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Author:

**Christina Marouli**

*UIA Expert*



The Urban Lab of Europe !

# The A2U Food project Journal N° 1

*Project led by the city of Heraklion*



**CIRCULAR  
ECONOMY**



# The A2U Food project

**A2UFood** aims to establish a holistic and coordinated management scheme to address food waste in the hospitality sector (hotels and restaurants) in the municipality of Heraklion. It wants to reduce avoidable food waste and use unavoidable food waste as raw materials through a broad range of innovative integrated tools and activities. For example project partners will develop a software to improve households' food management, making use of data stemming from supermarket loyalty cards. A second opportunity restaurant will use leftover food from the hospitality sector (collected through a pilot source separation scheme) to prepare meals for those in need. The project will also set up a pilot bio-plastic bio-refinery production system to produce compostable bags. A range of state-of-the-art autonomous composting units, using the aforementioned compostable bags, will be installed to maximize food waste valorization in the municipality. Citizens and local companies will be informed and engaged through a city-wide information campaign to ensure their large participation.

## **Partnership:**

- City of Heraklion
- United Association of Solid Waste Management in Crete - regional waste authority
- ENVIROPLAN S.A – waste management company
- University of Crete - higher education and research institutes
- Technological Educational Institute of Crete - higher education and research institute
- Harokopio University - higher education and research institute
- University of Stuttgart - higher education and research institute

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# 1. Executive Summary



Food waste is a significant environmental and social problem worldwide (FAO, 2011). In the European Union (EU), approximately 20% of produced food is wasted, an equivalent of 173 kg per person per year. Heraklion fares even worse than this EU average. Food waste generation in Heraklion has been estimated to rise to 201 kg per person per year, and to 142 kg per person per year for households.

The project aspires to design and implement a holistic food system involving food waste prevention, optimal use and composting. This integrated system will educate the public and hospitality sector to avoid food waste, with the use of especially designed digital tools; will redirect good quality surplus food to people in need by establishing a 2<sup>nd</sup> opportunity restaurant, or unavoidable food waste to a bio-plastics unit; and will promote composting by installing Autonomous Composting Units at households and neighborhoods. Communication activities will be central to the success of this challenging project, which connects two topics – food and waste – with contradictory cultural connotations.

The city of Heraklion, an old and anarchically built city – with its long history, high touristic activity and subject to the contemporary economic crisis – presents a dynamic and challenging environment. The Cretan culture with its characteristic hospitality that revolves around sharing food and drink constitutes a possible contributor to food waste generation in an urban environment like Heraklion, but also an opportunity for promotion of the circular management of food resources.

Recent European Union (EU) and Greek policies (e.g. EU: revised Waste Framework Directive, Circular Economy package, guidelines for food donations and for use of food for animal feed; and Greece: the recent National Waste Management Plan) have identified food waste as a priority issue, setting high food waste recovery goals for the Municipalities.

In this context, the project started in March 2018 and in its first 6 months has progressed with its initial actions with some obstacles and approximate 2 month delays in some actions, primarily related with licensing and procurement processes. The Information Campaign Plan for the food waste prevention campaign has been drafted and is being finalised. After investigation of similar digital applications, the project team has started designing a Digital Food Waste Prevention Tool as a mobile app. They also translated the RESOURCEMANAGER-FOOD (RMF) tool and manual from German to Greek. The building for the 2<sup>nd</sup> opportunity restaurant and the location for the bio-plastics unit have been selected. The

partners are now preparing the necessary studies and designs for both, to be submitted for the licensing procedures. After a call for interest, 4 hospitality units have expressed interest in the use of the RMF tool for food waste prevention, and 82 families in participating in the home composting activity. Potential locations in the areas of Agios Giannis, Mesampelies and Mastambas have been identified for the neighborhood autonomous composting units (ACUs) and the locations for the 2 big ACUs have been decided. The procurement for the internet based activities is in progress.

Delays are anticipated in the licensing of both the 2<sup>nd</sup> opportunity restaurant, since approval for the 2<sup>nd</sup> opportunity restaurant from the Archaeological Service will also be needed as the building is within the historic center of the city, and the bio-plastics unit, depending on its capacity.

