, 2018) So it can be said that the problems from the Bijlmer of the past still, to some extent, live on in the H-Buurt. To create a better understanding of these problems, a division is made between social problems and physical problems in the neighborhood. In addition, it has to be said that currently the Municipality of Amsterdam is investing more and more in the H-Buurt in order to make it a better area. (H-Midden Amsterdam, 2020)

Social problems

The biggest problems in the H-Buurt are the social problems. 22% of H-Buurt residents suffer from social exclusion, which means that due to circumstances and financial or health issues, they are not fully able to take part in society (SABO, 2020). Loneliness is also a problem among residents of the H-Buurt (Gebiedsplan Bijlmer Centrum, 2019). Another issue in the H-Buurt is poverty. A big group of people is always in 'survival mode' and struggles to get food on the table, often having to work multiple jobs (Het Parool, 2018). 35% of children in the H-Buurt grow up in poverty (DSP, 2007) Although a lot of H-Buurt residents have their problems in common, a lot of separation between residents still exists. Due to the high amount of cultures present, there are 'islands of cultures', meaning that the cultures do not mix or gravitate towards each other (Verwey-Jonker, 2012). There are only multiple small bubbles, which creates a sense of distrust and different expectations of usage of public space (Verwey-Jonker, 2012). So, the sense of being part of a bigger community of H-Buurt residents is lacking. The people in the H-Buurt often feel left out or forgotten by the municipality, they feel like they are not being taken seriously or understood. Which results in a lack of connection between them and the municipality.

Physical problems

Next to social problems, there are some physical problems in the neighborhood. First of all, the facilities in the H-Buurt are lacking, either they are not present or they are not being cared for and are unsafe. Sports facilities and good, safe facilities for children such as playgrounds are mainly lacking (SABO, 2020). In addition, according to residents, there is no good after school care (Buurttelevisie Amsterdam Zuidoost, 2015). In itself these problems might be easy to solve, but looking at the bigger picture, these problems are actually at the root of other problems. The main one being criminality, as the lack of good after school care and facilities for youth and/or sports cause young people to hang around in the streets, being bored and messing around. Because of this they come into contact with a lot of people which results in youth in the Bijlmer being more likely to come into contact with crime than an average person in Amsterdam (ZO= Zuidoost, 2021). Also taking into account that a lot of these young people grow up in poverty and do not have strong role models, makes the step towards criminality rather small.

Needs and wishes of residents

As the municipality of Amsterdam is investing in the development of the H-Buurt, a lot of research has been performed already. The general needs and wishes of the H-Buurt residents can be found in the area development plans, such as the ones discussed in the next chapter.. Most of these needs and wishes revolve around better or more facilities in the neighborhood such as, a permanent community centre, more sports facilities, more facilities for children, youth and elderly, a core/heart of the neighborhood, better and more after school care and also a place for kids to learn, play and get inspired.

(ZO= Zuidoost, 2021)

Gebiedsplan Bijlmer Centrum 2020

The H-Buurt is part of Bijlmer centrum, so the central area of the Bijlmer. The municipality of Amsterdam has set up an area development plan for Bijlmer Centrum for 2020. Currently this plan is being executed. This plan consists of a number of goals, aspirations and plans to achieve the goals the municipality has for the area.The main development areas of the municipality are the following; Improve development opportunities youth, reduce poverty, improve living conditions, improve and promote physical and mental health, improve and promote neighborhood participation and social cohesion, strengthen neighborhood economy, art and culture and stimulate sustainable business. From these goals, the main problems mentioned earlier (see chapter FIXME) can be recognized, which are mainly problems regarding youth, poverty, cultures and health.

Projects taking place

Although the H-Buurt is a place with a lot of problems, there are some good things going on. If you take a closer look, some positive initiatives and projects to better the neighborhood and community can be found. A neighborhood workroom (De Handreiking, 2021), neighborhood lab (Hoodlab 183, 2021), Creative community Heesterveld (HCC, 2021) and a public library can be found in the H-Buurt (Figure FIXME). All of these initiatives are there to help, inspire and attract people to the H-Buurt and make it a nicer place to live.

5. Scenario and Personas

Possible scenario

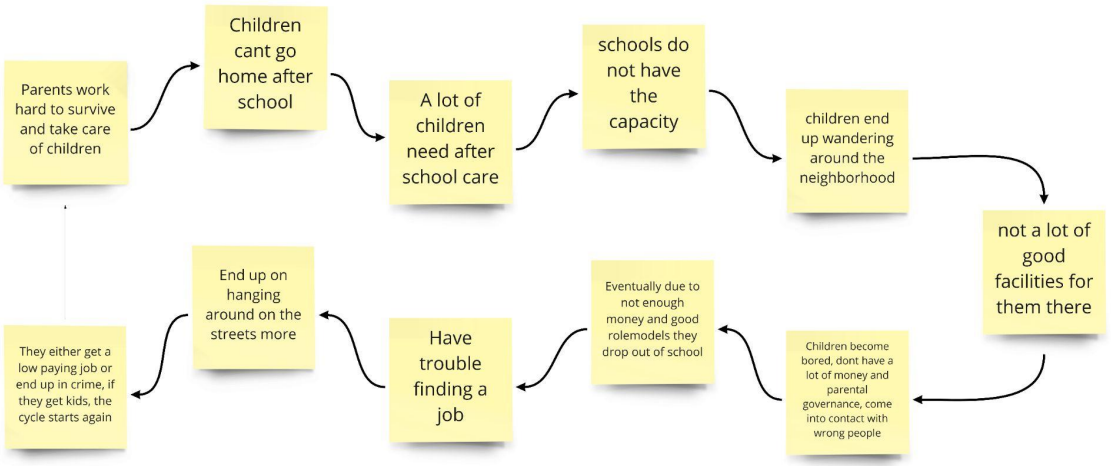
To make the current situation more clear and visualize some of the problems present, a scenario has been made. The perspective of the scenario is a child living in the H-Buurt, but the story starts with the parents.

The parents of the child work hard to survive and take care of their children; this means they often have to have multiple jobs in order to pay the bills.They will not be home often or will be home at irregular times.

This means their children can’t go home after school, as there is no one to take care of them and parents don’t want to leave them at home unattended. This results in a lot of children in need of after school care. This is a problem, as there is not enough capacity for all the kids to receive good after school care. What ends up happening is that kids start wandering around the neighborhood looking for things to do until their parents are home. Depending on the age of course.

While on the streets, these kids usually become bored, as there are not a lot of good facilities for them there. Add to this the fact that a large part of these kids grow up in poverty, without proper parental governance and are more likely to come into contact with criminality than the average dutch child.

Most likely in this scenario these kids will drop out of school, resulting in them having trouble finding a job. So they will spend more time being bored and hanging around on the streets. These kids either get low paying jobs or end up in crime. If and when they will have kids, there is a high chance the scenario will repeat itself.



Set up of persona's

Jamal, 12, School

Hi, my name is Jamal and I am 12 years old. I am in my 3rd year of havo at OSB. My mom works a lot to keep us afloat but sometimes she does not have the money for my books. So I am not able to keep up. Motivation for school is low, I don't like the topics either, so a lot of the time I do not attend and hang around on the streets with my friends, because sitting at home is boring.

I don't practice sports because my mom does not have the money to pay for training and membership. I mainly hang out on the streets and sometimes I get into situations I don't really like and come into contact with other kids who are doing bad things like stealing and stuff. I try to stay away from it, but it is difficult here.

I would really like to have some more places close to my house where I can play or hangout safely with my friends, although I don't like school I love experiencing new things and making stuff.

Faith, 36, supermarket & social work
Hello, my name is Faith, I am 36 years old and originally from Paramaribo. I lived there until I was 25 and then moved to the H-Buurt and have lived here ever since. After a couple of years of working at a supermarket and living here I decided to study to become a social worker in the Bijlmer in order to help and represent the people living here. It is a very beautiful neighborhood and a lovely community which I want to help flourish.

I don't make a lot of money but it is enough to get around and take care of my children. Unfortunately, the father is not around anymore. I understand the importance of my work and like my life here, although I do want my kids to have more opportunities and live a more comfortable life than I do.

What I would really like to have in this neighborhood is a safe place for my kids to play outside, play sports and learn in a more interactive way than just school. I would also really like to be able to watch over them easily. I want to give my kids a better chance in life than I had.

Edsel, 65, cleaner
Goodday, my name is Edsel, I am 65 years old and have lived in the H-Buurt for almost 30 years now. For the last 30 years I have worked multiple cleaning jobs, always on temporary contracts and with low pay. Sometimes I have to have multiple jobs in order to pay the bills, I barely make enough to live and sometimes don't eat. My social life is non-existent, the only place I go to for company is the church, sometimes I have lunch there to have social

interactions, they also provide me with food.

My health is also not as good anymore, I feel I am rapidly getting older. I tried to learn dutch but it is still very bad and my english is also very bad. So it is hard to connect and ask for help. I do really like the neighborhood though and would like to stay here.

The only thing I am missing in the H-Buurt is a nice place for old people to come together and socialize besides the church and a connection to a community in order to help each other out when it is necessary.
Further research

An interview with the leader of the MCTC was done to get to know the residents on a deeper level. The other students working on the CLT project also did interviews with community members of the CLT in order to get to know them better. The results of these interviews and insights into the community are shared in this chapter.

6. Summary of needs and wishes of intake interviews Irosha

Housing
What also became apparent from the interviews was that within the community the need for better housing and options for living exist. There are a lot of problems with housing cooperatives. Also, people do not want to pay too much money for their houses, this counts for both renting as buying.

Community & Youth
Something that is very important for the people of the community is actually that the community gets closer. The people have a need for company and they want more facilities that are suited for this in the neighborhood. They would like to be able to bring their cultures together and create a community where everyone is together. Another need having to do with this is about keeping youth in the H-buurt and supplying them with the right facilities to make it attractive for them to stay there. In order to also connect people from similar generations and even connect different generations.

Support and guidelines
Within the need for a closer community, there are some more specific needs. From the intake data it became apparent that inclusivity, mutual understanding and managing expectations were some topics needed within the community. Guidelines would also be necessary for the community to function properly. In addition, the community would need to provide support and inclusiveness. It would have to be a place for role models to stand up and where chances for youth in the neighborhood would come from.

Facilities
It also became apparent people wanted more and better neighborhood facilities. Specifically they wanted events around sports and culture, but also social events. In addition, more facilities focused on youth were necessary, specifically without a link to religion. Lastly, the

need for more independent community facilities aimed at residents is present within the community.

