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Author:

Christina Marouli

UIA Expert



The Urban Lab of Europe !

The A2U Food project Journal N° 2

Project led by the City of Heraklion



**CIRCULAR
ECONOMY**



The A2U Food project

“No more food to waste”

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 Consultants & Engineers 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



The A2U project aspires to design and implement a holistic food system involving food waste prevention, optimal use and composting with the aim to divert food waste from the waste stream and to feed the circular economy (and society) of the city. In the initial period, the partners initiated the awareness raising scheme, the design of the digital tool for the public, the update of the tool for the hospitality units, the selection of the location and licensing for the 2nd opportunity restaurant and for the bioplastics unit, the selection of the locations and the identification of the households, institutions and neighborhoods that will participate in the composting network of the city.

This second period was dedicated to preparatory activities regarding the design, tendering, purchasing and construction of the main technical actions – food waste prevention, optimal use

of avoidable and unavoidable food waste and composting, as well as the establishment of basic communication channels.

The Information Campaign Plan for food waste prevention has been enhanced with educational activities. Educational and communication materials have been prepared or are in the process of being drafted. The project team designed a Digital Food Waste Prevention Tool as a mobile app; it is now ready for beta testing for a couple of months, before it will be made widely available. The main project communication channels – the interactive website dedicated to the information campaign (www.foodsaveshare.gr), the project website (<https://a2ufood.gr>), and social media accounts (Facebook, Twitter, Instagram and YouTube, Google+) – were established. After two demonstration workshops, six hospitality units were selected to test the RESOURCEMANAGER-

FOOD (RMF) tool in their daily operations for 1 month in April 2019. Six RMF tools have been purchased and programmed. A qualitative and quantitative analysis of avoidable and unavoidable food waste in 15 units is in progress. For the 2nd Opportunity Restaurant, designs of the building were completed and an application for a permit from the Archaeological Service was submitted in December 2018. The approval is being awaited. The siting of the bioplastics unit has been challenging due to licensing issues and has not been finalised yet. Laboratory experiments regarding the transformation of food waste into bio-plastic are progressing well. A list of households, neighborhood parks and institutions that will install the home composters and Autonomous Composting Units (ACUs) has been drafted. A prototype monitoring system for household composting units, involving a mobile app with a sensor, has been developed. A market research has been conducted regarding the composters and ACUs and tendering documents are being prepared for them and the monitoring system. The challenges in this period have led to observed minor delays.

The team is steadily building up their efforts to address the challenge of the cultural re-conceptualisation of food waste as a valuable resource. Ultimately, the success of the project lies at shifting people's, entrepreneurs' and

institutions' mindsets towards food and food waste, while the team provides infrastructure that can support the redirection of food waste to composting, reusing or even prevention.

Partners worked together to overcome challenges in licensing and tendering procedures. With the common goal to make this project a success, they organised themselves to effectively address these challenges, and they have learnt to communicate better across traditional boundaries between Municipal departments, institutions, and disciplinary / professional lingos and protocols.

Bureaucratic procedures regarding tendering and licensing, as expected, were revealed as the two major challenges our actors had to face in this period. In some cases, licensing procedures proved a simple hurdle that are expected to be surpassed with patience and perseverance (e.g. the 2nd Opportunity Restaurant), and in other cases, they have required our actors to think flexibly and to identify alternative approaches that may be more feasible if not more effective. Flexibility and ability to identify alternatives - in the obvious and the not so obvious arenas - have proven important skills such an innovative and integrative project requires and luckily, the project team possesses.

2. Introduction

“... 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.”

(Marouli, Journal 1, October 2018)

In the life “stage” of Heraklion, our actors – the project partners – in the first 6 months of this project – the first act – tried to gauge the scene in which they intended to implement their challenging – integrative proposal, the potentialities for realising their objectives, the difficulties they should anticipate and the opportunities that existed. In that first period, the partners initiated the design of the awareness raising scheme, the design of the digital tool for the public, the selection of the location and licensing process for the 2nd opportunity restaurant and for the bioplastics unit, and the

selection of the locations for the autonomous composting units. They also updated the digital resource management tool for the hospitality units and they invited interest from households and hospitality units to participate in the utilisation and composting activities. Of course, they also had to align their ways of operating, a challenge in and of itself as such an integrative project requires collaboration of diverse actors: public and private entities; different departments of public bodies; different academic disciplines; lay people, entrepreneurs, scientists and policy makers. This was an introduction to the play.