A major challenge the project has to consider is the re-conceptualisation of food waste as a valuable resource and - even more challenging - as potentially good food for others in the context. This requires systematic and very good communication both within the project team and in the public awareness raising campaign. Furthermore, given the integrated and holistic character of the project, effective project management is also a must.

# 2. Introduction

## 2.1 Background

Life is exciting, unpredictable, dynamic, with challenges and opportunities. Life is a continuous creation, but within the limits and laws of the natural world. However, in present times, unpredictable as life may be, we have come to realize that it is highly probable that we will upset natural ecosystems to the degree that we will lead human societies to destruction too if we continue living the way we do. Environmental problems require new ways of thinking and acting that can lead to sustainable societies and cities – the human habitats. Circular thinking and a circular metabolism should characterize human communities and activities. The United Nations Sustainable Development Goals for 2030 (United Nations, 2015), aside of highlighting the most pressing social and environmental problems, underline the need for integrated approaches that simultaneously consider environmental (e.g. sustainable food production and consumption) and social concerns (e.g. hunger and extreme poverty).

Goffman, a renowned social scientist, suggests that life is a theater (Goffman, 1959), in which our lives unfold as different but intermingled plays. In this approach, people’s agency – ability to construct life, to change or maintain present practices or structures, and to interpret and then act upon life events - is highlighted, but within the boundaries / parameters of the stage. This is how we will present the A2U Food project – as a play; a play with a series of acts, and a play of which no one – including the actors – knows the end before experiencing the whole play.

In this first journal, we will start with a short description of the story line - the project - and the actors - project partners. We will then set the stage by describing the location and the social context in which the play – project takes place. After that, we will present the first act – the initial achievements of the project so far, as well as challenges and opportunities the project faces. We will close with a prelude to the next act.

## 2.2 The problem



## 2.3 The A2U Food project: The scenario

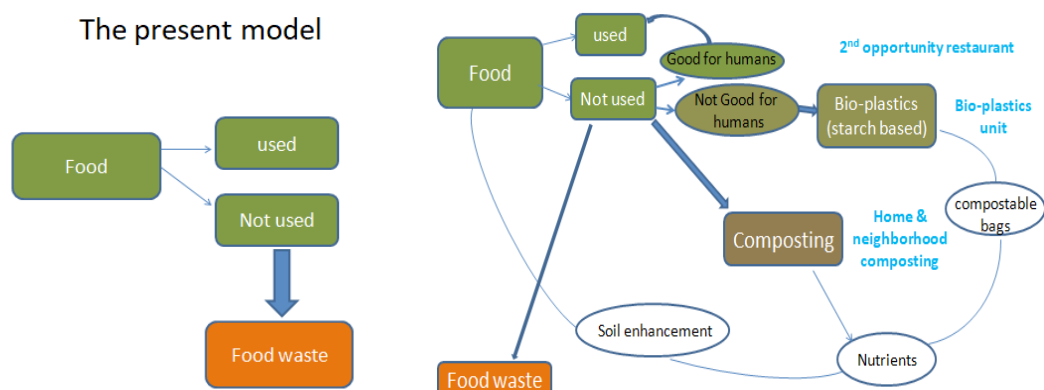
In Heraklion of Crete - Greece, a city with a long history and a favored tourist destination, a vibrant society exists, in which a significant amount of food is wasted in households and hospitality units, at the same time that there are people in need. A group of concerned and inspired entities – the City of Heraklion with the United Association of Solid Waste Management in Crete, the University of Crete, the Technological Educational Institute of Crete, Harokopio University, ENVIROPLAN S.A. and the University of Stuttgart – have joined forces for a common project: to design and implement an integrated food system involving food waste prevention, optimal use and composting. A system which will on the one hand educate the public and hospitality sector to avoid food waste, redirect surplus food for optimal uses, or compost food waste, and on the other, provide good quality and hygienic food to local people in need. In the course of this real life play, the actors / partners will develop digital tools to assist families and hospitality units to minimize food waste generation; will establish a restaurant that will redirect surplus food to meals for people in need; will build and operate a bio-plastics production unit using food waste as



*The project team in action - discussing the project's progress and challenges*

input; and will create a network of composting units installed in 100 households, 6 apartment buildings and 2 neighborhoods.