Interview results are under confidentiality

Interview results are under confidentiality

20 APPENDIX

Interview results are under confidentiality

Interview results are under confidentiality

Interview results are under confidentiality

Interview results are under confidentiality

PATRONEN IN INTAKES

- Deel v/d leden weet eigenlijk niet waar zich voor hebben aangemeld: vb. vrouw met Bijbelstudie

Welke aspecten van het CLT-verhaal trokken mensen aan en zijn blijven hangen?

- Hoop voor toekomst
- Dat men een eigen woning zou kunnen doorgeven aan kinderen en/of kleinkinderen (na overlijden bv.) in tegenstelling tot normale sociale huurwoningen
- Een woning voor thuiswonende volwassen kinderen regelen die momenteel niks kunnen vinden
- Behoefte aan een community plek; een eigen buurthuis met leuke activiteiten, workshops en educatie, vooral in de H-buurt
- Betaalbaarheid van wonen: lager dan huidige huur- en koopprijzen
- Samenwonen in diversiteit
- Een eigen restaurant starten in het gebouw
- Als kerkgemeenschap samenwonen
- Familie bij elkaar houden
- WoningNet wachttijd veel te lang, CLT zal sneller zijn hopelijk
- Thuis voelen in de wijk: men kent elkaar, leuke chaos, openheid
- Gemeenschapszin, gelijkwaardigheid, diversiteit en solidariteit
- Wonen in een interactieve community
- Toekomstperspectief voor jongeren
- Geen eenzaamheid
- Overtuigd door Moses
- Eindelijk eigen plekje “to call my own” maar wel in een community
- Verlangen om ondanks laag inkomen toch iets te kunnen kopen voor kapitaalopbouw
- Koopwoningen voor mensen met lage inkomens
- Inclusieve & democratische & duurzame aspect: “the core of what housing is about”

Wat is er nodig om CLT te laten slagen (to flourish) volgens de leden?

- Dat mensen de regels volgen
- Respect, solidariteit, liefde
- Communicatie en zeer goede samenwerking
- Schoon en net beheer van publieke ruimten: abide to the rules
- Elkaar goed leren kennen voordat we er gaan wonen
- Op basis van leeftijdsgroepen contact maken
- Genoeg ruimten en momenten voor ontmoetingen en interacties voor verbinding
- Mogelijkheden om kennis en middelen te delen

- vertrouwenspersonen en helpers in de community als contactpersonen voor problemen
- Een creatieve ruimte voor kunst (als expressie) en beweging (sport en danszaal)
- Democratische besluitvorming
- In publieke ruimten Engels of Nederlands praten (taal moet niet uitsluitend werken)
- Bewustzijn over diverse vormen van discriminatie en oordelen
- Actieve jongeren die in de Bijlmer willen blijven wonen
- Community events (like Kwaku Festival) = bonding
- De relatie tussen niet-kerkelijke jongeren en de oudere generatie verbeteren: intergenerationele sessies (bv. af en toe een drankje/jointje maakt je nog geen gefaalde crimineel

Welke spots zijn belangrijk voor mensen in de wijk (Zuid-Oost algemeen)?

- Mandelapark
- Bijlmerpark
- Amsterdamse poort
- Kraaiennest
- Bonte Kraai (Kraaiennest)
- HCC (voor HCC'ers)
- Bijlmerweide
- Stichting Spé (huiswerkbegeleiding Holendrecht groep 1 tot middelbare school)
- Voedselbank Ganzenhoef / Kraaiennest
- MCTC
- Diemerbos
- Pentecoastal churches of christianity community
- Bijlmer Sportpark
- Voedselbank Ganzenhoef

Wat missen mensen nu in de wijk?

- Meer diverse (indoor) sportfaciliteiten voor jongeren
- Een eigen buurthuis die past bij de cultuur van de bewoners
- Dat mensen zich breed kunnen ontwikkelen: toegang tot diverse activiteiten
- Dat (creatieve) talenten van jongeren uit de Bijlmer kunnen ontplooien en niet-witte inzichten/rolmodellen krijgen
- Eigen "chill en hang spots" voor (creatieve) jongeren in de H-buurt => sommige jongeren voelen zich niet thuis in huidige MCTC gebouw
- Aan zelfvertrouwen werken om iets te ondernemen bv. via opleidingskansen/trainingen met officiële certificaten
- Uitbouwen van de moestuin en onafhankelijk zijn van de gemeente
- Een repair café dat spullen verzameld uit de wijk en repareert en eventueel verkoopt

Wat kunnen we nog verbeteren in onze werkwijze?

- Heel regelmatig inzichtelijk maken wat we doen in audio, video en korte teksten
- Jongeren werven (vooral 20+) en social media beter gebruiken (vooral Instagram!); vertel ook over gemeenschappelijke ruimten en mogelijkheid voor ondernemerschap
- FAQs in video's toelichten
  - Wie gaan de CLT-woningen bouwen?
  - En van welk geld wordt het gebouwd?
  - Hoe werkt het precies met de koopopties?

- 10 euro contribution is heel weinig om kapitaal op te bouwen, waar is het voor bedoeld dan? => Vergelijking met WoningNet systeem (membership fee/capital).
- Hoe werkt een collectieve hypotheek? => meer mensen = samen meer lenen en fonds vanuit gemeente om te ontwikkelen (geleend) en rondom woningcorporatie een business model.
- Krijgen mensen die zich eerder hebben ingeschreven of veel betrokken zijn bij CLT voorrang op woningen?
- Is er een inkomensgrens?
- Kan de woning automatisch doorgegeven worden aan kinderen/familie?

- Zoom meetings don't work for us, misschien met meer interactie tussen leden onderling om elkaar beter te leren kennen
- Education of people in understanding well what they sign up for, what are the benefits & responsibilities
- Toelichtingen (10 minuutjes) over het project en wat membership betekent na kerkdiensten om beeldvorming strak te trekken
- Dat mensen anderen in hun netwerk aansporen om deel te nemen/actief te worden
- Jongeren die goeie "salespersons, role models and representatives" zijn voor CLT
- Blijf doorgaan met persoonlijk contacteren en intakes doen en flexibel zijn; dit geeft mensen een persoonlijke benadering, sense of belonging en een moment van verheldering en mensen in deze gemeenschap hebben soms flexibiliteit nodig

Overige ideeën n.a.v. gesprekken

- MCTC gebouw versieren met kunst ⇔ in samenwerking met Redefine Arts
- Infographics maken met tekentalenten
- Video maken met wat membership inhoudt (met belangrijke FAQs) en sturen naar alle oude en nieuwe leden (als welkom)
- Timebank idee wekt interesse
- Delen van spullen lijkt veel animo voor
- Samenkomen in groepen van 20 personen om dialoog te voeren over problemen, eigen mogelijke oplossingen en wensen
- Focus op de mensen die echt bereidwillig zijn om zich in te zetten: lead by example werkt in deze community het beste
- Via CLT-vereniging certificaten/diploma's halen voor bepaalde skills en kennis
- Uitbreidingsmogelijkheden en wensen met de moestuin (coaching, verhoogde bakken)

Appendix B - Specific Waste Research for concepts

1. Organic waste biodigester

Organic waste digester (circ biodigester 50 CIRC — BIODIGESTER)

- up to 50 kg organic waste per day
- up to 15m3 biogas per day
- up to 50 kg plant food/fertilizer

Implementation

- New buildings have to be fully free of natural gas
- Combination of following things is necessary for biodigester to work
    - heat pump
    - solar panels
    - Heat efficient houses (little heat loss through, isolated windows and seems, isolated curtains, etc)

Organisational model / connection to community/cooperative

- 1 - 2 people mainly responsible for organic waste separation total system and managing collectors
- per floor/part of building 1 responsible for collection of organic waste from residents and making sure they separate
- It is measured how much organic waste every resident contributes, and they get that exact amount back as biogas/electricity or tokens

Opportunities

- use biodigester to heat houses with boiler/CV
- use biodigester to create electricity from gas to heat houses
- use biodigester to cook food only
- Use fertilizer for common vegetable garden and house plants
    - also sell fertilizer to people in neighborhood and to plant/flower shops

Advantages

- no natural gas
- no more organic waste
- make money from it
- use it in the apartment complex
- have fertilizer for your gardens
- no more rats etc

Barrières

- people need to start separating their organic waste
- people need to be responsible for the systems in the building

- people need to collect the organic waste and feed it to the biodigester
- investment needs to be made

Scenario

1. people separate their organic waste
2. Organic waste is collected (almost all types of organic waste CIRC — Factsheet BioDigester)
3. organic waste is fed to the biodigester
4. biogas and fertilizer are created
    a. biogas is used for heating/cooking/electricity
    b. fertilizer is bottled and sold or used in garden
5. biodigester has to be cleaned every once in a while

Waste

- Amount of organic waste per person per year in Amsterdam:
    - 70.000 ton GF-E per year → 81 kg per person (GFE presentatie GFE project weer in beweging – Groene Hub)
- Amount of organic waste in CLT Bijlmer
    - 60 - 90 units gemengd wonen (Whitepaper - 2 concrete vervolgstappen (clt.amsterdam))
    - Gemiddelde huishoudensgrootte bijlmer centrum : 1,8 (Bijlmer Centrum (D,F,H) in Amsterdam - KadastraleKaart.com)
    - minimum: 60 x 1,8 = 108 people
      108 people x 81 kg GF-E = 8748 kg GF-E per year
      8748 kg / 365 days = **24 kg GF-E per day**
    - maximum: 90 x 1,8 = 162 people
      162 people x 81 kg GF-E = 13122 kg GF-E per year
      13122 kg / 365 days = **36 kg GF-E per day**

- Amount of organic waste per person per year in NL:
    - 140 kg per person per year, of which 62% (87 kg) is separated Afval scheiden: cijfers en kilo's | Milieu Centraal
- Amount of organic waste in CLT Bijlmer
    - 60 - 90 units gemengd wonen (Whitepaper - 2 concrete vervolgstappen (clt.amsterdam))
    - Gemiddelde huishoudensgrootte bijlmer centrum : 1,8 (Bijlmer Centrum (D,F,H) in Amsterdam - KadastraleKaart.com)
    - minimum: 60 x 1,8 = 108 people
      108 people x 81 kg GF-E = 9396 kg GF-E per year
      9396 kg / 365 days = **26 kg GF-E per day**
    - maximum: 90 x 1,8 = 162 people
      162 people x 81 kg GF-E = 14094 kg GF-E per year
      14094 kg / 365 days = **39 kg GF-E per day**

Gas

- Usage per household per day: Het gemiddelde gasverbruik in Nederland | Essent
    - Average per apartment: 900m3 per year / 75m3 per month / 2,5 m3 per day

    - Average small house: 1350m3 per year / 112,5m3 per month / 3,7 m3 per day

- Usage per household per day Amsterdam: Energieverbruik particuliere woningen; woningtype en regio's (cbs.nl)
    - Average per apartment: 760 m3 per year / 2,1m3 per day
    - average small house: 970 m3 per year / 2,65 m3 per day

- Gas generated by biodigester: (1Kg → 320 L biogas) CIRC Biodigester Factsheet CIRC — Factsheet BioDigester
    - min: (24kg → 7.7m3 biogas per day)
    - Max: (39kg → 11,7m3 biogas per day)
    - So 4 to 6 apartments can be fully heated every day → to little!!!

