TECHONEY

Development of a **blockchain-based ecosystem** that allows an **improved positioning of small producers of honey** on local and international markets

DELIVERABLE

D7.3.3 Aggregate report on events and conferences presence

DUE DATE OF DELIVERABLE	30.October.2025 (M42)
START DATE OF PROJECT	01.May.2022
DURATION	42 months
LEAD PARTNER FOR DELIVERABLE	INAT
DISSEMINATION LEVEL	PU (Public)

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Funded by the European Union

DOCUMENT CHARTER

TITLE BLOCK

PROJECT	PROJECT FULL TITLE	DEVELOPMENT OF A BLOCKCHAIN-BASED ECOSYSTEM THAT ALLOWS AN IMPROVED POSITIONING OF SMALL PRODUCERS OF HONEY ON LOCAL AND INTERNATIONAL MARKETS		TECHONEY
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		SECTION 2	Multitopic 2021	
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		TYPE OF ACTION	"Research and Innovation Actions (RIA)"	
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	FILENAME	TECHONEY-D7.2		
	ABSTRACT OF THE DELIVERABLE	The purpose of this deliverable is to provide a comprehensive summary of the communication and dissemination activities carried out throughout the entire duration of the TECHONEY project (M1–M42). Deliverable D7.4 forms part of WP7 and is associated with Task 7.2. This report outlines the main activities and impacts of the communication and dissemination actions implemented by all project partners between May 2022 and October 2025, in line with the Grant Agreement. The activities are presented by partner, communication channel, and country. As in the first reporting period (D7.2), the main communication tools used included:		

- The project website and online news updates
- Social and digital media posts (Facebook and LinkedIn)
- Presentations at conferences and public events
- Workshops and stakeholder meetings

Over the full project period, partners consolidated and expanded the visibility of the TECHONEY project, strengthening engagement with key stakeholders across research, industry, and policy. These sustained efforts significantly enhanced the project's visibility, ensuring that its results, innovations, and lessons learned were effectively disseminated and made accessible to the relevant audiences.

The main achievements during this period include a solid and growing network of stakeholders actively involved in the project's activities, co-creation processes, and validation of its outcomes. The coordinated communication and dissemination efforts have contributed to maximizing the project's reach and long-term impact.

VERSION TRACKER

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3	Tiziana de Magistris	CITA	30/10/2025	FINAL
4				

STATEMENTS

ORIGINALITY

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PROJECT ABSTRACT

TECHONEY project's main objective is to identify strategies and establish lines of resilience to the new challenges determined by the COVID-19 pandemic for beekeepers in the Mediterranean (Med) agricultural systems through the implementation, definition, enhancement and transfer of competitive, profitable, efficient and trustful honey supply-chain alternatives that address beekeepers' capacities and attractiveness to fulfil consumer needs on unexpected food market changes.

TECHONEY project proposes the development of a **traceability system to guarantee the quality and safety of honey within the supply chain** for more effective communication to consumers and to strengthen access to different markets (e-commerce, direct sales, etc.). This approach will be unfolded by the joint creation of two levels of interaction: **[1]** physical: characterization of honey; **[2]** "living laboratory": creation of a *Honey Community Living Lab* (**HCLL**) and a *Honey Innovation and Learning Ecosystem* (**HILE**) that will be the arena to collect information from beekeepers, stakeholders, and consumers to transfer and apply the new optimized models.

TECHONEY is structured in 4 main technological pillars: **[1]** creation of a consortium IoT (*Internet of Things*) Blockchain platform that involves various actors in the honey supply chain to ensure transparency and traceability, in addition to reducing costs and ensure the traceability in the honey supply chain; **[2]** creation of a transformative learning community to ensure a smart-short-resilient shared supply chain; **[3]** characterization of the quality of honey to guarantee its traceability within the Blockchain directly by consumers; **[4]** ICT tools for honey supply chain participants and consumers.

TECHONEY will be committed not only to promote the continuation of the direct sales of honey from producers to consumers even after the COVID crisis but also **develop a common methodology and clear new optimized resilience protocol** to be used by small-scale farmers, beekeepers, smallholders as a new business model with a more efficient added-value chain, sustainable with fair profit, accepted by final consumers, which will be replicable to other food products and supply chains.

TECHONEY will **help beekeepers to**: **[1]** generate a traceability mechanism for honey produced in the Med. Area; **[2]** diversify markets and distribution channels offers business flexibility and freedom from dependence on a single market, which will reduce risk in the event of a crisis; **[3]** cooperate and pool resources among themselves (pooling of the workforce, etc.) for logistical flexibility and solidarity in the supply chain, which will also reduce the risks in the event of a crisis.

TECHONEY proposes to design and develop a **multidimensional framework** to analyse 6 full honey supply chains (farm to table) that will integrate economic, social and environmental indicators and a traceability system, with a *bottom-up* approach considering the stakeholders´ perspectives. A consortium Blockchain, coupled with IoT (*Internet of Things*), system will be created to offer real-time tracking and complete traceability of honey along the supply chain from the characterization of honey in a certified laboratory, the retailer, until the end consumer.

The characterization of the quality and safety aspects of local honey through **local certified laboratories jointly with the use of e-commerce and quality labelling schemes** will increase the opportunity for beekeepers to be identified locally and allow them to gain access to new markets (foreign markets). The implementation of e-commerce with the mobile application will enable local honey to be **better traced by consumers who attach more value to local food and local beekeepers**.

TECHONEY contributes to increasing farm profitability and increasing flexibility and risk mitigation capabilities. A shared, short and circular supply chain will allow actors in the honey supply chain to **access markets** and have **higher incomes**, **share resources and skills** and **save money** by reducing costs (economies of scale) and increase the efficiency, sustainability and flexibility of processes to strengthen resilience and flexibility to face crises and lower risks. The learning community lab and the use of the Blockchain network will secure the storing of records, will **strengthen intellectual property rights**, as well as **bring transparency throughout the supply chain**; it will **reduce frauds**, **enhance food safety** and **improve the communication** between retailers and beekeepers. The traceability system offered will also allow consumers to give direct feedback to beekeepers.

To reach the overall objective, several **specific objectives** (SO) are set out as intermediate goals:

- **SO1:** Map the current added-value chains and complexity level for honey products in six case studies (Spain, Algeria, Tunisia, Turkey, Luxembourg and Morocco).
- **SO2:** Increase the competitiveness and power of the beekeeping supply chain by understanding consumers' and retailers' opinions and acceptance through non-hypothetical methods.
- **SO3:** To promote the traceability to differentiate local honey and guarantee food safety of honey produced in the Med. area by characterizing it in a reliable, certifiable, and documentable manner.
- **SO4:** Design and explore the feasibility of a new traceability ecosystems and effective business models across different stakeholders.
- **SO5:** Development of a new "Multichannel distribution" e-commerce platform implementing new business model as well as integrating and scaling up the outcomes from WPs 1, 2, 3 and 4.
- **SO6:** Maximize outreach and beneficial influence of the project results and reach the target users (beekeepers, small-scale food manufacturers and local distributors, canteens and retailers, local public authorities) through an effectively established communication and dissemination plan, including innovative training capsules.

Moreover, a **TECHONEY** web ICT tool consumer/farmer-centred will be developed, by testing and evaluating several machine and deep learning algorithms, providing small-scale beekeepers with key information on new markets and opportunities, contributing to a better decision making and to ensure the traceability of their product. Consumers will have exhaustive knowledge of the different honeys of the Med. area, knowing their traceability from the initial producer, guaranteeing the quality and safety of each product.

TECHONEY *is a project coordinated by CITA (Spain) and funded through the PRIMA Section 2 Multitopic 2021 – Thematic Area 3-Agrofood chain – Topic 2.3.1 Increasing the resilience of small-scale farms to global challenges and COVID-like crisis by using adapted technologies, smart agri-food supply chain and crisis management tools. (RIA*[5])" under the funding scheme of "Collaborative Project" and type of Action "Research and Innovation Actions (RIA)."*

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1-INTRODUCTION

The overall objective of the dissemination and communication activities is to ensure the broad, effective, and timely dissemination of the project's results to the relevant target audiences, using the most appropriate tools and channels. Furthermore, it is essential to engage key stakeholders involved in the exploitation and market uptake of the project outcomes from an early stage, and to encourage their active participation throughout all implementation phases.

