

Norwegian University  
of Life Sciences

**Master's Thesis 2018 30 ECTS**  
Association Madrid Agroecológico

# **The use of a community currency, the MOLA, as an agroecological initiative to encourage more sustainable food systems in the Community of Madrid**

Clara Zambrana Daudén  
European Msc Agroecology

## Table of contents

<b>Abstract</b> .....	5
<b>Acknowledgements</b> .....	6
<b>1. Introduction</b> .....	7
1.1. Local context for the MOLA in Madrid .....	7
<b>1.1.1. Timeline</b> .....	8
<b>1.1.2. Stakeholders</b> .....	9
<b>1.1.3. The system operation</b> .....	10
1.2. Problem Statement .....	11
1.3. Research questions and hypothesis .....	12
1.4. Theoretical framework .....	12
<b>1.4.1. The concept of circular economy</b> .....	13
<b>1.4.2. An insight into the complementary currencies</b> .....	13
<b>1.4.3. The environmental factor in complementary currency systems</b> .....	15
<b>2. Material and Methods</b> .....	16
2.1. Aim of the study .....	16
2.2. Data collection .....	16
2.3. Data Analysis .....	18
2.4. Methodology's SWOT analysis .....	19
2.5. Reliability and validity of the information .....	20
2.6. Ethical considerations .....	21
<b>3. Results</b> .....	22
3.1. Sociodemographic analysis in the MOLA community .....	23
3.2. Economic analysis in the MOLA community .....	24
<b>3.2.1. MOLA's income and transactions among the users</b> .....	24
<b>3.2.2. Main sectors of MOLA's spending</b> .....	25
<b>3.2.3. Reasons why the consumers have not used their MOLAS yet</b> .....	26
3.3. Clickoin service .....	27
3.4. Potential of the MOLA .....	28
3.5. Recycling habits .....	30
3.6. The MOLA as a tool towards more sustainable food systems .....	32
3.7. Open questions .....	32
<b>3.7.1. Reasons to join the MOLA platform</b> .....	32

3.7.2. Positive and negatives aspects of the MOLA .....	33
3.7.3. Future of the MOLA .....	34
4. Discussion.....	35
5. Conclusions .....	42
6. References .....	44
<b>Appendixes</b> .....	46
Appendix 1. Organic waste collection data from the Madrid Agrocomposta project.....	46
Appendix 2. Description of the MOLA cycle .....	50
Appendix 3. Literature review .....	53
Appendix 4. World map of complementary currencies registered in the CES platform.....	59
Appendix 5. Face to face interview guide for stakeholders.....	60
Appendix 6. Online questionnaire script for the MOLA users .....	61
Appendix 7. Graphics from the questionnaire results .....	68
Appendix 8. Map of time banks registered in the Community of Madrid.....	71

## Table of figures, graphics and tables

Figure 1. Project timeline.....	8
Figure 2. The MOLA community.....	10
Table 1. Methodological order followed during the case study.....	16
Graphic 1. Number of answered questionnaires/day in the MOLA questionnaire.....	18
Table 2. SWOT analysis of qualitative and quantitative research methods.....	20
Table 3. Stakeholders interviews during the first phase.....	22
Graphic 8. MOLA's transactions among the users.....	25
Graphic 9. Main sectors of MOLA's spending.....	26
Figure 3. Areas within the food sector in which more number of MOLAS are spent.....	26
Graphic 10. Main reasons of the consumers who have not used the MOLA yet.....	27
Graphic 11. Potential evaluation of the MOLA.....	29
Graphic 12. Changes on participants waste management.....	31
Graphic 13. Participants' knowledge about composting and agrocomposting.....	31
Table 4. Positive and negatives aspects of the MOLA.....	33
Figure 4. Most common suggestions of places/services where to spend the currency by the participants.....	34
Table 5. Outline of the research questions and the confirmation of their respective hypothesis.....	35
Table 6. Ratio of kilograms of organic waste per node in the month of October.....	46
Table 7. Ratio of kilograms of organic waste per node in the month of November.....	47
Table 8. Ratio of kilograms of organic waste per node in the month of December.....	48
Table 9. Ratio of kilograms of organic waste per node in the month of May.....	49
Figure 5. Collection node of the organic matter waste.....	51
Figure 6. Containers picked up by the van from “El Olivar” during the collection route.....	51
Figure 7. Equipped area for the composting of the organic matter waste.....	52
Figure 8. World map of alternative currencies registered in the CES platform.....	59

Graphic 2. Gender of the MOLA's participants .....	68
Graphic 3. Range age in the MOLA community .....	68
Graphic 4. Coexistence at the household in the MOLA community .....	69
Graphic 5. Number of people living at the household in the MOLA community .....	69
Graphic 6. Educational level in the MOLA community .....	70
Graphic 7. Employment situation in the MOLA community .....	70
Figure 9. Time Banks map of the Community of Madrid.....	71

## Abstract

Changing behavior patterns concerning the management of organic waste in the general population is a first step to start making a change towards an agroecological way of production and consumption of food. In this master thesis I explore if this change is possible at a local level and the important and direct implications it can have through the use of a community currency, the MOLA. MOLA is part of a more efficient bio-waste recycling system, in environmental and economic terms, with a huge social involvement that is very innovative in the Community of Madrid as well as in Europe. Citizens, schools and restaurants deliver their organic waste in exchange for the MOLA currency, which consumers can make use of in local shops or to purchase nearby farm products. This bio-waste is then agrocomposted by nearby farms keeping a circular economy at a very local level.

Several interviews with the main stakeholders followed by an online questionnaire and participatory observation were the chosen methods for this investigation. The interviews were especially useful in order to get to know the shop owners and farmers' point of view about the use of the currency, while the online questionnaire was more consumer oriented. Overall, the currency was rated as an important educational tool for social and environmental awareness, but its local limitation when it comes to spending, makes it difficult to use more frequently. New ways of MOLA's transactions could encourage more people to start using the MOLA beyond the local limits, maybe inspire public institutions to allocate more funds and to accept the currency as payment for municipal expenses. The MOLA could be a "teaching" tool for the general population on how to make a better use of the organic waste and stand up for more sustainable food systems in the near future.

**Keywords:** MOLA, Community Currencies, agrocomposting, circular economy, sustainable food systems, organic waste management.

## Acknowledgements

To my supervisor and guide in the MOLA community, Franco Llobera Serra, for giving me the opportunity to learn about the MOLA and know the people involved in it and for being a participant in its improvement and expansion in the future. Also for his great help throughout the research process and for integrating me in such a good way in the team.

To my supervisors from NMBU, Anna Marie Nicolaysen and ISARA, Mathieu Désolé for their useful advices and for being involved in the proper development of this master thesis.

Last, but not least, to the whole team of the MOLA, EBR, AUPA and CyC for accepting me as a member of the team and the help given during the development of this work in the field stage.

To Jose Luis Fernández-Pacheco, whose thesis and advice have served me as a great reference when dealing with the collection and analysis of the data.

# 1. Introduction

Alternative economic systems based on the circular economy concept are constantly emerging around the world, especially when it is on a small scale. These circular economic systems are based on an efficient use of natural resources while improving the economic results. A method used by many communities is the use of complementary currencies that aims to enrich the local economy, while keeping it away from the capitalist world, and which is often strongly associated with environmental issues. Purchase of local agricultural products, second-hand objects, exchange of services, etc., are among the most popular exchanges using complementary currencies (Metabolic, 2017).

Uniting the concept of circular economy and waste management, various initiatives have emerged all over Europe in order to achieve the goal of the European Union; to increase up to 50% the materials recovered by recycling by 2020 (EU 2008). Such initiatives are, for example, to incorporate an exclusive separation of organic matter, to promote more sustainable production habits, as well as other concepts such as Pay as you throw (PAYT), in which citizens get monetary charges for the collection of the household trash. This encourages citizens to recycle more and control more what they waste.

The “Materia Orgánica Liberada”, which means “organic matter released” (MOLA), is among these initiatives, based on the concept of circular economy. It is a unique and innovative project in Europe in which a complementary currency is entirely backed by trash.

## 1.1. Local context for the MOLA in Madrid

The “MOLA” is a community currency backed by the value of managing organic matter waste, which is treated to make compost instead of being sent to the landfill to be burned. The MOLA project was launched in September 2017 in the district of Hortaleza in the city of Madrid. It is run by EBR (Economías BioRegionales), AUPA (Asociación Unida de Productores Agroecológicos) and CyC (Coopera y Composta), different associations that are all actively involved in the platform Madrid Agroecológico.



### 1.1.1. Timeline

MOLA is part of a larger project called “Madrid Agrocomposta”, designed in 2016. The goal of which is to encourage people to efficiently recycle the organic waste that is generated in private households and out-of-home kitchens, such as schools, restaurants, breweries, fruit shops, etc., by making compost of it on specific farms. This compost is then applied as natural fertilizer.

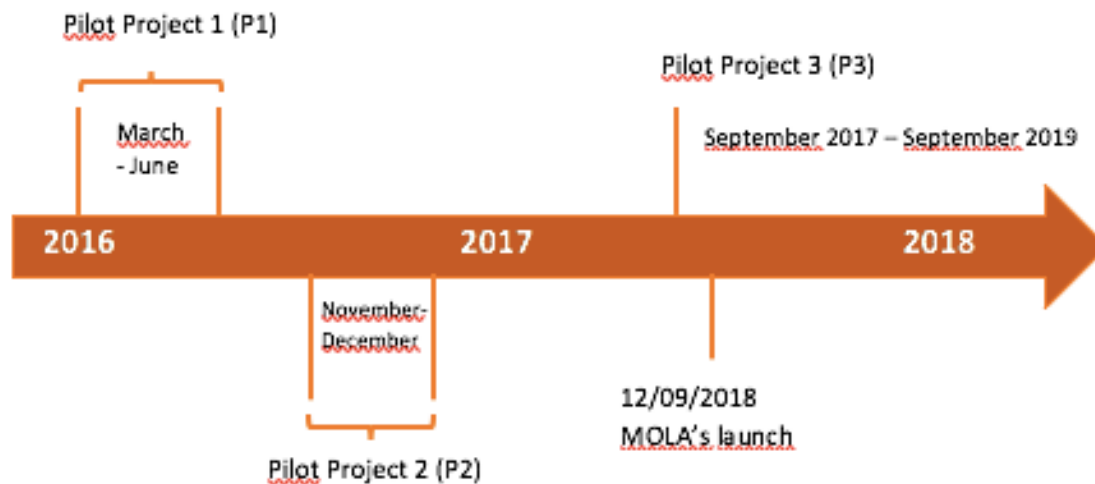


Figure 1. Project timeline. Figure made by author.

Figure 1 shows the timeline of the project. In March 2016 P1 was launched, and several shops, restaurants and schools in Madrid and various citizens from the district of Hortaleza donated their organic waste to make compost with it as part of the project. During these 4 months the project collected 17 tons of organic waste that was composted rather than burned in the landfill. Once completed, the project obtained funding again for P2, and could continue for 2 more months, and in October 2017, P3 was financed with 200.000 € for a period of 2 years, starting in September 2017.

In September 2017, in P3, the community currency MOLA was launched in order to further root this agroecological transition in the region. People who join the project now have the possibility to receive a community currency in exchange for their organic waste. This currency is backed by the value of the cost of managing organic wastes (0'25 €/kg of organic waste) and can be used as discount money in different shops, local markets and for services in the community.

This project, in which 200 tons of organic waste are collected a year, is the largest in Spain. Even so, it collects only a small amount of all the waste that is generated in the city every day. In 2015, with a population of 3.165.541 inhabitants in Madrid, the organic

waste generation was 440.000 tons, from which 2572.600 tons were incinerated (Ayuntamiento de Madrid 2015). The attempts of the City Council to make selective collection of organic waste have failed in many aspects, as this material has contained around 30 per cent non-organic waste, which makes it unfit for making compost. The project in which the MOLA operates manages to have only 0,01 per cent non-organic waste items in the collected materials. Appendix 1 shows an overview of the total kilograms of waste collected per week and month in the different nodes, as well as the percentage of non-organic waste material.

### 1.1.2. Stakeholders

The different stakeholders or actors involved in the operation of the MOLA are as follows:

1. **Users:** They donate their organic matter waste in exchange for the community currency MOLA. Since the beginning of the project, in September 2017, the number of users has reached 177.
2. **Shops and businesses:** They accept the community currency as a discount in exchange for the products they offer. Certain shops, such as those who sell fruit and vegetable also donate organic waste, but for the moment do not receive the currency in exchange for their waste. The only way they can start using the MOLA is if the customers buy products or services in these shops.
3. **Collection nodes:** These are places that are enabled so that people deposit the waste in specific sealed containers. These nodes are schools, shops, restaurants and community composting places, among others. There is a total of 18 nodes around Madrid, and the organic waste is deposited in hermetic blue drums arranged for that purpose.
4. **Transport association “El Olivar”:** The association “El Olivar” is in charge of collecting the waste from the nodes and its transport to the farm. It is an association of social inclusion, which gives an opportunity to people who are in need of work and housing. Two employees are now in charge of transporting the waste to the farm and these are now regular positions.
5. **Farmers:** Small vegetable producers that are located within a distance of 30km from Madrid city center. They receive the organic matter waste and are in charge of making the compost. There are four farms involved which collaborate in these tasks, but only one of them offer their products in exchange for the currency.

6. **The City Council of Madrid:** It finances the project, which has 200.000 € for a period of two years and receives periodic updates about how the project develops over these two years.
7. **Project committee:** Composed of representatives of the associations EBR, AUPA, and CyC. They are responsible for guaranteeing that the agreed objectives are being accomplished and for monitoring the project. Among all their obligations are the registration of new users in the platform as well as making the periodic payments to them, the dissemination of the project to the media, informing the City Council about the evolution of the project and the economic management.

### 1.1.3. The system operation

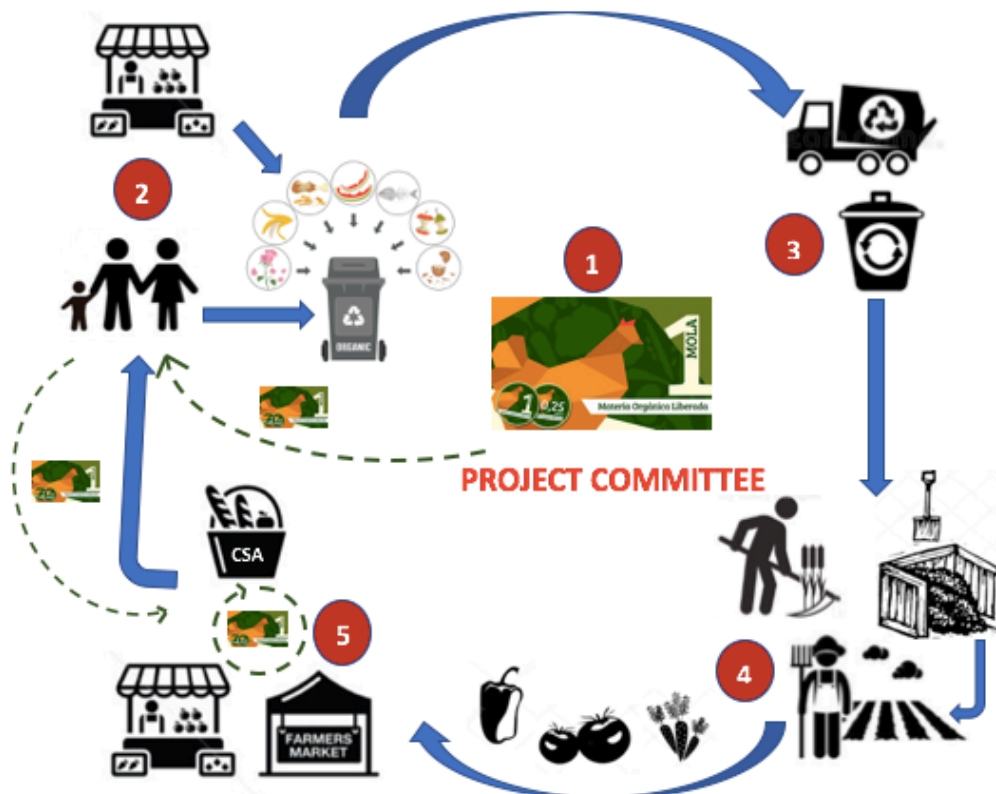


Figure 2. The MOLA community. Figure made by author

The blue lines show direct actions that are carried out within the system, such as depositing the waste in the bucket, the truck picks up the buckets, etc. The dashed green lines show where the MOLAs transactions can be made and where the initial MOLAs come from, which is the project committee.

Figure 2 above which gives an overview over the project. The first step was that the Project Committee (1) launched the currency, and gave the currency to the people who wanted to give their organic waste in exchange. These people place their organic waste in specific nodes (2), which are picked up by the transport association (3) who transport them to the farm (4) where the farmers make the compost and fertilize their land with it. The Farmers have the opportunity of selling their products in farmers markets or through Community Supported Agriculture (CSA) (5). This is a system in which people request to receive a basket with seasonal farming products on a regular basis, with prior arrangement of the price. Users can pay farmers with the MOLA currency for the farm products, but also use the MOLA in other shops in the neighborhood. These shops can then also spend the MOLAs they receive in other shops, markets, etc., all of it done through a mobile application called Clickoin, since the MOLA is a currency in a digital format. Appendix 2 shows more in detail each step of the process and how each of the stakeholders are actively involved in the project.