In the second act – the period November up to March 2019, the preparation for the main part of the play continued and entailed background - foundational work for the different story lines (project actions – work packages).

This 2nd journal aims to share the progress and achievements of the project team in this period, discuss the challenges that the partners faced as well as the ones that still remain, and to identify useful lessons for other cities that aspire to undertake groundbreaking projects.

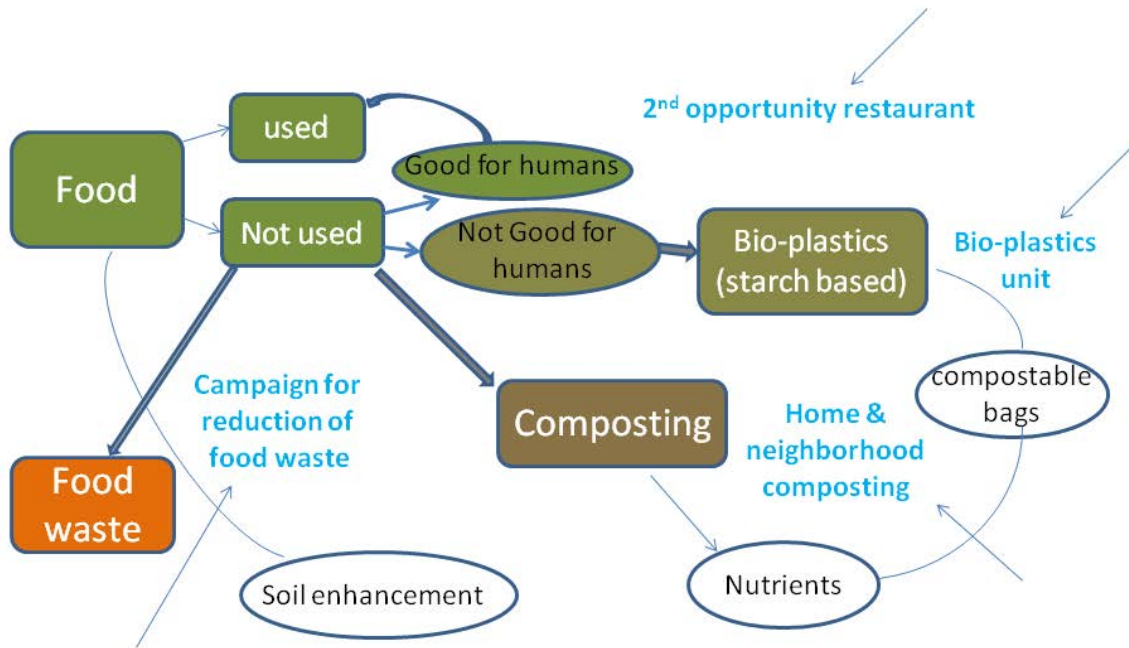


Figure 1: The A2U Food concept – Main project actions
 NOTE: In blue, the project's main actions.

3. The A2U Food story unfolding: Act 2

3.1. Act 2: A period of lots of Leg work

In this time period/act, the partners undertook lots of leg and paper work and many deliberations, with the aim to facilitate and advance the technical actions of the project – food waste prevention, utilisation of avoidable and unavoidable food waste, and composting – to take place in the future. They focused on design work, licensing and tendering activities that are prerequisites for the actual implementation, as well as activities that brought the stakeholders close to the project raising their interest in food waste utilisation and composting activities. In this process, they continued and prepared a careful communication plan and a set of communication channels between the project and the citizens of Heraklion.

and collaborated effectively and the Municipality’s project working group – involving representatives of relevant departments – met regularly, sharing their expertise in order to set the ground for the implementation of their plan and the coordinated achievement of their goals. They also hired a consultant to facilitate project management and communication actions.