Work Package 7 (WP7) "Communication and Dissemination" is dedicated to implementing a wide range of dissemination and communication actions. These include the development of a comprehensive communication plan, the creation and maintenance of the project website, the release of press materials, organisation of webinars and newsletters, preparation of scientific publications, participation in conferences and congresses, and active engagement through social media platforms. Together, these activities aim to amplify the visibility, reach, and impact of the TECHONEY project's results.

This deliverable, D7.2, reports on the progress of the ongoing communication and dissemination activities carried out between Month 1 (May 2022) and Month 42 (October 2025). It provides details on events attended, conferences participated in, and other outreach initiatives undertaken during this period.

D7.2 represents the final report in a series of three deliverables originally planned for submission at Months 12, 24, and 36, with the final deadline extended to Month 42 following the six-month project extension approved by the PRIMA Office. Each deliverable covers dissemination and communication activities over a 12-month period, except for this final report, which summarises efforts and achievements across the entire project duration (M1–M42).

This deliverable is one of four deliverables within WP7, "Communication and Dissemination Activities," and is closely related to the following:

- D7.1: Communication and dissemination project planning tool (PU) [UMMTO]
- D7.3: Project website, logo, social media, visual identity, newsletter templates and internal communication manual (PU) [LIST]
- D7.4: Monitoring tool for communication and dissemination status reports and performance evaluation (R, PU) [CITA]

The deliverable is organized as follows: Section 1 presents the context and objectives, Section 2 outlines the methodology, Section 3 summarizes dissemination and communication results, and Section 4 concludes with key achievements and overall progress.

2-METHODOLOGY

The methodology applied in this report follows the steps outlined below.

All project partners were requested to provide detailed information on their dissemination and communication activities throughout the entire project period (2022–2025). Data collection was conducted using the Monitoring Log Excel file developed under Deliverable D7.1. Each partner completed the template and submitted it along with supporting materials such as photos, links, and other relevant documentation to INAT, the partner responsible for preparing Deliverable D7.2.

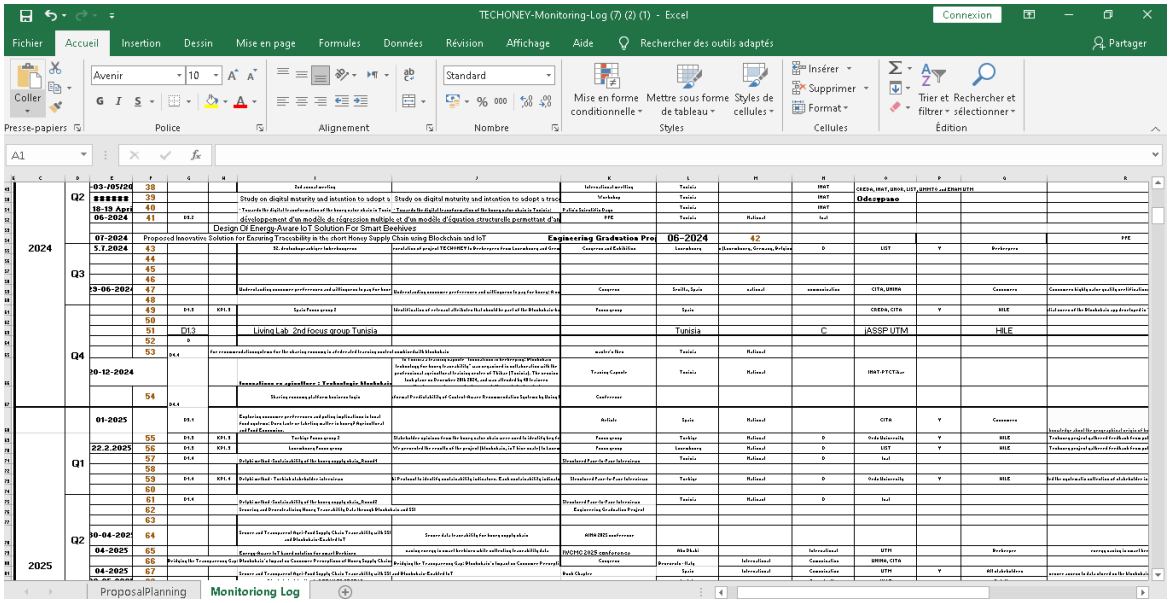

Figure 1: Excel sheet created to list the TECHONEY communication and dissemination activities

All data were organized by type, country, and date in the TECHONEY Monitoring Log and analyzed. The results of the project's dissemination and communication activities are presented in the following section.

3-COMMUNICATION TOOLS AND CHANNELS

3-1. PROJECT LOGO AND VISUAL IDENTITY

Communication materials developed in line with the Brand Guide included an information brochure, templates for PowerPoint and posters. The Brand Guide was presented by LIST to all partners, is mandatory for the creation of any project-related dissemination materials.

Figure 2 : TECHONEY LOGO

A set of templates for various communication purposes including PowerPoint presentations and posters has been developed by LIST in accordance with the TECHONEY visual identity and logo.

Templates are essential tools to ensure a coherent and recognisable visual identity for the TECHONEY project across all communication and dissemination activities. They contribute to maintaining consistency in appearance and enhancing the visibility and recognition of the project among stakeholders and the wider public.

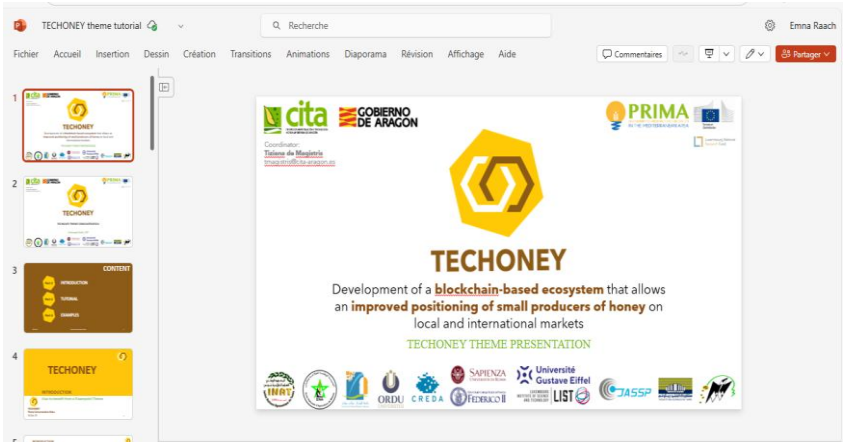

*Figure 3: Microsoft PowerPoint themes of these (*.thmx / *. potx)*

3-2- Official Website

LIST developed the project's official website using the Typo3 Content Management System (CMS). The website is hosted and maintained by LIST and is accessible via the registered domain : www.techoney.org

The TECHONEY project website serves as the central online platform for presenting the project's objectives, activities, and achievements, while ensuring transparency and accessibility for stakeholders, researchers, and the wider public. It provides continuously updated information, resources, and interactive content to foster engagement and visibility.

The TECHONEY's website is structured around the following key sections:

- Funding and Partners: Information on the project's funding framework, supporting programme, and consortium members, including profiles and institutional links.
- Research: Presentation of the project's scientific objectives, methodology, and ongoing research activities.
- Results: Highlights of the main outcomes, deliverables, and innovations produced throughout the project.
- News: Regular updates, announcements, and articles on project progress, events, and sector developments.
- Gallery: Visual documentation of project events, workshops, and field activities.
- Contact: Contact details and a form allowing stakeholders and visitors to reach the project team.

Overall, the TECHONEY website operates as a core communication and dissemination tool, strengthening the project's visibility and ensuring that its results and insights are easily accessible to all audiences.