## 1.2. Problem Statement

Any project that is starting up and that gets out of the ordinary to which people are used to in the daily life, it needs time so that people adapt to it and adjust to achieve its best potential. Approximately 7 months since the MOLA was launched in September 2017, it can be said that it has been quite successful and has gotten a huge acceptance by the members. There is even a waiting list to sign up, as the current resources cannot serve more users and nodes. However, there are some issues to take into account so that the currency can be sustained. The project “Madrid AgroComposta” already existed before the MOLA was introduced, and in this project the users donated their organic waste for the mere fact that they wanted to give a better end to it than the landfill. The exchange of waste for a currency is an addition that so far, users are not taking advantage of. It is stagnant and does not circulate as much as expected. The service that is most appealing for users is the CSA provided by the farm “El Chorrillo”, that has become a sink of MOLAS. The circulation of MOLAS between users, stores and farms needs to increase, and especially among the farmers. The places that accept MOLAS are all located in the district of Hortaleza, considerably far from the places that farmers frequent in their daily life, since the farms are further away. The list of demands is bigger than the offer, and this needs to be better balanced for the best circulation flow of the currency.

### 1.3. Research questions and hypothesis

- *Have the stakeholders involved in the MOLA project developed more awareness about organic food waste management?*

Hypothesis: I expect the stakeholders who got involved in the initiative to now be more conscious about how to make the most of the organic waste and the importance of its recycling. Especial interest is put on the youngest members, who might adopt these environmentally friendly habits during their learning years and can make a fundamental change in the way they act in the future.

- *Is the MOLA succeeding as an agroecological tool to make more sustainable food systems?*

Hypothesis: The answer to this question is expected to be yes, since the project prevents a large number of tons of organic waste from going to the municipal landfill, which is several km's away. The ecological footprint is reduced and a circular economy is promoted by local production and consumption.

- *Has a closer and trusting relationship been created between producers and consumers?*

Hypothesis: I expect the consumers to develop more interest in knowing where the food comes from when purchasing it and develop bonds with the producers. Such bonds are created from the exchange between consumers giving the food waste to fertilize the ground and the producers giving the products that were grown, thanks to the collaboration of everyone. Also, enhancement of local consumption should increase and more importantly, create habits of purchasing and consumption that are more environmentally friendly.

- *Can the MOLA be expanded to other sectors, services or products, such as public transport, municipal taxes?*

Hypothesis: The MOLA can increase its scope and be accepted in more shops and other services, since it is a project that has recently started. To be accepted outside the local community, in municipal services such as public transport services, for example might be complicated if the project is not marketed outside the neighborhood in which it is currently working.

### 1.4. Theoretical framework

This section contains a short literature review, however Appendix 3 shows a more extensive version and more detailed information about what is discussed in this section.

### **1.4.1. The concept of circular economy**

The concept of a circular economy is about reducing as much as possible the number of inputs, as well as outputs in a system. The key to circular economy is the economic growth taking into account environmental sustainability, and moving from a resource-based to an operation-based growth (Lett 2014). This transition on how to arrange production and consumption could be the key to the future of the global economy. Any circular economy model is based on: a circular supply chain, the extension of the shelf life of a product, recycling, a common platform to share and the possibility to offer services instead of products (Lacy and Rutqvist 2016).

Local economic systems, in which an alternative currency is incorporated, are fundamentally based on the idea of a circular economy, in which everything circulates within the local system. The concept of a circular economy appears to answer some of the current economic, environmental and social issues, which is based on the three major rules towards more sustainable systems: reduce, reuse and recycle. Reducing the entry of materials and closing the “loops” of ecological and economic flows by reducing and recycling. This way the waste, for example, is not seen as if it has already fulfilled the mission it initially made for, but as raw material to perform a new function (Lett 2014).

The bond created between environmental sustainability and economic growth leads to the concept of economic sustainability, but reaching this at a global scale is practically impossible. Here is where the importance of creating hundreds of thousands of local economic balances lies (Brenes 2013). Grassroot movements can play a fundamental role in the development of a more sustainable economic system, an economy that is able to grow in balance with the limited environmental resources of our planet (Válek 2013).

### **1.4.2. An insight into the complementary currencies**

In recent years, there has been a significant boom in community currencies, coinciding with the economic crisis, especially in Europe, (Fritzsche 2014). In times of economic recession, complementary forms of currencies start to appear as a means to maintain the wealth in the region (Block 2009). Quoting Calvo and Morales (2014; page 5) “a complementary currency is an agreement to use something other than legal tender as a medium of exchange, with the purpose to link unmet needs with otherwise unused resources”

Community currencies arise due to different reasons. There are the economic, social, but also ecological reasons. Quoting Rogers (2011; page 13) “A monetary monoculture dominated by a handful of powerful national currencies has the same effects as monocropping in a landscape-extreme specialization and efficiency at the price of resilience in the face of challenges”.

When it comes to classifying Community Currencies (CCs), overall, we can distinguish two types: (1) Currencies which are backed by legal tender coins, having the opportunity of exchanging them for official currency. (2) Mutual credit currencies: The currency is created at the time of the transaction. Examples of these systems are Local exchange Systems and Time Banks (Llobera 2015, Llobera 2017). The MOLA is not backed by euros or any other legal currency, but rather by waste, so it would fall into the second category.

The main idea behind CCs is not to accumulate it but rather to spend it to multiply the wealth within the area, which breaks completely with the principles of the hegemonic system, in which the idea of money is basically to have as much as possible (Brenes 2013).

There are plenty of initiatives regarding the emergence of CCs in the local economy all over the world (Llobera 2015). Spain is a country with a big number of initiatives, with more than 30 different types in the whole country. Some of the more representative are the Mora in Madrid, Ekhi in Bilbao or Puma in Sevilla (Calvo and Morales 2014, Llobera 2015). These are just some examples of CCs working in Spain, however, one of the most emblematic at a global scale are the Brixton pound in UK. This is a based-on-legal-tender currency type, so people can even receive part of their salary in Brixton pound, pay taxes and so on (Bristol Pound 2012, Seyfang and Longhurst 2013).

So far, some of the CCs that have worked best are those backed by a legal tender coin, since they are the most appealing for consumers. The main reason for that is that the currency has been paid with legal money, which leads people to be more conscious of wanting to take advantage of it. There are other community currencies, such as the Chiemgauer in Germany, that include an expiration date of the currency, so that if it is not used in a certain period of time, it loses its value. Thus, the currency circulates much faster and local economic growth increases (Chiemgauer regiogeld 2018, Thiel 2011).



These are mainly examples of well-developed community currency systems in Europe, most of them registered into the CES (Community Exchange System) website. This is a web resource that compiles the biggest number of community currencies in one place, with about 994 different community currencies all over the world. Appendix 4 shows a map taken from the CES website, with all the CCs that are registered on the platform at the time. Europe has the largest number of alternative systems of exchanges, and Spain is the most emblematic on the continent. (CES 2018).

### **1.4.3. The environmental factor in complementary currency systems**

On many occasions, CCs emerge as a response to a failure in the environmental aspect of a system and intend to be more environmentally friendly (Seyfang 2004b). An example of this is the case of rewarding with a community currency for the organic waste of households to be composted, like the MOLA. So far, there is no evidence of another community currency based on the exchange of organic food waste, but there is a case that resembles it to some extent. (Seyfang and Longhurst 2013). This is the case of the *e-portemonnee*, in the Netherlands, which works as a reward system. The citizens making environmentally friendly activities, such as changing the energy supplier to a greener one or reducing food waste in the households are rewarded with e-points that can be used for purchasing goods, public transport tickets, etc. (CCIA 2018).

The lack of CCs backed by a good environmental action might be due to the little importance that has been given to the environment in the past, but environmental issues are now on the agenda of many governments. The Waste Framework Directive of the European Union has a goal for 2020 to increase up to 50 per cent the materials recovered by recycling (EU 2008). Answering to this Directive, Madrid's city council calls for projects to help achieve this ambitious goal, and one of these is "Madrid Agrocomposta", in which the MOLA plays an important role.



## 2. Material and Methods

### 2.1. Aim of the study

This project focuses on the MOLA community and explores the experiences that the MOLA users (farmers, shop owners, consumers) have had, in order to know if the participation in this project has meant a change regarding the management of recyclable organic material waste. The goal is that the growth of an agrocomposting movement such as this one, which collects the largest amount of organic waste in Spain for composting purposes, can have such an impact that it echoes at higher levels. This could show that a change in the management of organic waste is necessary and, more importantly, that it is backed by a large percentage of the population which is already collaborating in this agroecological transition.

### 2.2. Data collection

This project has been carried as a descriptive investigation. Initially the descriptive analysis was done through qualitative methods, and later in the research, it was decided to also add quantitative methods.

Table 1 shows the different stages in which the whole study has been based on. The methodological approach has combined qualitative and quantitative methods in order to obtain more accurate information.

<b>First stage</b>	Conduct semi-structured interviews with the main stakeholders in order to know which aspects are of most concern for the people. Participatory observation
<b>Second stage</b>	Analysis of the interviews and launch of a structured online questionnaire to all the people registered on the MOLA platform. The scope using an online tool was considerably higher than the face-to-face approach, especially concerning users who do not have a business.
<b>Third stage</b>	Data analysis of the questionnaire results

Table 1. Methodological order followed during the case study.

The choice of this multi-methodological design advocates for the complementarity of both techniques, so that the quantitative method answers to questions that the qualitative cannot and vice versa (Fernández-Pacheco 2017).

The use of different methods in the same study usually gives more chances to answer the objectives of the study. Validity and reliability of the study are also enhanced by the use of this multimethod approach where the key lies in the complementarity of both (Hunter and Brewer 2003).

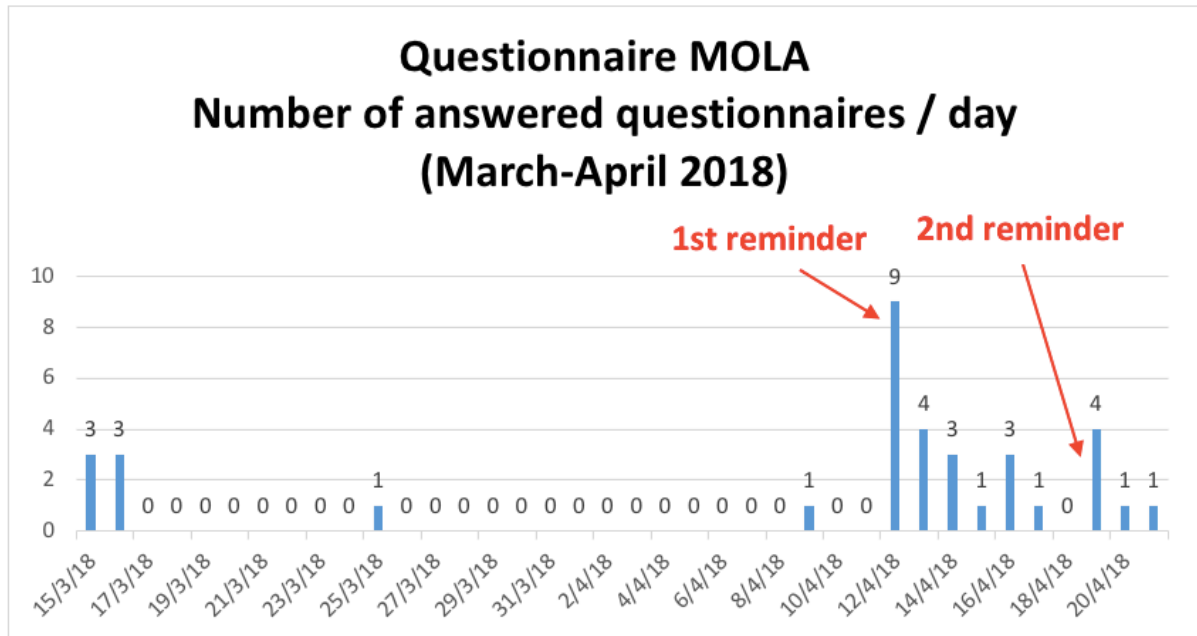
The first step was the development of the research questions, defining what I wanted to obtain with this study and thus, what I wanted to get from the interviews. For the selection of participants, having a broad representation of the stakeholders involved in the MOLA was fundamental, to get a good insight into a rich picture of what was happening.

Participatory observation and interviews were the chosen methods for the qualitative research. The nature of the interview was semi-structured, thus allowing the interviewer and interviewee to freely communicate within a frame of premeditated questions (see Appendix 5 for the interview guide). The interview was approached as a conversation in many cases, where the interviewee could feel comfortable and explain his/her perspective in confidence. The interviews were conducted in the daily environment of the participants. There was a clear difference in the time spent on the interviews among the different stakeholders. While people in charge of the shops would be more proactive to have a longer conversation, the families had less time for the interview and these were kept rather short and more structured.

Once the interviews were conducted, the quantitative data collection was launched. Online survey research has the advantage of allowing the interviewer to reach individuals who are more difficult to approach in person, for example families and members of the community who do not have a shop or offer a service that accept the currency (Wright 2005). For this purpose, an online questionnaire seemed to be a very reasonable tool to obtain this information (see Appendix 6 for the online questionnaire), taking the example of Fernández-Pacheco (2017).

The questionnaire was sent via email to the users three times, in order to remind those who did not answer the previous times. The gap between the first and second reminder was considerably bigger, and being much shorter between the second and the third one. The following graphic 1 shows the number of questionnaires that were answered per day

as well as when the reminders were sent to the users. A total of 35 answers were obtained, out of the 150 emails that were sent to the users. The total of users registered on the platform is 177, however several errors were found and 27 of the email addresses were incorrect and therefore 150 users had the chance to answer. This represented a response rate of 23 per cent.



Graphic 1. Number of answered questionnaires/day in the MOLA questionnaire. Graphic made by author.

### 2.3. Data Analysis

The qualitative information gotten from the interviews was analyzed first. This helped to create the questionnaire for the quantitative analysis.

In qualitative research, the process is not linear and collection data and the analysis are carried out almost simultaneously. The approach I used was to structure the data, organize the text into different categories by topic and by type of stakeholder, and describe the experiences of each of the interviewees from their own point of view. The opportunity to collect and analyze the data at the same time allows for greater flexibility when it comes to interpreting and you can adapt the following interviews (Del Álamo 2009, Hernández et al. 2010).

For the quantitative analysis Excel was the tool used in order to create the graphics and main percentages for those data that could be quantified (demographic, economic and socio-community analysis).

## 2.4. Methodology's SWOT analysis

As for any methodology, strengths, threats, opportunities and weaknesses are found and examined in order to keep the whole perspective of the chosen methodology.

Qualitative research using interview tools	Opportunities	<ul style="list-style-type: none"> <li>• Research questions can be modified, depending on the gathered information through the interviews.</li> <li>• Semi-structured interviews bring the opportunity to gather very different information without being bound to structured questions.</li> </ul>
	Threats	<ul style="list-style-type: none"> <li>• All the gathered information depends on the researchers, his/her ability to do it, objectivity and capacity</li> <li>• The ability of the interviewer to create friendship bonds with the interviewees and at the same time maintain the researcher attitude.</li> </ul>
	Strengths	<ul style="list-style-type: none"> <li>• The obtained information can be incredibly rich when it is provided in a descriptive manner as it is an interview based on the narrative.</li> <li>• The information is gathered in a natural environment, therefore interviewers can feel comfortable during the interview.</li> </ul>
	Weaknesses	<ul style="list-style-type: none"> <li>• There is a risk of getting false information, and interviewees might not be completely honest during the interviews.</li> <li>• Qualitative information is highly subjective to personal interpretation. Therefore, objectivity of the researcher must be impeccable.</li> </ul>
	Opportunities	<ul style="list-style-type: none"> <li>• Reach a larger population to obtain more data.</li> <li>• The chance of using long-range collection tools as online surveys.</li> </ul>

<b>Quantitative research using online questionnaires</b>	Threats	<ul style="list-style-type: none"> <li>• The information obtained is limited to the questionnaire that is provided to the interviewers.</li> <li>• There is a risk that people might not be totally honest with the information provided.</li> </ul>
	Strengths	<ul style="list-style-type: none"> <li>• You can obtain and analyze quantitatively a great amount of data.</li> <li>• Less costs added and less time consuming</li> </ul>
	Weaknesses	<ul style="list-style-type: none"> <li>• You cannot interact with the person or ask for clarifications of the answer. More impersonal.</li> </ul>

Table 2. SWOT analysis of qualitative and quantitative research methods

## 2.5. Reliability and validity of the information

In social research, reliability and validity are basic principles. In regards to reliability, this relates to the quality of the measurement. Results should be of such a good quality that if the study is replicated, the same results are obtained. This is why it is important to carefully explain the methodology that is used, for other researchers to be able to replicate the study in other scenarios. Validity, on the other hand, relates to the ability to measure what it is supposed to measure in the first place. Both concepts are fundamental and complementary in order to have good results in the study (Calvo and Morales 2014).

Although in all research there is a risk of obtaining dishonest information, this project is running primarily because of the willingness of the involved actors. It is a project moved by the people of the region, their solidarity and free will, where trust has always been fundamental for the well development of the project. Trust concerning where the waste is put once it is handed to the farms, trust when exchanging the waste for the new currency, and so on.

A critical step in qualitative analysis is the commitment of the researcher to report the results from the interviews in a transparent way. This is where the integrity of the researcher is revealed. Transparency is what truly shows the degree of commitment of the author, and has to be as open as possible throughout the process of data collection and analysis. In this way the data can be replicated in future analysis and give it the validity that any scientific study requires (Miles and Huberman 1994).

