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JOURNAL

PROJECT

A2UFood - Avoidable and Unavoidable Food Wastes: A Holistic Managing Approach for Urban Environments

Heraklion, Greece

TOPIC

Circular economy

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A2UFood Journal 6 - Looking back, learning for the future

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In the last journal of the A2UFood project, UIA expert Christina Marouli presents the project continuation after its official end date and discusses the main lessons and insights from running such an integrative and innovative project on food waste.

1. Executive summary

The A2UFood project of the Municipality of Heraklion worked to minimise food waste by focusing on reduction – via the use of digital tools and awareness raising activities -; utilisation of avoidable and unavoidable food waste, by developing a bioplastics pilot unit and a 2nd Opportunity Restaurant; and home and neighbourhood composting. All the activities, despite delays, were implemented with full or partial success, with the exception of the 2nd Opportunity Restaurant which faced obstacles in licensing and tendering procedures some of which proved insurmountable in the project's time frame. (For more information on the project's activities during its lifetime, please check the journals and zoom-ins of the project at https://uia-initiative.eu/en/uia-cities/heraklion)

After the project end date, the project team continued the pilot operation of the bioplastics unit up to December 2022, the monitoring of the Autonomous Composting Units (installed at selected neighbourhoods and institutions) and awareness raising for their better operation. In addition, Chalkiadakis Super Markets decided to uptake and make available the digital tool FoodSaveShare to their employees for more efficient food purchase and consumption planning. Furthermore, the Municipality has committed to implement the 2nd Opportunity Restaurant in the future and is presently looking for funding sources.

This last journal provides concise information on the project continuation after its official end date and discusses the main lessons and insights from running such an integrative and innovative project on food waste, based both on the successes and the 'failures' of the project. It concludes with my main takeaways from the project.

2. Project's progress after its official completion

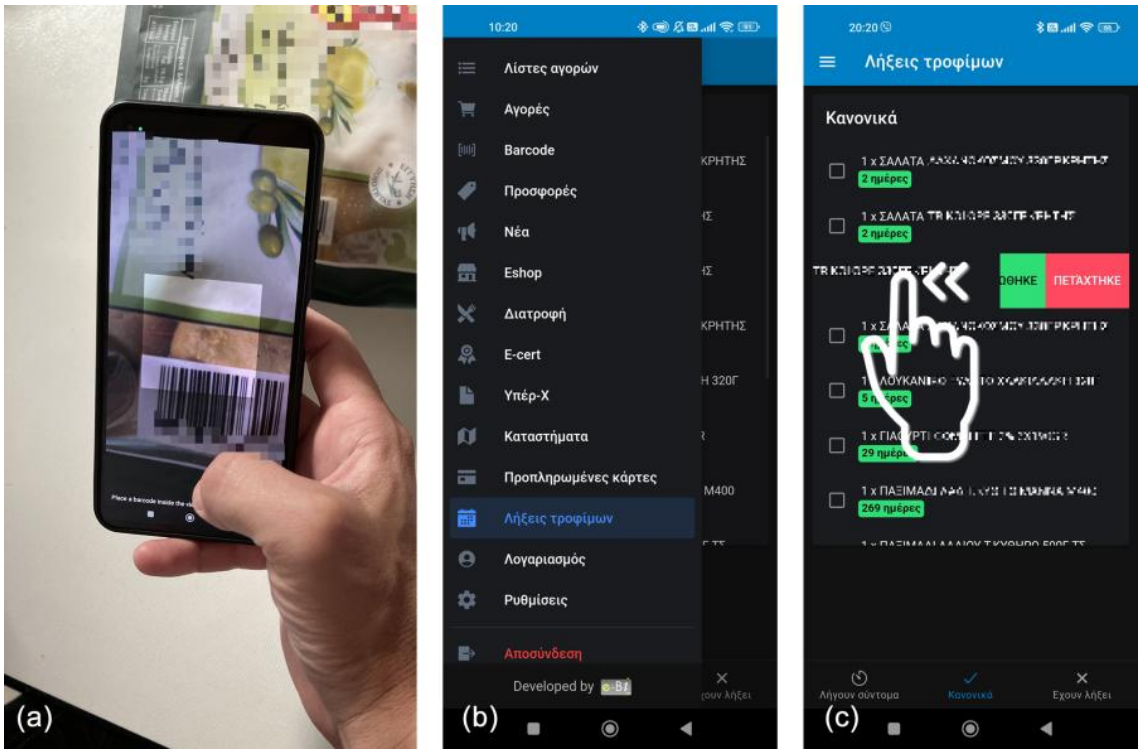
The A2UFood project has been completed. In the context of the project, the MoH, UMU, HUA, ESDAK, ENVIROPLAN, and University of Stuttgart implemented a series of actions for food waste reduction, the use of good quality food that is not used, and composting in the city of Heraklion, Crete. Amongst others, they created a digital tool to help the general public better plan their purchases; they enhanced and used a digital tool for hotel kitchens to limit food waste; they built and operated a bioplastics unit; they installed home composters and Automatic Composting Units