Their aim is to reduce food waste (or should it be called wasted or surplus food?) by 1% in households and by 2-3% in the hospitality sector in the course of the project. Their intention is to revolutionize the food system in the city and to establish this integrated initiative as a long-standing process of the city of Heraklion. They understand that it is important for them to try – despite the existing challenges – and to succeed in order to transition to a sustainable urban community. To what degree will they be successful?



*Figure 1: The A2U Food concept: From food waste to food prevention, optimal use and composting*

*NOTE: In blue, the project's proposed actions*

## 3 The Stage

### 3.1 The city of Heraklion: Where antiquity aspires to meet a sustainable future

#### 3.1.1 The city

The city of Heraklion (older Chandax or Candia) is the fourth largest city of Greece, the largest city of Crete and Crete's administrative capital. Heraklion has a long history. It is located near the ruins of the Minoan palace of Knossos, while the present city of Heraklion was founded by the Arabs in the 820s. In 961 AD, the city was taken over, destroyed and rebuilt by the Byzantines, until 1204 when Venetians took control over it. They built huge fortifications around it; most of these walls are still in place and delineate the old city, while the Venetian fortress in the harbor still greets incoming visitors. In 1648, the

Ottomans besieged the city for 21 years. During the Cretan State (1898 -1908) – governed by the Great Powers (the United Kingdom, France, Italy and Russia) – Candia was renamed Heraklion. After that, Crete (and Heraklion) became part of Greece.

The contemporary city is anarchically built and consists of the old city which is located within the Venetian walls, and the newer urban areas which have been built all around the fortifications. Recently, the Municipality of Heraklion expanded and now includes some agricultural areas as well.

#### 3.1.2 The people

The city of Heraklion has 140,730 inhabitants – 48.9% men and 51.1% women –, while the population of the Municipality of Heraklion is 173,993, according to the 2011 census. The average economic status of Heraklion inhabitants is relatively good placing them in the middle range of all regions of Greece in terms of poverty. The most common professions are: employees in the service sector and sales, professionals, or skilled craftsmen and related professions (24%, 21%, 13% respectively according to 2011 census data).

With the economic crisis, the at-risk-of-poverty rate in the Prefecture of Heraklion increased reaching 25.5%-26.8% in 2011 (according to Artelaris and Kandylis, 2014), while the groups that are particularly vulnerable are the unemployed (15,100 people in 2011 according



*The center of the city of Heraklion at night.*

to the 2011 census), children and women (Vakethianaki, 2017).



This city also attracts hundreds of thousands of tourists each year for a period of approximately

6 months, making tourism an important source of income and jobs for the local population.

### 3.1.3 Culture, food and waste

Hospitality characterizes the Cretan culture – a trait that, along with the beautiful landscape and climate, attracts tourists to the island. Sharing food with others beyond the family, invitations to food fiestas, etc. constitute an integral part of the Cretan culture and hospitality. There is a special word for this too: filevo (φιλεύω) – treat someone food, usually prepared at home. And of course, best quality food is offered to visitors. This implies the existence of surplus food for visitors. When the household was directly connected with agricultural activities, no food was wasted. Now, in urbanized Heraklion (and other cities), such cultural practices may easily lead to discarded surplus food, in other words, the generation of food waste.

At the same time, the Cretan society, like the rest of Greece and generally Western societies, perceives waste as something negative - i.e. it is dirty, unhygienic, to be avoided, not to be touched (see also ADEME – INCOME Consulting – AK2C, 2016, page 3). As food is essential for human health and has a high cultural value, food quality and safety constitute important concerns. Thus,



food and food waste have contradictory cultural connotations. Consequently, surplus or unused food is not worth giving to anyone else – unless offered before it starts being conceived as lower quality food or waste.