## **2.6. Ethical considerations**

Since this research is entirely based on the information gathered through interviews and online questionnaires, ethical consideration is of crucial importance.

All the information gathered through the interviews will be used in order to evaluate the current situation and find trends, as well as to develop new ideas and alternatives for the future. None of the information will be at any moment be related to the person that it came from, and it will be completely anonymous. The interviewees were notified of this prior the interview, so all of them were aware of the conditions before they agreed to participate.

Related to the writing, there will not be any statement or testimony that could be related to a person's name, place of work or any other personal aspect.

### 3. Results

Regarding the results, there is first an insight of the face-to-face interviews that helped to develop the questionnaire. Then, the results are distributed by topic according to the sections of the questionnaire, in which are also included the opinions from the shops, farmer and other stakeholders who were interviewed in order to enrich the answers taking into account all the stakeholders.

First, 16 interviews with different stakeholders were conducted, which are displayed in table 3.

<b>Shops</b>	<ul style="list-style-type: none"> <li>➤ Food shop “Alimentación fruta y verdura”</li> <li>➤ Gym “Estudio 47”</li> <li>➤ Cultural Space “Danos Tiempo”</li> <li>➤ Florist store “Verde y en Botella”</li> <li>➤ Pet’s shops “Lemi mascotas”</li> <li>➤ Fruit and vegetable store “Frutas y verduras Daniel”</li> <li>➤ Shoe shop “Zapatería-cuchillería Ángel y Paqui”</li> <li>➤ Hairdresser “Barbería César”</li> <li>➤ Butcher shop “Carnicería Nápoles”</li> </ul>
<b>Families</b>	<ul style="list-style-type: none"> <li>➤ 5 Women interviewed at the exist of the school Luis Cernuda</li> </ul>
<b>Transport service</b>	<ul style="list-style-type: none"> <li>➤ Transport association “El Olivar”</li> </ul>
<b>Farmer</b>	<ul style="list-style-type: none"> <li>➤ Agroecological farmer in charge of the CSA. Only farmer that accept the currency MOLA</li> </ul>

Table 3. Stakeholders interviews during the first phase.

The interviews served to a great extent to learn about the experience of the shop owners in the MOLA, since they are the largest abundant group of the interviewees. In addition, no shop owner answered the questionnaire, so the interviews were a very valuable source of information about their point of view.

Overall, the people working in the stores are very open-minded and willing to accept that consumers pay in MOLAs, since that means they can also exchange them. However, all of them agree that the frequency with which consumers pay in MOLAs is very low or

nonexistent. Two thirds of the shop owners say that at most they have 1 or 2 buyers who pay in MOLAs per month, but there are shops that have not received any MOLA yet.

Another aspect on which around 7 of the 9 businesses interviewed agreed is that they think that the reason that customers do not pay in MOLAs is because the payment method is not made for the usual clients that the shops in this neighborhood have. According to the businesses; making the payment through a mobile application restricts the payments in MOLAs, and that is the reason why the circulation of the MOLA is so low. Although the store owners agree that the Clickoin application is a good payment method, many believe that if the currency was a physical one, more payments would be made and so local commerce would benefit more from the use of the MOLA. It should be noted that many of them have not had the possibility to make exchanges in MOLAs, given the low circulation, however the farmer, who has the highest percentage of MOLAs and who has already made many transactions, believes that the payment method is very simple and that it has worked very well so far with all his buyers. This actually defined one of the questions of the questionnaire; to know what is the opinion of the users concerning the use of a mobile application to make the payments, since they are the ones who do it after all.

Many of the interviewees, especially some shop owners and users, mentioned that the concept of the MOLA has good intentions, such as to support local trade, implement new lifestyle, etc. However, they also agree that it has not been able to involve new people in the project, but only those who were already aware of environmental issues are those who participate in it. A smaller portion of the interviewed shop owners had a different point of view and affirmed that this has meant a total change in their lifestyle and get to know the importance of agrocomposting. This debate, which was found among the different interviewees, led to the creation of some of the questions. I wanted to know whether they already had these organic matter recycling habits and advocated for shorter supply food systems before the MOLA.

### **3.1. Sociodemographic analysis in the MOLA community**

First of all, in order to understand what the concerns and necessities of the MOLA community are, it is important to know the people who form part of it, especially the users. Appendix 7 shows all the graphics obtained through the analysis of the demographic questions asked during the questionnaire. From the 35 people that answered the questionnaire, nearly 63 per cent of the MOLA members are women, while 37 per cent



are men, which is a quite remarkable difference (See graphic 2 in appendix 7). Regarding the age, the most represented age group is the one that consist of those between 41 to 50 years old, which contains about 43 per cent. The second largest group is the one with participants who are from 51 to 60 years old, with approximately 29 per cent. Overall, most of the people who answered were between 40 and 60 (See graphic 3 in appendix 7).

It is relevant, in this case, to know how many people live in the household, since, in each house, it may be that only one person is registered as a member of the MOLA, but that all the people in a house actively participate in the project. It is important to know, not only how many people are registered, but also how many people who are involved in the project. As shown in graphics 4 and 5 in appendix 7, the most abundant group, with 34 per cent is that in which two people live in the accommodation, closely followed by three and four people and finally five members. In a much smaller proportion are those who live alone, with 8,57 per cent.

Regarding the educational level of participants, graphic 6 in appendix 7 shows that the vast majority has reached university studies. 83 per cent of the population has university studies and a minority of 14 per cent has finished high school studies.

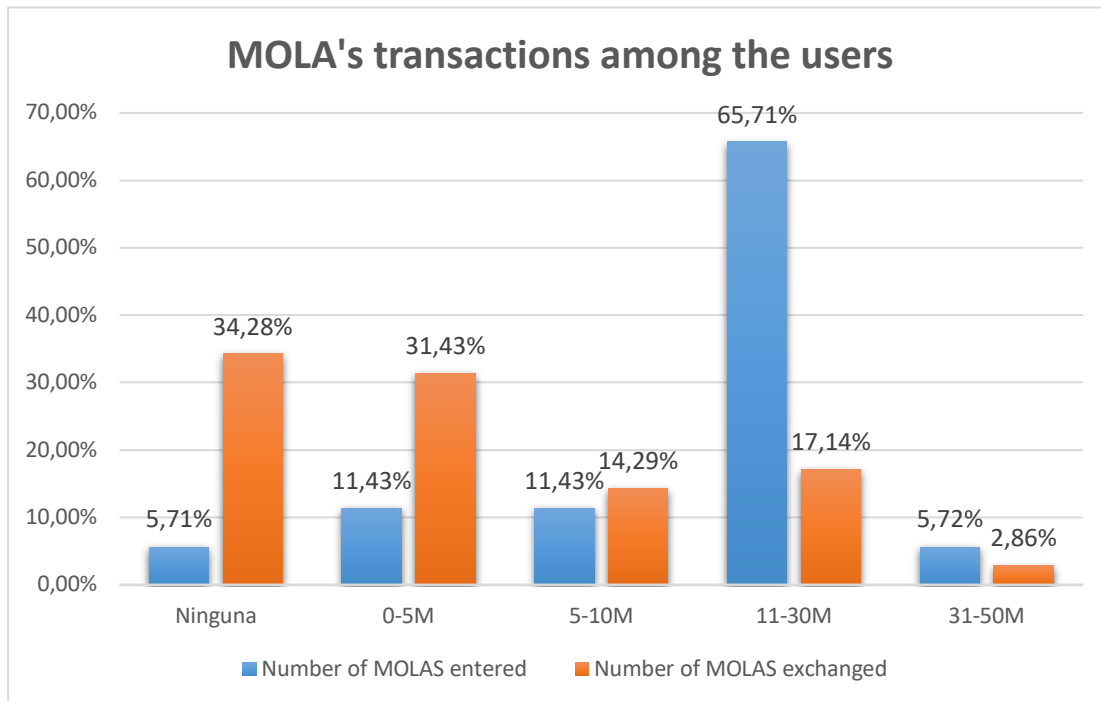
As for the employment situation of the participants, the majority of them, 47 per cent, have a permanent salary, as shown in graphic 7 in appendix 7. The second most abundant group are those with a temporary or eventual salary, 17 per cent, but it is not far from the group of retirees and unemployed, with an 11 per cent each.

## **3.2. Economic analysis in the MOLA community**

### **3.2.1.MOLA's income and transactions among the users**

It was important to know about the transactions of MOLAS that participants have performed since joining and focus on the reasons. Graphic 8 below shows both the revenues and transactions of MOLAS made by the users. There is clearly a difference of results from both actions. The number of MOLAS entered by the users is greater in the range that goes from 11-30M, and significantly decrease in the other ranges. This is because all participants receive a payment once they sign up that covers the organic matter they will hand in in the following months, which is usually around 25-30 M. However, a large change in proportions is observed concerning the transactions. The

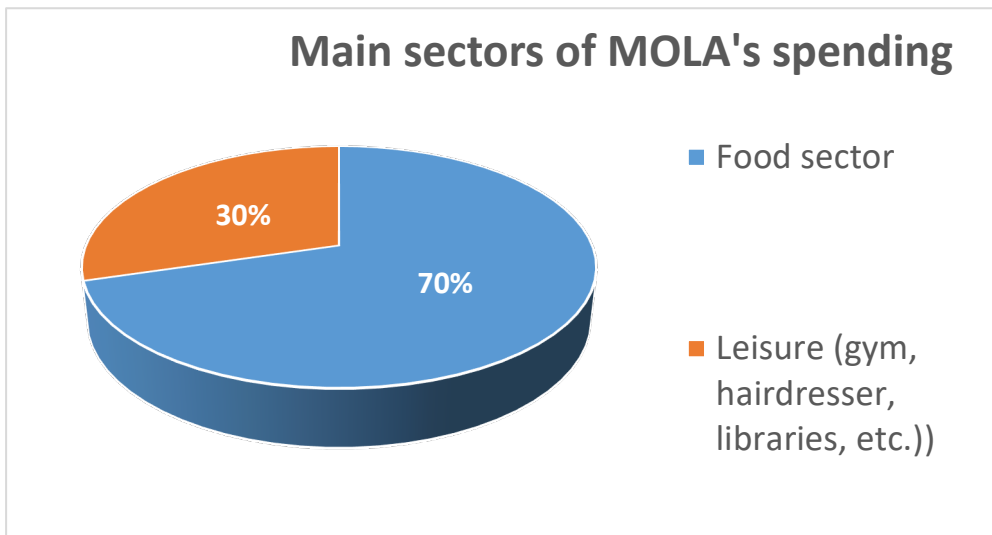
highest per cent, 34.28, indicates that many users have not made any kind of transaction yet, and not much less people have made transactions for more than 5 M. Generally, the number of MOLAS exchanged decreases as the amount gets bigger, which shows a very poor circulation of the currency in the area.



Graphic 8. MOLA's transactions among the users. Graphic made by author.

### 3.2.2. Main sectors of MOLA's spending

Among all the users that have already spent some of their MOLAS, graphic 9 shows which sectors are the most popular for them to spend in. The food sector is the most successful, with 70 per cent of the votes, while only 30 per cent of the time, the participants choose to spend them on leisure time, such as hairdresser, gym, etc. There is also more offer on the food sector than in any other. To get into more detail within the food sector, figure 3 shows what are the most named elements by the consumers according to the size of the letters. Therefore, the CSA seems to be the most popular way for the consumer to spend their MOLAS. This is probably due to the high number of parents who are part of the primary school "Luis Cernuda", which is where the CSA is delivered. The second most popular one is the farmers market, where consumers get the chance to buy fresh products from producers, such as farm "El Chorrillo" or "La Huerta de Leo".



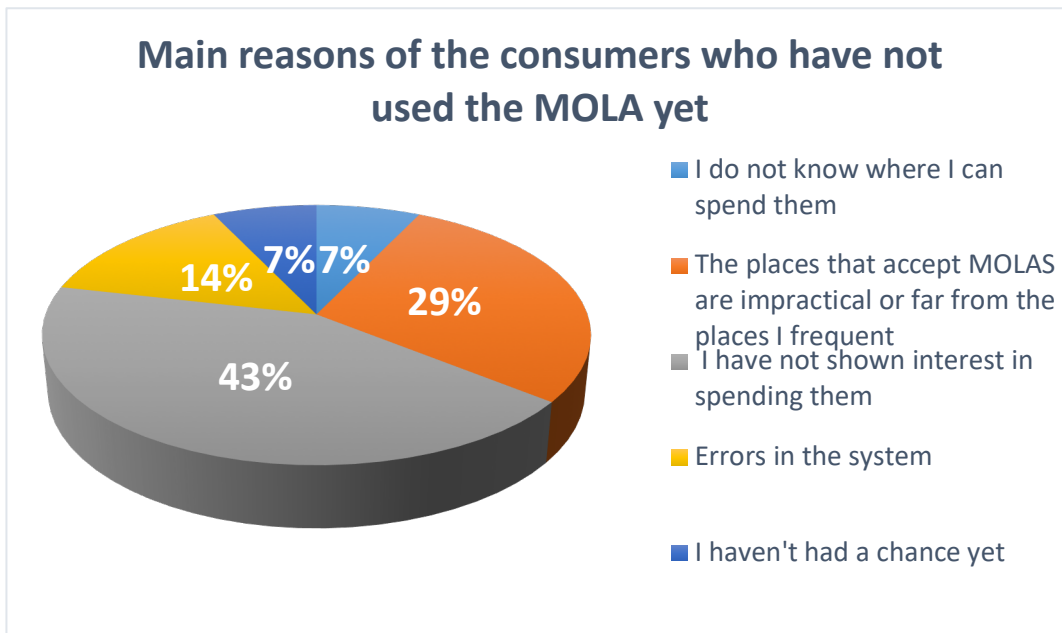
Graphic 9. Main sectors of MOLA's spending. Graphic made by author.



Figure 3. Areas within the food sector in which more number of MOLAS are spent. Figure made by author.

### 3.2.3. Reasons why the consumers have not used their MOLAS yet

For those participants who have not used their MOLAS in any place yet, graphic 10 shows the main reasons. The most frequent answer, with 43 per cent, is that they have not shown any interest in spending them. This suggests that the project appeals to them more in the aspect that concerns the donation of the organic waste that the reward that is offered, the MOLA. The second most popular answer, with 29 per cent, is that the places which accept MOLAS are impractical or far from the places they frequent. That makes sense, since most of the places are very concentrated in a specific area, and might be far for many people in the area.



Graphic 10. Main reasons of the consumers who have not used the MOLA yet. Graphic made by author.

### 3.3. Clickoin service

One of the points that raised more concern during the face-to-face interviews, especially for the shops, is that the tool used for the MOLA transaction (Clickoin) is not the most appropriate. Some of the statements were:

“The MOLA is not succeeding, it does not promote the local economy and it is because this is a neighborhood where there are a lot of old people. Older people are not used to managing technologies to pay at the grocery stores. A paper currency would be more successful, older people would see it more natural and MOLA would be used more often in the neighborhood stores”.

(Interview store #1\_2018).

Due to the constant references on the part of stores on this subject, we asked the users about their opinion on this issue. 88.6 per cent (31 people) of the population thinks that the Clickoin service is a good method for carrying out MOLAS transactions, compared to 11.4 per cent (4 people) that they think it is not. It should be noted that of these 4 people, 50 per cent have not made any transaction with the app and stated among their responses: "I do not know it" or "I do not know this application". As for the 88.6 per cent

who responded favorably to the use of the application they stated that "it is comfortable and easy to use" "fast and efficient" "simple 'fast and practical".

### 3.4. Potential of the MOLA

One of the key points on the online survey was to know which aspects of the MOLA are the most valued by the users. Graphic 11 below shows that the most positively valued aspect by the participants is the educational one, more than any other. It is closely followed by "it encourages awareness on the recycling of organic matter and more sustainable food systems" and also "it is a good incentive to involve people in the agrocomposting of organic matter". However, the potential that the MOLA enhances the local economy is mostly valued with medium potential. It is interesting that the shops has kind of the same opinion about this. Some verbatim of the interviewed shops are highlighted below:

"...that is what it should happen, that the local trade is favored, the intention is good, but it is not what is happening"

(Interview store #2\_2018).