High quality Plant Fertilizer/Food
- Fertilizer generated by biodigester (1kg waste → 1 L fertilizer)
- minimum 24 kg = 24L fertilizer
- maximum 39 kg = 39L fertilizer

- salesprice per L = €5,- (competitive average price based on similar products online)
- profit
    - minimum: €120 per day
    - maximum: €195 per day

Space:
- 240 x 150 x 170 (LxBxH)
- 3,6m2
- 800 kg empty / 2200 kg full

Price:
- ??? 42,500 Green Gallery: #40 Circ — The Green Quest
- payback period 3 to 5 years
- there is a possibility to subsidize the biodigester

2. Wormery

Wormery / worm hotel Wormenhotel – samen composteren

Implementation
- installed in a public area of the CLT (usually outside)
    - perhaps close to gardens?
- workshops are organized to teach residents how to use it

Organisational model / connection to community/cooperative

- 1 person responsible for maintaining wormhotel, checking it every once in a while, also if people throw in the right organic waste
- The worm hotel keeps track of who throws their organic waste in there and how much. People can enter a dashboard to see who is leading and how full the reservoir is
- a community event is organized every time the reservoir can be emptied. everyone gets some of the fertilizer and an instruction on how to use it. Next to that, some is used to feed and maintain the plants owned by the community
- in the dashboard you can also upload what you have used the compost/fertilizer for, to inspire other people and get more people to use it.

Opportunities
- less organic waste goes to waste
- fertilizer/compost is gained to feed to plants and use it for the common vegetable garden
- opportunity to make it something social, connecting the residents
- Sell the rest to neighbors

Advantages
- less waste
- no more rats etc
- very passive solution

Barrières
- not all organic waste can be used (no cooked food leftovers, meats, pasta, bread etc)
- Get people to separate their waste

Scenario
- a workshop about the wormhotel is held to inform people
- People start to separate organic waste
- Feed it to the wormhotel themselves
- every once in a while they empty the tray and divide the compost
- start process again

Waste
Less organic waste then biodigester, as food leftovers and other waste can not be put into worm hotel, so roughly 60%?????

- Amount of organic waste per person per year in Amsterdam:
  - 70.000 ton GF-E per year → 81 kg per person (GFE presentatie GFE project weer in beweging – Groene Hub)
- Amount of organic waste in CLT Bijlmer
  - 60 - 90 units gemengd wonen (Whitepaper - 2 concrete vervolgstappen (clt.amsterdam))
  - Gemiddelde huishoudensgrootte bijlmer centrum : 1,8 (Bijlmer Centrum (D,F,H) in Amsterdam - KadastraleKaart.com)

    - minimum: 60 x 1,8 = 108 people
      108 people x 81 kg GF-E = 8748 kg GF-E per year
      8748 kg / 365 days = **24 kg GF-E per day (60% = 14,4 kg)**
    - maximum: 90 x 1,8 = 162 people
      162 people x 81 kg GF-E = 13122 kg GF-E per year
      13122 kg / 365 days = **36 kg GF-E per day**

- Amount of organic waste per person per year in NL:
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      14094 kg / 365 days = **39 kg GF-E per day**

Fertilizer
- first wait 4-8 months for first batch of fertilizer
- then it can be harvested every couple of months, depending on the size of the container

Price
- 2000 - 10.000 euro Wat zijn de kosten? – Wormenhotel

3. Plastic upcycling

Plastic upcycling
- A Big Bang for Plastic Recycling (preciousplastic.com)
- How to turn plastic waste in your recycle bin into profit (theconversation.com)

Implementation
- facility inside the building
    - hard plastic is cleaned, separated and shredded and used for different kinds of things with 3d printer and such
    - 3d printer and other production machines need to be present
        - 3d printers
        - cleaner

        - shredder
        - recyclebot [RepRap Recyclebot Turns Plastic into 3D Filament for $700 -- Campus Technology]
        - storage space and solution
    - instructions need to be visible and clear
    - some standard parts and product plans need to be there for production

organisational model / connection to community/cooperative
- 2 people responsible for running the operation
    - giving instructions
    - collecting and processing hard plastics
- can also be a collection point for entire community, people can hand in their plastic and get some money per kg
- shop sellling standard products need to be run

Opportunities
- using 3d printer to create parts for broken products
- having a platform where people can list the broken items they have, so the plastic upcycling facility can fix them (maybe people need to provide the plastic themselves and provide only payment for service?)
- using recycled plastic for public spaces in community (furniture etc)
- organizing creative workshops with plastic waste, for community
- sell filament and standard products in shop connected to processing facility
- Join a 3d printing service platform to earn money by printing other people's projects and keep the printers in operation.

product examples:
- 3d printed water saving taps
- 3d printed water saving shower heads
- 3d printed tupperware to store food
- household items
    - coasters
    - bowls
    - plantpots
    - strainer

Advantages
- less plastic is wasted
- People can earn money from it
- other products can be repaired
- people can buy necessary

Barrieres
- investment cost
- people need to be trained/ have the skills to work with it

Scenario

- people separate their hard plastics from the rest using special baskets
- it is collected by one of the responsible community leaders
- the plastic gets cleaned
- the plastic gets separated
- the plastic gets shredded and turned into filament
- one printer produces standard household products
- other focuses on custom jobs

Waste

- 24 kg hard plastic (verpakkingen) per year per person Afval scheiden: cijfers en kilo's | Milieu Centraal
- min 108 people in CLT, max 162 people in CLT (60 - 90 units x average persons per household (1,8)
- Minimum per year = 24 x 108 = 2592 kg plastic per year / 7,1 kg per day
- maximum per year = 24 x 162 = 3888 kg plastic per year / 10,65 kg per day

Profit/return

price

- 3d Printers
  - small DIY printer = €190 Creality 3D Ender 3 Pro 3D printer Creality3D 123-3d.nl (123-3d.nl)
  - better printer €535 Creality 3D Ender-6 3D-printers 123-3d.nl (123-3d.nl)
  - Bigger more professional, plug and play solution = €1190 Creality 3D CR-5 Pro 3D-printers 123-3d.nl (123-3d.nl)
- filament maker
  - diy solution : €700 and 24 hours to make it yourself RepRap Recyclebot Turns Plastic into 3D Filament for $700 -- Campus Technology
  - plug and play solution: €717 Felfil EVO Pellet Extruder | wit | 1,75 mm | geassembleerd Felfil 123-3d.nl (123-3d.nl)
  - Plug and play solution with spooler : €1160 Felfil EVO Pellet Extruder & Spooler set | wit Felfil 123-3d.nl (123-3d.nl)
- Shredder
  - DIY shredder : €1100 Precious Plastic Basic Machines
  - buy premade 1300 Working precious plastics shredder
  - shredder and motor, no mount etc : 500 Machines :: Shredder :: Shredder Fully Built :: SHREDDER + MOTOR (preciousplastic.com)
  - manual shredder CE certified 950 Manual Shredder - CE certified (preciousplastic.com)
- cleaning station
  - met de hand schoonmaken: gratis
  - Vaatwasmachine: vanaf €300 Vaatwasser kopen? | Morgen gratis thuisbezorgd | bcc.nl
- Extra equipment (cleaning, post processing, tools etc) €100 - 500 Top 25 Must-Have 3D Printing Accessories (Updated 2021) | 3D Reviews (3dprinterreviewsite.com)

total price

part	price
3d printer (2x)	190 / 535 / 1190
filament maker	700 / 1160
shredder	1100
cleaning	0 / 300
extra equipment	100 / 500
Total	**minimum 2280 / maximum 5440**

4. textile upcycling

Textile upcycling
- turning old clothes into new fabrics / clothing

Implementation
- have a place in the building where people can hand in their old clothing
- part of it is a sewing studio and part of it is a shop
- also an area for workshops
-

Organisational model / connection to community/cooperative
- 2 or more people who run the shop
    - managing store
    - separating textiles
    - deconstructing
    - sewing
- activities for the community are organized every once in a while
    - clothing repair cafes
    - sewing workshops
    - training etc
    - workshop to sort out your closet and give away your old clothing

Opportunities
- create insulating curtains from wasted textiles, to reduce energy bills
- let community repair own clothing under guidance of staff
- not all clothing is recycled immediately, clothing that is still good is sold in shop for small amount

Advantages

- less textile is wasted
- people are able to come together and learn a skill
-

Barrieres
- investment
- expertise
- people want to wear new/expensive/designer clothes, not second hand or upcycled clothing

Scenario
- collect old clothing
- bring it to the sewing shop
    - it gets put in the shop
    - it gets put in the recycle bin
- it gets sold or sorted and deconstructed
- it gets remade into new clothing or textiles
- and sold in the shop
- or used for workshops

Waste
- CONCEPT (amsterdameconomicboard.com)
    - 3.1 kg textile per person per year separated and thrown away in amsterdam
    - 12 kg textile per person per year unseparated thrown away in amsterdam
- 15kg x (108 - 162) =
  minimum: 1620 kg per year in CLT → 4,4kg per day
  maximum: 2430 kg per year in CLT → 6,7kg per day

Profit/return

price
- sewing machines (4x) Bernette B05 Academy naaimachine | Schuring naaimachines (schuring-naaimachines.nl) €400 a piece = 1600 total
- other equipment
- storing solutions

investment: 2000 - 3000 euro

5. woodworking / repair cafe

Repair/ upcycle / lease cafe
- repair broken products
- make new products from grofvuil
- https://makerslokaal.nl/

Implementation

- workshop/workspace for community to fix their broken products
- place where people can store and lease out their tools to other residents
- place where people can build / make products from grofvuil
- shop to sell products made from grofvuil or planks from grofvuil to make their own items

Organisational Model / connection to community/cooperative

- 2 responsible people / full timers
    - making stuff from grofvuil
    - helping people with fixing products
    - managing shop
    - maintaining tools
    - collect grofvuil
- informational events and workshops will be held to inform residents
- repair cafe every 2 weeks/month

waste:
68kg per persoon per jaar in amsterdam StatLine - Huishoudelijk afval per gemeente per inwoner (cbs.nl)

68 x (108 - 162)
minimum: 7344 kg per year → 20kg per day
maximum: 11016 kg per year → 30kg per day

usable amount: 60% roughly, so 12 - 18kg (wood and furniture as usable material)