(ACUs) in selected neighborhoods of Heraklion; and they developed educational and awareness raising packages that were used in several trainings. They also faced obstacles in the licensing and tendering procedures, which led to the inability of the Municipality to establish and operate a Second Opportunity Restaurant for the needy. The project has been recognised for its innovative character and has been included in the innovation and best practices portal of the Greek Ministry of Internal Affairs, whilst the Bioplastic Pilot Plant has been praised for its innovation and has received support from the Greek Recycling Association. For more information on the project, please visit https://uia-initiative.eu/en/uia-cities/heraklion.

But although the play is over and the curtain has fallen, the efforts to reduce, reuse and compost wasted food stuffs in Heraklion continue and some of these actions have developed further.

1. Food waste prevention: Digital tools and awareness raising activities

The digital tool FoodSaveShare that HMU developed for the general public, in collaboration with Chalkiadakis Super Markets, is available online for Android (https://play.google.com/store/apps/details?id=com.xalkiadakismobile.app&hl=el&gl=US) and for iOS (https://apps.apple.com/us/app/xalkiadakis/id1469437510). In addition, it has been made available to Chalkiadakis Super Market employees (about 1000 people). Approximately 500 are active users of the tool. Furthermore, Chalkiadakis Super Markets have incorporated several of the elements of the A2UFood tool in their own app (e.g. expiry dates of purchased goods) which they used for advertising purposes, with the aim to help consumers avoid food wastage.



Picture 1: Photos and screenshots of the Chalkiadakis app, now containing functionalities from the FoodSaveShare app: (a) Scanning product barcodes to populate a shopping list, (b) navigation to the expiration estimation of purchased products, and (c) expiration estimates for purchased products. In (c) the arrow shows that when swiping a product, the user can select if it was consumed or wasted.
Photograph by I. Daliakopoulos (HMU), 29 December 2022

HMU continues the awareness raising activities on reduction, reuse and composting of wasted food as one of their regular activities. For example, 5th grade school students from the 52nd Primary School of Heraklion and their teachers (total 54 individuals) visited the Automatic Composting Unit (ACU) of HMU in March 2022, while HMU staff made a relevant presentation at the Environmental Education Centre of Archanes in November 2022, addressing 40 secondary school students and environmental educators.

Picture 2: Awareness raising activity regarding composting
Photograph by I. Daliakopoulos (HMU), 25 November 2022

2. Avoidable and unavoidable food waste utilisation

1. The Bioplastics Pilot Unit

Due to delays in the licensing and design procedures, the first operation of the bioplastics unit began within the project lifetime but was completed after its end date, in May 2022. It included 11 cycles of pilot operations, with approximately 65-96 kg of incoming food waste per batch. This first pilot operation provided useful insights for the enhancement of the production process of bioplastics from food waste and promising scientific insights. Bioplastic was not produced as the filter proved insufficient for this process; a new filter based on the principle of centrifugation (i.e. centrifugal separator) is needed.

