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Summary of pilot workshops of bio-based job opportunities creation

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[1] PU = Public
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Summary

The UNLOCK project aims at unlocking a feather bioeconomy for keratin-based agricultural products. The overall objective is to contribute to replacing fossil-based raw materials with bio-based, renewable material by valorizing current unused and underused by-products of poultry processing.

As part of Pan-European process of developing feather-based bioeconomy clustering, the UNLOCK project has designed activities aimed at fostering new, sustainable and high-tech job opportunities in the bio-based sector.

This deliverable includes a summary from the preparation and celebration of two pilot participative workshops that were organized in Poland and in Spain between October and November 2024.

Based on practical experiences gained during the UNLOCK implementation, the events were organized in participative, agile and interdisciplinary way, gathering also insights and outcomes from other UNLOCK communication and dissemination activities, as well as from UNLOCK networking activities.

The first pilot workshop *Startup your bio-based business!* took place in Poland as part of feather-bioeconomy clustering in Poland. It was organized for young entrepreneurs, including farmers, willing to start or re-shape its current business into a bio-based one. It took place between 17th-18th of October 2024 in the city of Radom (Mazovia region). The second workshop - *Local Bio-based Leaders* – was aligned with feather-bioeconomy clustering and organized on 22nd of November 2024 in the IES Albayzin Institute in Granada in connection with the UNLOCK Spanish Roadshow in Spain.

In total, both events gathered 31 participants and its execution was closely interconnected with clustering activities implemented in Poland, Spain, France and Europe. Having in mind the dynamic and ongoing UNLOCK clustering process, more similar activities are planned to be organized in the near future remotely for PhD students, startups and entrepreneurs.

Disclaimer

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1. Introduction

The European poultry sector produces 3.6 million tons of waste feathers annually, mainly valorised in low added value products. In line with EU Bioeconomy strategy, the UNLOCK project aims to transform this waste into valuable raw material to create a new sustainable value chain.

UNLOCK is led by CIDETEC and driven by a well-balanced consortium of 15 partners that covers the whole value chain, from feedstock and supply chain analysis to processes, end-product fabrication and sustainability assessments.

The main objective of the UNLOCK project is the design and demonstration of an economically and environmentally sustainable supply-chain for a feather-based bioeconomy which will generate innovative bio-based functional materials for agricultural applications.

The initiative is working on the creation of bio-based products for agriculture, such as:

- Seed trays
- Mulch films
- Hydroponic foams
- Nonwoven geotextiles

And to do it, is using three different technologies for feather treatment:

- Mechanical grinding
- Steam explosion
- Microbial fermentation.

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2. Objectives

The UNLOCK pilot workshops were organized as part of the communication, dissemination and exploitation activities organized within the UNLOCK project to foster new job opportunities in bio-based sectors.

The main objectives of the workshops were to trigger new job and business and to:

- to raise awareness on UNLOCK project within participants, showcase innovative solutions and work together on their applications in agriculture and other potential sectors;
- to provide young entrepreneurs and potential innovators with knowledge and tools necessary to transition their businesses into bio-based models.
- to foster an interactive learning environment using dynamic tools that encourage participation and collaboration among attendees
- to connect participants with industry experts, potential investors, and other stakeholders in the bio-based sector, facilitating future partnerships and collaborations.
- to enable attendees to explore UNLOCK solutions and develop actionable activities, also using digital and deep-tech technologies tailored to their specific business contexts in the bioeconomy.
- to interact directly with current and future stakeholders to explore technological, project and business cooperation opportunities.
- to cross-fertilize with projects and initiatives related to circularity, sustainable innovations and bioeconomy developments to discover new areas for collaborations.

With a pragmatic approach of showcasing the potential of feathers to foster circularity in agriculture, the workshops contributed to raise awareness and support preparing the ground for market uptake of feather conversion technologies and new products. Its format, approach and methodology were designed in in accordance with the UNLOCK stakeholder engagement strategy to ensure a collaboration spaces for diversity of innovation actors to interact, learn from each other and create or discover new knowledge, technology, products and services along the bio-based innovation process. They also included cross-cluster cross-fertilisation perspective to generate interlinks and synergies between different projects, initiatives and networks that can support promotion of circular innovations and releasing the potential of feathers to create feather-based bioeconomy. Having in mind those interconnected axes, the format of the events, venue and participants was motivated to bring added-value to UNLOCK´s project, partners and stakeholders and contribute to boosting feather-based industries clustering activities and further uptake of UNLOCK´s developments.