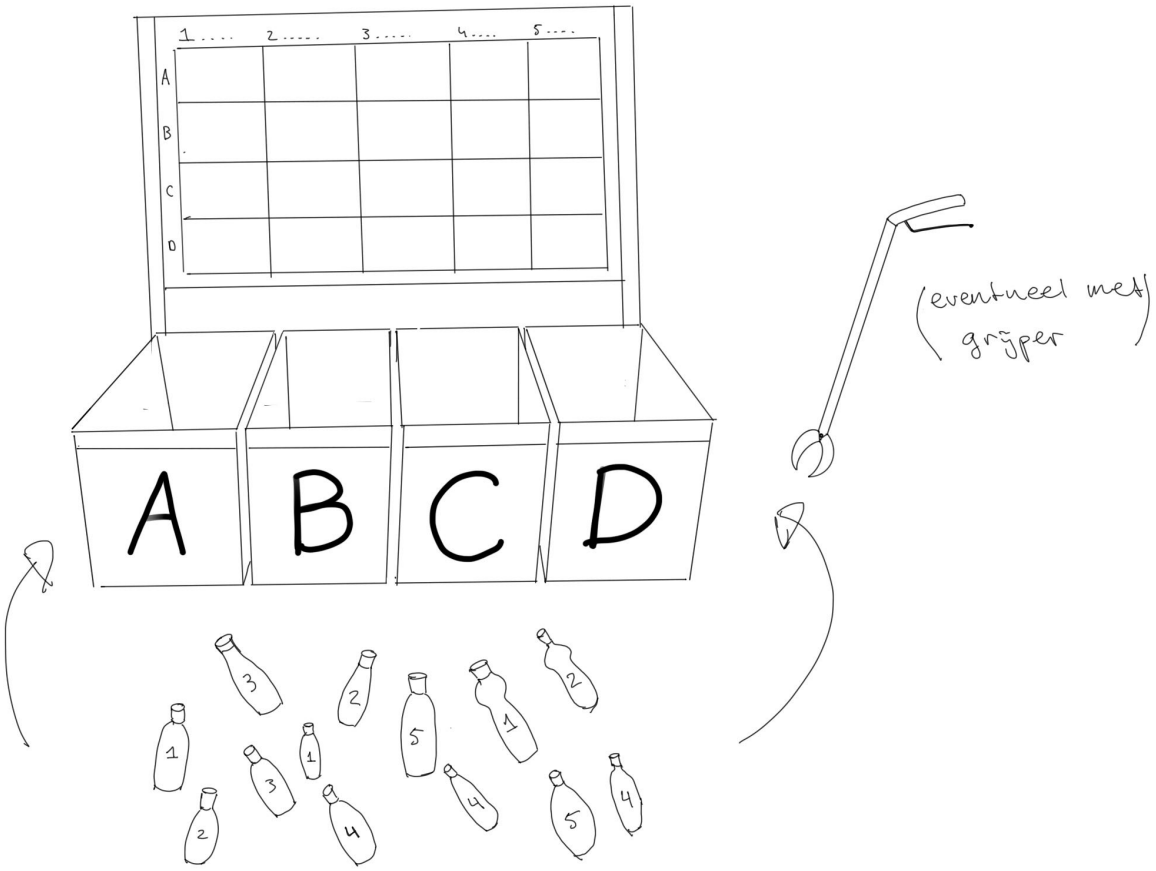
source:
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjdx8_ujoDvAhWBtqQKHTIYDIMQFjABegQIAxAD&url=https%3A%2F%2Fpublicaties.vlaanderen.be%2Fdownload-file%2F12439&usg=AOvVaw0fIAzGS4SJr7ii1Lh4o4kX

Appendix C - setup field session 1 @ MCTC

1. Initial idea

Goals:

- Erachter komen wie de buurtbewoners zijn en wat ze belangrijk vinden mbt tot afval, de wijk & (samen)werken voor de gemeenschap om zo criteria op te stellen om een richting te kunnen kiezen.
- De richtingen zelf toetsen bij de bewoners om zo een eerste selectie te kunnen maken



Idee:

- Afval in bak gooien / afval oprapen en in bak doen met grijper/prikker
    - Bord met stellingen en situaties (max 5) neerzetten, waarbij vier (A B C D) verschillende antwoorden/mogelijkheden uitgelegd worden
        - Afvalscheiden
        - Welk afval zien ze waarde in?
        - Wat en wanneer willen ze wat doen voor de community/wijk?
        - Wat willen ze er voor terug?
        - Richtingen/concepten
    - Een aantal vuilnisbakken (A B C D) neerzetten bij afvalcontainers
    - Oude en schoongemaakte plastic flessen meenemen en er labels 1 t/m 5 op plakken, voor situatie/stelling 1 t/m 5

- **Belangrijk om goed aan te geven/ op het bord te zetten dat het voor de toekomstige H-Midden wijk en Community Land Trust is en dat het invloed heeft op de hele H-Buurt**
    - Aan bewoners die afval weggooien vragen of ze willen mee willen doen aan een onderzoek om de toekomstige CLT & H-Midden te helpen vorm te geven, door afval op te rapen en weg te gooien in de bak met het antwoord op de stelling/situatie die ze het liefst willen of het meest mee eens zijn
    - Achteraf nog even kort een vragenlijstje doorlopen waarom ze het gekozen hebben en wat ze eventueel zelf nog zouden willen doen / veranderen
    - **Communicatie**
        - Op Bord
            - Draag je steentje bij aan de nieuwe H-Buurt, samen ontwikkelen we H-Midden, help jij mee?
            - Aan de slag met je afval

        - **Introductie/script**

Hoi! Lijkt het je leuk om mee te doen aan een onderzoek waarbij je de nieuwe H-Buurt en Community Land Trust helpt vormgeven? Ik ben student en werk samen met de gemeente, de CLT buurtvereniging en de maranathakerk en doe onderzoek waarbij we erachter proberen te komen wat jullie visie is en wat jullie behoeften en gewoonten zijn als het gaat om afval in de wijk en afval scheiden. Het doel is om samen met jullie, de bewoners, activiteiten en projecten te ontwikkelen voor een leefbaardere en duurzame buurt. De gemeente en de buurtvereniging willen jullie hier graag in de toekomst de juiste faciliteiten voor bieden. Daarnaast willen we ook laten zien wat er eventueel nog mogelijk is met afval als het gaat om recyclen en er waarde voor de buurt uithalen en waar jullie zelf kansen of mogelijkheden zien voor de buurt.

Het gaat als volgt;
Eerst doe je het spel, vervolgens heb ik nog wat vragen achteraf en daarna is het klaar en mag je koffie of thee pakken en wat te eten.

Het spel gaat zo; Op het bord is elke rij een bepaald thema of vraag, genummerd 1 tot en met 5. Op elk van de thema's of vragen zijn 5 antwoorden mogelijk, namelijk A tot en met E. Op de grond voor je zie je plastic flessen liggen ook genummerd 1 tot en met 5. Die zijn gekoppeld aan de 5 thema's. Ook zie je daar 5 prullenbakken staan, A tot en met E, die komen overeen met de antwoorden. Vervolgens mag je per thema/vraag bedenken welk antwoord het meest voor jou van toepassing is. Je geeft antwoord door met de grijper de fles met het overeenkomende nummer in de vuilnisbak met voor jou het juiste antwoord te gooien.

Extra Uitleg CLT:
De komende jaren gaat het gebied waar de parkeergarages hakfort en huigenbos staan/stonden op de schop. Het plan van de gemeente is om hier tussen de 200 en 500 nieuwe woningen en andere voorzieningen te realiseren. Dit doen ze graag in inspraak en samenwerking met de bewoners.
De CLT Buurtvereniging wil ook graag woningen bouwen in H-Midden dit is een groep van bewoners van de H-Buurt die zelf bezig zijn met de bouw en ontwikkeling van deze nieuwe

woningen om zo goed mogelijk aan te sluiten bij de behoeften van de bewoners en de buurt. Hun doel is om het voor de huidige en toekomstige generaties van de H-Buurt betaalbaar te houden, ze ook een kans te geven om eigenaar te zijn en zeggenschap te hebben en de wijk duurzamer en leefbaarder te maken.

- Stellingen/situaties
    - Afvalscheiden
        - A - Doe ik niet
        - B - Alleen plastic en karton (of iets anders, namelijk …)
        - C - (zo goed als) alles wordt gescheiden
        - D - Ik wil het wel, maar ik heb er geen mogelijkheid voor
        - E - Anders, namelijk;
    - Welk materiaal zou je in de buurt/CLT/gemeenschap willen houden om er iets nieuws van te maken of geld aan te verdienen? (Focus op afval)
        - A - Organisch (*voor planten compost (& biogas)*)
        - B - Plastic (*voor nieuwe plastic (huishoud) producten, bakjes schotels etc, 'statiegeld' op plastic afval*)
        - C - Textiel & Gebruiksproducten (*voor nieuwe kleding/textiel, tweedehands winkel, swapshop, goedkope kleding, ruilen met buurtgenoten, minder geld uitgeven aan nieuwe producten*)
        - D - Grofvuil (*voor houten planken, tweedehands meubels, refurbished meubels, geen geld uitgeven aan nieuwe producten, minder betalen door meubel lease, kapotte meubels kunnen gerepareerd worden*)
        - E - een andere afvalstroom; namelijk
    - Op wat voor manier zou je bereid zijn om in de toekomst bij te dragen aan de CLT / H-Midden/Buurt met betrekking tot afval? Wat hebben ze er voor over?
        - A - Liever niet eigenlijk
        - B - Alleen afval scheiden
        - C - Afval ophalen, verzamelen en verwerken met een van bovenstaande opties (bijvoorbeeld in weekend of vrije tijd)
        - D - Zou graag iets doen met het eindproduct; maken, verkopen of gebruiken
        - E - Iets anders, namelijk….
    - Wat zou je terug willen voor je bijdrage aan de community/CLT/H-Midden?
        - A - Niets
        - B - Niets, als buurtgenoten ook mee helpen
        - C - Een vergoeding, geld, leuke activiteit, spullen, erkenning
        - D - Meer inspraak in de wijk, schonere wijk en ruimte voor buurtinitiatieven en activiteiten
        - E - iets anders; namelijk ….
    - Wat denk je dat het best past bij de nieuwe H-Buurt, de CLT en de bewoners en het meest waardevol voor ze is? (Focus op ecosystemen)
        - A - Organisch afval scheiden, en verzamelen in heel H-Midden er compost van maken en gebruiken voor een gedeelde groentetuin en buitenkeuken en terras. zodat mensen samen kunnen komen en genieten van de tuin/kas en vers voedsel

- B - Plastic afval scheiden en verzamelen in H-Midden, shredden en er huishoudelijke producten van maken en geld verdienen aan je plastic afval
- C - Textiel verzamelen vanuit hele H-Buurt, tweedehands kleding en spullen verkopen/ruilen + naaiatelier en modelabel H-Buurt samen met Heesterveld Creative Community, zorgt dat er minder kleding verloren gaat en nog gebruikt kan worden
- D - Grofvuil verzamelen in hele H-Buurt en meubels opknappen, nieuwe maken van verzameld hout en gezamenlijke workshop, leasen/ verkopen aan bewoners, gebruiken in huizen CLT
- E - iets anders; ….