Picture 3: At the bioplastic pilot unit, during the operation after the project end date
Photograph by M.Zagkotis, 14 December 2022

A second 2-month long pilot operation of the bioplastics unit was implemented, with the beneficiaries' (especially ESDAK's) own funding contribution and the regular support of UoC and ENVIROPLAN, in the period October to December 2022. It included 4 cycles of approximately 65kg each. In this second pilot operation, an improvement in the quality of the output of the 1st reactor was documented. However, this was done with the old filter due to the cost of purchasing a centrifugal separator. Instead, ESDAK undertook actions to lease such a filter for a few days, which took place in December 2022.

ESDAK continues its efforts to find a feasible approach for the continued operation of the bioplastics pilot unit in the long run, in collaboration with the University of Crete.

2. The Second Opportunity Restaurant

The Second Opportunity Restaurant still remains a dream and a commitment of the Municipality of Heraklion.

However, the studies and tendering documents are ready, and the Municipality continues its efforts to materialise it by seeking funding for it.

3. Composting

Home and neighborhood composting continue, albeit with challenges. HMU continues monitoring the operation of the Automatic Composting Units (ACUs), by visiting them once a month. They presently have information about all the ACUs and their use. After vandalisms at two ACUs, the ACUs were repaired in the course of the project and are now back in operation. Following this experience and the observation that mixed materials - including plastics – were thrown in several composters, HMU did an additional door-to-door campaign after the end of the project in 2 areas where ACUs operate. They did measurements before and after the new awareness raising campaign and they found that after the campaign, there was a clear improvement in the use of the composters, in terms of both quality and quantity. The partners concluded that repeated awareness raising campaigns are needed for effective sustainable waste management approaches.

Picture 4: The ACU content 'before' and 'after' the awareness raising campaign
Photograph by I. Louloudakis (HMU), 18 April 2022

Municipality representatives were concerned about the neighborhood composters, as improper separation by the users is a frequent challenge, and with the human resource capacity of the Municipality, more frequent monitoring of the composters or awareness raising campaigns are not feasible. Furthermore, they saw a competitive relation between the brown-bin system, which is promoted in Municipalities in Greece, and the neighhborhood ACUs.

Twenty-five (25%) of the originally distributed home composters are being used. Data collection from them is scant as their use depends significantly on the users (e.g. responsiveness to partners' calls when the battery of the monitoring device needs recharging).

4. Communication

Project results were communicated with several presentations at a couple of international conferences (CORFU 2022, 9th International Conference on Sustainable Solid Waste Management, June 15-18, 2022; Retaste 2022 conference, October 20-21, 2022), as well as through a couple of scientific publications.

3. Generated knowledge - Lessons learnt and recommendations

The legacy of this project includes several lessons and recommendations regarding both the food waste sustainable management and the process of implementing such innovative projects.

1. Changing behaviours and social practices

The sustainable management of food resources and the reduction of food waste requires source separation. However, source separation is a challenge that is frequently faced in the Greek (and not only) context. Incentives, especially financial ones, may be useful to assist people to separate and reduce food waste, as well as to prompt market players, such as supermarkets, participate more actively in relevant efforts. Furthermore, digital tools aiming to support users to efficiently plan their food purchases and consumption can help food waste reduction. However, implementation from above can bear only temporary results. It is most important to change attitudes, and this takes systematic effort starting from early on in the educational system, as well as continuous awareness raising campaigns, at least until the new required social practices for the transition to sustainable food systems get widely adopted. As project partners indicate, nothing compares with the effectiveness of communication in the field, with hands-on experiential activities, personal communication, etc.