The project team in action - discussing the possible locations for the Autonomous Composting Units

As the challenges of real-life implementation mounted, the project partners communicated

Project work flow

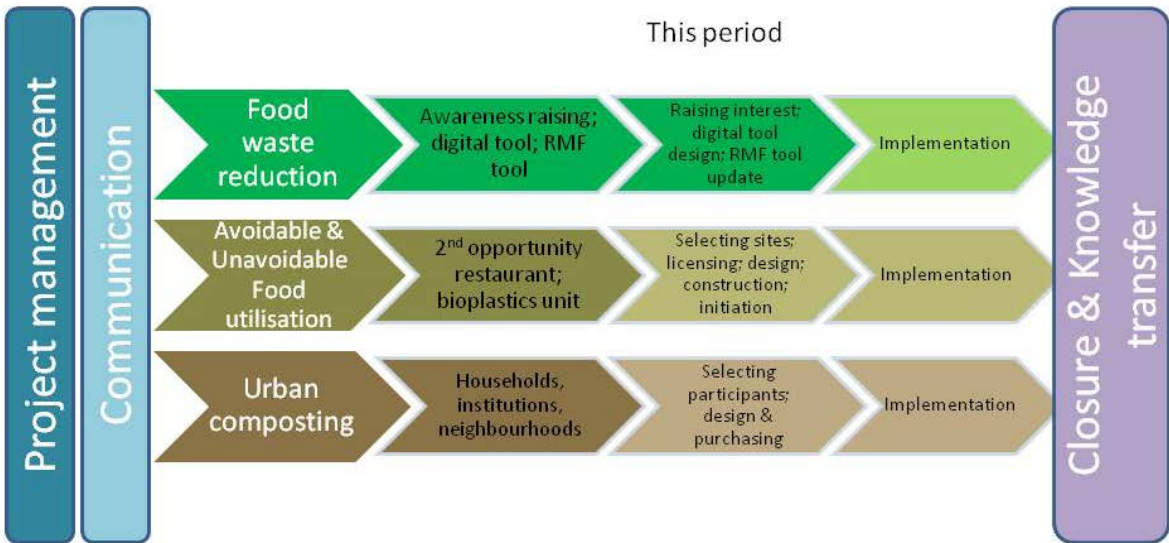


Figure 2: Project work flow – Actions implemented this period

3.1.1. Food waste prevention

A very significant story line is food waste prevention, which requires changes in attitudes and daily practices. Awareness raising and digital means constitute the methods and tools our actors have selected to facilitate these changes.

HUA revised the information campaign plan for food waste prevention with the input of other partners and the external expert, with the aim to make it more enticing for stakeholders and more effective in promoting the reconceptualisation of food waste as a valuable resource. In this context, experienced environmental educators were contracted and prepared educational materials for the purposes of the project, including 9 participatory group activities of diverse format on personal consumption choices, date labeling, advertising, food waste disposal and management, food prevention and cooling technologies, social contexts and food waste. They then tested the educational materials in 3 teachers' workshops in the Greater Athens area. This material will be used in the 30 training

workshops that project partners intend to implement in the next project periods.

After a review of the available e-tools (i.e. apps, platforms, digital tools) for food waste prevention and the identification of the appropriate parameters for the prediction models, the TEIC team in close collaboration with HUA and ENVIROPLAN completed the background data and prediction models for the development of the Digital Food Waste Prevention Tool for supermarket customers. The Digital tool is now ready for beta-testing. After a 2-3 month testing by 10 users, the tool will be optimised and made widely available as a mobile app. Given the aim of the tool, awareness raising messages regarding food waste impacts will also be displayed.

The project team recognizes the paramount significance of effective communication channels for the mobilization of stakeholders and for desired behavioural changes. They designed the digital tools to be used and they undertook the required procurement procedures. They cleverly decided to do one tender for all foreseen