- **Vragen**
  - Wat was je achterliggende gedachte/redenatie bij 1 t/m 5, waarom heb je dit antwoord gekozen?
  - Wat is voor jou de belangrijkste reden om te gaan afval scheiden of om niet afval te scheiden?
  - Wat vind jij belangrijk om te hebben of te kunnen doen in je wijk? en wat mis je nog?
  - Heb je het idee dat er problemen zijn in de wijk? En hoe zou je die zelf oplossen of graag opgelost zien worden?
  - Heb je toevallig nog hobby's of dingen die je in je vrije tijd doet of zou willen doen?
  - Hoe zou je zelf de community bij elkaar brengen, of creëren in de wijk?
  - Hoelang woont u al in de H-Buurt?
  - Bent u zelf actief in de wijk?
  - Kent u mensen die actief zijn?
  - zo ja, wat doen die precies en merkt u daar wat van?
  - Denk u er zelf ook weleens over na om te helpen? Waarom wel/niet?
  - Wat is uw achtergrond? (Opleiding, huidige werk, afkomst, etc)

- **Data Collection**
  - Count and keep track of amount and type of bottle per answer
  - Write down choices of every participant
  - Record interviews
  - Make notes at interviews
  - Passive data collection?
    - keep the test setup there overnight with stickers so people can vote on what they think is most important per question
- **Conclusions**
  - How many people is enough? 10?/20?/50?
  - When can a conclusion be made?
  - Extra research options:

- social media polls (instagram)

Nodig:

- E prullenbakken met (A B C D E)
- 25 Plastic flessen schoongemaakt en gelabeld (1 t/m 5)
- Bak voor plastic flessen eventueel?
- Grijper eventueel
- Frame voor bord, van hout?
- Bord met stellingen en antwoorden (gemaakt in illustrator)
    - veel illustraties en meerdere talen, zo simpel mogelijk
- Schroeven om het frame en bord vast te maken
- Vragenlijsten
- Stickers 1 t/m 5 (5 x elk)
- Fruit (appels, bananen, sinaasappels, kiwi's etc)
- Fruitschaal
- Thermoskannen met koffie en thee
- Tafel om het op neer te zetten
- Stoelen voor vragen achteraf

Testplan

Waar

- zet opstelling neer bij vuilcontainers
    - welke containers/locatie?

Wanneer

- liefst op een zonnige dag doordeweeks/weekend, dat mensen het fijn vinden om buiten te zijn/blijven

Hoelang

- 1 a 2 dagen (mocht er op dag 1 weinig opkomst zijn)
- van sochtends 10 uur tot savonds 7 uur
- eventueel een tweede test op een andere locatie

Hoe

- Mensen aantrekken door:
    - Bord met : Help mee aan het verbeteren van je buurt, door deze quiz/spel te doen
    - Wat krijgen ze er voor terug?
        - Zet een fruitschaal neer (appel, banaan, sinaasappel, etc)
        - Koffie & thee
- Mensen instructies geven
    - Eerst situatie en antwoorden lezen/begrijpen
- Spel doen

    - Vervolgens met grijper, handen, fles met corresponderende nummer in afvalbak gooien met juiste antwoord
- Vragen
    - Na spel kort wat vragen stellen mbt spel en antwoorden
    - Fruit laten uitzoeken
- Datacollectie
    - Tijdens spel turven welke antwoorden gegeven zijn
    - Zodra het spel 4x gespeeld is en de flessen op zijn, tellen hoeveel van elke fles met nummer er in elke afvalbak zit als check

Test #	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

bestellijst
Nodig:

- 25 Plastic flessen schoongemaakt en gelabeld (1 t/m 5)
- Frame voor bord, van hout?
- Bord met stellingen en antwoorden (gemaakt in illustrator)
    - veel illustraties en meerdere talen, zo simpel mogelijk
- Nietpistool
- Vragenlijsten
- ~~Stickers 1 t/m 5 (5 x elk) zwart 5 cm~~
    - ~~Stickers en Plakletters | Gemakkelijk online bestellen!~~
- ~~Stickers ABCDE (kleur hangt af van kleur afvalbak)~~
    - ~~Stickers en Plakletters | Gemakkelijk online bestellen!~~
- ~~Schroeven om het frame en bord vast te maken~~
- ~~Grijper~~
- ~~Bak voor plastic flessen eventueel?~~
    - ~~Mand | Action.com~~
- ~~E prullenbakken met (A B C D E)~~
    - ~~Action,~~
    - ~~ikea FNISS Afvalemmer, wit, 10 l - IKEA~~

reclamebord opties:

- spandoek
    - Bedrukte spandoeken van vinyl, Spandoeken van vinyl bedrukken | Vistaprint
- roll up banner
    - Roll up banner bestellen | Vistaprint
- Foambord
    - Foamboards drukken, posterborden drukken | Vistaprint
- simpel spandoek, zelf simpel frame bouwen en doek er aan vast binden
    - Spandoeken bedrukken, alle materialen | Drukwerkdeal.nl max 40 eu (1m x 2,5m)

Belangrijkste vragen per thema:

Kennismaken:
- Wat houdt de bewoners zoal bezig? Wat vinden ze leuk om te doen?

Afval
- Doen ze al aan afval scheiden, waarom wel/ niet, zien ze er waarde in?
- Wat zouden ze het liefst hergebruiken of zien hergebruikt worden en waarom? (Organisch, textiel, plastic, grofvuil, tweedehands spullen)

Wijk en bewoners
- Wat is het belangrijkst om te hebben of kunnen doen in de wijk?
- Wat missen ze nog? & Wat zien ze als problemen?

Community
- in hoeverre zijn ze bereid om samen te werken of zelf hun handen uit de mouwen te steken voor of met de community?
    - Niks, afval scheiden, afval verzamelen, afval verwerken, iets anders?
    - Wat willen ze er voor terug?

Richtingen
- Welke richting vinden de bewoners het interessants qua materiaalstroom en waardecreatie?
- Wat zien ze als het meest waardevol voor hun?

2. Research testplan

Testing plan:

Why:
- In order to set up criteria for selection of one of the circular waste concepts
- Find out what direction to take for the

Where:
- Put test set-up next to waste containers in H-Buurt, and or close to MCTC

When:
- to be determined with Joris and Moses

How long
- 1 or 2 days of active testing
- 1 or 2 days of passive testing

What (instructions)

- Plastic bottle garbage bin game
- Board with themes/ questions which is linked to bottles on the ground
- Answers A, B, C, D & E per question, linked to garbage can A, B, C, D & E
- Put the bottle linked to the question into the garbage can linked to the answer of your preference using the grijper

How

- Get attention from people through sign/board and ask them to participate when they throw away their garbage and explain test and what it is for
- What do they get in return?
    - Piece of fruit
    - coffee or tea
- Give people instructions
- Do game
- Ask questions afterwards
- Thank them and give them gift

introduction tekst:

Eerst doe je het spel, vervolgens heb ik nog wat vragen achteraf en daarna is het klaar en mag je koffie of thee pakken en wat te eten.