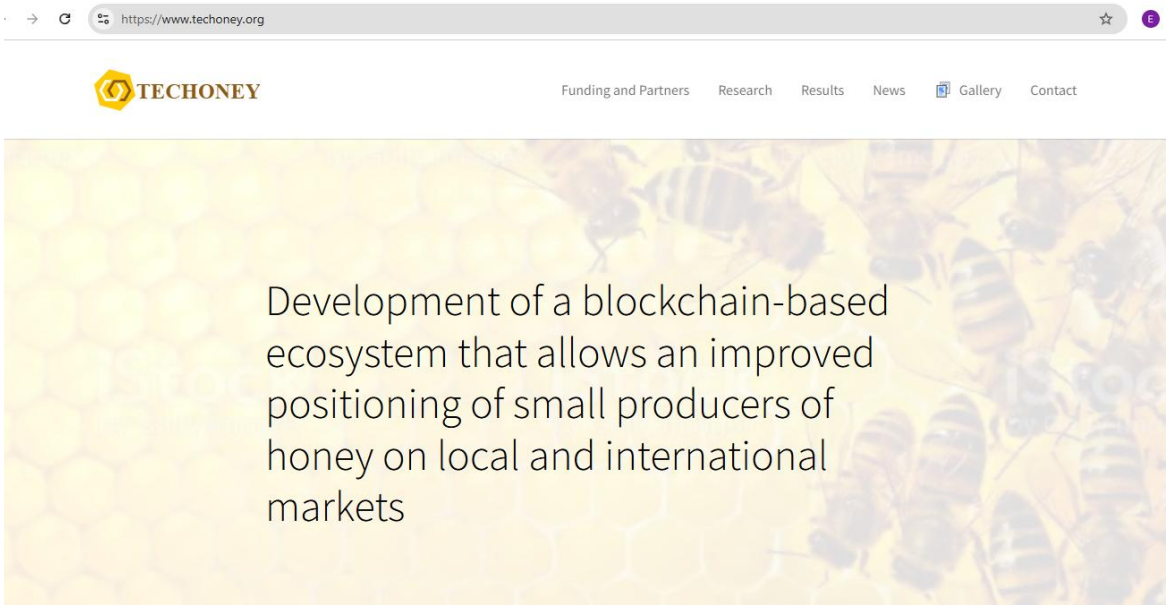

Figure 4: Screenshot of the TECHONEY website

The TECHONEY website is continuously updated to reflect the project's ongoing developments including news, publications, and downloadable materials, in order to ensure accuracy, relevance, and an optimal user experience. The platform was maintained and regularly monitored by LIST, thereby supporting the long-term visibility and dissemination of its results.

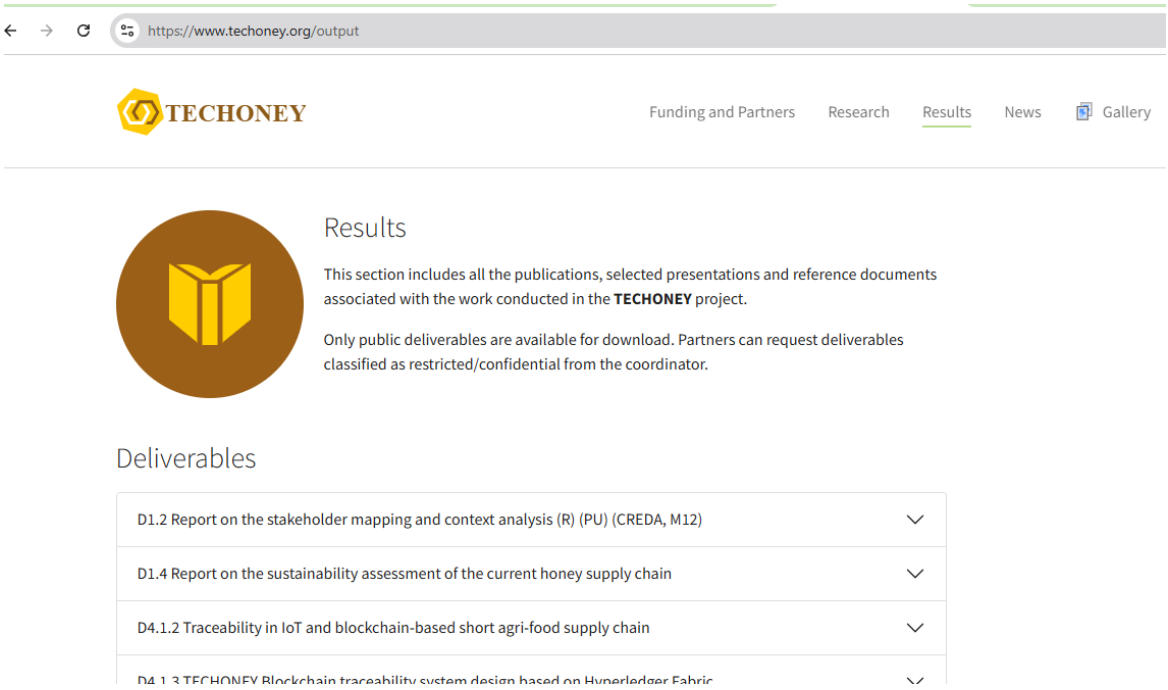

Figure 5: Screenshot of an updated section of the TECHONEY website

Website Analytics

These figures provide an overview of the website's reach and engagement up to **Month 42 (M42)**.

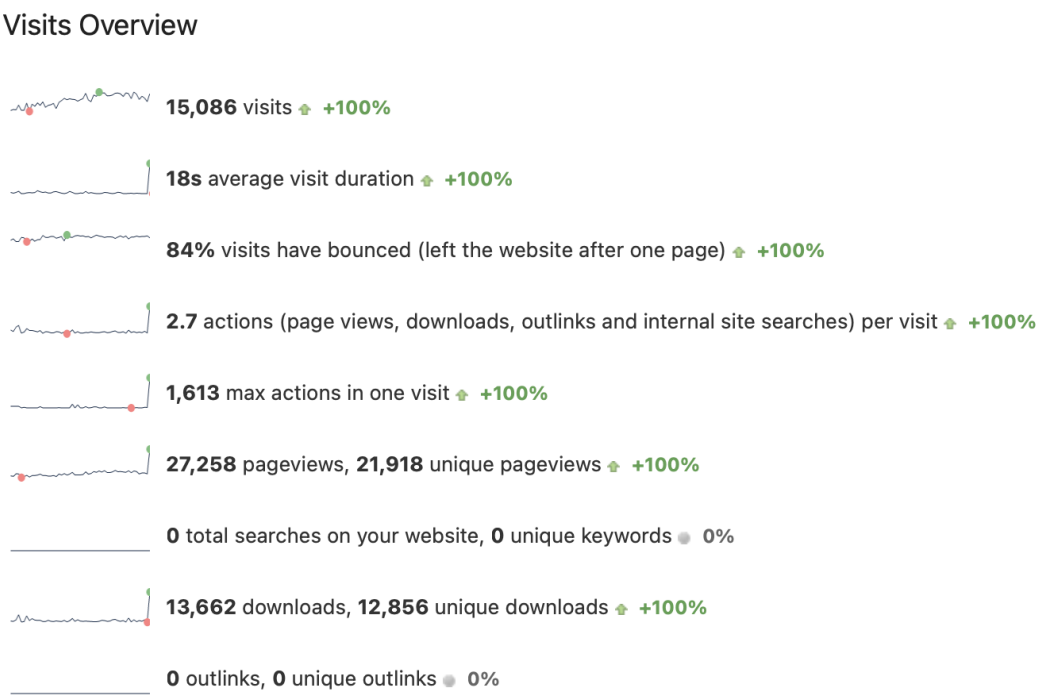

Figure 6: Screenshot of an updated section of the TECHONEY website

In addition, LIST set up a Microsoft Teams and SharePoint-based document repository to facilitate collaboration among project partners. This platform provides shared access to all presentations, deliverables, and key project documents, ensuring efficient communication and information exchange within the consortium.