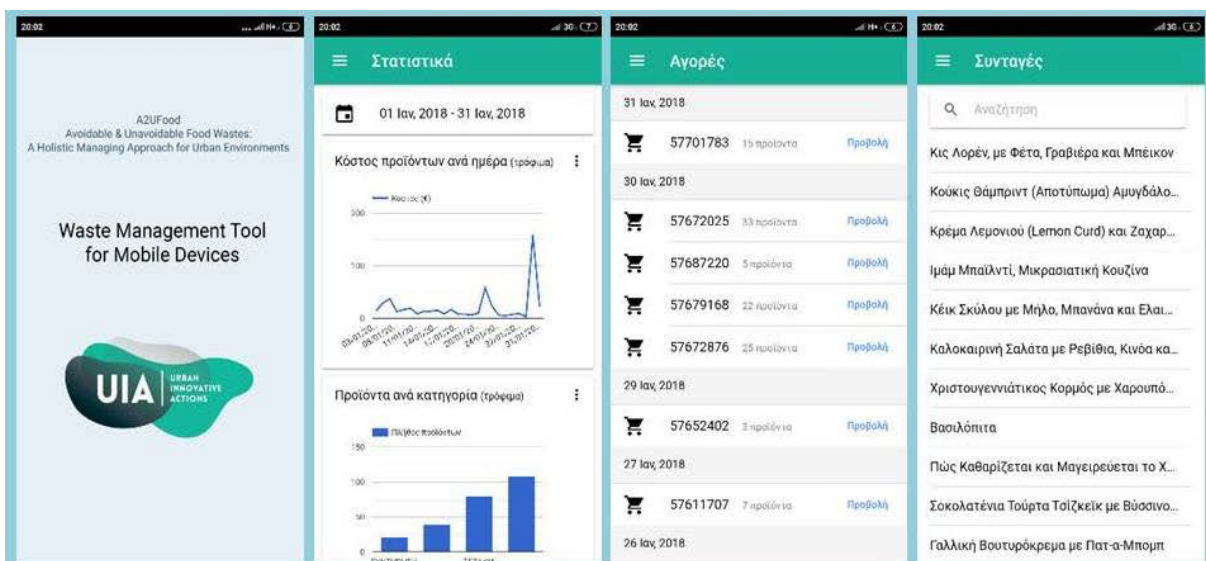


Figure 3: Screens of the FoodSaveShare Digital Tool prototype. From left to right, splash screen, purchase statistics, past purchases, recipes

communication actions in order to minimise potential delays in tendering. Interested people, including you, can get informed via the interactive website dedicated to the information campaign (<https://foodsaveshare.gr>), the project website (<https://a2ufood.gr>), social media (Facebook, Twitter, Instagram and YouTube, Google+) channels that have been created. They are operational and the Municipality will use them regularly as the project actions unfold. In addition, a contractor has been selected for the production of a series of 3 leaflets (one for the public, one on source separation, and one on Autonomous Composting Units) and the manual for the digital tool; partners are working to prepare their content.

The RMF tool – a tool designed by USTUTT and piloted in a few cases – had been updated from the previous period. However, hospitality units did not show significant interest in the original call for interest of the project. USTUTT and TEIC organised 2 demonstration workshops that targeted hotels and chefs' schools in November 2018, with the aim to raise interest in the RMF tool among hospitality units. As a consequence of this approach and personal contacts, 6 hospitality units – 4 hotels and 2 catering services – have been selected to test the RMF

tool at their premises. Six RMF tools have been purchased and programmed and their installation along with the training and measurement campaign are planned for April 2019, the beginning of the tourist season.



Hands on testing of the RMF from hotel personnel during the demonstration workshop



Philipp Fuchs explains food waste importance to the chef instructors of the Kappa Studies School of Tourism and Hospitality

3.1.2. Avoidable and unavoidable food waste utilisation

A second story line is the utilisation of avoidable and unavoidable food waste. It is a multi-level effort, entailing the need to document the present situation, to establish the 2nd opportunity restaurant and the bioplastics facility, and to select the optimal collection route for avoidable and unavoidable food waste from the participating hospitality units.

The partners tried to first qualitatively and quantitatively analyse avoidable and unavoidable food waste in 15 units in order to then design an optimal collection route. However, the open call to the hospitality units, when it was first launched in the summer of 2018, did not prove very fertile. Thus, partners resorted to personal contacts. TEIC via site visits and interviews identified 6 hotels, 6 event stages and halls and 3 catering services that will participate in the source separation scheme of food waste. TEIC also distributed a questionnaire to these facilities in order to document the quantity and purity of their food waste. The collection of the questionnaire is still in progress and thus, the selection of the optimal collection route for both avoidable and unavoidable food waste had to also be postponed by approximately 3 months.