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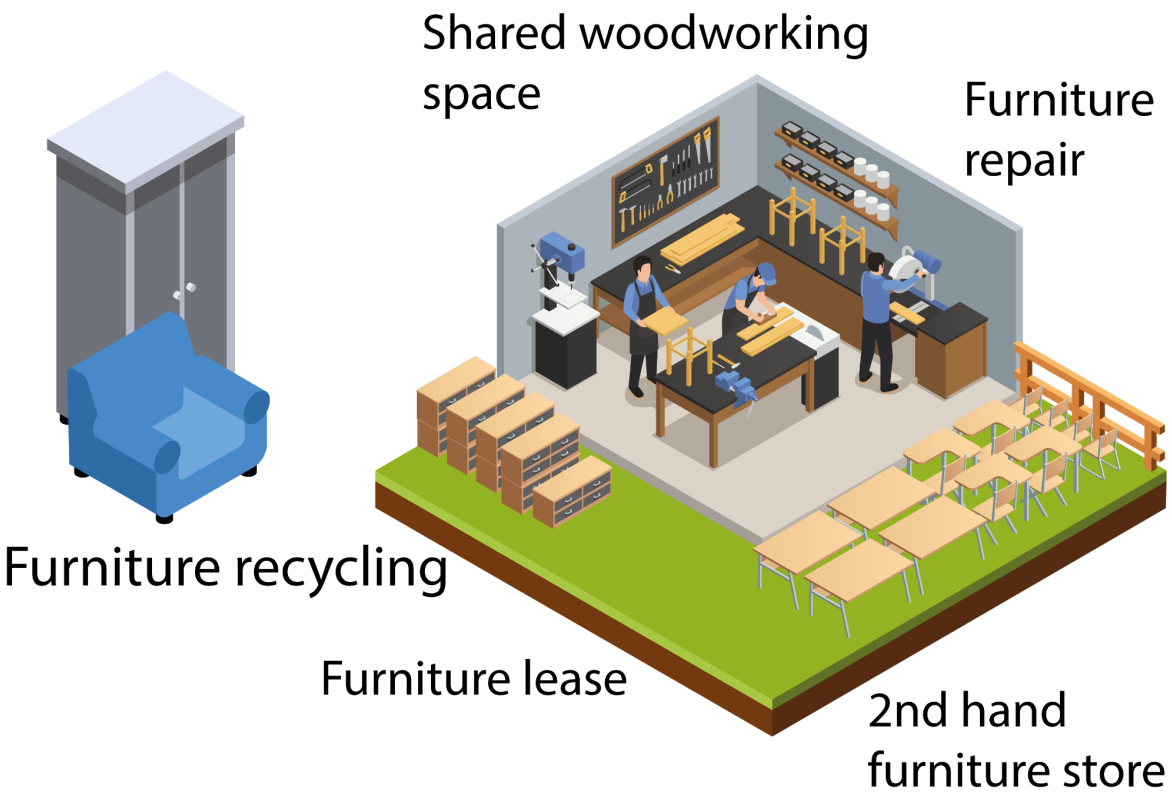
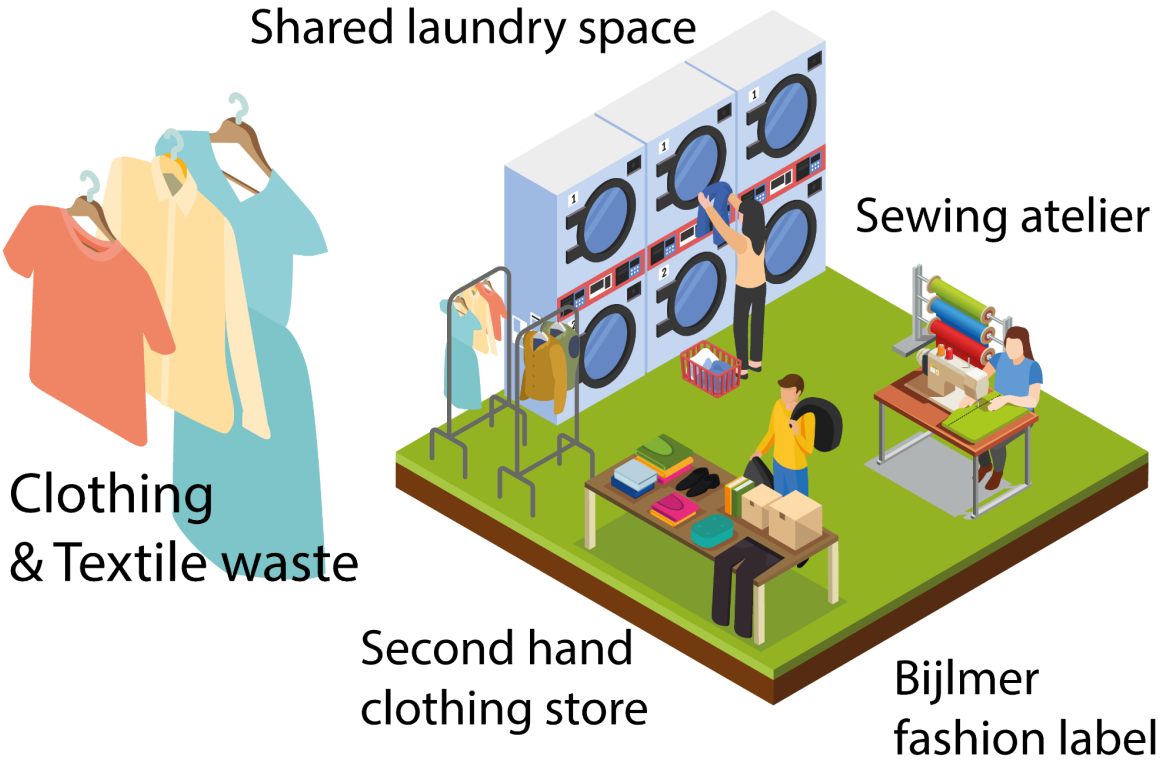
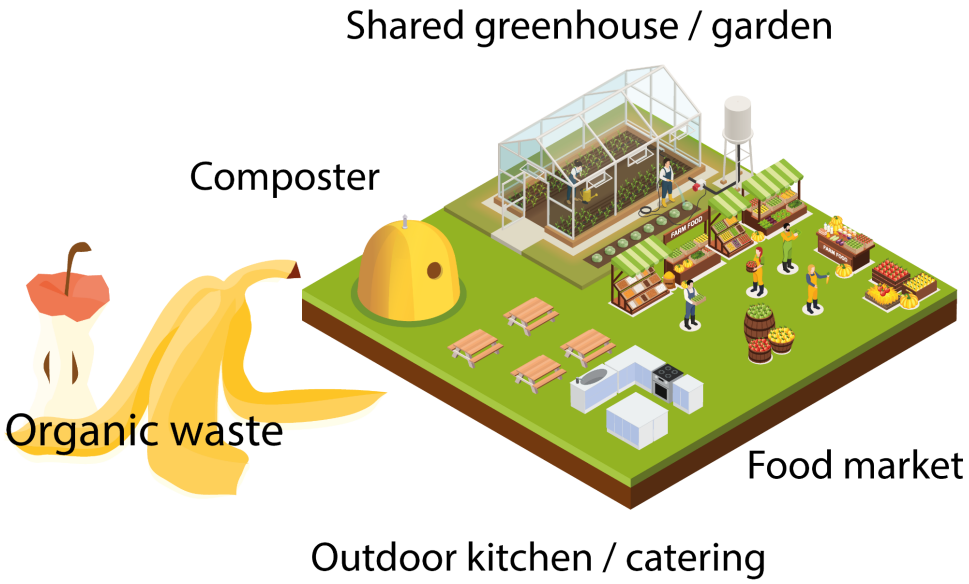
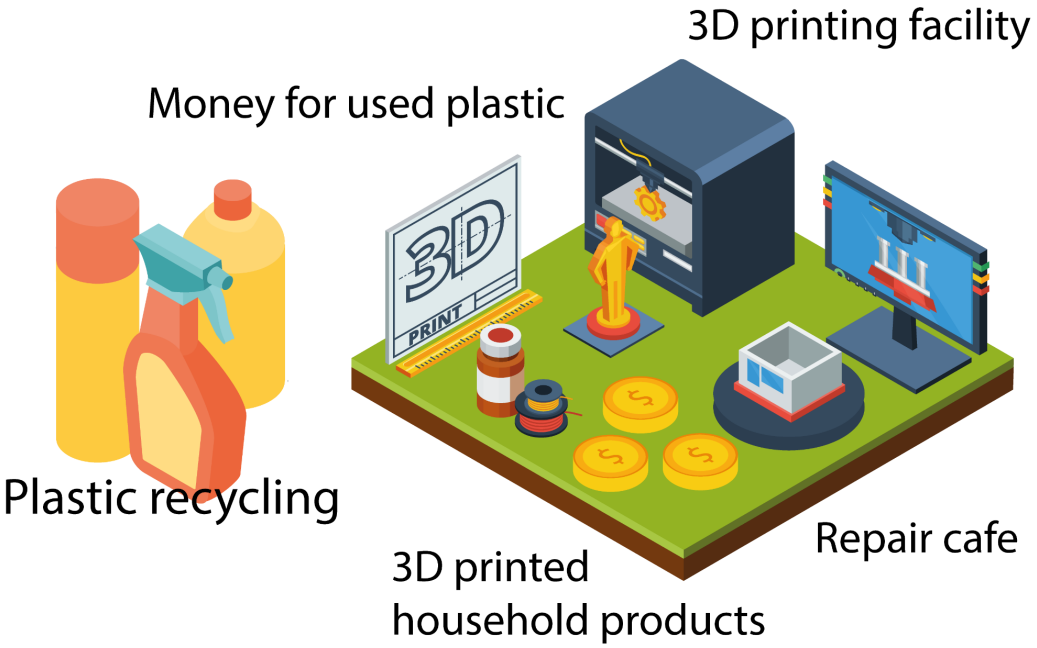
Images shown at test





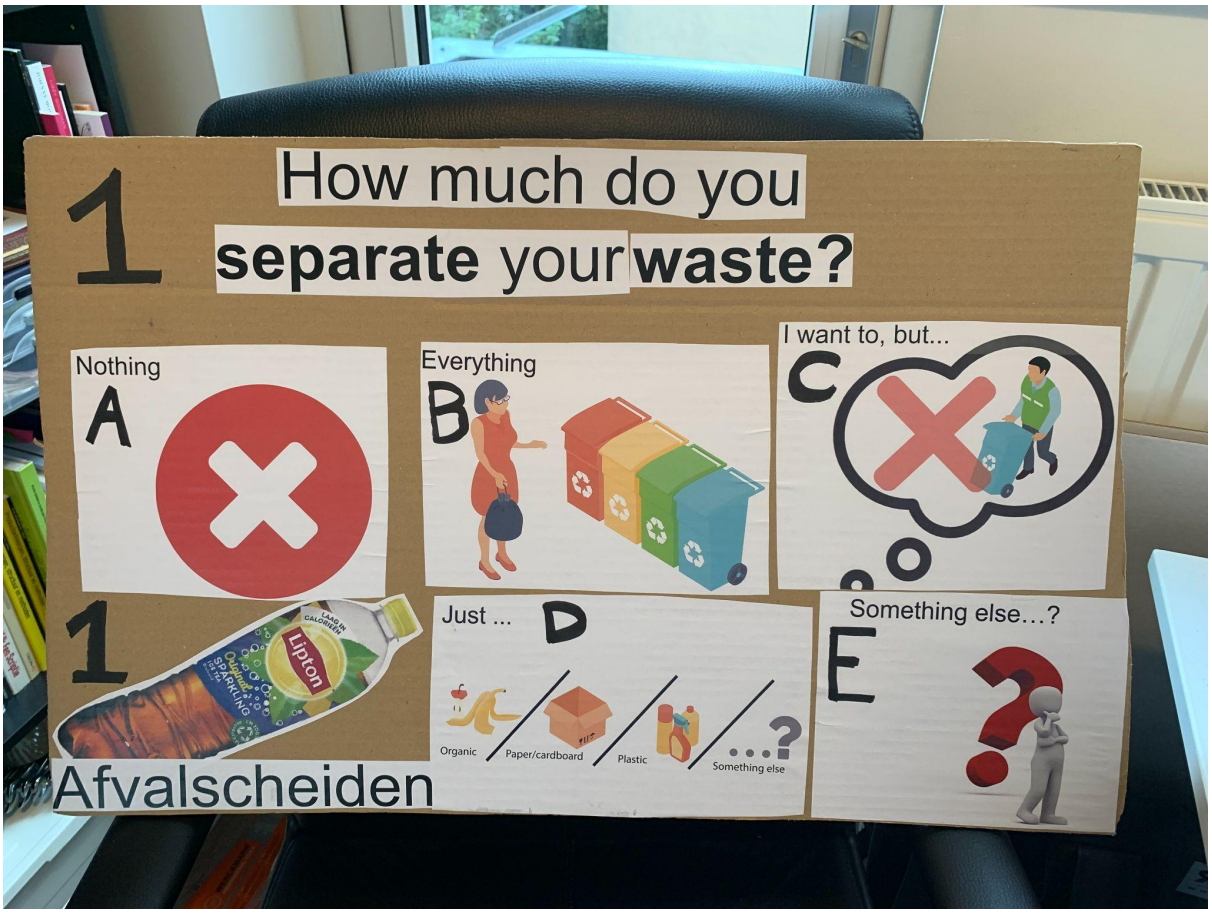

Shared greenhouse / garden
Composter
Organic waste
Food market
Outdoor kitchen / catering