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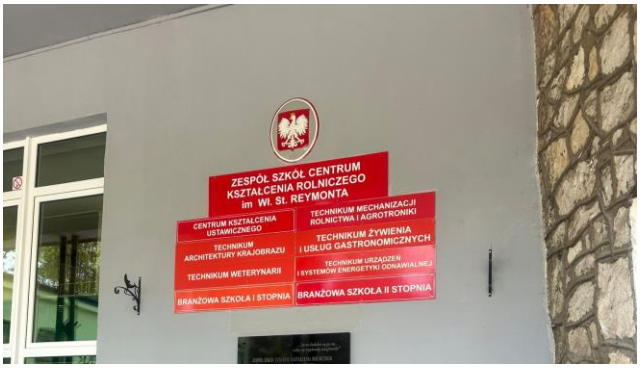
3. Implementation

Both pilot workshops were led by UNIMOS in collaboration with project partners, especially in terms of providing samples and information about UNLOCK solutions.

Startup your bio-based business!

The first workshop ***Startup your bio-based business!*** was organized at the Władysław Stanisław Reymont Agricultural Complex of Institutes led by Ministry of Agriculture and Rural Development and located in Poland, in the city of Radom. The center is also located in the zone where AgroBioCluster coordinated by UNIMOS performs variety of activities for research, innovation and internationalization and closely collaborates with quadruple helix stakeholders.

Figure 1. Picture of the venue in Poland



The complex offers interdisciplinary vocational education and training in areas connected with the UNLOCK project, such as:

- Agricultural mechanization and agritech technician;
- Technician of renewable energy devices and systems;
- Landscape architecture technician;
- Veterinary technician;
- Mechanic - operator of agricultural vehicles and machines

The teaching and practical courses emphasize UNLOCK complementary sectors and the availability of experimentation fields provides a space for its students, as it features hands-on installations that allow them to experience agricultural techniques on test farmlands. In these spaces, it is possible to practice seeding new plantations and work with advanced farming equipment and heavy machinery.

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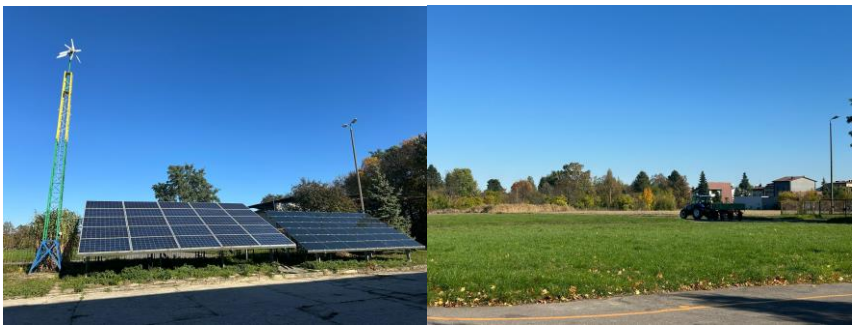
Figure 2. Experimental fields in Poland



This approach adds value, as it also builds a ground for potential further collaborations in conducing pilots with UNLOCK solutions, enabling students to explore the possibilities of applying in agriculture novel and innovative products offered by the project.

The center primarily serves young farmers who seek education to be applied in the future to farming, cultivation, and the agricultural industry. Its students come from urban and rural zones, including young farmers already engaged in family businesses and are interested in new materials, trends and bioeconomy development directions. That way the profile, scope and participants align perfectly with the objectives of the UNLOCK project.

The organization of the pilot workshop was also closely connected with two UNLOCK networking events, especially the one organized in Warsaw during Mazovia Development Forum and gathered representatives from traditional and high-tech sectors, as well as cluster, academic, industry and policymakers.

The workshop was held in Polish and the agenda of the workshop included the following components:

1. **Introduction to the UNLOCK project and showcasing of the UNLOCK solutions as examples of feather-based bioeconomy innovations.**

During the presentation, the participants were informed about the UNLOCK objectives and multidisciplinary project consortium involved in the development of technologies used in the transformation of feathers into new circular economy products with increased added value. Participants were provided with promotional materials, leaflets and project samples such as: seed trays, mulch films, hydroponic foams and nonwoven geotextiles to get familiar with real examples of bioeconomy innovations.