But this delay is not a main concern for this set of actions as the licensing of the 2nd Opportunity Restaurant has proven more challenging than anticipated. The municipal building that was selected as appropriate for the Restaurant (162 m²: ground floor, loft & 1st floor) did not have building survey or topographical designs. Furthermore, it is located within the part of the city of Heraklion that has been declared an archaeological site. ENVIROPLAN delivered the designs for the building, which the Technical Services Department of the MoH approved, and also developed the additional studies and

documentation needed for the “legalisation” of the building in accordance with the legal requirements for the declaration of old buildings. Given its location, a permit from the Archaeological Service is required – a lengthy process. The partners submitted the needed documentation in early December 2018 and they are awaiting the decision of the Archaeological Service. In the best of circumstances, a delay of at least 2 month is certain.

The licensing of the bioplastics unit was another major concern for the project partners in this period. That also proved more challenging than foreseen. The initially selected location – near the existing BMT plant and the Materials Recovery Facility – proved impossible. The licensing requirements made this choice not feasible. The project partners, with ESDAK taking the lead, looked for alternatives. Two other locations were considered. After several deliberations between the partners and the competent authorities, the project team has concluded that the Wastewater Treatment Plant of Heraklion is the most suitable location for the installation of the bioplastics pilot unit. Despite an original positive reaction from the relevant authority, the final decision on the site is still pending. Our heroes have lots of leg and paper work to do still.

In the meantime, UOC proceeded with the laboratory experiments regarding the transformation of food waste into bio-plastic. So far, UOC has reproduced the synthesis of the biopolymer PLA from a commercial monomer (lactide) according to the literature and has developed a characterisation protocol. Now, it continues with experiments regarding the transformation of food waste to lactide. Experiments are progressing well; however, as the time they required was not properly foreseen

in the proposal, a delay of 6 months in their completion is anticipated. Nevertheless, the partners disconnected the experiments from the design and development process of the bioplastics unit, which progresses on the basis of

initial laboratory results and literature data, in order to minimise delays in the bioplastics unit. The bioplastics unit is expected to start operation in fall 2019.

3.1.3. Urban composting

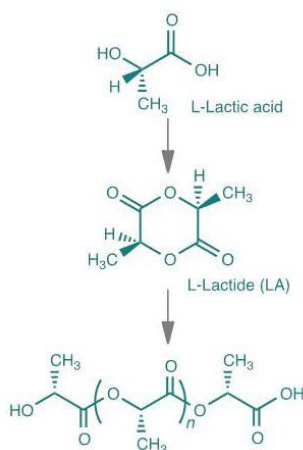
Along with the other two story lines, the project team promotes composting in the city at the household and neighborhood levels as an additional, aside of food waste reduction and utilisation, measure that diverts food waste from landfilling. Apartment buildings were also targeted in the beginning, but as they proved very difficult to organise the partners decided to focus on two big institutions instead.

The project team has compiled a list of 100 households and of locations – neighborhoods and big institutions – where the small and large ACUs will be installed. They do, however, also have a contingency plan in case obstacles arise at the last minute.