3-3- Social Media

JASSP created social media Pages:

Facebook Page: https://www.facebook.com/profile.php?id=100083262554890

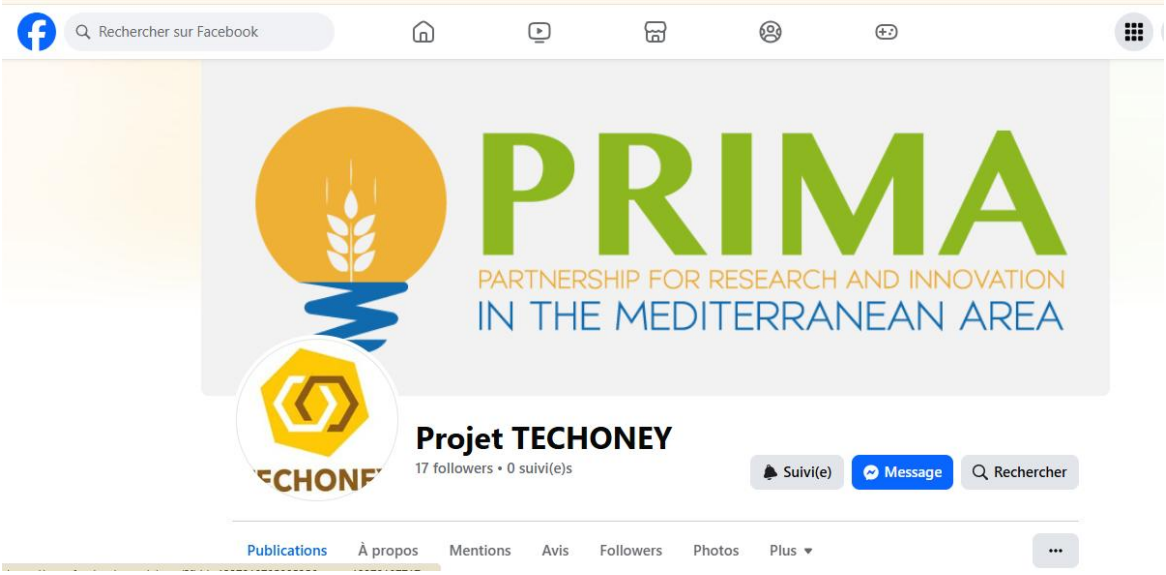

Figure 7: Screenshot of the TECHONEY facebook'profile

The project launched a **LinkedIn page** to strengthen its digital presence and connect with stakeholders across the research, industry, and policy communities.Linkedin Page: https://www.linkedin.com/company/87158906/admin/

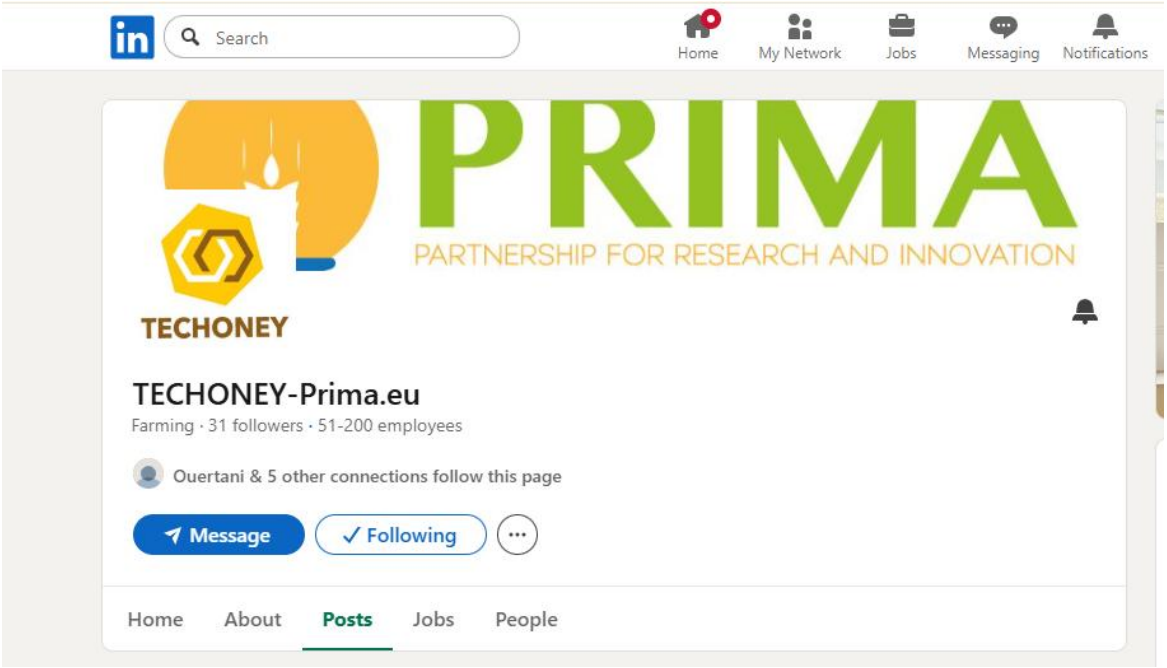

Figure 8: Screenshot of the TECHONEY LinkedIn'profile

3-4- PRINTED COMMUNICATION MATERIALS

This section provides an overview of the printed communication materials produced to raise awareness about the project and reinforce its visual identity. The materials developed included a project leaflet, and a roll-up banner.

- ***Project Leaflet:***

INAT produced two versions of the project leaflet in 2023, available in French and Arabic. The leaflet provides stakeholders and key actors with a concise overview of the project, outlining its objectives, partners, and main phases in an accessible and visually coherent format. Its content is fully aligned with the information presented on the project website and was made available in both digital and printed formats.

Figure 9: TECHONEY's leaflet (printed Arabic version)

- ***Roll-up Banner and Posters***

As part of the project's communication and dissemination materials, project partners (CITA, JASP, INAT, UNOR) designed and produced differents versions of roll-up banner and posters to ensure a consistent and recognisable visual identity for the TECHONEY project. These materials include the project logo, partner logos, the national agencies and PRIMA funding acknowledgements, the project website, and social media links.

The roll-up and posters were created to reflect the visual design and colour scheme of the TECHONEY website, ensuring coherence across all communication tools. They present key information about the project, including its objectives, partners, and main activities, through clear text and engaging visuals.

Prepared in Spanich, French and English, these materials are used to raise awareness among stakeholders and the general public. They have been displayed at various national events, including workshops, Living Labs, conferences, and project meetings, to promote the project's visibility and enhance stakeholder engagement.

Figure 10 : Example of TECHONEY rollup banner and poster.

3-5 OTHER PROMOTIONAL MATERIAL

During the implementation of the TECHONEY project, a variety of promotional items and gadgets were designed and distributed at events to enhance the project's visibility and brand recognition. These items included branded notebooks, pens, etc., all featuring the TECHONEY logo and project website.

These materials were distributed during Living Labs, workshops, and stakeholder meetings to reinforce the project's identity and promote engagement among participants.

Figure 11 CITA's focus group dissemination materials.

Figure 12: INAT's dissemination materials used during the first focus group.

Figure 13: INAT's dissemination materials used during the second focus group.

4- COMMUNICATION AND DISSEMINATION ACTIVITIES OVERVIEW (2022-2025)

EVENTS ORGANISATION

This section provides an overview of the meetings, workshops, and events organized during the implementation of the TECHONEY project. These activities were designed not only to promote and communicate the project's objectives, progress, and achievements, but also to enhance awareness and understanding of its approaches and innovations among relevant stakeholders. The activities included both internal consortium meetings and external dissemination events.

4.1. Organisation of Internal Meetings

Throughout the project, the TECHONEY consortium held several internal meetings, including four (4) annual general assemblies and regular coordination sessions. These meetings were essential to ensure effective project management, monitoring of progress, and alignment of activities among all partners. They provided a platform to discuss technical developments, administrative matters, and strategic planning, fostering efficient collaboration and decision-making within the consortium.

4.1.1. KICK OFF MEETING (Zaragoza)

The Kick off Meeting was organized on 5th and 6th of May 2022 in Zaragoza. CITA, CREDA, UNINA, ONRU, SAPIENZA and LIST attended the KOM, whereas the rest of partners will attend online because of the budget was not available or the visa was not got ontime. The event was opened on May 5 with remarks by the Executive Director of the PRIMA Foundation, Octavio Quintana Trías, and by Alberto Bernués, Director of Research at CITA.

Afterwards, the coordinator CITA briefly presented the agenda and the activities planned for the two days of the meeting. During this first day, the Project Officer of the PRIMA Foundation, Mohamed Wageih, participated, focusing on the implementation of the MEL platform for managing the technical reports of the TECHONEY project.

El proyecto Techoney arrancó en 2023 y finalizará en octubre de este año. FOTOS: CITA

'Focus group' del proyecto en las instalaciones del CITA en Montañana.