"...not for me, I don't think the goal of the MOLA is to increase the local trade, for me it is a tool to increase environmental awareness"

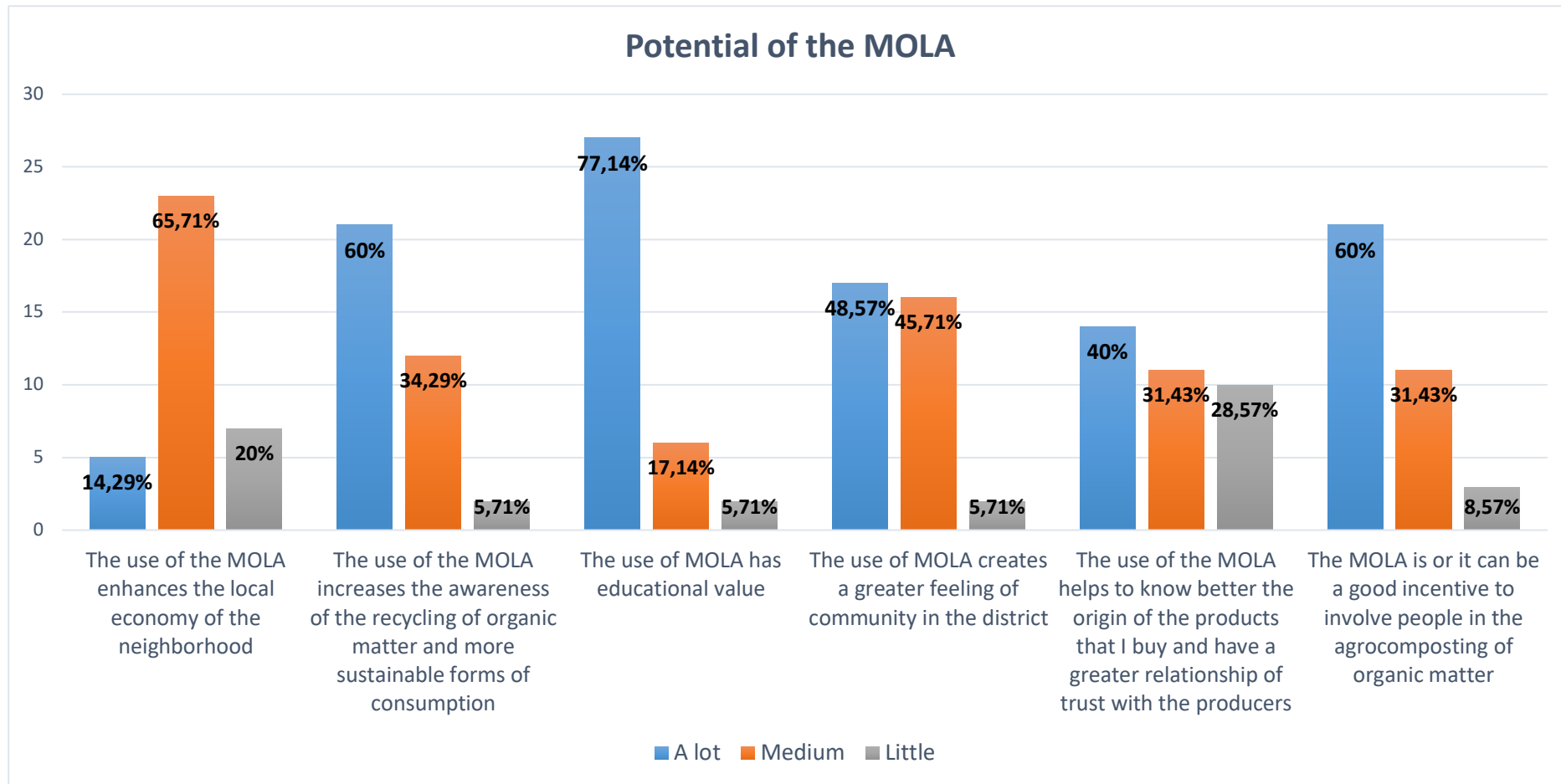
(Interview store #3\_2018).

The potential of the MOLA as a tool to create a greater feeling of community is very much even in its evaluation of a lot and medium. In fact, some of the stores emphasize that this project is special and unique because it is something that works thanks to the solidarity between neighbors

"The most special thing about this is the link that can be created between neighbors and businesses, just for that this is worth it"

(Interview store #4\_2018).

The only factor that is valued very similarly in the rating scale is that the use of the MOLA helps to know better the origin of the products that users buy and have a greater relationship of trust with the producers. This question was specially addressed to the users who buy through the CSA.



Graphic 11. Potential evaluation of the MOLA. Graphic made by author.

### 3.5. Recycling habits

In order to answer one of the research questions, I asked the questionnaire participants if the MOLA has managed to implement new behaviors patterns regarding more sustainable ways of waste management, given some statements from the face-to-face interviews:

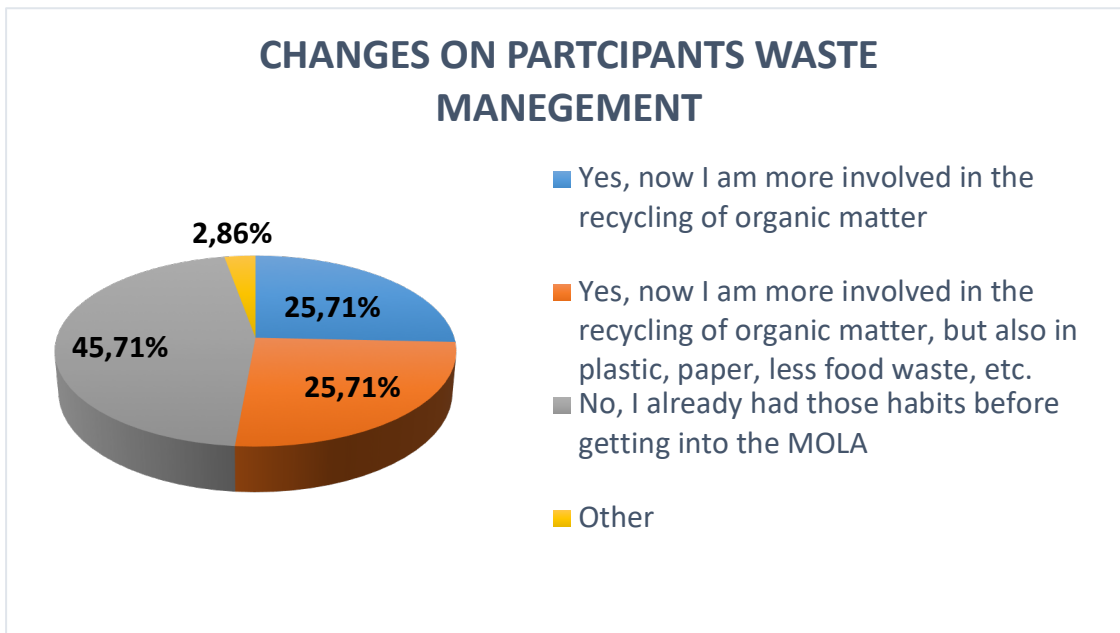
“The fact that people have to take the trash to specific place, other than at the door of their house costs people effort. It is an extra effort that they do not want to make and which they are not used to...It depends a lot on people’s culture and the willpower that they have. The MOLA only attracts to a specific niche of people, and only the most aware people about this topic are attracted to it. The more aware people there are, the more people will sign up, but I doubt it happens the other way around..”

(Interview store #4\_2018).

“The waste should come from conscientious people who share specific ideals and who do something in order to reduce or recycle their organic waste properly”

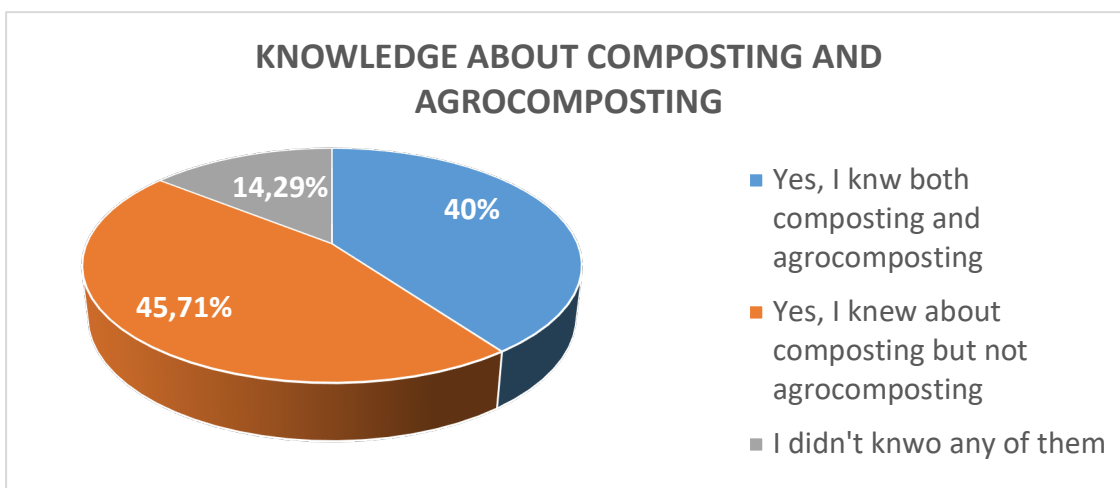
(Farmer #1\_2018).

Given these statements, participants were asked if the MOLA has meant a change for them regarding the organic waste management or if they already have them rooted and thus, willing to participate in the project that shares their ideals. As graphic 12 shows, 45,71 per cent answered that they already had those habits before starting at the MOLA. 25,71 per cent, answered that the MOLA has meant a change and they are now more involved regarding the recycling of organic matter and again 25,71 per cent answered that besides recycling organic matter, they are now more self-aware in the recycling of all type of waste.



Graphic 12. Changes on participants waste management. Graphic made by author.

It was also interesting to know how informed they were about agrocomposting, which is the organic waste management tool used in this project, but also about composting which is more common. There is not a big difference between those who knew only about composting (45,71 per cent) and those who knew also about agrocomposting (40 per cent), as graphic 13 shows below. A smaller proportion (14,79 per cent) did not know any of the two concepts before getting into the MOLA. These answers show what many of the interviewees already observed. So far, a good proportion of the participants are usually people already aware about these issues.



Graphic 13. Participants' knowledge about composting and agrocomposting. Graphic made by author.



### **3.6. The MOLA as a tool towards more sustainable food systems**

Regarding this question, out of the questionnaire, 88,57 per cent of the participants answered that they believed this initiative of recycling the organic matter and the use of the MOLA helps to create more sustainable food systems, while 11,67 per cent remained with an answer of no. What is interesting about this is what they think is a sustainable food system and why do they think the MOLA can help to achieve that. Some of the reasons that were followed by a yes are: “it helps to raise awareness about local producers”, “it is a multiplier effect on the more sustainable management of the whole food cycle and consumption”, “it encourages local food consumption and the circular economy, it connects citizens with the nearby agrarian activity”, “less chemicals, less transport and more healthy social relationships”. Given these responses, it is understood that the majority associate sustainable food systems with consuming products of proximity, choosing consumption options that are more respectful with the environment, etc. The MOLA can be seen as a trigger that establishes good consumption and buying behavior in its participants.

### **3.7. Open questions**

In order to deepen more in what the users think about the MOLA, it was crucial to ask open questions, in which the users could express their opinions a little more.

#### **3.7.1. Reasons to join the MOLA platform**

We wanted to know what were the reasons that led them to be part of the MOLA community and there were two types of responses that stood out more than the rest, which were: “the revaluation of the organic matter, recycle the organic matter of my waste and return it to the earth, close the cycle” and “It is a different channel to capitalism, it is an innovative and pioneering project in Madrid which I want to be part of”. To a lesser extent, only two of the participants answered that what made them get into the MOLA was the incentive to get discounts on the shops and other services. One of the answers was: “I think it is fair that for the organic matter we give we get a payment in return”. As for the face-to-face interviews, all the personal users that were interviewed answered that they got into the MOLA because they were already participating in Madrid AgroComposta before, and the MOLA was a plus. Below there is a verbatim of one of the users:

“I already brought the waste for recycling before the MOLA started, it may mean a change of mentality for many people, but for me it's secondary”

(Interview user #1\_2018).

What many of the participants seems to agree is that:

“The MOLA creates complicity, creates a community that everyone feels part of, since it represents certain values that all of us who are part of this share”

(Interview user #2\_2018).

### 3.7.2. Positive and negatives aspects of the MOLA

On the other hand, I asked what aspect they like most and least about the MOLA, so that we can boost its strengths and work on the weak points. Table 4 shows what were the most common responses of the participants, which are grouped by categories and the percentage of people that answered such things. For the first column, what participants like the most is how the credit is obtained but they also appreciate the fact that the MOLA creates a sense of community around it. For the things they like the least about it, a good amount of people answered that they do not know or do not see any inconvenience. However, a fair amount of people answered that is not very widespread and not many shops affiliated to the MOLA yet.

¿What do you like the most about the MOLA?	¿What do you like the least about the MOLA?
<ul style="list-style-type: none"> <li>• It is obtained by composting, the circular economy cycle 27,02%</li> <li>• The feeling of community that is created through it 24,32%</li> <li>• The environmental and social values that are forested 18,92%</li> <li>• It encourages the consumption of local products and stores 13,51%</li> <li>• Innovative project 8,11%</li> <li>• Don't know or don't have used it yet 8,11%</li> </ul>	<ul style="list-style-type: none"> <li>• It is quite limited for the exchange, little widespread 34,28%</li> <li>• There are few shops attached 25,71%</li> <li>• Few people participate 5,71%</li> <li>• Problems with the exchange app 5,71%</li> <li>• Have not used it yet or don't know what to say about the question 28,57%</li> </ul>

Table 4. Positive and negatives aspects of the MOLA

### 3.7.3. Future of the MOLA

One of the main goals of launching this questionnaire was that participants could tell what they see in the future of the MOLA and they made important suggestions. Among them were to increase the number of shops where to spend MOLAS, but also not only add more business but add the possibility of getting MOLAS in case of not having a business, as the only way that users can increase their income is through the delivery of organic waste. Some of the interviewees mentioned the same:

“Perhaps you could consider the introduction of services between users, given that the amount of MOLAS that are generated are not enough to maintain a constant consumption”

(Interview user #2\_2018)

But above all, they mentioned the need to spread more the concept of the MOLA, if there was a greater diffusion by public administrations, the circulation of the currency would increase, according to the user’s opinion.

Finally, since one of the long-term goals of the MOLA is to extend to other sectors or even neighborhoods in Madrid, users commented on the places or areas that they would like to use the currency. Figure 4 below shows the most popular sectors where people would like to spend their MOLAS in the future if the currency manages to be successful enough that it could be extended to a higher level.

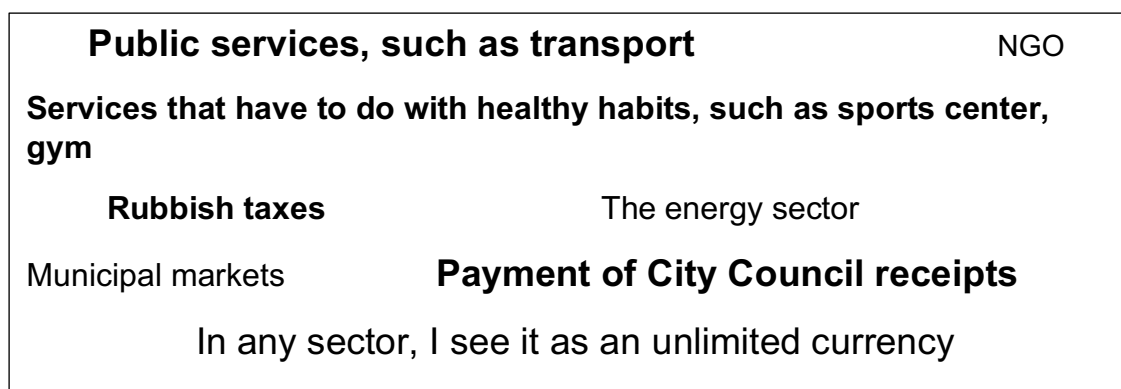


Figure 4. Most common suggestions of places/services where to spend the currency by the participants

## 4. Discussion

Table 5 below shows a brief summary of the research questions, their hypothesis and whether or not they have been confirmed during the whole process of the investigation.

Research question	Hypothesis	Confirmed hypothesis
<b>Have the stakeholders involved in the project developed more awareness on the organic food waste management?</b>	I expect the stakeholders who got involved in the initiative to be now more consciousness about how to make the most of the organic waste and the importance of its recycling. Especial interest is put on the youngest members, who might have learnt it during their learning years and can determine a fundamental change on the way they act in the future.	YES
<b>Is the MOLA succeeding as an agroecological tool to make more sustainable food systems?</b>	The answer to such question is expected to be yes, since it prevents a large number of tons of organic waste from going to the municipal landfill, which is several km's away. The ecological footprint is reduced and maintains a circular economy by promoting local production and consumption.	YES
<b>Has a closer and trusting relationship been created between producers and consumers?</b>	I expect the consumers to develop more interest into knowing where the food comes from when purchasing and develop bonds between them. Such bonds are created from the exchange of consumers giving the food waste to fertilize the ground and the producers giving the products that were grown thanks to the collaboration of everybody. Also, enhancement of local consumption should increase and more importantly, create habits of purchasing and consumption that are more environmentally friendly.	Partially confirmed
<b>Can the MOLA be expanded to other sectors, services or products, such as public transport, municipal taxes?</b>	The MOLA can increase its scope and be accepted in more shops and other services, since it is a project that is just starting, however, to be accepted outside the local community in municipal services such as public transport service might be complicated if the project is not given much visibility outside the neighborhood in which is currently working.	Partially confirmed

Table 5. Outline of the research questions and the confirmation of their respective hypothesis

➤ ***Have the stakeholders involved in the project developed more awareness on the organic food waste management?***

The MOLA aims to involve the people in a more efficient organic waste recycling and maintain a circular economy in the community. It is true that according to the results of the survey in graphics 12 and 13, an important percentage, although not the majority, already maintained these habits of organic matter recycling to make compost and knew about the concept of agrocomposting. However, as for any other innovative project that is just starting, it is normal that at the beginning only the most militant and aware people feel attracted to the project. It takes time to involve people who are less involve in agrocomposting, recycling or environmental issues.

Besides that, in order to answer this question, it is relevant to mention the importance that participants gave to the educational value of the project above any other aspect, especially when rating the different potentials of the MOLA. The educational value was the best rated so far and it is because many people see the MOLA as a tool for social and environmental awareness. Since it is a very little extended tool so far, local economy does not get boosted as efficiently as expected, but it helps to inculcate certain values in all the people who gets involved or just hear about it. As graphic 4 in appendix 7 shows, most of the users live with more people in the household and in family, generally. This triggers a chain movement in which some practices such as a good separation of the organic waste portion and learn about agrocomposting, are transmitted from one to another. All the interviewed parents who are part of the MOLA community and who deliver the organic waste at the school Luis Cernuda, mentioned how incredibly aware their children are about these issues and all the children in the school too.