### 3.1.4 Food waste and food needs

Food waste constitutes a significant problem worldwide, from both an environmental and a social point of view<sup>1</sup>. The UN (2015) identifies “zero hunger, food security and sustainable agriculture” and “responsible consumption and production” of food too, as major sustainable development goals to be achieved by 2030.

Food waste generation in Heraklion has been estimated to rise to 201 kg per person per year and to 142 kg per person per year from households (see the “WASP Tool” project, funded by the EU LIFE Programme). Thus, food waste generation is a significant problem in Heraklion, with households playing a significant role in this process. Two thirds of the household food

<sup>1</sup> In the European Union, approximately 88 million tons of food waste are generated each year, an equivalent of 173 kg per person per year, while approximately 20% of produced food is wasted (FUSIONS, 2016).

waste is unavoidable, while 1/3 is avoidable. The hospitality sector – given the high touristic activity in the city – is also a major contributor to the generation of food waste.

As a consequence of the economic crisis in Greece, poverty and food support needs have increased in the last years. According to the Social Development Division of the Municipality of Heraklion, in the last year an approximate 4,000 people received monetary assistance

under the Social Solidarity Income - provided to those living in poverty; 3,800 families received food assistance under the Greek Fund for European Aid to the Most Deprived (FEAD/TEBA) in comparison to 2,500 families 4 years ago; 109 homeless are reported living in Heraklion; and approximately 2,200 people (including approximately 520 immigrants and 500 Roma people) are served by the Municipal Social Services.

### **3.2 The city of Heraklion and the European Union and Greek policy context**

In the EU, an estimated 20% of the total produced food is lost or wasted, while 55 million people cannot afford a quality meal every other day. In line with the UN target – set in the Agenda for Sustainable Development – of halving the per capita global food waste generation at the retail and consumer levels by 2030, the EU has revised the Waste Framework Directive (see Directive 2018/851) prioritizing food waste prevention and reduction. Member States are called to limit food waste generation at each stage of the food supply chain, aiming to a 30% reduction of food waste by 2025 and a 50% reduction by 2030. They must also regularly monitor and report on food waste levels. Food waste prevention is also presented

as a priority in the EU Circular Economy Package (December 2015). Furthermore, the European Commission has adopted guidelines aiming to facilitate food donations (Commission Notice, 16/10/2017), as well as guidelines regarding the use of food for animal feed (Commission Notice, 16/4/2018).

In Greece, the recent National Waste Management Plan (NWMP, 2015) identifies food waste as one of the priority areas and sets even stricter targets than the EU legislation. By 2020, 40% of bio-waste should be diverted from landfilling. This target requires Municipalities, which are responsible for waste collection, to take immediate and bold action in this domain.

# 4 The play begins: Act 1

## 4.1 First actions and achievements

The play officially began in March 2018.

The partners met and organized themselves, with a Project Management Board to oversee the project implementation, a Project Coordinator to coordinate the whole action, as well as a Project Manager in each partner. The Municipality of Heraklion also set up an internal Project Working Group to facilitate communication and coordination among different Municipal departments and to attend to daily matters. An external consultant for project management support is soon to be hired.

Action continued with tendering for all digital activities – project website, social media, etc. – of the project. The full start-up meeting was organized in March 2018 and significant press coverage has been achieved.

Technical actions are three-prone: Food waste prevention, avoidable and unavoidable food waste utilization, and urban composting. They are complementary but not interdependent.

Food Waste Prevention requires awareness raising and technical support. Partners did significant preparatory work. They drafted an Information Campaign Plan, which awaits internal discussions to be finalized. After investigation of similar digital applications, they have started designing a Digital Food Waste Prevention Tool as a mobile app. They also translated the RESOURCEMANAGER-FOOD (RMF) - a software for monitoring food waste at the consumption level that was developed by the Technology Transfer Initiative at University of Stuttgart - tool and manual from German to Greek. They invited