Picture 5: Students visiting the ACU at the Hellenic Mediterranean University
Photograph by I. Christoforidi (HMU), 29 March 2022

2. Involving people and stakeholders

The municipal authorities' collaboration with local citizen groups that are active significantly contributes to people's effective involvement in and uptake of initiatives for alternative food resources/waste management methods. Thus, it is worth for the Municipality to dedicate time and effort to identify people that are interested in food waste reduction and alternative management and to then establish ways of involving them as equal partners and of regular communication with them.

3. Bioplastics from food waste

The bioplastics pilot proved to be scientifically and technically challenging as it was a very innovative initiative, and the transfer from laboratory work to the pilot level is a qualitative jump. The challenges were overcome with the dedication of the scientists and other involved partners, ESDAK's knowledge of the workings of public administration as well as their problem-solving approach, the effective collaboration between UoC, ESDAK and ENVIROPLAN (i.e. three partners each with different expertise and a different profile), and ESDAK's willingness to use own funds for the operation of the bioplastics pilot unit after the project end date.

For future efforts to enhance bioplastics production from food waste, other municipalities or interested parties should know that:

- Bioplastics production is a demanding process that requires continuous scientific support. In the A2UFood, the UoC lab produced the microorganisms for the bioplastics pilot operation and performed the required regular checks.
- It is good to plan more automations in such a unit. For example, in the context of the A2UFood, when the unit was in operation, the pH had to be checked every 3 hours.
- As the project did not manage to produce bioplastic, a financial feasibility study was not performed. This is needed before an upscaled application is undertaken. It appears that a subsidy of the initial investment costs of such a plant is needed for it to be considered a financially attractive investment.

4. Pilot innovative projects and public administration

Municipalities are intricate entities, involving political and administrative personnel, being guided by a tight system of regulations, and being organised in a rather compartmentalised way. As a consequence, they often face challenges in terms of their operational effectiveness and flexibility. In this context, the following points have been identified as

significant:

- Political will from the side of the Municipal government and flexibility in the public administration are prerequisites for the short and long-term success of the project idea.
- Licensing and tendering are frequent challenges for pilot innovative projects, as these are treated as regular projects. Consequently, public administration personnel often have difficulty categorising them and deciding which legal requirements apply. Central governments (certainly in Greece) should consider special provisions for pilot projects in order to render them feasible.

4. Conclusion

This project faced significant obstacles in its implementation (from the pandemic, to delays and some insurmountable obstacles in terms of licensing or tendering, to difficulties in identifying proper sites for some of its activities); however, it has left a significant legacy, opening new ways of thinking about approaches of dealing with present environmental challenges.

It is interesting to note that the project, despite of the obstacles faced, achieved its objectives to one degree or another in terms of its environmental and technical dimensions (like development and implementation of the digital tool FoodSaveShare for the public and the RESOURCEMANAGER-FOOD (RMF) tool; installation and operation of the ACUs and home composters; installation and operation of the bioplastics pilot unit). The main failure of the project relates with the primarily social activities, i.e. the 2nd Opportunity Restaurant. This is worthy of reflection in this type of environmental projects and inside the A2UFood project team.

1. Integrative / Holistic Approaches needed and promising

What I found very attractive, and still consider promising, in this project was its really integrative character: not only in terms of an integrated environmental approach to food waste management – i.e. reduction, utilisation of unused food, composting – but also in terms of integration of environmental and social concerns related to food.

This was a rather challenging approach, leading to a real need of cooperation across boundaries, like public – private sectors, civil society – public authorities – scientists, different departments of the Municipality. The partners nicely 'packaged' different elements of this approach in the project, in order to make them feasible. In addition, a diverse partnership – including the Municipality, ESDAK – a semi-public body with knowledge of the public administration processes but also freer in its regulatory framework, universities with expertise and experience in different aspects of the project and relevant projects, and a private environmental consulting company – contributed to the project based on their individual expertise and strengths. This allowed for the independent development of different parts of the project, but also integration amongst them.

Although the project did not fully achieve its objectives, it has set an example for this needed new integrative approach, revealing the challenges – especially in the simultaneous pursuit of environmental and social goals – and some possible approaches.