Especially the most vulnerable group of people in the MOLA, the children, have adopted deeply rooted behavior patterns regarding the importance of composting the organic waste. Habits that can hardly be exterminated if getting them as such young age and in many cases, transmitting those habits to their parents. On the other hand, many of the interviewed people and also participants in the questionnaire mentioned that they already maintained such habits. The MOLA has not meant an important change in their personal values about environmental issues but has just given them the tool to achieve those goals.

Definitely, although few of the interviewees and also some of those who answered the questionnaire mentioned that they were already aware of alternative organic food waste

management initiatives, the educational value that the project entails is indisputable. It is expected that at the beginning only the most militant people get involved in these type of projects since it catches more their attention, however the great impulse that the project has received, especially in the school and in the community of Hortaleza, has made many people who were unaware of these aspects, begin to understand the concept of agrocomposting and change their lifestyle habits. Given the answers in the questionnaire, most people have now become more aware and more involved in agro-composting issues. In addition most of the interviewees in the face-to-face interviews, especially the businesses, mentioned that thanks to the initiative they are now more aware. This is why the first hypothesis is confirmed and the majority of the stakeholders who got involved in the MOLA are now more consciousness about how to make the most of the organic waste. It is after all, a great tool to educate both the younger generations as to the more adult ones into new waste management methods.

➤ ***Is the MOLA succeeding as an agroecological tool to make more sustainable food systems?***

In order to answer to this research question is important to define what globally is understood by sustainable food systems. According to the FAO, sustainable food systems ensure food security but at the same time, these are systems that use the environment resources in a more efficient way, from production to consumption, ensuring that the impact they leave during the process is way less damaging (FAO 2016). However, other than the official interpretation of Sustainable Food Systems, it is relevant to take into account what the MOLA users think about this concept and how the MOLA helps or not to achieve this. The majority of the participants believe that the MOLA helps to create more sustainable food systems, and more importantly is why they think so. The majority of the participants believe that being part of this project, and using the MOLA, is a trigger to change other patterns related to environment care and consuming habits. For them, the MOLA promotes important environmental and also food values, which means that by using the MOLA, they support local trade and an alternative method of organic waste management based on the concept of circular economy. Ultimately, create shorter food channels and more connected to the producers. It is interesting to mention that many believe in this project because it is an alternative way of living to the capitalist model in which we live in and which they do not feel identified with.

The other key point of this question is whether MOLA can be considered an agroecological tool. Agroecology tries to strengthen the social and environmental resilience of a territory, as well as to change to alternative lifestyles taking into account the environment and a better relation between producers and consumers (Altieri 2009). The MOLA accomplishes all this, reinforces the social relationships between the project members, brings together people who share certain ideals but also attracts new people willing to change their habits of recycling and consumption. It supports the consumption of agricultural products of proximity, and most importantly, the basis of this currency, the credit is obtained through composting. For all this we can say that the MOLA is a tool that promotes more sustainable actions and advocates for an innovative exchange system. Being a pioneer currency in the way of obtaining credit, it is an excellent example to demonstrate that new forms of exchange are possible, with fewer intermediaries involved and valuing more the natural resources, in this case allowing organic waste to return to the earth maintaining the life cycle.

In conclusion, the hypothesis to this research question is accepted. The MOLA supports the local economy of the region, promoting the consumption of quality and proximity products. Even though the MOLA is still not used in a large proportion by the consumers, with each purchase in MOLAS that is carried out, small producers growth and a more integrated organic material recycling process is supported. Therefore, it can be said that MOLA is an agroecological tool which has great potential to expand in Madrid on a larger scale in the future.

➤ ***Has a closer and trusting relationship been created between producers and consumers?***

An important concept behind the MOLA is the support to local businesses and small farmers. The intention of the MOLA is to spend it on stores or services that share the same values of the community and maintain the circular economy within such community. While it is true that the currency has not fluctuated that much since it started, the highest percentage of MOLAS that has been spent is through the CSA provided by one of the farms. This has led to the creation of an important link between consumer and producer. Especially, the producer of the CSA highly values this exchange, since it has a great potential to bring consumers closer to the producer and thus, close the circle, even though the emergence of the currency has not resulted in new customers for him. However, the producer values much more having a solid customer base who shares the same ideals



and are involved in the agrocomposting process and circular economy than to attract new clientele that does not appreciate what is behind the products he offers.

On the shops side, they have little to say in this aspect, since the traffic of MOLAS has been minimum in the stores, so overall they do not consider that the community currency has stimulated the local trade and even less that it has strengthened the relations with consumers. They agree that it has good intentions regarding the promotion of local consumption but the MOLA has not achieved it yet. However, they trust it will do so once it reaches out more consumers and becomes more known by them.

As for the consumers side, as graphic 11 shows, the potential of the MOLA to better know where the products come from and have a better relation of trust with the producers, is the only variable that was rated in the most equitable way by the participants regarding if it had much, medium or little potential. Unlike other variables, such as education or the ability to change recycling habits, they do not consider that the strengthening of relations between producers and consumers is being promoted that much through the MOLA. This shows that consumers see the MOLA merely as an educational tool to become more aware of specific environmental issues and learn new ways of organic waste management and local economies.

It is worth mentioning that other producers, who accept the waste for composting, do not participate in the exchange with MOLAS precisely because of the little offer there is to spend the MOLA in other products or services. One way to encourage more producers to sell their products in exchange for MOLAS is to expand the offer of services and products adapted to their needs, and more importantly, the possibility that the payment could be made entirely in MOLAS. So far, the MOLA is only used as a discount currency by purchasing other products. The possibility to pay entirely in MOLAS for specific products and/or services could encourage more farmers to be involved in the exchange of products and supply their demands. For example the current CSA distributor would need to spend a huge amount of money in order to output all those MOLAS with the current form of payment. The possibility of implementing a full payment system as a time bank could encourage more people to get involved in the project, among them, farmers who would bring consumers products from the area's vegetable garden and encourage the short food systems.

Thus, the third hypothesis is not entirely accepted. Most of the CSA clients were already purchasing their products before the MOLA came into action, and the currency is just an addition that consumers appreciate but it is not what motivates them to buy these farming



products. There is no doubt that there is a special link between the CSA community and the agricultural producer, but it is not the MOLA what has encouraged it. However, and this is why I emphasize that the hypothesis is not entirely accepted, is that although the MOLA has not yet managed to create strong links between consumers and local producers and sellers, MOLA has managed to raise consumer awareness in many aspects. Some examples are transmitting purchasing and consuming habits that are more environmentally friendly. Buying food and products from nearby producers and without many intermediaries.

➤ ***Can the MOLA be expanded to other sectors, services or products, such as public transport, municipal taxes?***

So far, the MOLA is mostly accepted in food stores and herbalists, but also hairdressers, stationers, a gym, etc. The number of businesses getting involved in the MOLA acceptance has been increasing and diversifying since it started; however, the area where this currency is accepted is only confined in the Hortaleza district boundaries, in Madrid. The possibility that such currency can be accepted for purchasing other goods, such as the municipal bicycles or the metro, which is of use throughout the whole city of Madrid, is still a long-term goal. It would be a matter of using the currency beyond the border of the district of Hortaleza.

Since the launch of the MOLA, the currency has had a very low circulation. The reasons being, as many users pointed out, that they already participated in the project even before the currency came into force, so this has not been a huge incentive for users that has led them to spend them more often. Some of the reasons that participants pointed out were that its use is very restricted to certain stores, the CSA service or markets.

As for the way to earn credit, users have no way to earn more credit but through the delivery of the organic waste, while the people who offer services or products, like the stores, have a way of earning credit more often. Therefore, in order to meet these growing needs and increase the currency's circulation within the community, there is the following proposal:

Create a Time bank service to promote the provision of services in which, anyone registered in the platform can offer their services in exchange for MOLAS. The exchange would be completely in MOLAS, and legal currencies, like the euro, would not be part of the exchange in this case.

Bringing in the time bank in the MOLA community would be a further step towards this transition of a more complete circular economy and alternative to the capitalist system. One of the most powerful values of the time banks is that they reinforce the social relationships among the community members and brings together people who shares certain ideals and visions in an alternative space from the stipulated one (Seyfang 2004b). Citing Válek (2013): “Time Banks (TB) are designed to rebuild a fundamentally different economy, the economy of home, family, neighborhood and community”

In order to achieve this, one of the platforms that can be used to launch the Time Bank is the CES platform, in which many other complementary currencies are involved. The platform offers to users the possibility to present both offers and demands of the services they would like to offer or want to be supplied respectively. In this way, all users can see them and pay through the CES platform. This alternative would imply changing the way that the payments have been done till today (through Clickoin) and start using CES. Another way to make the Time Bank function is through the Google Groups platform. In this case, the payments would remain with the Clickoin app, which obtained a very positive rating from the participants. This would also avoid making a great modification in the way payments have been doing so far. The payment relation, in any case, would be of **10 MOLAS = 1 hour of service**.

There are examples of Time Banks that are succeeding all over the Community of Madrid, as can be seen in appendix 8, which shows where to find Time Banks in the city. One of them, the closest to the district of Hortaleza, is the time bank of Manoteras, which has a long list of offers and demands that users have created along all the years that has been active.

The possibility that brings the Time Bank and does not have the current system in which the MOLA is working right now, is that the MOLA could be use out of the neighborhood as well. Anyone willing to take part on this, would be able to pay for services in MOLAS, without having to take part in the organic matter donation to make compost, which is now at the limit of its capacity. This is the first step to give the project the visibility that it needs in order to expand and the chance to share its philosophy with more people. This could lead, in the future, to being accepted in public services such as public transport or municipal taxes, as happens with other currencies, like the Brixtol (Bristol Pound 2012).

Thus, the fourth hypothesis would be partially confirmed. It has the potential to expand to other sectors and even beyond the district of Hortaleza in the short-term, which would

satisfy the demand of many participants, and especially the CSA farmer. However, although other complementary currencies are accepted at the municipal level for the payment of many services, this currency is unique in the way credit is obtained, through organic matter waste. Since it is not backed by legal money, it is unlikely that it will be accepted as such in the near future. We believe that over time, and with the implementation of the Time Bank, the currency and the project itself obtains such visibility that the City Council has no longer choice but to accept the MOLA. It would be an opportunity to pay the rubbish taxes, public transportation or other services related to good environmental actions.

## 5. Conclusions

MOLA is a unique and pioneering initiative in the way that credit is obtained. The possibility of obtaining MOLAS from the donation of organic waste, makes this project a unique and innovative one all across Spain and Europe. Despite its short implementation time and limited resources, the MOLA and its values have managed to penetrate deeply into the district of Hortaleza. The MOLA as an agroecological tool capable of transmitting new values and the creation of more sustainable food systems based on the circular economy model.

It should be noted that the MOLA stands out especially for its educational potential. A priori, only the most aware group of people about more sustainable ways of organic waste management and environmental issues seemed to be more involved, however, the vast majority of participants in the project recognized that thanks to the initiative they are now more aware and involved with an appropriate organic waste recycling. The MOLA has served exactly for what it was created for, to inculcate awareness and transmit an alternative model of recycling but also of local consumption.

Create a special bond between producers and consumers was also one of the main objectives when launching the MOLA, but so far, this has not succeeded as much as other aspects. The reason being that the CSA farmer already had steady clients thanks to the Madrid Agrocomposta project before the MOLA came into action, but also the low circulation that the currency has had so far. Practically 70% of the spent MOLAS went in a single direction, the CSA program. This sink of MOLAS and the little exchange in the local stores generated some uncertainty as to whether the MOLA could become stagnant before even getting to circulate. Given the requests of many of the users and especially by the agricultural producer in charge of the CSA, new ways of exchange were needed.

Therefore, the possibility of implementing a Time Bank service among the MOLA users would give an opportunity to create a much more affluent flow of MOLAS and even expand the use of the currency and everything that entails beyond the borders of the district of Hortaleza.

In regards to the limitations of the project, although the number of answers to the questionnaire is within the accepted range, for future research it would be more relevant to have a larger number of participants and make more accurate statistical evaluations.

At this stage of the investigation is where new questions arise, such as will the implementation of the Time Bank make more people become part of the MOLA and therefore want to participate in the donation system of organic matter? This could be a turning point where the great demand of people willing to participate in such project will create sufficient echo into the public institutions to allocate more funds to the project. Funds that could be oriented to increase the collection capacity, which is now at its limit, and to use the currency in public transport services, fee payments, etc. Little initiatives like this one, but which have a large number of people who support them behind, are those who can change things on a larger scale. MOLA has the possibility to change the organic waste management system in Madrid and more importantly, be a role model to the rest of the population of Madrid, Spain and the world.

## 6. References

- Altieri, M. A., 2009. Agroecology, small farms, and food sovereignty. *Monthly review* 61(3), 102-113.
- Ayuntamiento de Madrid, 2015. Memoria de actividades 2015. Inicio del Mandato mayo 2015- mayo 2019. Madrid Observatorio, Madrid, Spain, 525 p.
- BDTOnline [Banco de Tiempo Online], 2018. Busca tu banco. <http://www.bdtonline.org> (retrieved June, 2018).
- Block, B., 2009. Local currencies grow during economic recession. [www.worldwatch.org/node/5978](http://www.worldwatch.org/node/5978) (retrieved January 2018).
- Bogner, J. A.M., Abdelrafie, C., Diaz, A., Faaij, Q., Gao, S., Hashimoto, K., Mareckova, R., Pipatti, T., Zhang, 2007. Waste Management. In: Metz, B., Davidson, O. R., Bosch, P. R., Dave, R., Meyer, L., A. (Eds.), *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. United Kingdom and New York, pp. 587-613.
- Brenes, E., 2013. Monedas complementarias y ambiente. *Cuadernos Interdisciplinar de Desarrollo Sostenible* 10, 111-147.
- Bristol Pound, 2012. How it works. <https://bristolpound.org/about/> (retrieved April 2018).
- Brown, S., Kruger, C., Subler, S., 2008. Greenhouse Gas Balance for Composting Operations. *Journal of environmental quality* 37(4), 1396-1410.
- Calvo, S., Morales, A., 2014. Exploring complementary currencies in Europe: a comparative study of local initiatives in Spain and the United Kingdom. *Living in Minca*, London, UK, 75 p.
- Castrejón-Godínez, M. L., Sánchez-Salinas, E., Rodríguez, A., Ortiz-Hernández, M. L., 2015. Analysis of solid waste management and greenhouse gas emissions in Mexico: A study case in the central region. *Journal of environmental protection* 6(02), 146-159.
- CES (Community Exchange System), 2018. Trade and exchange without physical currency. <https://www.community-exchange.org/home/> (retrieved May, 2018).
- Chiemgauer Regiogeld, 2018. Basinfo, Formulare. <https://www.chiemgauer.info/informieren/basisinfo-formulare/> (retrieved April, 2018).
- Community Currencies in Action [CCIA], 2018. Currency pilot: E-Portemonnee. <http://communitycurrenciesinaction.eu/e-portemonnee/> (retrieved February 2018).
- Del Álamo, F. C. G., 2009. Análisis sociológico del sistema de discursos, 43, 69-100.
- Echeagaray, S. M. E., 2011. Recrear el dinero en una economía solidaria. *Polis, Revista de la Universidad Bolivariana* 10(29), 261-280.
- Englander, M., 2012. The interview: Data collection in descriptive phenomenological human scientific research. *Journal of Phenomenological Psychology* 43(1), 13-35.
- EU, 2008, Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain directives, OJ L 312, 3–30.
- FAO, 2016. 10-Year Framework of Programmes Sustainable Food Systems Programme. <https://sustainabledevelopment.un.org/partnership/?p=12411> (retrieved June, 2018).