Figure 14: The Kick of meeting (May 2022-CITA-Spain)

4.1.2. First annual meeting (NAPLES)

The first annual meeting of the TECHONEY project was held from June 14 to June 16, 2023, at the University of Naples Federico II, hosted by the Department of Political Science (DiSP) in Naples, Italy. The event was organized by the University of Naples Federico II with the participation of all project partners from Spain, France, Algeria, Tunisia, Morocco, Turkey, and Luxembourg.

The main objective of the meeting was to review the progress achieved during the first year of the project, evaluate the initial implementation of activities under each Work Package,

and define common strategies for the next phases. The discussions focused on establishing clear operational guidelines for research activities, coordination mechanisms, and communication procedures within the consortium.

Over two days of plenary sessions, each Work Package leader presented an overview of the objectives, methodologies, and expected outcomes of their respective tasks. Particular attention was given to WP1 (Project Management and Coordination), WP2 (Characterization of Honey Value Chains), and WP3 (Consumer and Market Analysis), which laid the foundation for subsequent technical and demonstration work packages. Constructive exchanges between partners allowed the consortium to align timelines, clarify interdependencies, and strengthen collaborative dynamics across scientific, technical, and administrative dimensions.

The meeting gathered more than 25 participants representing all partner institutions, both in presence or online. It provided an excellent opportunity to consolidate the partnership and foster a common vision of the project's objectives. The event concluded with a guided walking tour of the historic centre of Naples, allowing participants to experience the city's rich cultural and historical heritage in a convivial setting that further reinforced networking and team cohesion.

Figure 15: The first annual meeting (June 2023 -UNINA-Italy)

4.1.3. SECOND ANNUAL MEETING (TUNISIA)

The second annual meeting of the TECHONEY project was held from May 2 to May 3, 2024, at the National Agronomic Institute of Tunisia (INAT). The event was jointly organized by INAT and the Faculty of Sciences of Tunis, the second Tunisian partner of the TECHONEY project.

The main objective of the meeting was to evaluate the overall progress of the project since the first annual meeting, which took place at the University of Naples Federico II in Naples, Italy. The discussions focused on reviewing the technical and scientific results obtained, identifying challenges encountered, and defining the next steps and corrective actions to ensure the timely completion of ongoing tasks.

Throughout the two days, partners delivered presentations and status reports on their respective work packages. Special attention was given to WP4, WP5, and WP7, which had experienced some delays, in order to define clear strategies and adjusted timelines for their implementation. Constructive discussions allowed partners to realign objectives, clarify responsibilities, and strengthen collaboration across the consortium.

The meeting gathered 25 participants representing all partner institutions, ensuring active engagement and knowledge exchange. The sessions fostered a productive atmosphere that promoted dialogue between technical, scientific, and administrative teams.

Figure 16 : The second annual meeting (INAT - Tunisia)

Figure 17: The second annual meeting (INAT - Tunisia)

By the end of the meeting, partners had agreed on a set of corrective measures and milestones to accelerate progress in the next reporting period. The consortium also reaffirmed its commitment to maintaining regular monitoring and communication through monthly follow-up meetings. Additionally, new opportunities for cross-collaboration between work packages were identified, particularly in relation to data sharing, field testing, and validation activities.

4.1.4. THIRD ANNUAL MEETING (TURKEY)

The third annual meeting of the TECHONEY Project was organized between 18 and 20 September 2025 at the Department of Economics, Faculty of Economics and Administrative Sciences, Mersin University (Türkiye).

The meeting focused on reviewing the final deliverables, key findings, and progress status of the different project work packages. Participants also discussed the preparation of final reports, the organization of the closing event, and the future possibilities for collaboration and follow-up activities.

The agenda included planning the communication materials to ensure wide visibility and dissemination of project results among stakeholders and the general public.

A total of six partner institutions took part in the meeting, with 11 participants attending in person and 4 joining online.

On the final day, the Vice-Rector of Mersin University and the Dean of the Faculty of Economics and Administrative Sciences were formally briefed on the project's scope, progress, and expected impacts. Both expressed appreciation for the consortium's contribution to the promotion of sustainable apiculture, rural innovation, and digital traceability systems within the Mediterranean context. As part of the local dissemination activities, a workshop was organized with a regional organic honey producer, providing an opportunity for field-level interaction and validation of the project's applied methodologies.

Following the meeting, a post-event evaluation survey was conducted among participants. The collected feedback was analyzed and integrated into the internal progress report to improve coordination and communication within the consortium. The meeting outcomes and key messages were subsequently shared with the public through institutional communication channels, ensuring transparency and visibility in line with PRIMA dissemination guidelines.

Figure 18: TECHONEY Final Meeting -Merson -Turkey (18-20 September 2025)

4-2- Organisation of External Meetings and Events

The TECHONEY consortium organized a range of external events aimed at engaging with different stakeholders and maximizing the project's visibility. These included a scientific conference and 7 stakeholder meetings, providing opportunities to share project results, demonstrate innovations, and encourage dialogue between the research community, industry representatives, policymakers, and end users.

4-2-1- LIVING LAB WORKSHOPS:

A particularly important activity was the Living Labs Workshop, which played a central role in disseminating knowledge about blockchain technology and the co-construction approach adopted by the project. These sessions highlighted the potential of the TECHONEY innovations to support transparency, traceability, and collaboration within the beekeeping sector, thus contributing to the broader innovation ecosystem.

Over the three years of the TECHONEY project, a total of seven (7) national and regional seminars and stakeholder workshops were organized as part of the Living Lab activities. These events took place across the four case study countries (Tunisia, Spain, Turkey and Luxemburg), ensuring broad geographical coverage and effective local engagement.

The Living Lab seminars served as interactive platforms that brought together a diverse range of stakeholders, including beekeepers, researchers, industry representatives, policymakers, etc. to exchange knowledge, share experiences, and co-design innovative solutions for the beekeeping sector. In total, approximately 200 stakeholders actively participated in these events, contributing valuable insights that helped refine the project's tools, methodologies, and technological prototypes.

The participatory approach adopted during these sessions allowed end users to provide direct feedback, fostering a sense of ownership and ensuring that the solutions developed under TECHONEY were practical, user-oriented, and adapted to real field conditions.

In addition to the technical discussions, the Living Lab meetings also served as opportunities to raise awareness about the benefits of innovation in the beekeeping sector, promote knowledge transfer, and strengthen collaboration networks between academia, industry, and local stakeholders.

Figure 19 : Second Focus Group in Spain

Figure 20: Second Focus Group in Tunisia.

Figure 21 . Second Focus Group in Turkey.

Figure 22: Second Focus Group FG2 in Luxembourg

4-2-2 - The 1st Francophone Conference on Blockchain Engineering

UTM has also organised Workshop "the Colloque francophone sur l'Ingénierie de la Blockchain (CFIB 2022)" for TECHONEY promotion, identification of the business process for information sharing and data interoperability. CFIB 2022 was organised on the occasion of the Francophonie summit to be held in November 2022 in Tunisia. This workshop was a space of interdisciplinary interactions bringing together scientists, researchers, government authorities, industry, financial operators, and regulatory authorities in a common track of invited conferences. CFIB was an opportunity to promote international cooperation undertaken in the framework of the TECHONEY project (http://blockchain.ieee.tn). The conference lasted one day and attracted around 100 participants in person from academia and industry. Four people participated remotely.

Figure 23. LIPAH Lab organisation of the 1st Francophone Conference on Blockchain Engineering on November 29th, 2022.

4-2-3. ORGANISATION OF CAPACITY BUILDING AND TRAINING EVENTS

A total of **four** capacity-building events were organized within the framework of the TECHONEY project.

Two of these events were organized by CREDA and specifically targeted project team members involved in WP1. They provided training on methodologies and tools relevant to their tasks, aiming to strengthen technical competencies and ensure a common understanding of key project activities, including the Analytic Hierarchy Process (AHP) and Delphi methodologies among the case study leaders. These sessions facilitated better coordination and consistency in the implementation of the tasks across different countries.