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2. **Division in groups and facilitation of highly co-creative dynamics of the practical implementation of UNLOCK solutions on agriculture farm**

After the introduction, participants were engaged in dynamic session conducted using agile and design thinking techniques and interproject synergies. Dedicated canvas and materials prepared in advance were distributed and participants were divided into smaller teams. The task consisted in familiarizing them with showcased UNLOCK samples, analyse their potential in cultivation and agriculture farms and work together on finding possible solutions and applications of the UNLOCK products in farm development. Attendees were also asked to provide examples of possible benefits and challenges faced in the introduction of UNLOCK solutions in current agriculture practices.

3. **Flash pitches, discussions and reflections**

At the end of the session, each group's representative delivered an elevator pitch presenting their results. In most of the cases, participants highlighted that UNLOCK solutions might have an advantage over fossil-based plastics by providing to the soil additional nutrients and microelements. Additionally, they provided insights about current practices used in farms and other issues related to introducing UNLOCK solutions. Key factor mentioned were pricing issues and potential resistance in innovating coming from elderly farmers who are not familiar with novel and bio-based solutions.

Lessons learned

The organization of the workshop highlighted the strong potential of unlocking job and business opportunities taking holistic, interdisciplinary approach to the treatment technology, bio-based innovations and local agriculture environment.

There is a genuine interest in getting access to knowledge and information about the newest solutions and there is a need to boost cross-sectoral awareness in form of a hands-on activities. Cultural perceptions and different mindsets between different generations of farmers, familiarity with bio-based products and economic considerations are factors to take into consideration in the further uptake of UNLOCK solutions.

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Figure 3. Dynamic session in Poland

Vocational schools are versatile spaces to promote hands-on trainings, develop workforce programmes, boost dual education, build partnerships with industry, policymakers and academia and also equip students with the necessary skills to contribute to bio-based industries. Introducing feather-based products through workshops and demonstrations can increase familiarity and build trust in new solutions, while clear examples of successful implementation and profitability can enhance acceptance.

Local Bio-based Leaders

The second workshop ***Local Bio-based Leaders*** took place on the 22nd of November 2024 and was held at the IES Albayzin Institute in Granada, Spain. The centre offers professional formation in many fields, including life sciences and biology and has been actively participating in COSME-EU funded projects identified in the UNLOCK Stakeholders Mapping.

Moreover, it has many collaboration agreements signed in the field of agriculture, bioeconomy and digitalization and is open for collaborations in the field of twin transition.

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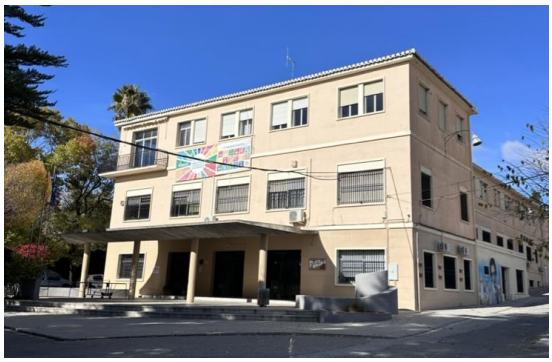
Figure 4. Picture of the venue in Spain



IES Albayzin also counts with another important feature for the UNLOCK project - experimental cultivation garden in which different solutions for the agriculture can be explored, tested and put into practice. It's been collectively developed, have compost and is offering hands-on learning, boosting environmental awareness among teachers, students, parents and stakeholders, as well as teamwork and responsibility in maintaining the garden. Before the workshop, the onsite visit took place, and it was led by Institute´s Director with the goal to explore possibilities of further collaborations and to compare currently used fossil-based products with UNLOCK solutions.

Figure 5. Experimental garden in Spain

The workshop was organized in connection with the UNLOCK Spanish Roadshow that took place within AgriTech Expo in Malaga between 26-28 November 2024 and took into consideration recent II Congress of Artificial Intelligence in Granada that gathered many of the UNLOCK current and potential stakeholders, representing agrifood, digital, deeptech and connected sectors identified in the stakeholders mapping.

The event was oriented on professional formation students, potential entrepreneurs and innovators willing to explore the combinations of bio-based innovations with new digital technologies, as well as work together on potential applications for UNLOCK solutions and their end-users.This way, the event was aimed at fostering new job and

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business opportunities, increasing awareness on biosolutions and integrating UNLOCK processes and new materials digital technologies.