- Fernández-Pacheco, J.L., 2017. Estrategias de desarrollo local frente a la crisis en entornos rurales vulnerables: una comparativa de casos entre Sudáfrica y España. Doctoral thesis. University Complutense of Madrid, Madrid, 647 p.
- Fritzsche, C., 2014. The Advantages of a Community Currency – An AOCA Perspective. Degrowth Conference. Theme: money localism theory. Leipzig, Germany, 22 p.
- Hernández, R., Fernández, C., Baptista, P., (2010). Recolección y análisis de los datos cualitativos. In: Hernández, R., Fernández, C., Baptista, P., (Eds.), Metodología de la investigación. Mac Graw Hill, Mexico pp. 406-489.
- Hirota, Y., 2016. Monedas sociales y complementarias. La economía social y solidaria: experiencias y retos. Oikonomics. Revista de economía, empresa y sociedad 6, 35-42.
- Hunter, A., Brewer, J., 2003. Multimethod Research in Sociology. In: Tashakkori, A., Teddlie, C. (Eds.), Handbook of mixed methods in social and behavioural research. Sage, pp. 577-594.
- Lacy, P., Rutqvist, J., 2016. Waste to wealth: The circular economy advantage 1, 19-23.
- Lett, L. A., 2014. Las amenazas globales, el reciclaje de residuos y el concepto de economía circular. Revista argentina de microbiología 46(1), 1-2.
- Lietaer, B., Hallsmith, G., 2006. Community Currency Guide. Global Community Initiatives, Montpellier, France, 32 p.
- Llobera, F., 2015. Manual para el diseño de monedas locales de iniciativa municipal. Grupo de desarrollo ADER La Palma, Spain, 77 p.
- Llobera, F., 2017. Redes y comunidades de intercambio. Las monedas sociales y complementarias como herramientas de transición ecológica. In: López, D., Fernández-Casadevante J., Morán, N., Oteros, E. (Eds.), Arraigar las instituciones. Propuestas de políticas agroecológicas desde los movimientos sociales.
- Metabolic, 2017. How alternative currencies can enable a circular economy. <https://www.metabolic.nl/alternative-currencies/> (retrieved May, 2018).
- Miles, M. B., Huberman, A. M., 1994. Qualitative data analysis: An expanded sourcebook. Sage Publications, 339 p.
- Recycling, E., 2008. Recycling, composting and greenhouse gas reductions in Minnesota. Make Dirt Not Waste, 21 p.
- Rogers, J., 2011. On the money : Getting the message out 15 (D), 11-16.
- Seyfang, G., 2004a. Bartering for a better future? Community currencies and sustainable consumption. The Centre for Social and Economic Research on the Global Environment (CSERGE), 04-10.
- Seyfang, G., 2004b. Working outside the box: Community currencies, time banks and social inclusion. Journal of social Policy, 33(1), 49-71.
- Seyfang, G., Longhurst, N., 2013. Growing green money? Mapping community currencies for sustainable development. Ecological Economics, 86, 65-77.
- Thiel, C., 2011. Complementary Currencies in Germany. International journal of community currency research, 17-21.
- Válek, L., Jašíková, V., 2013. Time bank and sustainability: The permaculture approach. Procedia-Social and Behavioral Sciences 92, 986-991.
- Wright, K. B., 2005. Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. Journal of computer-mediated communication, 10(3), JCMC103.

## Appendixes

### Appendix 1. Organic waste collection data from the Madrid Agrocomposta project

Proportion of kilograms of organic waste collected during the months of October, November and December 2017 in P3 among the different nodes of the Madrid AgroComposta network.

October	Week 1 (kg)	Week 2 (kg)	Week 3 (kg)	Week 4 (kg)	Week 5 (kg)	Total month (kg)
"El Olivar"	70,1	99	34	79	35	317,1
School "Méndez Núñez"			170	221	145	536
Food market "San Luis"				55	10	65
School "Pablo Picasso"	205,9	196	254	324	215	1194,9
Community composting "Arequipa"		20	70	72	0	162
School "Esperanza"	205,5	92	172	184	50	703,5
Food market "Nápoles"	175,2	282	247	257	165	1126,2
School "Luis Cernuda"	541,4	63	112	156	45	917,4
Neighbors school "Luis Cernuda"		175	335	225	221	956
School "Ciudad de Zaragoza"	587,6	360	482	530	300	2259,6
Urban farm "Alameda de Osuna"			32	30	30	92
Catering Mediterranea 1			761	1521,5	1000	3282,5
Catering Mediterranea 2				473,9	210	683,9
Food market "Sta M <sup>a</sup> de la Cabeza"	198,3	121	126	116	50	611,3
School "Siglo XXI"	467,8	220	257	221	120	1285,8
School "El Sol"	12	118	253	226,4	160	769,4
Brewery "Valle de Khas"	621	200	205	493	0	1519
<b>TOTAL</b>	<b>3084,8</b>	<b>1946</b>	<b>3510</b>	<b>5184,8</b>	<b>2756</b>	<b>16481,6</b>

Table 6. Ratio of kilograms of organic waste per node in the month of October. (Table obtained from the Madrid Agrocomposta Committee)



November	Week 1 (Kg)	Week 2 (Kg)	Week 3 (Kg)	Week 4 (Kg)	Week 5 (Kg)	Total Month (Kg)
"El Olivar"	30	55		69	22	176
School "Méndez Núñez"	93	176	281	230	219	999
Food market "San Luis"	30	5			12	47
School "Pablo Picasso"	161	273	314	248	190	1186
Community composting "Arequipa"	17	25	16	25	35	118
School "Esperanza"	37	141	171	138	136	623
Food market "Nápoles"	117	214	237	256	222	1046
School "Luis Cernuda"	30	85	132	127	81	455
Neighbors school "Luis Cernuda"	173	344	344	337	230	1428
School "Ciudad de Zaragoza"	92	450	593	448	305	1888
Urban farm "Alameda de Osuna"	0	60	46	24	32	162
Catering Mediterranea 1	372	1215	1600	1429	1022	5638
Catering Mediterranea 2	170	452	446	456	291	1815
Cantine "CSIC 150"			313	302	229	844
Cantine "CSIC 117"			340	350	272	962
Food market "Sta M <sup>a</sup> de la Cabeza"	67	96	116	120	101	500
School "Siglo XXI"	120	282	165	174	108	849
School "El Sol"	44					44
Brewery "Valle de Khas"	185		450			635
<b>TOTAL</b>	<b>1738</b>	<b>4233</b>	<b>5564</b>	<b>4733</b>	<b>3507</b>	<b>19775</b>

Table 7. Ratio of kilograms of organic waste per node in the month of November. (Table obtained from the Madrid Agrocomposta Committee)



December	Week 1 (Kg)	Week 2 (Kg)	Week 3 (Kg)	Week 4 (Kg)	Week 5 (Kg)	Total Month (Kg)
"El Olivar"	34	57	48	80	90	309
School "Méndez Núñez"	44	111	233	259	0	647
Food market "San Luis"	12	25	40	50	45	172
School "Pablo Picasso"	70	116	291	213	0	690
Community composting "Arequipa"		26	28	35	25	114
School "Esperanza"	26	55	168	130	60	439
Neighborhood space Hortaleza		36	55	65	25	181
Food market "Nápoles"	27	94	192	271	284	868
School "Luis Cernuda"	19	48	117	119	0	303
Neighbors school "Luis Cernuda"	139	197	336	352	404	1428
School "Ciudad de Zaragoza"	118	141	486	410	170	1325
Urban farm "Alameda de Osuna"		20	32	25	45	122
Catering Mediterranea 1	280	634	1608	1758	1062	5342
Catering Mediterranea 2	76	270	444	546	345	1681
Cantine "CSIC 150"	63	177	302	301	0	843
Cantine "CSIC 117"	62	176	365	339	234	1176
Restaurant "el Fogón Verde"		15	83	82	57	237
Food market "Sta M <sup>a</sup> de la Cabeza"	22	61	81	76	75	315
School "Siglo XXI"	30	70	172	100	0	372
Brewery "Valle de Khas"	223	212	235	225	0	895
<b>TOTAL</b>	<b>1245</b>	<b>2541,00</b>	<b>5316</b>	<b>5436</b>	<b>2921</b>	<b>17459</b>

Table 8. Ratio of kilograms of organic waste per node in the month of December. (Table obtained from the Madrid Agrocomposta Committee)

May	Week 1 (Kg)	Week 2 (Kg)	Week 3 (Kg)	Week 4 (Kg)	Week 5 (Kg)	Total month (Kg)
"El Olivar"	0	0	61	0	130	191
School "Méndez Núñez"	50	285	228	290	238	1091
Food market "San Luis"	20	232	112	84	113	561
School "Pablo Picasso"	127	255	248	310	304	1244
Community composting "Arequipa"	53	0	41	50	75	219
School "Esperanza"	80	227	187	208	200	902
Families school "Esperanza"	0	23	20	43	42	128
Neighborhood space Hortaleza	30	65	81	43	50	269
Food market "Nápoles"	50	81	97	97	95	420
School "Luis Cernuda"	52	141	96	116	148	553
Neighbors school "Luis Cernuda"	185	385	336	433	367	1706
School "Ciudad de Zaragoza"	101	547	377	512	337	1874
Urban farm "Alameda de Osuna"	86	0	60	40	52	238
Catering Mediterranea 1	497	1631	1173	1470	993	5764
Catering Mediterranea 2	165	614	350	570	431	2130
Cantine "CSIC 150"	106	326	241	347	333	1353
Cantine "CSIC 117"	131	341	343	399	356	1570
Restaurant "el Fogón Verde"	26	119	68	84	61	358
Food market "Sta M <sup>a</sup> de la Cabeza"	39	77	72	50	51	289
School "Siglo XXI"	48	61	82	69	112	372
Brewery "Valle de Khas"	220	0	218	0	238	676
<b>TOTAL</b>	<b>2066</b>	<b>5410</b>	<b>4491</b>	<b>5215</b>	<b>4726</b>	<b>21908</b>
Km	193	532	484	483	419	2111
Total non-organic waste items	0,00	3,70	4,10	8,00	1,80	17,60
% non-organic waste items	<b>0,00</b>	<b>0,07</b>	<b>0,09</b>	<b>0,15</b>	<b>0,04</b>	<b>0,08</b>

Table 9. Ratio of kilograms of organic waste per node in the month of May. (Table obtained from the Madrid Agrocomposta Committee)

## Appendix 2. Description of the MOLA cycle

Initially, in September 2017, everyone willing to join the project had to attend the local market, which is organized twice a month in the district of Hortaleza. There, the organic waste is weighed and each person is registered into the “Clickoin” mobile application. This application allows the users to make transactions through the phone without having to carry the currency in a physical way. Once registered, each person is handed the number of MOLAs that correspond with the kg of organic waste they bring in. The exchange rate is one MOLA per four kg of organic waste. This system only worked for the first month, but given the inconvenience of having to bring the organic waste to a specific place for being weighed, it was proposed that only 2 nodes, from all those which collect organic waste, would give MOLAs in exchange. These 2 nodes are located in the school “Luis Cernuda” and the community composting area of Hortaleza. A characteristic that especially stand out in the distribution of MOLAs among the users is that it is done in an equitable manner, it does not matter if a person brings weekly more kgs of waste than another, since this project believes in equality and in the importance of evenness with such an ingrained social character. Therefore, an estimation on the amount of organic waste collected per month in each of the nodes is made and every person would receive the number of respective MOLAs given the estimation that has been calculated previously. In this way, each person receives a payment of MOLAs approximately every 6 months, based on the estimation that has been previously calculated.

The nodes mentioned above are equipped with one or several hermetically sealed buckets where the waste is disposed, as it is showed in figure 5. It can be disposed either without bag, as shown below, or with a biodegradable bag.



*Figure 5. Collection node of the organic matter waste. Picture taken by me.*

Every day, the association “El Olivar” (representing step 2 in figure 2), is in charge of picking up the organic waste from the different nodes. At some nodes, the waste is collected every day, due to the amount of waste deposited there, while at others, it is picked every two or three days. In order to do the collection, “El Olivar” has a van, as shown in figure 6, in which two employees are in charge of the collection. They follow the route to pick up the containers, weigh them and transport them to the farm.



*Figure 6. Containers picked up by the van from El Olivar during the collection route. Picture taken by me.*

Once at the farm, the total weight of the collected waste is summed up in order to know the amount of organic waste that is picked up every day. Afterwards, the entire content of the containers is disposed in the area that is equipped for composting, where the

farmers and the carriers help to unload and clean them so that they can be returned to the respective nodes. Figure 7 below shows the area where the composting is done. Even though there are four farms in charge of the management of the compost, the area intended to compost on is located only in one of them: “La Huerta de leo”. Even though the process is done only here, all the farms collaborate everyday with the unloading and management of the compost. This area is made up of several conditioned surfaces in which the waste is accumulated, from the oldest to the more recent waste collected. Each of these surfaces has a different age and therefore, the oldest has compost closest to be ready. They have machinery that is rented from time to time in order to stir the compost to achieve optimal conditions and they also receive large amounts of dry leaves that are donated by the City Council, which is critical for the well development of the compost



Figure 7. Equipped area for the composting of the organic matter waste. Pictures taken by me.

There is a large variety of places and services that receive MOLAs in exchange for their goods and/or services, including: eight food-stores, three herbal shops, two hairdressers, two clothing stores, two florists, two stationary stores, two leisure places for children, one gym, one shoe shop, one pet’s shop and one cultural space. All of them accept MOLAs as a 10-20% discount on the purchase. The following link shows a map where all the stores, nodes and farms are located in the city:



<https://www.google.com/maps/d/edit?mid=1VzTWCT0gfKqWjIQ7OIYVMoBCVqifK1eC&ll=40.43505981942384%2C-3.7210010471775377&z=11>

In addition to the list above, there are other services that accept MOLAs, such as flea markets and farmers' markets that are usually arranged twice a month. MOLAs' users can buy fruits and vegetables from some of the farmers that compost the organic matter waste material, closing the gap. The flea markets also promote the recycling of all type of products.

The other service, and the one that so far has been most successful within the community, is the CSA. This service is provided by one of the farms "El Chorrillo", which works with the families at the school "Luis Cernuda". Families pick their CSA basket each week at the school and get 10% discount by using the MOLA. Currently this is the system that is best working among all services that are available in the MOLA.

### **Appendix 3. Literature review**

#### **The concept of circular economy**

The MOLA is entirely based on the concept of circular economy, which tries to reduce as much as possible the number of inputs, as well as the outputs out of the system. The key to circular economy is the economic growth taking into account environmental sustainability. Moving from resource-based growth to an operation-based one (Lett 2014). This transition on how to arrange production and consumption could be the key to the future of the global economy. Any circular economy model is based on: a circular supply chain, the extension of the shelf life of a product, recycling, a common platform to share and the possibility to offer services instead of products (Lacy and Rutqvist 2016).

Local economic systems, in which an alternative currency is incorporated, are fundamentally based in the idea of circular economy, in which everything circulates within the local system. The concept of circular economy appears to answer some of the current economic, environmental and social issues, which is based on the three major rules towards more sustainable systems: reduce, reuse and recycle. Reducing the entry of materials and closing the "loops" of ecological and economic flows by reducing and recycling. This way, for example, the waste is not seen as if it has already fulfilled the mission that was initially made for, but as raw material to perform a new function (Lett 2014).

The emergence of these alternative economic systems are frequently linked to the many fluctuations that socioeconomic systems suffer constantly. Hard times of economic recession replaced by times of economic prosperity. The system changes all the time, and must be more resilient to handle these increasing difficulties of any region's economy. In order to reach such sustainability, this should be done through its three main axes: economic, social and environment (Brenes 2013).

This bond created between environmental sustainability and economic growth leads to the concept of economic sustainability. However, reaching economic sustainability at a global scale is practically impossible. There is a huge global imbalance and it is extremely difficult to achieve the total balance, and so this is where the importance of creating hundreds of thousands of local economic balances lies (Brenes 2013). The MOLA is one of these little local economic systems, but as this one there are many others all over the world. Grassroots movements can play a fundamental role in the development of a more sustainable economic system, an economy that is able to grow in balance with the limited environmental resources of our planet (Válek 2013).

### **An insight on the complementary currencies**

Although the concept of community currencies can sound as something innovative, however, the emergence of community currencies goes back many years, to the ancient Egypt, when different currencies were used for different purposes. However, in the recent years, and especially in Europe, there has been a significant boom in community currencies, coinciding with the economic crisis (Fritzsche 2014). In moments of economic recession, complementary forms of currency start to appear as a way to maintain the wealth in the region, restoring the value of local economy and production (Block 2009). Therefore, community currencies try to deal with the economic difficulties that certain regions may suffer but also aims to answer to social and environmental issues (Seyfang 2004a, Seyfang 2004b). Quoting Calvo and Morales (2014) "a complementary currency is an agreement to use something other than legal tender as a medium of exchange, with the purpose to link unmet needs with otherwise unused resources"

Community currencies arise due to different reasons. There are the economic, social, but also ecological reasons. Quoting Rogers (2011) "A monetary monoculture dominated by a handful of powerful national currencies has the same effects as mono-cropping in a landscape-extreme specialization and efficiency at the Price of resilience in the face of challenges".

Given the large number of alternative currencies of different particularities that exist there is a great debate when it comes to classify them. Taking into account the different objectives with which the complementary currencies are developed, we can distinguish two types:

- Currencies which are backed by legal tender coins. These are one of the most used all over the world, since in order to acquire such currency, it must be paid beforehand in legal currency. The opportunity of exchanging these type of currencies for official currency appeals much more to the population, which is a great advantage. It is also the model that most resembles the law and therefore, administrations tend to promote more these type of currencies. It can be used, for example, to pay municipal taxes (Llobera 2017). As it is a currency easily convertible into legal tender, in many cases a bank interest is applied when the currency wants to be refunded in euros or another currency. This is done to maintain liquidity in the same community for a longer period of time (Hirota 2016).
- Mutual credit currencies: In this type of system, the currency is created at the time of the transaction. There is no issuance of the currency itself. Examples of these systems are Local exchange Systems and Time Banks. The money supply is constantly self-regulated, it is not fixed, which allows to expand and contract according to the demand and supply (Llobera 2015, Llobera 2017).

Each of them has specific features and the ideal community currency will depend on the situation in which it wants to be implemented and its circumstances (Lietaer and Hallsmith 2006).

One of the main principles behind community currencies is that it has no interest added. The idea is not to accumulate it but rather to spend it, which breaks completely with the principles of the hegemonic system, in which the idea of money is basically to have as much as possible. In these alternative, the money must be spent in the community, which will multiply the wealth within the area (Brenes 2013).

Social inclusion plays an important role in some of these systems. Just like the local economy ends up benefiting from these initiatives, in many occasions it also seeks to benefit the most marginalized social groups, by giving them more employment and resources. It is what is called a solidarity-based economy. The profit does not get



accumulated, but is rather shared; and competition is supplanted by cooperation by the community (Echegaray 2011, Seyfang 2004b).

The MOLA is not backed by euros or any other legal currency, but rather by waste, so it would fall into the second category. The monetary mass of MOLAS is not fixed, it fluctuates as more people join the platform or others withdraw.