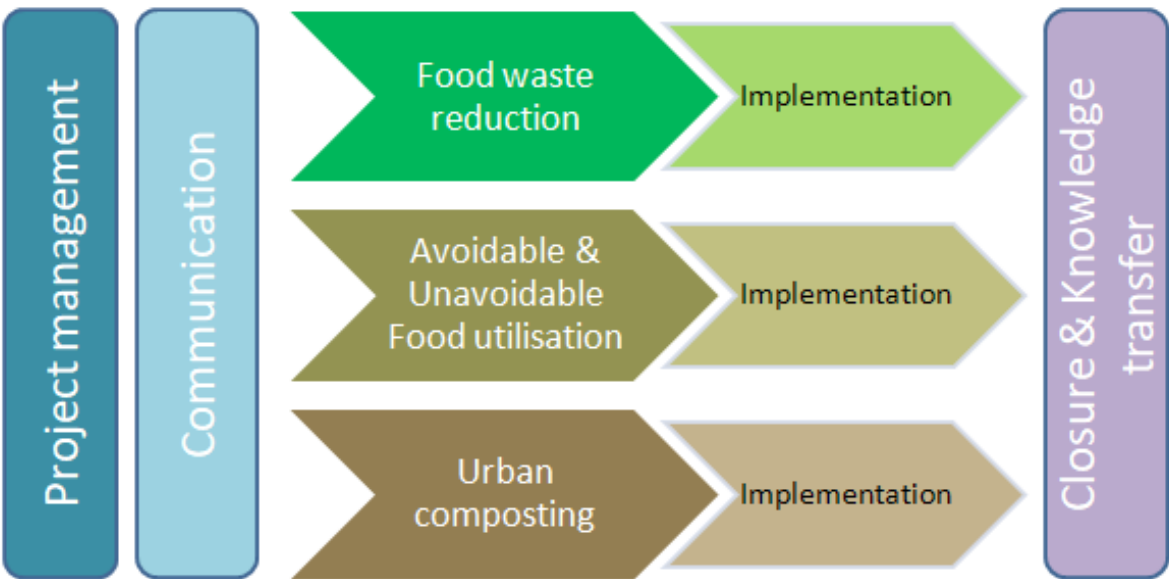


Figure 2: Project work flow



*The building that was selected for the Second Opportunity Restaurant*

hospitality units to participate in the project but the list is still open. Four (goal: 6) hotels have expressed interest so far. An introductory demonstration, planned in November 2018, will help finalize the list.

For the establishment of a restaurant that will use good quality food to prepare meals for people in need, the partners selected an appropriate building within the city walls, after consideration and inspection of different public buildings as well as consultations with the Region's responsible Services (Department of Environmental and Health Control of the Public Health and Social Welfare Directorate of Heraklion) regarding the selection of the building. They are now preparing designs, documenting the present situation and describing the intended changes in order to be submitted for the necessary licenses. Approval from the Archaeological Service is also needed as the old city is an archaeological site.

The wasted food that is not appropriate for human use will “feed” a bio-plastics unit. The location for the construction of the bio-plastics unit has been selected. Partners are presently preparing the documentation for the licensing procedures.

In line with the foreseen urban composting at the levels of households, apartment buildings and neighborhoods, partners investigated possibilities. Composting at apartment buildings did not prove feasible, as no interest was expressed by citizens and it requires the agreement of all the tenants of an apartment building. Thus, project partners redefined the task after the performed “reality check”: 100 household autonomous composters (ACUs), 6 neighborhood composters and 2 composters in large facilities (Venizelio hospital and Technological Educational Institute of Crete, which have already accepted). They identified possible locations for the neighborhood ACUs in the area of Agios Ioannis and neighboring areas Mastambas and Mesambelies, which will be finalized soon. Eighty two (goal: 100) households have so far expressed interest for the home composting action after a call of interest and personal contacts.



*The project team visiting the Venizelio Hospital where one of the ACUs will be installed*

## 4.2 ... And first challenges

Life is not easy or smooth however. The heroes of our real-life play have already met the first obstacles and are facing them with decisiveness and flexibility.