The workshop was held in Spanish and the agenda of the workshop included the following components:

1. **UNLOCK samples exhibition**

A small exhibition showcasing UNLOCK samples and dissemination materials was organized to facilitate a better understanding of the transition from fossil-based products to bio-based alternatives. This approach aimed to raise awareness by providing tangible examples of UNLOCK innovations, serving as a platform for participants to engage directly with the materials. By allowing attendees to see, touch, and understand the benefits of bio-based products, the exhibition reinforced the potential of these solutions to enhance sustainability in agriculture. It also encouraged first discussions about the importance of shifting perceptions and increasing acceptance of bio-based technologies among farmers and the wider community. Through this hands-on experience, the initiative sought to elevate awareness, foster curiosity, and inspire action towards sustainable practices and business.

2. **Introduction to the UNLOCK project and showcasing of the UNLOCK solutions as examples of feather-based bioeconomy innovations.**

Similarly to the first workshop, participants were then introduced to the UNLOCK project, its consortium members, challenges identified, and technologies used to convert them into new and added-value products. Tangible examples of seed trays, hydroponic foams, non-woven geotextiles and mulch films were showcased together with different treatment technologies used by project partners. Special focus has been put on triggering new business and job opportunities from applying circular mindset to maximize the use of resources, minimize waste, and convert underutilized resources into valuable assets. Additionally, raising social awareness about innovative bio-based products and emphasizing the importance of reducing fossil-based materials in agriculture through the implementation of interdisciplinary strategies drawn from new technologies to creating biodegradable products.

3. **Agile and collaborative approach of working with new technologies on potential applications of UNLOCK solutions**

For the Spanish workshop, a dedicated methodology has been designed and implemented. It consisted in five steps approach to work on selected UNLOCK solutions in smaller groups, while fostering agile interactions. To do so, a dedicated

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canvas was prepared and printed to effectively work in dynamic groups. It contained following five phases:

1. Selection of the UNLOCK solution to work on
2. Creative ideation using Crazy 8 techniques combined with AI solutions
3. Analisis of the pros and cons of potential solutions
4. Selection of the final solution
5. Preparation of a flashpitch and its presentation

and collective reflection and feedback at the end. The methodology and canva were then used in the dynamic session.

4. Dynamic collaborative session connecting human-and-AI-driven ideation

Participants were divided into two groups and were asked to select one of the UNLOCK solutions. Then, a creative ideation session using the Crazy 8 technique began, consisting of ideating eight potential applications for the selected UNLOCK innovation, especially in agriculture. Working in smaller groups benefited student participation, as they could cover a greater number of topics and ideas while holistically targeting the use of UNLOCK products and materials in agriculture, construction, and other sectors. Following this, students were asked to consult AI tools to generate additional ideas for further comparison.

Next, an analysis of the pros and cons of the potential solutions took place, comparing human-ideated and AI-ideated possibilities, which allowed participants to examine their benefits in relation to commonly used plastic materials. Throughout the workshop, students emphasized the practical applications of the materials provided, always considering innovation and collaboration to develop high-quality solutions. Each group was then tasked with arriving at a final solution based on their discussions.

As a concluding activity, participants were asked to prepare a flash pitch—presenting their idea in 10 words to the entire audience—and discuss it with their peers, fostering a collaborative learning environment and encouraging constructive feedback. Each group selected a leader to present the results of their collaborative efforts and elaborate on them, with a particular focus on the necessary steps for implementation.

5. Lessons learned

Young generations, especially Gen Z and Gen Alpha (students and PhD candidates), are digital natives, environmentally conscious, and interested in learning through real-life examples. Participants generated at least 30 potential applications of UNLOCK solutions in an agile, time-limited, and participative manner, selecting two as the most