### **Other complementary currencies around the world**

There are plenty of initiatives regarding the emergence of CCs (Community Currencies) in the local economy all over the world (Llobera 2015). It is important to mention that is in the local economy where community currencies can make a substantial change and help to create more sustainable economic models (Brenes 2013). Spain is a country with a big number of initiatives, with more than 30 different types in the whole country. Some of the more representative are the Mora in Sierra Norte in Madrid, Ekhi in Bilbao or Puma in Sevilla. All of them have something in common, they are created through a bottom up approach of the social movements and share common values, such as sustainability, equity, local economy growth, etc. These are just some examples of community currencies working in Spain, however, one of the most emblematic at global scale are the Brixton pound in UK and Sol-violette in Toulouse (Calvo and Morales 2014, Llobera 2015).

The Brixton pound was launched in 2009 as a kind of response of the economic crisis of 2008 and is, so far the most successful local currency that has been implemented in UK and a role model for other emerging systems. This is a based-on-legal-tender currency type, so people can even receive part of their salary in Brixton pound, buy goods at the local stores, pay taxes and so on. In this way, the money keeps circulating in the community by supporting the independent businesses in Bristol and strengthen the local economy (Bristol Pound 2012, Seyfang and Longhurst 2013).

So far, some of the community currency systems that have worked best are those backed by a legal tender coin, since they are the most appealing for consumers. The main reason for that is that the currency has been paid with legal money, which leads them to be more conscious of wanting to take advantage of it. For example, there are other community currencies, such as the Chiemgauer, in Germany, that include an expiration date of the currency, so that if it is not used in a certain period of time, it loses its value. Thus, the currency circulates much faster and local economic growth increases (Chiemgauer regiogeld 2018, Thiel 2011).

These are mainly examples of well-developed community currency systems over Europe, most of them registered onto the CES (Community Exchange System) website. This is a web resource that compiles the biggest number of community currencies in a same space, providing a wide range of exchanging methods in more than 94 countries and with about 994 different community currencies all over the world. Not all the CCs that work globally are registered but those which are, CES provides them with the tool to manage the exchange and a network to operate within the community (CES 2018). Appendix 3 shows a map taken from the CES website, with all the CCs that are registered on the platform at the time. Europe is crowned with the largest number of alternative systems of exchanges, and being Spain the most emblematic within the continent. Countries such as New Zealand, United States, South Africa, France, Canada or Mexico are some of the countries with more known alternative exchange systems after Spain (CES 2018).

### **The environmental factor in complementary currency systems**

As mentioned earlier, community currencies try to give more protagonist to the environment and incorporate the importance of protecting the environment in the economic system. In many occasions, community currencies emerge as a response to a failure on the environmental aspect of a system and intend to be more environmentally friendly (Seyfang 2004b). An example of this is the case of rewarding with a community currency for the organic waste of households to be composted, like the MOLA. So far, there is no evidence of another community currency based on the exchange of organic food waste, but there is a case that resembles in some extent. (Seyfang and Longhurst 2013). This is this case of the *e-portemonnee*, in the Netherlands, which works as a reward system. The citizens making environmentally friendly activities, such as changing the energy supplier to a greener one or reduce food waste in the households are rewarded with e-points that can be used for purchasing goods, public transport tickets, etc. It is a community currency completely backed by a good environmental action (CCIA 2018).

The lack of CCs backed by a good environmental action might be due to the little importance that has been given to the environment in the past, but this is now changing. Environmental issues are on the agenda of many governments nowadays, given the rapid evolution of climate change, overexploitation of resources, etc. The Waste Framework Directive of the European Union has a goal for 2020 to increase up to 50% the materials

recovered by recycling (EU 2008). Answering to this Directive, Madrid's city council calls for projects to achieve this ambitious goal, one of these, "Madrid Agrocomposta".

Over the last years there has been a lot of emphasis on the need of separate the waste, recycle plastics, paper. However, specific organic food waste recycling has taken a second place. More emphasis should be put on the importance of allocating the organic food waste to compost and give it another purpose. When the organic food waste is stored in a landfill, it decomposes anaerobically, liberating great amounts of GHG emissions, being the first source of methane released by humans or is incinerated in great quantities. Composting is a better solution to reduce GHG emissions and help to improve the quality of the soil at the same time (Recycling 2008).

The high rates of urbanization, makes a big increment of organic waste that goes to landfills and incineration is progressively increasing in developing countries (Bogner et al. 2007). Overall, incineration is the most waste management measure that has been applied in the recent years in many European cities, given the great amount of waste generated and the limited space available. Nearly, 130 million tons of waste are annually incinerated all over 35 countries. This measure, which implies mass burning of tons of waste is typically expensive and even though it reduces some of the GHG emissions from landfill storage, especially CH<sub>4</sub>, it is not a great solution for the long-term (Castrejón-Godínez et al. 2015).

Projects like the MOLA are small initiatives that essentially helps to make people aware of the importance of doing good environmental actions. These alternative systems are a trigger to educate the people and once these behaviors are well established, it could be done on a larger scale and with more resources that the MOLA does not have at the time.

## Appendix 4. World map of complementary currencies registered in the CES platform

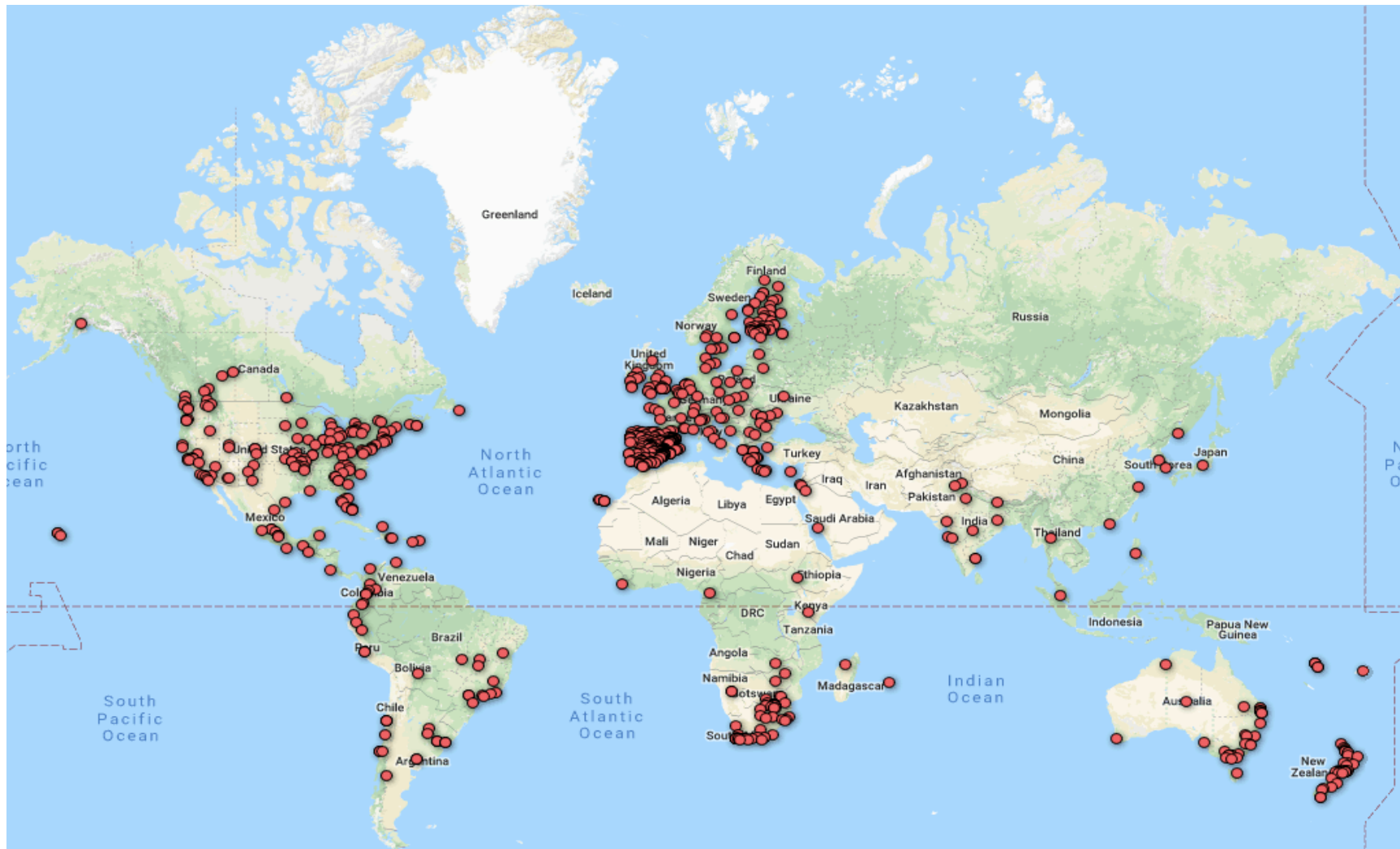


Figure 8. World map of alternative currencies registered in the CES (Community Exchange System) platform, ( CES, 2018.)

## Appendix 5. Face to face interview guide for stakeholders

This is a guide for the interviews made to some families, shops and businesses, and which were used to develop the questionnaires based on what is gotten out of this.

Presentation:

My name is Clara Zambrana and I'm doing my master thesis as part of a master in Agroecology. The topic of my thesis is the use of the MOla, as an agroecological initiative to promote more sustainable food systems in the Community of Madrid

This interview aims to know the experience of each stakeholder actively involved in the development of this project, understand how the different parts work and the relation with each other, find new opportunities and aspects which can be improved. This interview will be kept completely confidential and this interview will not be possible to relate with you or other unique personal characteristics. The content of this interview will be used for academic purposes as part of my thesis' results.

(For shops and families)

- How and why did you get involved in this project? How long have you been in it?
- Have you ever been involved in a project such as this one?
- What is it that drives you from this proposal to participate?
- Do you think it helps to boost the local economy?
- Have you heard about composting and agrocomposting before?
- Do you think agrocomposting is the best way to give the organic food waste a new purpose? Why?
- Has this project meant a change in your way of managing the food waste (For example raising awareness on what you throw away and how)
- Do you consider this initiative has an important educative value?
- Do you think the use of the MOLA is a good incentive to encourage agrocomposting or a waste management strategy more responsible with the environment?
- Which shops/businesses do you use the MOLA most?
- (In case of shops only) How do you use/spend the MOLAs that you receive as payment from customers?

- (In case of shops only) Do you get an important transit of MOLAs at your establishment?
- Do you think the system in which the MOLA is currently working, works good? Do you have any suggestions?
- Overall and in your opinion, which is the main area of improvement for this project?
- Do you think this initiative has potential to spread to other neighbors of Madrid? And other areas? Such as time banks, other shops, the city hall?
- Do you think this initiative of recycling the organic matter and the use of this community currency creates more sustainable food systems?

## Appendix 6. Online questionnaire script for the MOLA users

# QUESTIONNAIRE FOT THE " MOLA" USERS

Hello MOLA users!, we would appreciate if you'd answer this questionnaire, which is part of an investigation about the "MOLA". The goal is to know the current situation of the currency, and how it can be improved and enhanced in the future. We thank you in advance for your time invested into answer it, which will not be longer than 10 minutes, and, without any doubt, your answers will help to create a better exchange community and adapted to the circumstances. Finally, we guarantee that your answers will be completely anonymous.

\*Required



## Demographic information

1 **1. Sex \*** *Only mark one circle.*

- Mujer
- Hombre

2 **2. Age (write a number) \***

\_\_\_\_\_

3 **3. On what date did you start participating in the MOLA? \*** *Example:*  
*December 15, 2012*

4 **4. As for the coexistence at your home/house Who do you live with? \***  
*Only mark one circle.*

- I live alone
- I live with my family or with a member of this one
- I live with other people, outside of my family unit
- Another: \_\_\_\_\_

5 **5. What is the number of people living in your home / dwelling?\*** *Only mark one circle.*

- 1 person (I live alone)
- 2
- 3
- 4
- 5
- 6
- 7
- More than 7 people

6 **6. What is your highest level of education attained? \*** *Select all that apply.*

- Without studies
- Primary school
- Secondary school
- General Certificate of Education / Certificate of Higher Education
- University Degrees (Bachelor's degree, Master's degree, doctorate)
- Dk/Na

7 **7. What is your field / areas of training? (Both at academic and working level) \***

\_\_\_\_\_



- 8 **8. What is your employment situation?\*** *Only mark one circle.*
- Permanent salaried (salaried, on a commission, daily wage, etc.)
  - Eventual salaried or temporary (salaried, on a commission, daily wage, etc)
  - Professional entrepreneur with employees
  - Self-employer worker
  - Member of a cooperative
  - Unemployed
  - Another: \_\_\_\_\_

## Economic information

- 9 **9. How many MOLAs have you entered since you joined the platform? \*** *Only mark one circle.*

- Nothing
- 0-5 M
- 5-10 M
- 11-30 M
- 31-50 M
- 51-70 M
- 71-100 M
- More than 100 MOLAs

- 10 **10. How many MOLAs have you exchanged since you joined the platform? \*** *Only mark one circle.*

- Nothing
- 0-5 M
- 5-10 M
- 11-30 M
- 31-50 M
- 51-70 M
- 71-100 M
- More than 100 MOLAs

- 11 **11. How many euros per month do you think you save or stop spending by using the MOLA? \*** *Only mark one circle.*

- Nothing
- 0-5 €
- 5-10 €



- 11-30 €
- 31-50 €
- 51-70 €
- 71-100 €
- Más de 100 €

## Services / products of the MOLA

12 12. Do you offer any service and/or product in the MOLA? For example: I offer vegetables, butchery, hairdressing service, gym, etc. \* *Only mark one circle.*

- Yes *Go to question 13.*
- No *Go to question 15.*

## Services / products of the MOLA

13 13. What type of service and/or product do you offer at the MOLA? \*

14 14. Do the service (s) / product (s) that you offer have a relationship with your profession? \* *Only mark one circle.*

- Yes
- No

## Socio-Community information

15 15. ¿Has utilizado tus MOLAs para el intercambio por algún producto o servicio? \* *Only mark one circle.*

*Sí Pasa a la pregunta 16.*

*No Pasa a la pregunta 17.*

16 16. In what shops, products, services, etc. have you spent your MOLAs? \* *Go to question 18.*

17 17. Why have not you used them yet? \* *Only mark one circle.*

- I do not know where I can spend them
- The places that accept MOLAs are impractical or far from the places I frequent
- I have not shown interest in spending them
- Other: \_\_\_\_\_

## Clickoin service

18 18. Do you think that using the Clickoin application to make MOLAs transactions is a good method? \* *Only mark one circle.*

Yes

No

19 Explain the reason for your answer \*

---

**MOLA's potential** *Rate the following affirmations from A lot to Nothing*

20 19. The use of the MOLA enhances the local economy of the neighborhood. \* *Only mark one circle.*

- A lot
- Medium
- Little
- Nothing

21 20. The use of the MOLA increases the awareness of the recycling of organic matter and more sustainable forms of consumption.\* *Only mark one circle.*

- A lot
- Medium
- Little
- Nothing

22 21. The use of MOLA has educational value. \* *Only mark one circle.*

- A lot
- Medium
- Little
- Nothing

23 22. The use of MOLA creates a greater feeling of community in the district. \* *Only mark one circle.*

- A lot
- Medium
- Little
- Nothing

**24 23. The use of the MOLA helps to know better the origin of the products that I buy and have a greater relationship of trust with the producers. \***

*Only mark one circle.*

- A lot
- Medium
- Little
- Nothing

**25 24. Do you think that the MOLA is or can be a good incentive to involve people in the agrocomposting of organic matter? \***

*Only mark one circle.*

- A lot
- Medium
- Little
- Nothing

## Information on recycling habits

**26 25. By participating in this initiative, has it been a substantial change in your way of waste management? \***

*Only mark one circle.*

- Yes, now I am more involved in the recycling of organic matter
- Yes, now I am more involved in the recycling of organic matter, but also in plastic, paper, less food waste, etc.
- No, I already had those habits before getting into the MOLA
- Other: \_\_\_\_\_

**27 26. Did you know what composting and agrocomposting was before participating in MOLA? \***

*Only mark one circle.*

- Yes, I knew composting, but not agrocomposting
- Yes, I knew both
- I did not know any of the two

**28 Do you think that this initiative of recycling the organic matter and the use of the MOLA helps to create more sustainable food systems? \***

*Only mark one circle.*

- Yes
- No

29 Explain the reason for your answer \*

---

## General information

30 28. What were your reasons for enrolling in the MOLA? \*

---

31 29. What do you like the most about the MOLA? \*

---

32 30. What do you like the least about the MOLA? \*

---

33 31. Do you think that the system in which the MOLA works is well designed? What would you do differently?\*

---

34 32. What do you think would make it easier for you to use the MOLA in a more regular basis?\*

---

35 33. In addition to the areas / sectors in which you can already use MOLAS, what other areas / sectors do you think could be incorporated into the MOLA?\*

---

36 34. Is there anything you want to add regarding the MOLA and / or this questionnaire?