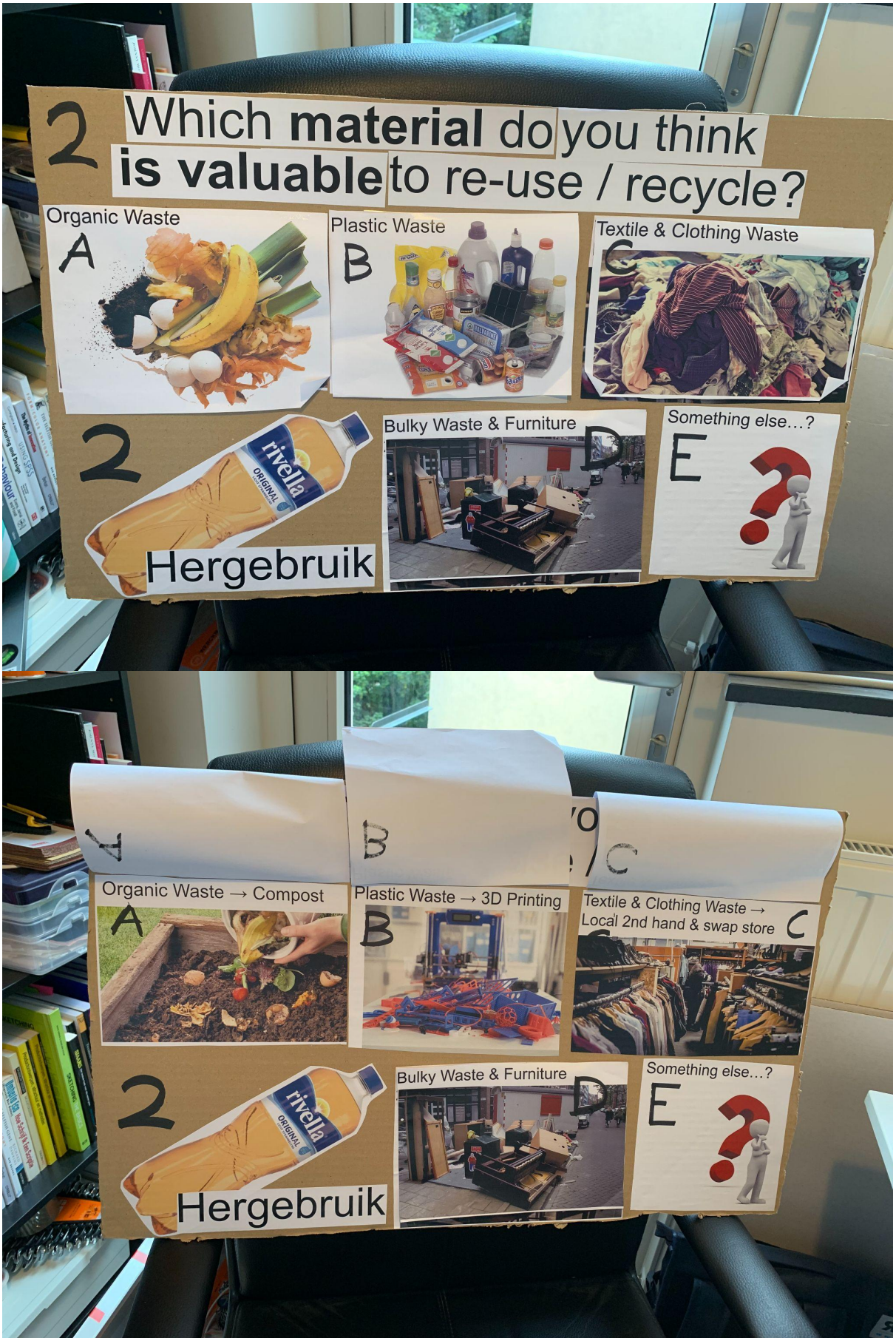

3D printing facility
Money for used plastic
Plastic recycling
3D
PRINT
Repair cafe
3D printed
household products

full proposed spandoek

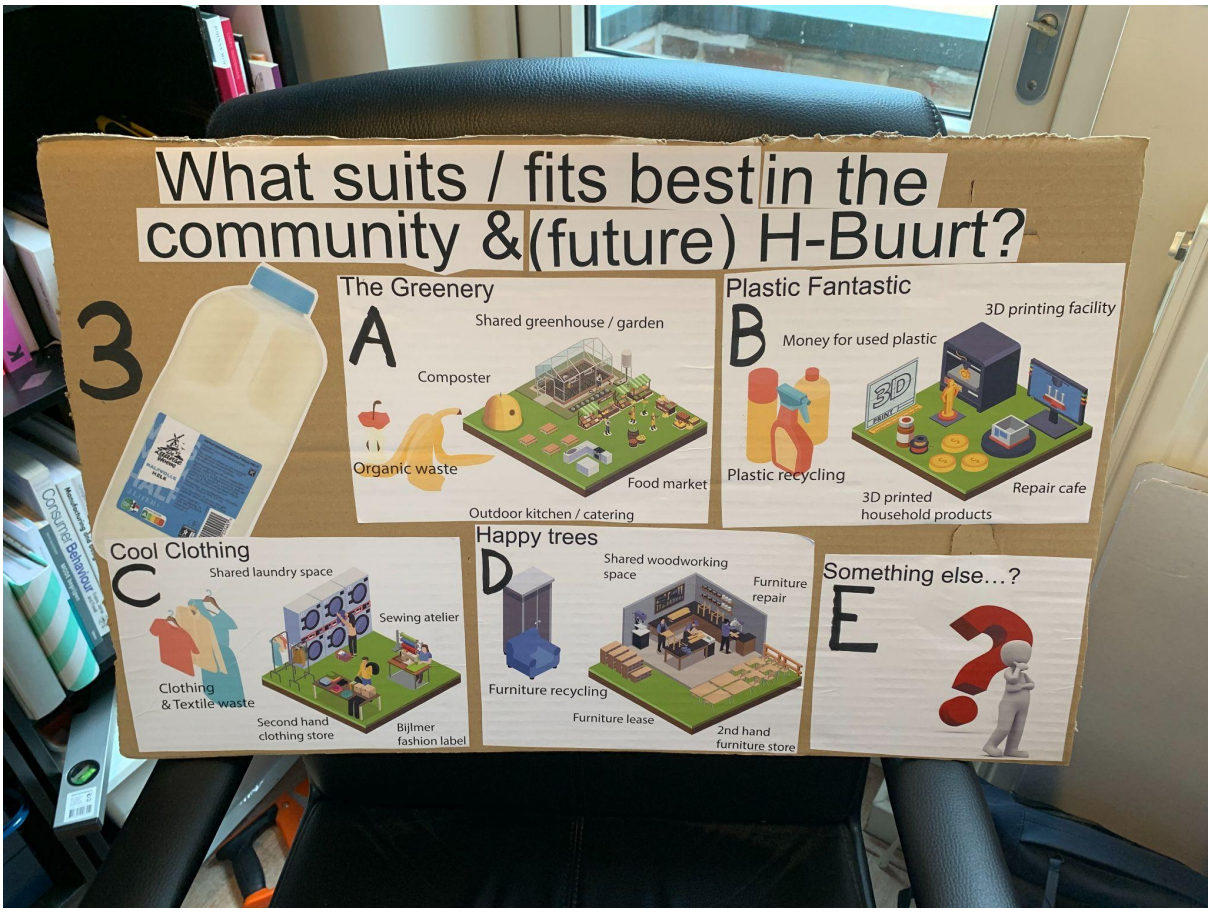
Appendix D: Props used at test sessions with community

Props used at test 1




2
Which material do you think is valuable to re-use / recycle?
Organic Waste
A
Plastic Waste
B
Textile & Clothing Waste
C
2
rivella
ORIGINAL
Hergebruik
Bulky Waste & Furniture
D
Something else…?
E
A
B
C
Organic Waste → Compost
A
Plastic Waste → 3D Printing
B
Textile & Clothing Waste → Local 2nd hand & swap store
C
2
rivella
ORIGINAL
Hergebruik
Bulky Waste & Furniture
D
Something else…?
E


Local 2nd hand & swap store
C
Bulky Waste & Furniture →
2nd hand furniture store
D
Something else…?
E


What suits / fits best in the community & (future) H-Buurt?
3
The Greenery
A
Shared greenhouse / garden
Composter
Organic waste
Food market
Outdoor kitchen / catering
Plastic Fantastic
B
3D printing facility
Money for used plastic
Plastic recycling
3D printed household products
Repair cafe
Cool Clothing
C
Shared laundry space
Sewing atelier
Clothing & Textile waste
Second hand clothing store
Bijlmer fashion label
Happy trees
D
Shared woodworking space
Furniture repair
Furniture recycling
Furniture lease
2nd hand furniture store
Something else…?
E

Props used at test 2


Organic waste
Step 1
Composting organic waste
Step 2
Growing fruit & vegetables in vegetable garden with self made compost
Step 3
Farm food stand selling vegetables with free food for garden workers & composters
1 hour of work = 1 vegetable
10 kg organic waste = 1 vegetable
Step 4
Neighborhood BBQ
Food festivals
Food for at MCTC
FARM FOOD
Recept voor Compost
Zelf snel en makkelijk composteren
Bruin GFT
Groen GFT
Compostmolen
Wormenhotel

Appendix E - Waste separation exploration

Exploration of products and incentives of organic waste separation with a vegetable garden and composter

Organic
In order for the community to start separating organic waste, it is important to provide the right stimuli on an individual level and community level. The first thing was to find out which direct incentives were provided by the vegetable garden. Multiple levels of incentives provided by the vegetable garden have been identified and can be seen in the list below. The first levels are more suited to the individual, while from level 4 the incentives are focused on the community.

level 1: compost
level 2: part of the harvest
level 3: food made from harvest
Level 4: neighborhood food events
Level 5: provide food for the community
Level 6: provide food for the food bank at MCTC

Now that the initial product levels are set up, it is time to get more specific and dive deeper into what is possible with individual and community products and incentives in relation to organic waste separation, composting and a vegetable garden. This is done to get a better understanding of the value each level brings and to make the incentives more specific.

products per level

1. compost
2. Spices, herbs, vegetables, fruits
3. Meals, meal packages
4. Neighborhood BBQ, harvest party, culture market, gardening workshop, compost workshop, open days for the garden, weekly garden cafe/ tea party
5. Make meals for the community, provide elderly with lunch or dinner at MCTC
6. Make meal packages for food bank, provide neighborhood lunches/dinners, swap food for other items

As mentioned, levels 1 to 3 are mainly focused on the individual, so provide products which are also used as the incentives for waste separation. So by providing waste, an individual would receive something based on one of these levels. Although a good amount of products for the community are listed in level 4, 5 and 6, they can not be directly translated to incentives, as there is not a clear correlation present between separating organic waste and a product from one of those levels. So, another brainstorm on incentives and products related to the community is necessary.