### Procurement

Licensing often hides complications in Greece. As the selected building for the 2nd Opportunity Restaurant is located within the ancient city walls – an archaeological site, a license is required from the Archaeological Service. This process may be time-consuming and is likely to lead to further delays. The project team is working to prepare the documents.



### Procurement

The licensing procedure for the bio-plastics unit is also expected to be longer than foreseen due to bureaucratic processes, especially if its capacity may require a more stringent licensing procedure. The project team is finalizing estimations of its capacity and the required documents for the licensing procedure, and at the same time, it is considering alternative locations in case the need arises.



### Procurement

The procurement for required equipment for the lab optimization of the bio-plastics unit proved longer than foreseen and the risk for such delays was not planned for in the proposal. The project team is planning to decouple lab experimentation and the licensing procedure for the bio-plastics unit to minimize delays.



There was no response to the first e-call for interest by the Heraklion community for composters and by hospitality enterprises for the RMF tool, probably because it was announced in the peak of the tourist season (August). The project team followed up with telephone calls to hotels and a 2nd invitation for home composters.

As a consequence, delays of approximately 2 months are observed in the selection of the hospitality units, the households and the parks where project actions will take place. These may affect the overall project implementation if project management is not tight and effective. Longer delays are being anticipated in the licensing procedures of the 2nd opportunity restaurant and in the finalization of the bio-plastics unit, both due to a potentially lengthier licensing procedure. These delays can seriously affect the project implementation; however, their impact is expected to be mitigated by the design of the project (i.e. project main implementation actions are not interdependent) along with appropriate choices by the project team.

The re-conceptualization of food waste as a valuable resource and - even more challenging - as potentially good food for others in the context of the characteristically hospitable culture of Crete is another significant challenge the project has to address<sup>2</sup>.

<sup>2</sup> For a further discussion of challenges the project faces, you may check Annex 1.

## 4.3 But also opportunities

But no difficulties come without some positive aspects. The context of the Municipality of Heraklion offers some opportunities for the A2U Food project, facilitating its implementation and providing possible solutions to potential challenges.



The project team is capable, with diverse knowledge and real interest in the topic, as well as experience in Greece and abroad.

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In the Municipality of Heraklion, several projects have been implemented in the recent years relating to food waste, its documentation and reduction or use in the logic of the circular economy. These include [WASP Tool](#), [Food4Feed](#) (both funded by the EU LIFE funding instrument) and [ACUA](#).

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In Heraklion, there are several higher education and research institutions (University of Crete, Technological Educational Institute of Crete, and Foundation for Research and Technology - Hellas) with expertise relevant to the project.

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There are small unused municipal areas or parks which can be used for the installation of the neighborhood composters.

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There are a couple of reliable initiatives in Heraklion that support poor people with food: the Orthodox Church (a long standing initiative) and Kalokairinos Foundation soup kitchen. These efforts can facilitate the needed connection between the supply of surplus food and the people in need of good quality meals.

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The leadership of the Municipality understands the issue and wishes to address it effectively. (However, municipal elections are coming up in spring 2019 which may lead to a change in the Municipal Authorities.)

## 5 What next?

In the next months, much foundational work and the initial implementation of some actions are anticipated.

Will the information campaign for food waste prevention have unfolded? Will the design of the Digital Tool have progressed satisfactorily? Will 6 hospitality units have started using the RMF in their daily operation? Will workshops and training sessions have been organized?

Will a collection scheme for avoidable and unavoidable food wastes and their analysis have been completed? Will the laboratory experiments regarding the transformation of food waste into bioplastic have progressed effectively, even if not completed?

Will the list of the households that will use the home composters and the locations for the ACUs have been finalised? Will the monitoring system for the home composting units have been developed? Will the tendering documents for the home composting units and the ACUs have been completed?

Will our heroes – as a closely working team – have overcome the challenges they now face and have delineated a way to their project’s success? Will they have established effective communication with the people they want to engage? Will they meet new challenges?

We will know in a few months.