---

## Email

37 If you are interested in knowing the results of the investigation, leave us your email to receive information about it

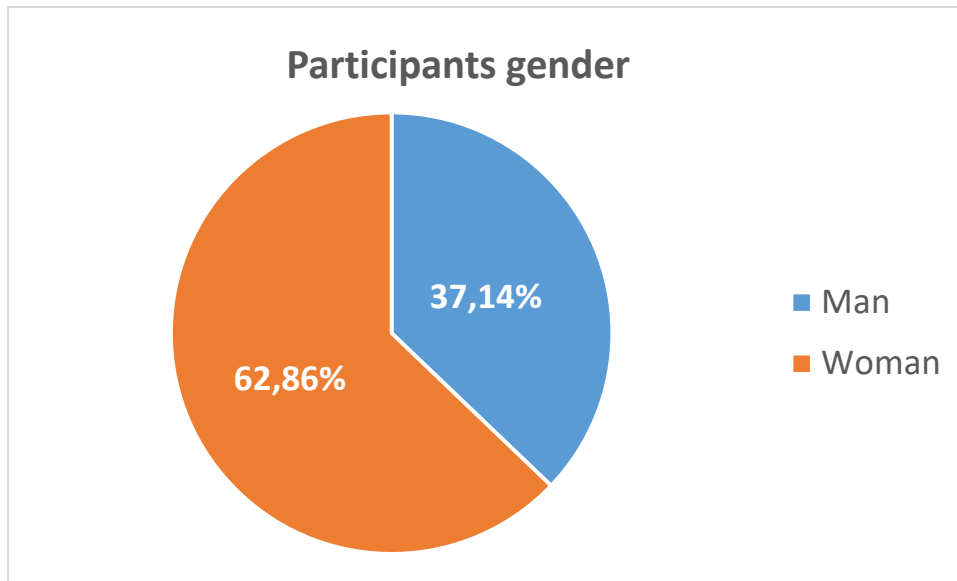
---

## Acknowledgment

38 We thank you for taking the time to complete the questionnaire and you will be of great help to carry out future evaluations and improve the exchange system of the MOLA!

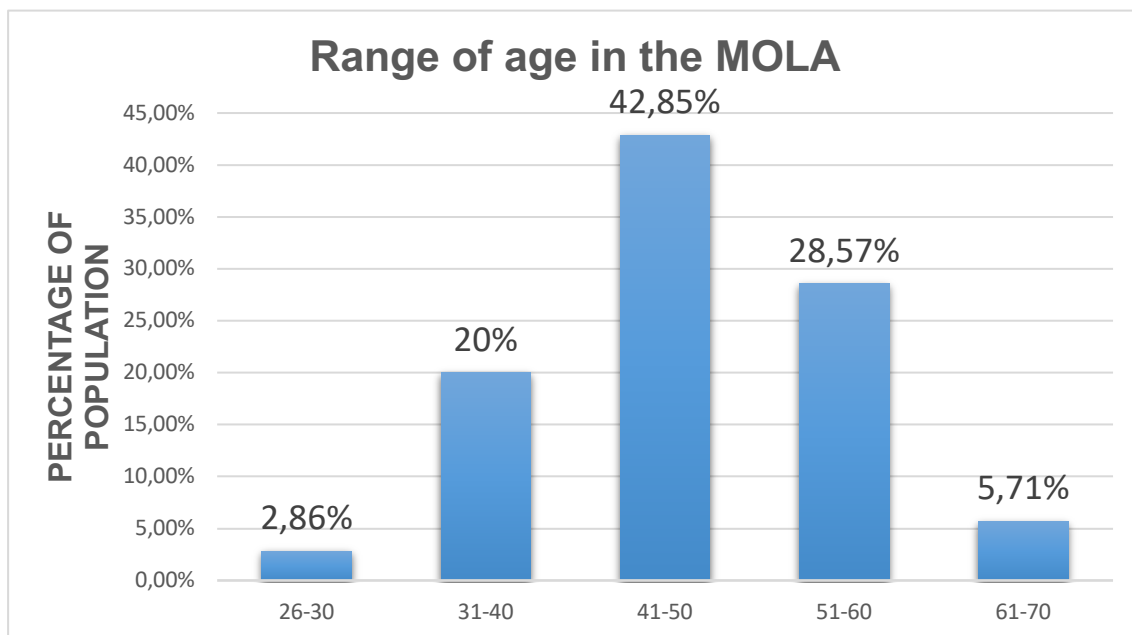
## Appendix 7. Graphics from the questionnaire results

### Gender of the MOLA's participants



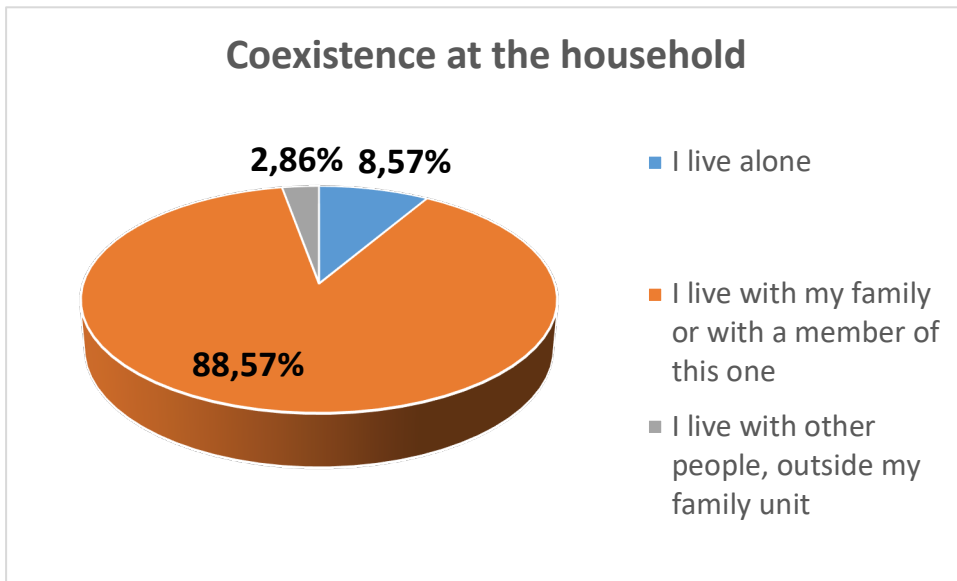
Graphic 2. Gender of the MOLA's participants. Graphic made by author

### Range of age in the MOLA



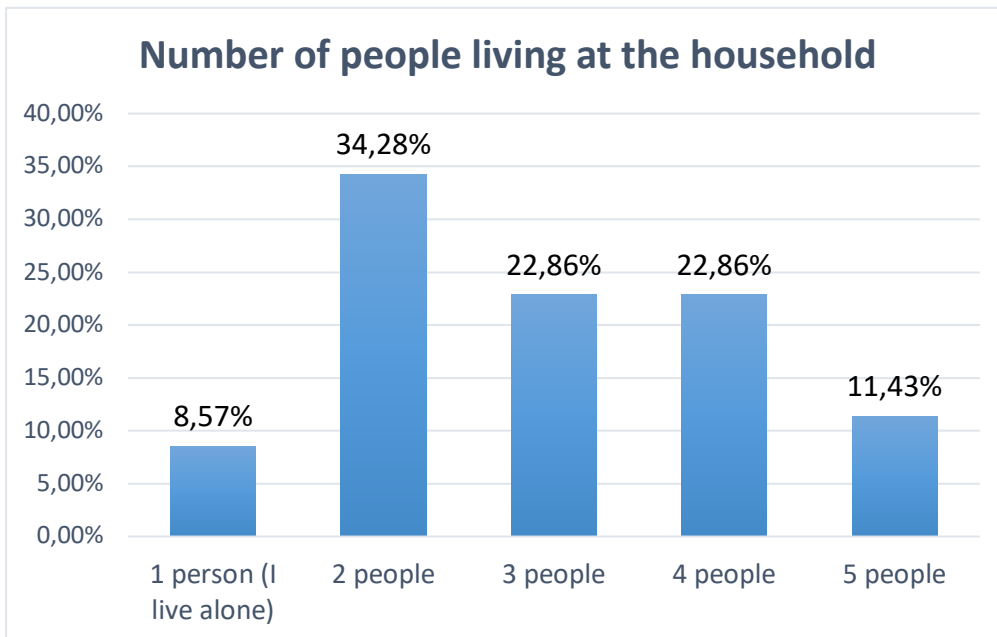
Graphic 3. Range age in the MOLA community. Graphic made by author

### Coexistence at the household



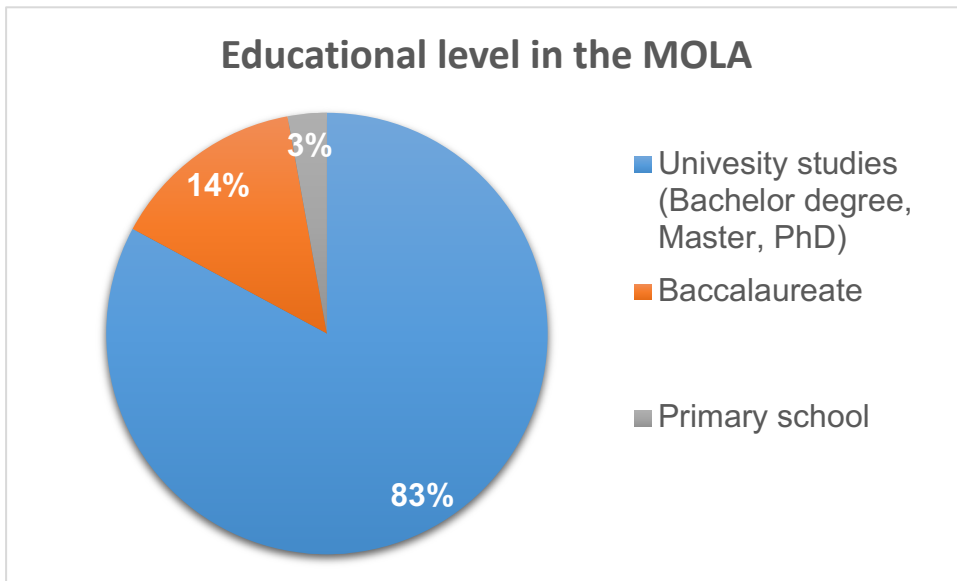
Graphic 4. Coexistence at the household in the MOLA community. Graphic made by author

### Number of people living at the household



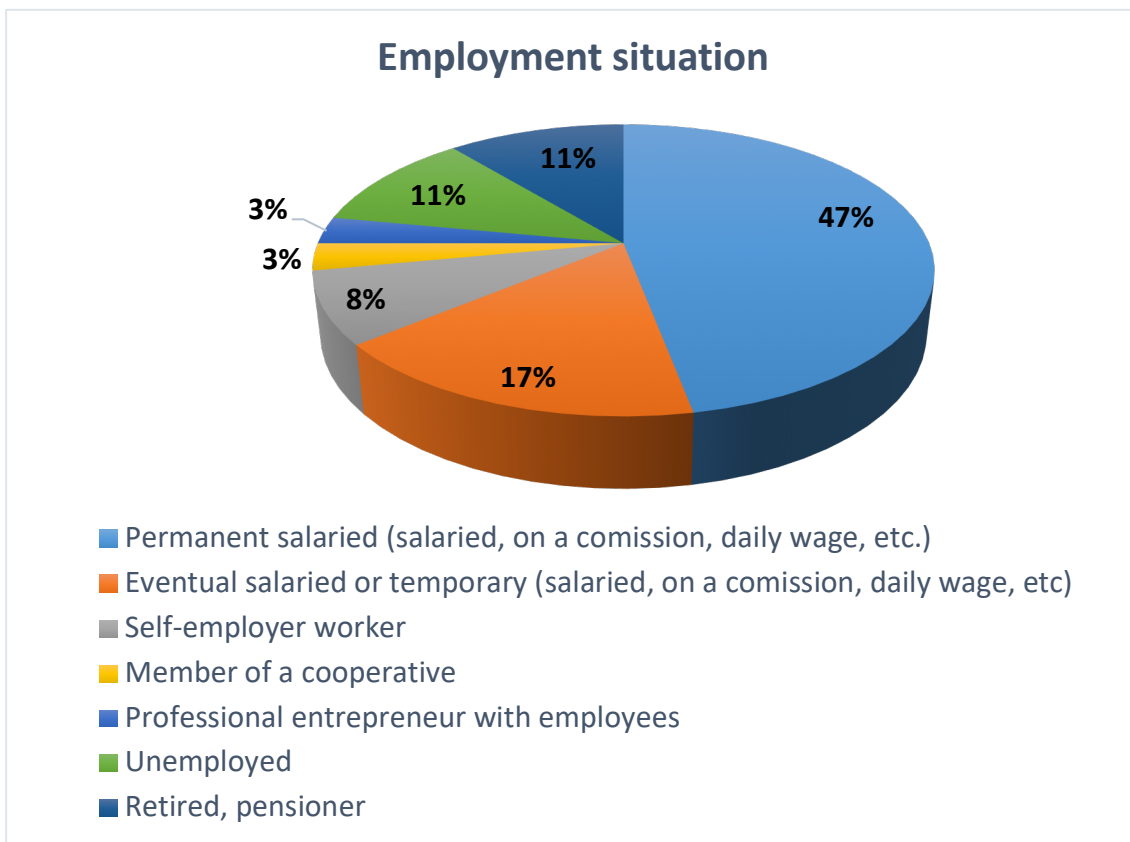
Graphic 5. Number of people living at the household in the MOLA community. Graphic made by author

## Educational level in the MOLA



Graphic 6. Educational level in the MOLA community. Graphic made by author

## Employment situation



Graphic 7. Employment situation in the MOLA community. Graphic made by author

## Appendix 8. Map of time banks registered in the Community of Madrid

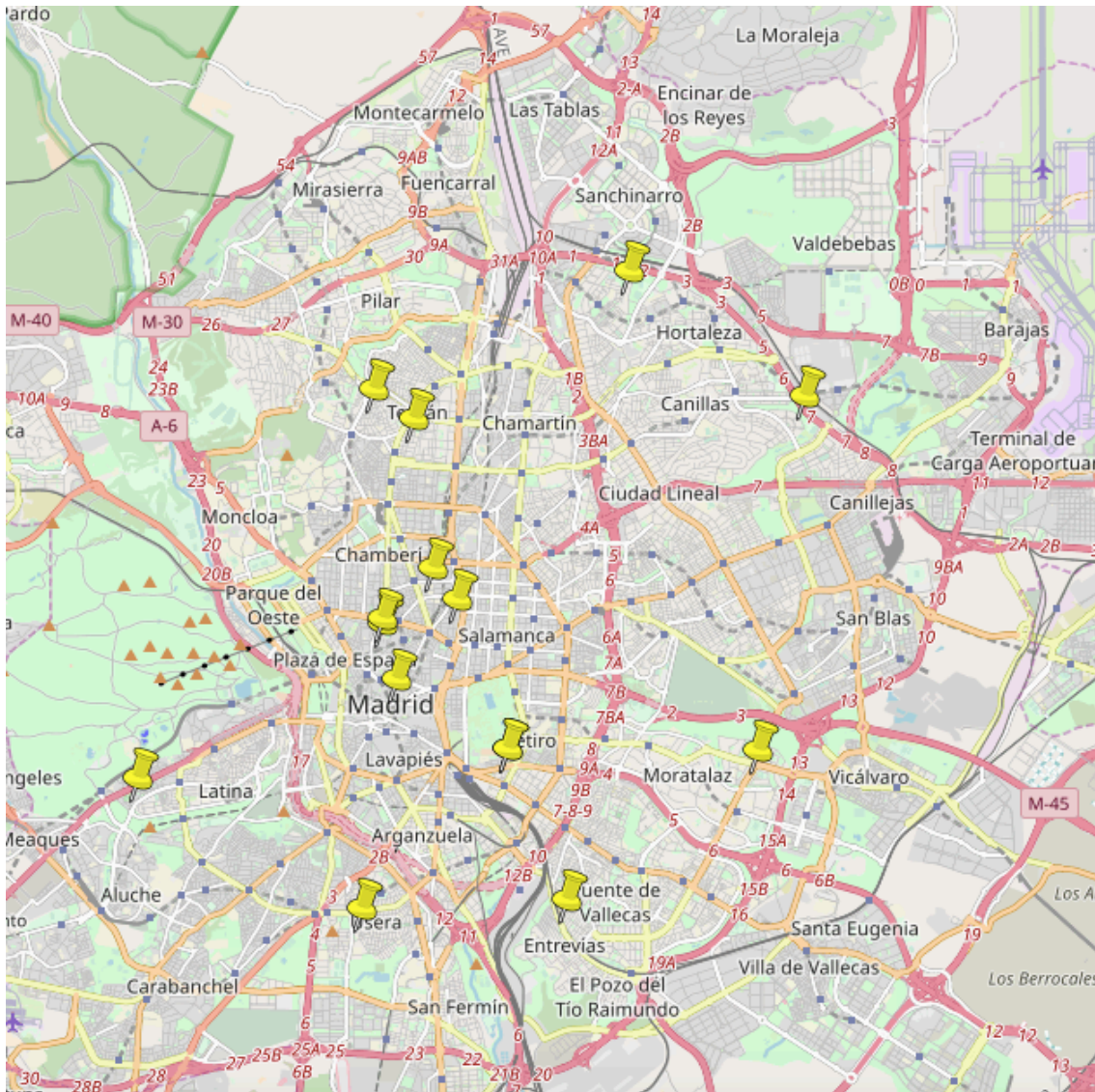


Figure 9. Time Banks map of the Community of Madrid. The yellow pins show where the Time Banks are located along the city of Madrid, (BDTOnline, 2018).





Norwegian University  
of Life Sciences

Postboks 5003  
NO-1432 Ås, Norway  
+47 67 23 00 00  
[www.nmbu.no](http://www.nmbu.no)