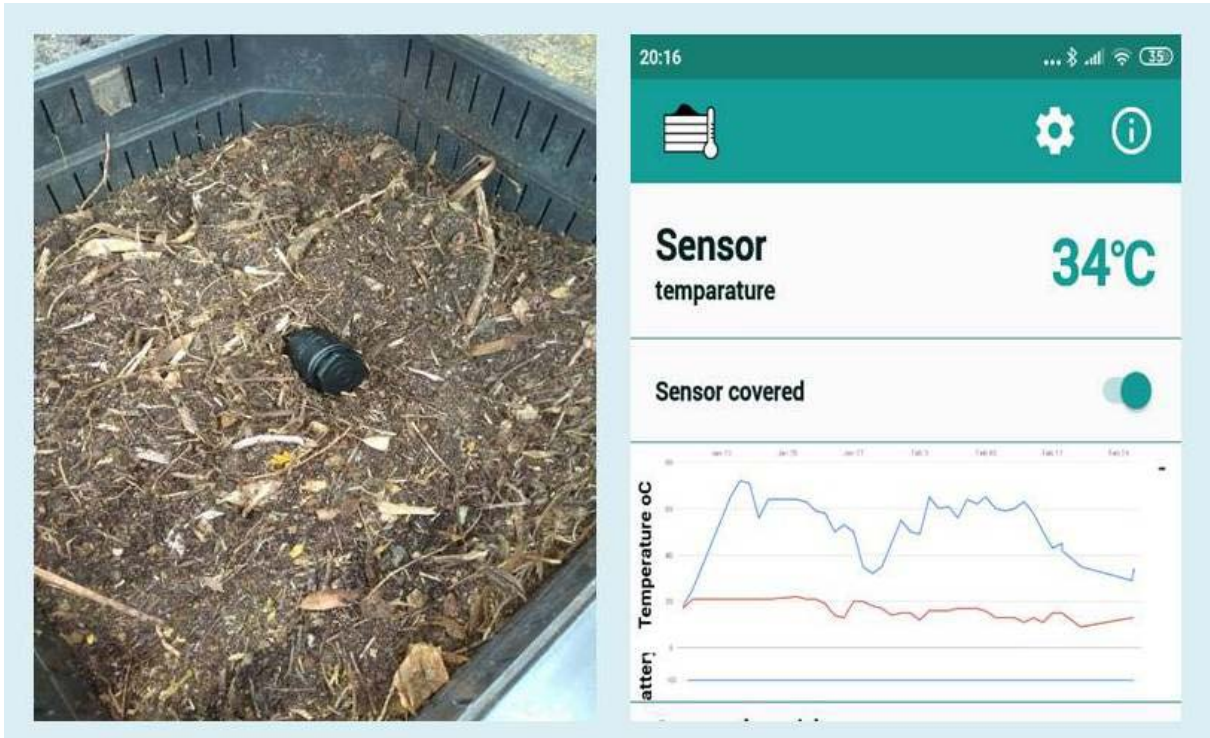
In this period, HUA in collaboration with TEIC and ENVIROPLAN developed a questionnaire for the assessment of home composting potential. TEIC produced a prototype monitoring system for household composting units, involving a mobile app with a sensor that is located in the compost

pile. The monitoring system documents the composting process parameters (e.g. temperature) and provides guidance to the household owners. Tendering remains to be done.

ENVIROPLAN conducted a thorough market research of manufactured home composting bins of different capacity, compost extraction method, complexity and price, as well as of manufactured Autonomous Composting Units (ACUs). TEIC and ENVIROPLAN are preparing the tendering documents for the procurement process of the home composting monitoring systems and the ACUs that will be used in the project, after consideration of relevant legal requirements regarding licensing. The partners are considering to launch common tendering procedures regarding all the required equipment for composting and for the collection of food waste for the bioplastics facility, in order to make the tender more attractive to suppliers.



Laboratory experiments for the reproduction of biopolymer PLA



Prototype of the monitoring sensor and mobile app

3.1.4. Communication

Aside of the technical actions that absorbed much of the partners' time, the partners also established the basic communication infrastructure of the project:

- They enriched the information campaign with a more detailed description of the developed educational material (as an e-book) for the upcoming training courses.
- They tendered all the communication actions together and thus established in the fall of

2018 the project website, the interactive web site for the food waste prevention campaign, and social media accounts on Facebook, Twitter, Instagram, YouTube and Google+. They have also contracted the production of leaflets and they are now drafting their content.

They closely collaborate for the full scale launching of the awareness raising campaign.

3.2. Challenges faced: The road has been bumpy

The preparation for the technical actions of the project, especially the utilisation of avoidable and unavoidable food waste, has proven a challenging process.

- The summer period, a high tourist season in a city dependent on tourism, was not a good time for calls of interest to the general public or the hospitality units. Personal contacts were subsequently used as a complementary method of approaching the target populations; this method proves to be a more effective approach in the Cretan / Greek context, especially regarding such an issue that is new to the local people.
- The delayed selection of the 15 hospitality units that will participate in the source separation of food waste has also caused a delay in the completion of the qualitative and quantitative analysis of avoidable and unavoidable food waste in the city of Heraklion. This along with the delay in finalising the location of the bioplastics facility has also postponed the determination of the optimum collection route for avoidable and unavoidable food waste, which subsequently affects the purchasing of needed equipment (trucks). However, the partners intend to prepare the tendering documents for the needed trucks by the end of March 2019 on the basis of indicative data and the budget constraints of the project in order to minimise observed delays.
- However, the delay in the identification of the optimum collection route of avoidable food waste proves insignificant in comparison to the one observed in the licensing of the 2nd Opportunity Restaurant, since the optimum collection route will be ready before the licensing and renovation of the Restaurant. As anticipated, the significant delay is expected to be experienced in the approval of the permit from the Archaeological Service due to its usually lengthy decision making process. The intervention of the MoH management team may be advisable to speed up the process.