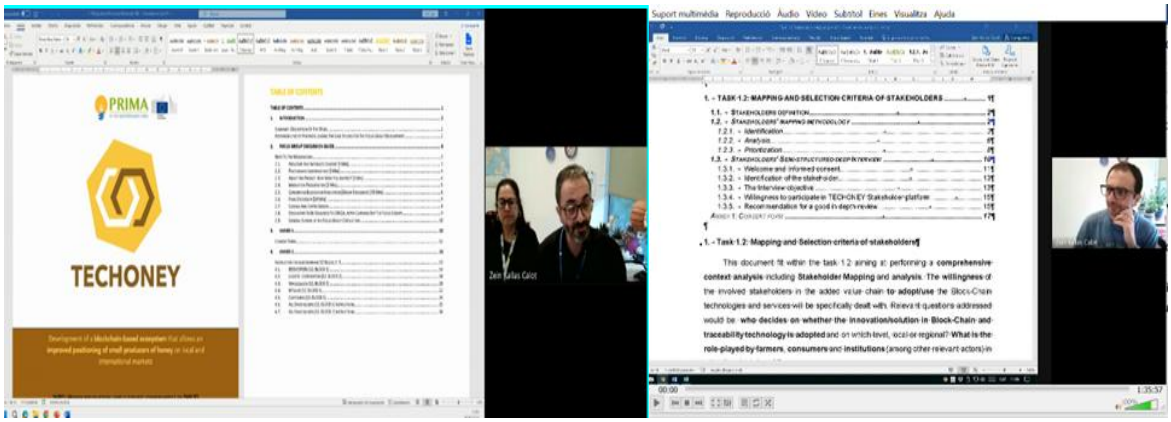

Figure 24. Internal training webinar about Mapping of stakeholders and Delphi methodology (CREDA)

The third capacity-building event was organized by INAT and targeted members of the Living Lab. The training was delivered by Ms. Raoudha Helal, an expert in honey quality control and chemical analysis from the Central Laboratory for Analysis and Studies of Tunis.

This session introduced participants to sensory analysis methods and techniques for honey, enhancing their knowledge and practical skills in this area. The main activities and outcomes of the training included:

- Assessment of the participants' ability, beekeepers and other stakeholders—to recognize and taste honey aromas.
- Olfactory differentiation exercises, helping participants improve their ability to distinguish among a range of scents.
- Comparative evaluation of four honey samples, allowing participants to identify differences in flavor and aroma profiles.

Figure 25 Training on "sensory analysis methods and techniques"

Finally, a training capsule titled **"Innovations in Beekeeping: Blockchain Technology for Honey Traceability"** was held by INAT at the Agricultural Professional School of Thibar in Tunisia, in collaboration with the Professional Agricultural Training Center of Thibar. The session was attended by approximately 36 to 40 participants, including beekeepers, farmers, trainers, retailers, students, technicians, and instructors. The training focused on introducing blockchain technology for honey traceability, sharing practical knowledge, and enhancing participants' skills in digital solutions for the beekeeping value chain.

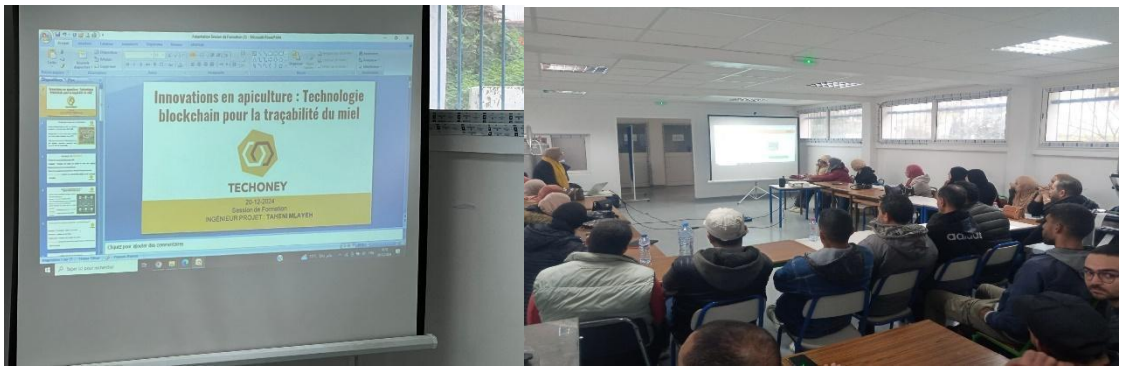

Figure 26: Training capsule "Innovations in Beekeeping: Blockchain Technology for Honey Traceability'' (20 December 2024)

5- TECHONEY PARTICIPATION IN SCIENTIFIC, TECHNICAL, INDUSTRIAL EVENTS

This section describes the different scientific and technical events, as well as trade fairs, organized by third parties, in which TECHONEY project partners participated. These events provided important opportunities to disseminate and communicate the project's objectives, activities, and results to a wide range of stakeholders.

Through participation in such events, partners were able to increase the project's visibility, share scientific findings and technological advances, and engage with target audiences, including researchers, industry professionals, policymakers, and the general public. Participation took various forms, such as oral or poster presentations, exhibitions, dedicated booths, and networking sessions.

The task leader, INAT, coordinated this activity by ensuring systematic monitoring of relevant scientific and industrial events and by informing partners regularly via email about upcoming opportunities. This coordination helped maintain a coherent and proactive approach to dissemination throughout the project's duration.

By the end of the project, the TECHONEY consortium had carried out a total of approximately **22** contributions in various scientific and professional events.

These participations can be categorized as follows:

- 17 scientific communications in 14 conferences workshops and seminars (10 international and 7 national), where partners presented research findings through oral and poster communications.

- 1 National Technical specialized workshop focused on knowledge exchange and dissemination of technological innovations and project results;
- 4 agricultural and innovation fairs (1 international and 1 national), where partners showcased project outcomes, technologies, and potential applications to industry stakeholders.

5-1. PARTICIPATION IN SCIENTIFIC EVENTS

1. REN A25 (December, 2025)	
Authors	Nadia Massoudi, À. Ajal, À, Bajoub, M.F.Ortiz, S.Ennahli
Title	1. Quality Profiling and Volatile-Biochemical Characterization of Mediterranean Honeys from Diverse Regions
Congress	International Congress on Natural Resources and Sustainable Development (RENA25)
Date	18-20 December, 2025
Location	El Jadida, Morocco
Presentation	Oral
Media	To be held

2. XVIII EME Colloque International AREFI (October, 2025)	
Authors	Arfa L., Erraach Y., Ouertani E., Mlayah T., Kallas Z., & De Magistris T
Title	2.La technologie blockchain pour la sécurité alimentaire et la gestion des risques de la chaîne de valeur du miel en Tunisie
Congress	XVIII EME Colloque International AREFI
Date	24-25 October 2025
Location	Hammammet, Tunisia
Presentation	Oral
Media	

2. XVIII EME Colloque International AREFI (October, 2025)	
Authors	Ouertani E, Erraach Y, Arfa L, Ornelas Herrera, S.I. De Magistris, T., Kallas Z

Title	3.Vers une apiculture plus résiliente : facteurs influençant l'adoption de stratégies d'adaptation climatique
Congress	XVIII EME Colloque International AREFI
Date	24-25 October 2025
Location	Hammammet, Tunisia
Presentation	Oral
Media	

3. XV Congress of Agri-Food Economics (September 2025)	
Authors	Erraach, Y.; Ouertani, E.; Arfa, L.; Ornelas Herrera, S.I.; Mlayah, T.; Kallas, Z.; Mutlu Çamoğlu; S.; De Magistris, T.
Title	4.Factores determinantes de la adopción de un sistema de trazabilidad blockchain en el sector apícola.
Congress	*XV Congress of Agri-Food Economics*
Date	03-05 September 2025
Location	Granada, Spain
Presentation	Oral
Media	

3. XV Congress of Agri-Food Economics (September 2025)	
Authors	Ornelas Herrera, S.I.; Kallas, Z..; Erraach, Y.; Ouertani, E.; Arfa, L.; de Magistris, T.
Title	5.Transparencia y Autenticidad en la Industria de la Miel: El Impacto del Blockchain en la Intención de Compra de los Consumidores del Mediterráneo
Congress	*XV Congress of Agri-Food Economics*
Date	03-05 September 2025
Location	Granada, Spain
Presentation	oral

Media	

3. XV Congress of Agri-Food Economics (September 2025)	
Authors	Bekkouche, S., Halimi, J., De Magistris, T.
Title	6.Mapping the Adoption of Digitalization in the Food Supply Chain to Improve the Traceability : A Scoping Review
Congress	*XV Congress of Agri-Food Economics*
Date	03-05 September 2025
Location	Granada, Spain
Presentation	oral
Media	