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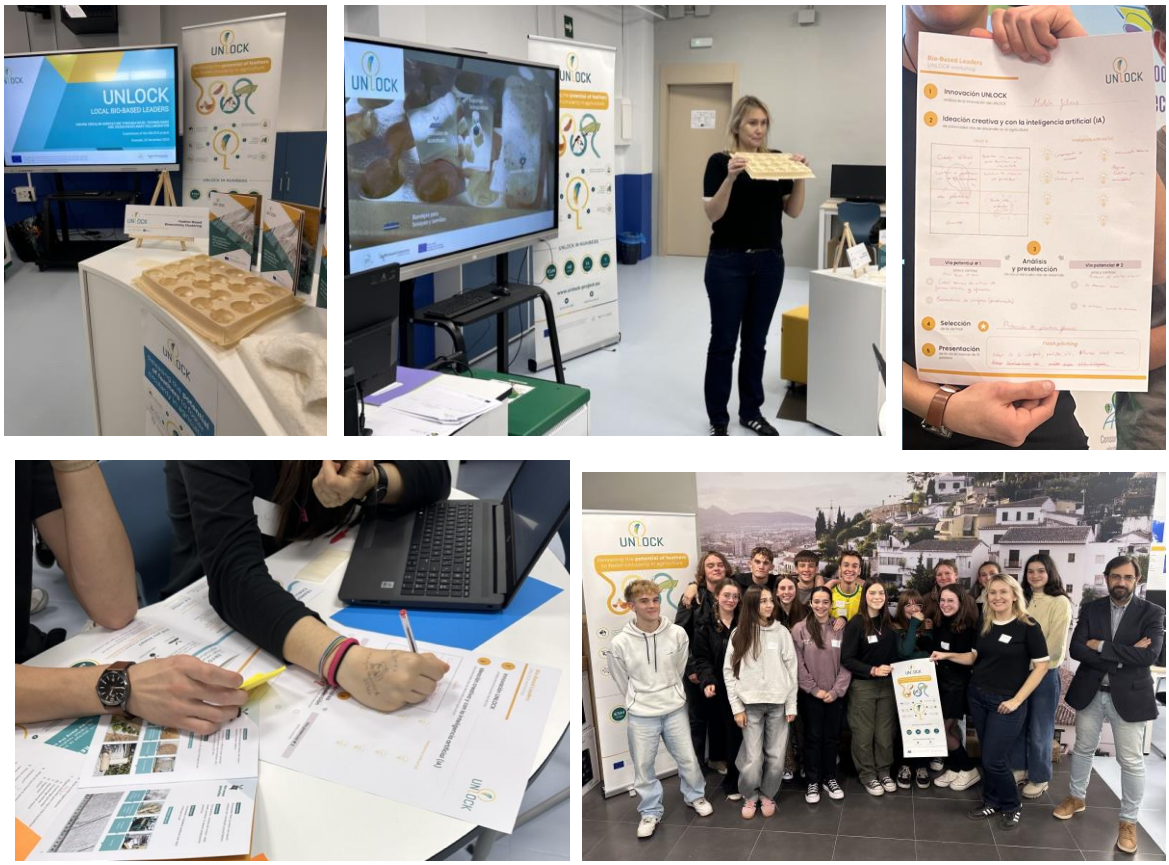
promising: biodegradable mulch films and non-woven geotextiles for the protection of young plants.

Figure 6. Dynamic sessions Spain



They highlighted the learning experience of combining human ideation in teamwork with AI ideation, characterized by speed and diverse suggestion capabilities. Transitioning from fossil-based to bio-based solutions can be significantly accelerated by the facilitated use of digital technologies (including AI).

4. Conclusions

The main objective of the pilot workshops organized within the clustering activities led by UNIMOS was to foster new business and job opportunities based on experiences, solutions, and possibilities developed during the implementation of the UNLOCK project. These events also aimed to educate participants about the potential of new bio-based solutions and products developed by the consortium members of the UNLOCK project.

The first workshop focused on exploring potential applications of UNLOCK solutions in agriculture through a hands-on and interdisciplinary approach, aimed at fostering new

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entrepreneurial opportunities. In contrast, the second workshop sought to disseminate the experiences of the UNLOCK project in promoting circular agriculture through novel technologies and cross-disciplinary collaboration.

Both workshops placed a special emphasis on actively engaging over 30 participants and stimulating holistic and innovative thinking around sustainability, the circular economy, and the bioeconomy. The chosen approach encouraged agile and dynamic interaction, combined with agile methodologies, to collectively work on real-world innovations applicable in agriculture.

It was observed that, in both Poland and Spain, although educational and research institutions are recognized as key places for knowledge production and innovation, there is a need to purposefully expand collaborations between education and industry. Better integration of educational and research institutions with industry and other innovation actors is essential in order to provide access to real-world cases that can serve as teaching material and inspiration for new business development among young people, entrepreneurs, and innovators. Building cross-sectoral bridges and orchestrating collaborations is needed to stimulate entrepreneurship development and foster new job opportunities in bio-based sectors.

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