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# Annex 1:

**Table: Mapping A2U Food against UIA criteria**

Challenge	Level	Observations
Leadership	Medium	<p>a. The Municipality's hierarchy shows understanding of the problem of food waste and its significance, while it is interested in the project and its success. The challenge may be that Municipal elections are coming up in spring 2019 and the Municipal leadership may change.</p> <p>b. The leadership of the project (project coordination and management) is capable and experienced in their fields and proper project management structures have been set up. It remains to be shown that they are fully exploited. The Consulting and Advisory Board has not been set up yet.</p>
Public procurement	High	<p>Procurement and licensing are usually time consuming processes and can cause delays. Innovative ways of public procurement should be investigated at the EU and national level to facilitate circular economy.</p> <p>Delays have been observed in the tendering of the project management external assistance and that of the dissemination activities. More serious delays are anticipated in the licensing of the bio-plastics unit and the 2<sup>nd</sup> opportunity restaurant.</p>
Integrated cross-departmental working	Low	<p>Integrated / holistic initiatives required cross-departmental collaboration. Different Municipal departments often have different bodies of knowledge, different ways of working, different concerns, making cross-departmental communication and collaboration a challenge.</p> <p>In the Municipality of Heraklion, a project Working Group with the participation of several relevant Municipal departments has been established. The Social Development Division is not included but the project team will collaborate with them.</p>
Adopting a participative approach	High	<p>Participatory practices are not part of the Greek organizational culture and require a sustained effort. Such a process has not started in a systematic way yet.</p>
Monitoring & evaluation	Low	<p>Systematic data regarding food waste in Heraklion is being collected in the context of other ongoing projects (e.g. Food4Feed – LIFE funding).</p> <p>The project team has the capacity to monitor and evaluate the project impact.</p> <p>A procedure for the evaluation of the quality of project outputs, outcomes and impacts is needed.</p>

Challenge	Level	Observations
Financial stability	Medium	The economic crisis makes funding availability, cash flow, etc. a big concern / unknown for Greek projects. However, the financial situation of the Municipality of Heraklion is overall positive. This is especially of concern after the end of the project, in relation to the sustainability of project results and upscaling.
Communicating with target beneficiaries	Medium	Contrasting cultural conceptions of food (positive) and waste (negative) makes this a hard topic to address, requiring careful and clever communication actions. Environmental marketing may be useful for effective approaches. Regular communication with target beneficiaries should be maintained.
Upscaling	High	Upscaling requires: <ul style="list-style-type: none"> <li>- securing resources for the continuation of the project (from the Municipality of Heraklion itself or from private sector)</li> <li>- securing political will for the project to continue</li> <li>- connecting with the market (needs, opportunities, etc.) for sustainability purposes.</li> </ul> Marketing expertise is needed (during the project too) and a business plan for upscaling the initiative after the project end is advisable.

NOTE: Challenges are categorized as high, medium or low, with the criteria of level of risk and probability of it occurring, as follows:

- High: if two conditions are met:
  - o It is something that can undermine project implementation to the degree that this may become ineffective in achieving desired impacts within its approved duration; something that can seriously undermine the sustainability of project results after its end date;
  - o high probability that a "high" risk/challenge may occur
- Medium:
  - o something that can create obstacles to effective project implementation, but may be surpassed if given additional time;
  - o medium level of possibility that a "high" risk/challenge can occur
- Low:
  - o a risk with minor impacts for the project implementation
  - o if it is unlikely that an obstacle to the effective project implementation may occur

Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.

UIA projects will produce a wealth of knowledge stemming from the implementation of the innovative solutions for sustainable urban development that are of interest for city practitioners and stakeholders across the EU. This journal is a paper written by a UIA Expert that captures and disseminates the lessons learnt from the project implementation and the good practices identified. The journals will be structured around the main challenges of implementation identified and faced at local level by UIA projects. They will be published on a regular basis on the UIA website.



## Urban Innovative Actions

Les Arcuriales  
45D rue de Tournai  
F- 59000 Lille

**+33 (0)3 61 76 59 34**  
info@uia-initiative.eu  
**www.uia-initiative.eu**

Follow us on **twitter**  
@UIA\_Initiative  
and on **Facebook**.