***4. XVII EAAE Congress* (August 2025)**	
Authors	Belinda López-Galán, Pilar Uldemolins, Mario Amato, Zein Kallas, Fabio Verneau, Tiziana de Magistris.
Title	7.Framing Effects on Willingness to Pay for Blockchain Traceability Systems and Origin Label: the Case of Honey Across MED Countries
Congress	*XVII EAAE Congress Food System Transformation in challenging times.*
Date	August 26–29, 2025
Location	Bonn, Germany
Presentation	Poster
Media	

***5. SIDEA-SIEA-CESET Conference* (July, 2025)**	
Authors	Amato, M., La Barbera, F., De Magistris, T., Verneau, F.
Title	8.Bridging the Transparency Gap: Blockchain's Impact on Consumer Perceptions of Honey Supply Chains
Congress	*SIDEA-SIEA-CESET Conference*
Date	3th-5th july 2025
Location	Benevento, Italy
Presentation	Oral
Media	

6. JS-PATIO'S 2025 (May, 2025)	
Authors	Erraach, Y., Mlayeh T., Ouertani E., Arfa, L., Kallas, Z., Ennahli, S., Mutlu Çamoğlu S., Di Magistris, T.
Title	9.Are Retailers Ready for implementing Blockchain Traceability Systems in the Honey Supply Chain
Congress	JS-PATIO'S 2025 – 7th Edition Innovative Trends for Sustainable Foods
Date	22 - 23 May 2025
Location	Tunis, Tunisia
Presentation	Oral
Media	

7. 21st International Wireless Communications & Mobile Computing Conference (May, 2025)	
Authors	10.Nourhene Ellouze, Cyrine Bouallegue, and Hella Kaffel Ben Ayed
Title	Energy-Aware IoT based solution for smart Beehives
Congress	21st International Wireless Communications & Mobile Computing Conference
Date	12–16 May 2025
Location	Abu Dhabi, UAE
Presentation	Oral
Media	

8. XV Congress Español de sociologia (June, 2024)	
Authors	Somia Bekkouche, Pilar Uldemolins, Belinda López Galán y Tiziana De Magistris.
Title	11.Understanding consumer preferences and willingness-to-pay for honey: A comparative analysis of Choice Experiments
Congress	*XV Congreso Español de Sociología*
Date	26-29 June 2024
Location	Sevilla, Spain
Presentation	oral
Media	

9. 4th Edition of the Research Days (May, 2025)	
Authors	Nadia Messaoudi, À. Ajal, À. Bajoub, and S. Ennahli
Title	12.Rapid and Accurate Detection of Honey Adulteration Using Artificial Intelligence and FTIR Spectroscopy: A Lever for Sustainable Agriculture

Congress	4th Edition of the Research Days “"Translational Research: Pathways for Innovation and Collaboration in Patient Care"
Date	May 29-30, 2025
Location	Rabat, Morocco
Presentation	Oral - First Prize
Media	

10.JS-PATIO’S 2024 (April, 2024)	
Authors	Arfa, L.; Erraach, Y.; Ouertani, E.; Kallas, Z.
Title	13.Towards the digital transformation of the honey value chain in Tunisia: Diagnostic study
Congress	JS-PATIO’S 2024 – 6th Edition "Tomorrow's food : issues and challenges"
Date	18 and 19 April 2024
Location	Tunis, Tunisia
Presentation	Oral
Media	

11.Forum: Innovative agricultural research: a lever for sustainable development (December, 2023)	
Authors	Erraach Y., Arfa L., Ouertani E. Mlayeh T. & Kallas, Z., De Magitris T
Title	14.Quel rôle pour l'innovation digitale dans le développement de la chaîne de valeur du miel en Tunisie ?
Congress	Forum: Innovative agricultural research: a lever for sustainable development.
Date	27 December 2023
Location	Tunis, Tunisia
Presentation	Poster

Media	

12.Forum: Innovative agricultural research: a lever for sustainable development (December 2023)	
Authors	Erraach Y., Ouertani E., Arfa L. & De Magitris T.,
Title	15.TECHONEY a project for the development of a blockchain-based ecosystem for a better positioning of small honey producers on local and international markets. Forum: Innovative agricultural research: a lever for sustainable development
Congress	Forum: Innovative agricultural research: a lever for sustainable development.
Date	27 December 2023
Location	Tunis, Tunisia
Presentation	Poster
Media	

***13. XVII Congress of the European Association of Agricultural Economists (EAAE)* (August 2023)**	
Authors	Tiziana de Magistris, Mario Amato, Zein Kallas, Fabio Verneau
Title	16.Living Lab for CoDesigning Blockchain Based Ecosystem for More Sustainable And Competitive Small Beekeepers: TechoneyProject
Congress	*XVII Congress of the European Association of Agricultural Economists (EAAE) "Agri-food systems in a changing world: Connecting science and society"*
Date	August 29 to September 1, 2023
Location	Rennes, France
Presentation	Oral
Media	

***14. Reseach in Food Safety 2022* (December, 2022)**	
Authors	Christoph Stahl (LIST)
Title	17.TECHONEY - Development of a blockchain-based ecosystem that allows an improved positioning of small producers of honey on local and international markets
Congress	*"Reseach in Food Safety 2022" EFSA Focal Point Conference, organised by EFSA European Food Safety Authority.*
Date	22 December 2022
Location	Virtual venue. https://securite-alimentaire.public.lu/fr/actualites/evenements/2022/research-in-food-safety-2022.html
Presentation	Oral; poll among 100 participating food safety experts on honey adulteration. They estimated that 40%-59% of honey products in the EU are non-authentic (mixed with artificial ingredients)..

Media	

5-2. Participation in Technical events, Agricultural and Industry and others dissemination Events.

1. **Innovation Fair – Enabling that step forward (List, October 22-23, Brussels)**
   - Pitch presentation for investors
   - Exhibition of project results
   - Networking with other PRIMA projects

Figure 27: TECHONEY stand at Innovation Fair

Figure 28 : PRIMA projects networking meeting at Innovation Fair, Brussels.

2. 18th Edition of the International Agriculture Show: "Sustainability of Livestock Production and Food Sovereignty" (ENAM, April 20 – 26, 2025 Meknes, Morocco)
3.

Organized an interactive exhibition stand featuring:

- **Project Presentation**
- **Honey Exhibition:** Display of honey samples from various Mediterranean origins (Morocco, Tunisia, Turkey, France, Italy and Spain).
- A scientific poster display: **"Quality Assessment of Honey from Different Botanical and Geographical Origins of the Mediterranean Region."**

Figure 29: Poster display at the 18th Edition of the International Agriculture Show

4. Research Night Event (Zaragoza, 26-27th of September 2025)

We presented the Techoney project. Our aim was to explore how blockchain technology and certification schemes can improve transparency, trust and sustainability in food supply chains. We shared our research goals through interactive activities and engaged with citizens to promote dialogue between science and society.

Figure 30: CITA participation in the Research Night Event

5. **<u>Workshop on the presentation of the results of development research at the Sylvo-Pastoral Northwest Development Office</u> (ODESYPANO, 17 April 2024; Beja – Tunisia)**

    - Project Presentation

Scientific communication by Dr. Yamna Erraach (INAT) : Study on digital maturity and intention to adopt a traceability system based on "blockchain" in the honey value chain in Tunisia (Erraach, Y.; Arfa, L.; Ouertani, E.; Kallas, Z., Di Magistris, T.)

- Networking
- Audience: 40: policy makers, managers, researchers, engineers, and technicians

Figure 31: INAT participation in the ODESYPANO workshop.

6. **<u>92. Deutschsprachiger Imkerkongress (Luxembourg, 5th-7th September 2024)</u>**
    - Exhibition of project TECHONEY to Beekeepers from Luxembourg, Germany, Austria, Switzerland. Recruitment of stakeholders for Living Lab activities.

Figure 32: LIST participation in the 92nd German-Speaking Beekeeping Congress, Luxembourg.

6 PRODUCTIONS OF SCIENTIFIC PUBLICATIONS

Within the framework of the TECHONEY project, a total of **six scientific** publications has been produced to date, including **five peer-reviewed** journal articles and **one book chapter**. Most of these publications are available in open access, ensuring broad dissemination of the project's findings within the scientific community.