4. Looming challenges

Of course, challenges for the actors of this real-life play have not ended. Some remain and need to be addressed, other new ones are ahead.

- Since licensing and tendering procedures have not been concluded, bureaucratic procedures, licensing and tendering requirements continue being noteworthy challenges for the upcoming period. Partners need to continue being creative and flexible in their approaches.
- Municipal elections are coming up in spring 2019 which may lead to a change in the Municipal Authorities. Furthermore, these municipal elections are organised with a new system for the Greek context which is expected to lead to more diverse Municipal Councils and potentially more cumbersome decision making processes. The project team needs to plan appropriately to avoid unnecessary delays in tendering procedures.
- The first pilot implementation of the RMF tool will last 1 month. Given the initial low interest

on behalf of hospitality units, partners expect that the pilot trial of the RMF tool will persuade participating units for its value for their food purchasing and management practices, worth the time they need to spend to incorporate it in their daily practices. Partners should carefully monitor this activity and work with the hospitality units to persuade them to extend the pilot implementation time. They should ideally try to extend the duration of the implementation to a whole tourist season or 1-2 months of in both tourist seasons included in the project duration for reliable results and real benefits for this effort.

- In the past period, no developments have been observed when it comes to the challenges of Monitoring & evaluation and Upscaling.

5. Some useful lessons

New ideas, new integrative approaches, new uses of old infrastructures require existing procedures and cultures to adapt. This process is challenging and requires adaptive management approaches: set some goals, make an action plan, start implementing and as you face challenges adjust your course of action to overcome obstacles but still – probably better – serve your vision and goals.

Our heroes faced significant challenges in this period, and thus they had to creatively think of alternatives and to do readjustments in the foreseen scenario. They had to consider alternatives in the ways to persuade stakeholders, in the siting of the bioplastics facility, in the tendering procedures and their organization etc., so that their goals and objectives remain possible. Flexibility and creative thinking “out of the box” prove to be key for the achievement of the goals and vision of innovative projects. Collaboration, partners’ sharing of strengths and effective organization are also significant assets for the resolution of obstacles.

At a more practical level, realizing that licensing and tendering procedures often pose significant challenges, a “smart” organization of tendering and licensing procedures is a positive approach. Combining lengthy tendering procedures in one to avoid multiple delays is a useful strategy to consider. Using forward-planning, preparing tenders in parallel with the finalisation of relevant activities that provide information for the tender requirements, can also help minimise delays in these bureaucratic processes. Furthermore, an Advisory Board involving stakeholders and experts, like the Consulting and Advisory Board of this project, can also help in such processes both with their internal knowledge of relevant procedures and legislative requirements and with possible contacts.

6. What next?

In the next period, we expect training sessions regarding food waste reduction to have begun, the digital tool to be ready for wide application, and the pilot implementation of the RMF tool in the selected hospitality units to have been completed with many if not all of the participants having seen its usefulness in action and wishing to continue its use.

The licensing of the 2nd Opportunity Restaurant and of the bioplastics unit, the qualitative and quantitative analysis of food waste generation, the collection scheme of avoidable and unavoidable food waste, the completion of laboratory experiments, as well as the tendering of food waste collection trucks, are main tasks to be completed in the next period.

The tendering and purchasing of the prototype monitoring systems, the home composters and the neighbourhood and big ACUs are expected to be finalised as well.

The next few months constitute a crucial period for the A2U Food project – play.

Will the A2U Food team overcome the present challenges and will the implementation be ready to begin? Will the information campaign for food waste reconceptualisation and prevention have unfolded? Will they have mobilised the people they want to engage? Time will show, but they will persist.

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**.