2. Approaches that are well-rooted in Local reality and Local people

Despite some general trends and similarities, each context is unique and poses special challenges. Place-based approaches, which are well-rooted on an in-depth understanding of the local context and a realistic assessment of the opportunities and obstacles it poses, are needed. These approaches should build on the strengths of the local community.

Even more significantly, close connections among local institutions and people are fundamental. In the A2UFood project, it was helpful that most of the partners were local, with knowledge of the local context and vested interest in its enhancement. Furthermore, as the partners themselves indicated too, collaborations with other – external to the project team – interested local parties and groups of active citizens can be a key to the success of a project. In A2UFood, the collaboration with Chalkiadakis Super Markets and the Citizens' group at Agios Yannis contributed significantly to the achievement of project objectives.

3. Proper project coordination and communication

Innovative projects aiming to reduce-reuse-compost wasted food require integrative approaches. In this context, a tight coordination of the project team and among the different departments of the responsible municipality is fundamental. This also depends on continuous and effective communication internally – among project partners – but also between municipal departments that are called to contribute to the effective implementation of the project idea and

plan. As public administration is organised in a fragmented manner, it is very useful to establish some interdepartmental body (as was done in this project) that can bridge the different Municipal departments' perceptions and priorities for the benefit of the project but also take responsibility for such integrative efforts.

4. Commitment - Ownership

Commitment to the project and its main idea is fundamental for the success of such projects, and the overcoming of inevitable obstacles. It is important that the whole team shares this commitment to the same goal and objectives. Sometimes, this may not be the case from the beginning; different members of the project team may have concerns or qualms about the idea or the project's feasibility, as the benefits of an innovation are often not obvious from the start. This may be expected when different aspects of the issue – e.g. environmental and social – are targeted, thus implying the involvement of different departments or bodies with quite different thematic concerns. It is important that the team consciously works from the very beginning to build this shared sense of ownership among all the partners, via proper and regular communication.

But it should be emphasised that what is needed is a commitment not simply to the project, but most importantly to its vision; such commitment can carry through such efforts beyond the project end date. Also, long standing commitment and a sense of ownership is needed from the Municipal authority as a whole, not only the Municipal government that initiated the project. Such a commitment can mobilise needed resources (e.g. personnel, with appropriate incentives) to continue the project's efforts after its end date.

The bioplastics pilot unit in this project is a good example, where the A2UFood partners have recognised its importance and have contributed own funds and human resources to continue it after the project end date, with the aim to obtain useful scientific and demonstration results. Furthermore, the Municipality of Heraklion has repeatedly stated its commitment to the 2nd Opportunity Restaurant and their intention to implement it, now that the studies for it are ripe. Given the present inflation in the prices of food stuffs and the rising concern for food insecurity, this may be a very opportune time for such an effort as well as for further mobilisation of local residents to participate in the effort to reduce their food waste.

5. Funding

Funding is always a challenge for such innovative 'risky' investments and public authorities rarely have sufficient funds. Thus, the continuation of such projects often depends on EU or government financial support, although Public-Private Partnerships have been repeatedly discussed. For innovations to be taken up as regular practices, it is good for the foreseen financial support to cover not only infrastructure acquisition but also operation and maintenance, and where possible not only within the lifetime of the project but also beyond its end date (something that requires additional budget flexibility). Funding the operation of innovative approaches for food waste reduction and alternative management can be connected with the landfill tax, a Pay As You Throw system or other similar schemes. With the recent Greek law which opened up possibilities for such financing approaches, this time period may be very opportune in Greece.

6. A reflection on the Greek context

Especially for the Greek context, where trust to public authorities is lacking and the civil society has been shattered in almost 15 years of crises, public authorities striving to introduce new and more sustainable approaches to food waste (and not only) should work to cultivate trust among the public as an important element of such efforts. This requires continuous meaningful communication with local people, and open collaboration with local groups as equal partners in discussions and decision making.

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