Exploration of products and incentives of textile waste separation using a swap closet

Textile
Similar to the organic waste concept, first the products and incentives directly related to the intervention have been identified. As it is key to the correct functioning of the intervention, that the community separates their textile waste and deposits it at the collection point or clothing exchange cabinet. The incentives and products can be found in the list below.

incentives & products
- free clothing
- no more disused or old clothing taking up space in house
- clothing repair
- new kids clothing from upcycled old clothing
- giving back to the community
- community events around clothing (clothing swap market, 2nd hand clothing market, sewing workshops, clothing repair workshops

As seen in the list, the first four incentives are physical incentives and are on an individual level. The last two are social incentives and are on a community level. But while giving something back to the community is rather straightforward and has a direct link to the exchange cabinet, this can't be said of the community events. So similar to the event based incentives from the organic waste intervention, there is a gap between separating waste and the incentive.

Social waste separation exploration

To get a better understanding of what incentives are present for organic and textile waste and exploration was done. After the right incentives were listed, they were categorized based on level, from individual to community incentive. These lists can be found in the chapters of both interventions, see appendix E. The incentives are mainly focused on direct products related to the interventions.

    - Problem
- Individual incentives vs value for the community

As mentioned in the main report, the problem is the following; separating waste is mainly focused on the individual, as someone needs to make an effort to do so within their homes and put the trash out. However, the result of separating waste should benefit the community in the first place. While it might be a good incentive if something is of value to the community, it does not guarantee that everyone will separate waste. There also needs to be a certain value to the individual, if you want to make sure the most people will cooperate. So separating waste needs to benefit the individual and the community at the same time.

- No correlation between individual waste separation and neighborhood events

Another problem is the following: What is often most valuable to a community when it concerns waste has to do with bringing the community together and strengthening the bond

they have. The value should be felt by all, which is best done when everyone is together and the more people there are, the more value is created. This is not necessarily a problem in itself, but the main thing is that there is no clear correlation between individual waste separation and community events. So next to having to benefit the individual and the community, waste separation also has to have a clear connection with community events. This way, people will understand that they are adding value to certain events when separating waste.

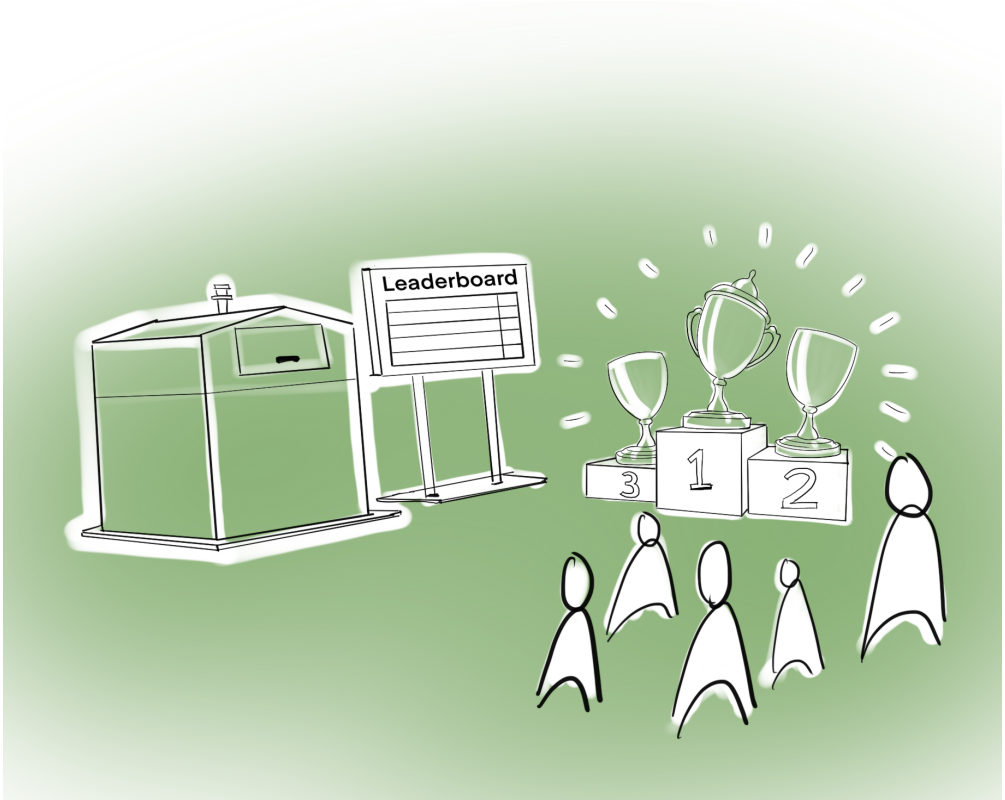
- Ideation

To get towards a solution for these problems, an exploration and ideation was done on community incentives in general and specific for both organic and textile waste. In addition, an ideation was done connecting waste to neighborhood events. After the ideation was finished, solutions were created by combining results of both ideations.

- Initial solutions

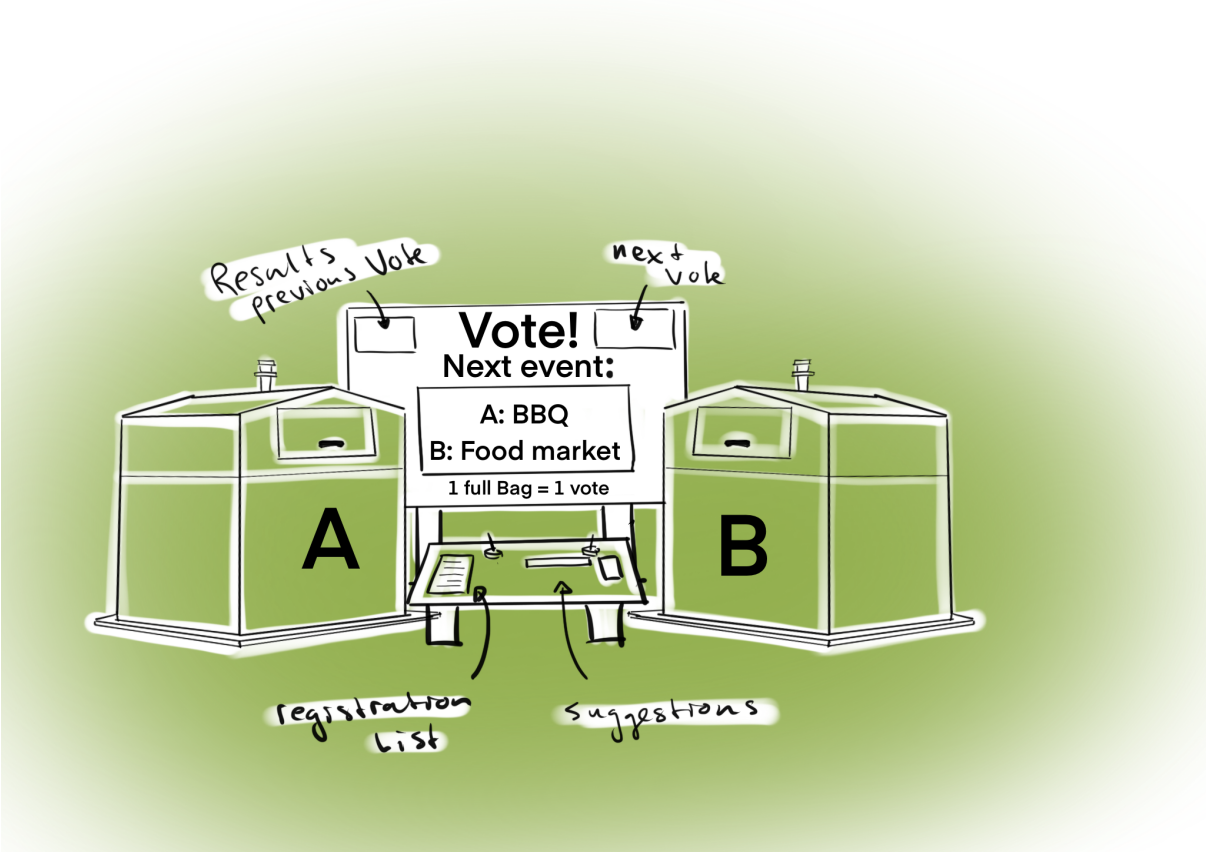
Waste separation competition

First of all, the idea of creating a competition arose based on findings having to do with social modelling and setting group goals, while providing insights into waste separation statistics of the individuals in the neighborhood (VANG, 2020). It mentions that people tend to follow the group, so by showing them what other people in the neighborhood do with their waste, how they feel about it and what happens to it, more people will start doing the same. This is called social modelling. In addition, by setting goals and providing feedback on how the waste separation is going, a competition can be initiated and rewards can be introduced. Both the competition and introducing awards are effective ways to get a community to start separating waste. (VANG, 2020)



The competition could be initiated through an event or by setting a good example which the entire community can see. Providing feedback can be done through a leaderboard, as can be seen in the figure on the previous page. In addition, the competition can come to a close at another event, where the awards are handed out and a new competition is initiated.

The second idea which combines waste separation with social events and value for the community does so through a voting system and by providing the right facilities to separate waste at home. It uses standardized bags and provides the community with waste bins for these bags, so separating at home is made easy. A full waste bag counts as one vote. The voting happens at the MCTC where every month a different poll is held. The poll can be concerning the next neighborhood events, which problems to address in the neighborhood, which initiatives people would want to see, etc. In addition, the voting system could also serve as a way to communicate with the municipality concerning the mentioned topics.



The voting system tackles multiple problems at once. First of all, it provides a way to connect waste separation with value to the community. Also, it allows the community to get more control over the neighborhood and provides a way to communicate with the municipality. Both problems are discussed in the research chapters on the H-Buurt and its residents. In addition, the voting system also provides a way for the community to overcome any language barrier that might be present due to the many nationalities.

- Next steps

While both solutions to social waste separation look promising, it is not yet clear if they would work. So the logical next steps of the process would be to create MVP's of the solutions and do pilots or test them in some way. However, due to time constraints in the project and it not being the main focus of the project, the decision was made to not continue with this for now, but leave it as is. The other results of the ideation are shared in the list below, to add to the solutions and in order to be considered in a later stage as well.

List

- Social incentives
    - Organic
        - Lottery
        - Auction
        - Fundraisers
        - Access to weekly tuincafe
        - Competition with leaderboards
        - Control over next neighborhood events (through voting system)
        - Food events
    - Textile
        - Clothing repair network
        - Clothing swap network
        - Clothing market
        - Clothing collection competition/fundraiser
        - Clothing (swap) markets
        - Neighborhood fashion show or workshop
        - Control over community initiatives (through voting system)

Appendix F - Initial structure of part of platform