In addition to these publications, the project has also contributed to academic capacity building through the supervision of **6 master's thesis and undergraduate final projects** (PFE) carried out in partner institutions.

Furthermore, **five additional scientific articles** are currently under revision in peer-reviewed journals, reflecting the ongoing dissemination and valorization of the project's outcomes. These forthcoming papers will further strengthen TECHONEY's scientific visibility and contribute to advancing research in sustainable apiculture, digital transformation, and agri-food innovation.

Further details are provided below

6-1- PUBLISHED PEER REVIEWED PAPERS

1. Lopéz-Galán, B., de-Magistris, T. Exploring consumer preferences and policy implications in local food systems: Does taste or labeling matter in honey?. *Agric Econ* 13, 4 (2025). https://doi.org/10.1186/s40100-025-00347-9

2. Ouertani E, Erraach Y, Arfa L, Kallas Z, De Magistris T and Ornelas Herrera SI (2025) Beekeepers' intentions to adopt resilience strategies for climate change: a comparative and integrated approach using the theory of planned behavior and protection motivation theory. Front. Clim. 7:1604488. doi: 10.3389/fclim.2025.1
3. Ornelas Herrera SI, Baba Y, Erraach Y, Ouertani E, Arfa L, Çamoğlu SM, de-Magistris T and Kallas Z (2025) Analysing blockchain adoption in beekeeping:application of theoretical models and their effectiveness. Front. Sustain. Food Syst. 9:1566341. https://doi.org/10.3389/fsufs.2025.1566341
4. Rachida Ouaabou, Lahcen Hssaini , Abderrahim Alahyane , Lahrach Abdessamad, Jalal Isaad a , EL amine Ajal f , Said Ennahli (2025). Moisture adsorption characteristics of freeze-dried royal jelly: thermodynamic properties, modeling, and assessing microstructural changes. Journal of Food Engineering. (2025)
5. Lahcen Hassaini and Said Ennahli (2025). Preprocessing-Dependent Machine Learning Models Enhance Mid-FTIR Detection of Honey Adulteration. Journal of Food Composition and Analysis. (Q1, IF.4.6)

6-2- PEER REVIEWED PAPERS UNDER REVISION

Besides, Techoney partners have already 5 papers under revision:

1. Belinda López-Galán, Pilar Uldemolins, Mario Amato, Zein Kallas, Fabio Verneau, Tiziana de Magistris. Framing Effects on Willingness to Pay for Blockchain Traceability Systems and Origin Label: the Case of Honey Across MED Countries (It has already submitted to Journal of Agricultural Economics (JAE))
2. Ouertani E, Erraach Y, Arfa L. Coping with climate change: Adaptive strategies and resilience profiles among Tunisian beekeepers (under revision in Emirates Journal of Food and Agriculture)
4. Tiziana de-Magistris, Somia Bekkouche, Fabio Verneau, Pilar Uldemolins, Belinda López-Galán, Mario Amato. Is Origin Enough? Evidence on Digital Traceability and PDO in Consumer Choice. (paper under revision).
5. Jihan Halimi, Belinda Lopéz-Galán, Tiziana de Magistris. Analysis of consumers' behaviour toward digitalization tools to prevent - food fraud during the purchase-decision making: A meta-analysis approach. (paper under revision).

6. Bekkouche, S., De Magistris, T. Digitalization in the European Agri-Food Supply Chain: A Scoping Review of Traceability, Transparency, and Sustainability. (paper under revision).

6-3- Book chapter

1. Jihene Khoualdi, lhem Abedlmoula , Hella Kaffel Ben Ayed and Donia ben Sedrine, Secure and Transparent Agri-Food Supply Chain Traceability with SSI and Blockchain-Enabled IoT, in Proc. of The 39th International Conference on Advanced Information Networking and Applications (AINA-2025), Spain, April 2025 Volume 5, Volume 249 of the Lecture Notes on Data Engineering and Communications Technologies series, LNDECT 249 https://doi.org/10.1007/978-3-031-87775-9_33

6-4- Master and Engineering dissertation

1. **Engineering Graduation project**: Ameni Khemissi, Securing Honey Traceability Data through Blockchain and Self-Sovereign Identity (SSI), (UTM- LIPAh, 2025)
2. **Engineering Graduation project**: Donia Ben Sedrine, Proposed Innovative Solution for Ensuring Traceability in the short Honey Supply Chain using Blockchain and IoT (UTM- LIPAh, 2024)
3. **Engineering Graduation project**: **Hana Guirat:** *Study of Digital Maturity and the Intention to Adopt a Blockchain-Based Traceability System in the Beekeeping Value Chain in Tunisia* (INAT 2023- supervised by Dr. Yamna Erraach and Dr. Emna Ouertani)
4. **Engineering Graduation project**: **Yasmine Ben Hassine:** *Determinant Factors Influencing the Intention to Adopt Resilience and Adaptation Strategies to Climate Change among Tunisian Beekeepers* (INAT and ESAM, 2025 supervised by Dr. Emna Ouertani and Dr. Yamna Erraach)
5. **Master of Science thesis: Jihan Halimi:** Analysis of consumers' behaviour toward fraud risk perception and digitalization tools to prevent some honey fraud during the purchase-decision making (CITA and CIHEAM IAMZ, 2023 supervised by Dr Tiziana de-Magistris and Dr Belinda Lopéz Galán)
6. **Doctoral thesis: Somia Bekkouche:** Analysis of consumer preferences and acceptance of improved labelling systems and traceability technologies in the agro-food sector (CITA and UNIZAR, 2023-2027, supervised by Dr.Tiziana de-Magistris)

7- PRESS RELEASES AND MEDIA VISIBILITY ACTIVITIES

The TECHONEY project actively used press and media channels to disseminate its objectives, activities, and results to a broad audience beyond the consortium and immediate

stakeholders. Over the course of the project, a total of **46 press releases** were issued, covering major milestones such as the launch of the project, Living Lab workshops, and the capacity-building events.

These press releases were published in national and regional newspapers, online news portals, and specialized trade magazines, reaching an estimated audience of over 50,000 readers.

In addition, the project received media coverage through interviews and feature articles on radio programs in partner countries, further amplifying public awareness and engagement. The coverage targeted diverse groups, including beekeepers, research institutions, policymakers, industry representatives, and the public, ensuring broad dissemination of TECHONEY's innovations, particularly in blockchain-based traceability systems and sustainable practices in the beekeeping sector.

All media coverage significantly contributed to the visibility, credibility, and impact of the TECHONEY project, reinforcing its outreach at both national and international levels.

7-1- PRESS RELEASES

1. *Agronews Castilla y León. 2022. "El CITA coordina un proyecto europeo sobre blockchain para mejorar el posicionamiento de los pequeños productores de miel," May 7. https://www.agronewscastillayleon.com/el-cita-coordina-un-proyecto-europeo-sobre-blockchain-para-mejorar-el-posicionamiento-de-los*
2. *Altoaragón Agroalimentario - Diario Del Alto Aragón. 2022. "El Cita Coordina Un Plan de Productores de Miel," May 5.*
3. *Aragón Digital. 2022. "El CITA Coordina Un Proyecto Para Mejorar El Posicionamiento de Los Pequeños Productores de Miel," May 1.*
4. *Aragón hoy. 2022a. "El CITA coordina un proyecto europeo sobre blockchain para mejorar el posicionamiento de los pequeños productores de miel," May 1. http://www.aragonhoy.es/ciencia-universidad-y-sociedad-del-conocimiento/cita-coordina-proyecto-europeo-blockchain-mejorar-posicionamiento-pequenos-productores-miel-86111*
5. *Aragón hoy. 2022b. "El CITA coordinará el proyecto europeo TecHoney sobre el desarrollo de un ecosistema de blockchain para mejorar el posicionamiento de los pequeños productores de miel en mercados locales e internacionales," May 1. http://www.aragonhoy.net/index.php/mod.noticias/mem.detalle/relmenu.47/id.297817*
6. *Aragón hoy. 2022c. "El proyecto europeo Techoney evalúa sus primeros 6 meses de trabajo," October 19. http://www.aragonhoy.es/ciencia-universidad-y-sociedad-del-conocimiento/proyecto-europeo-techoney-evalua-primeros-6-meses-88778*

7. *El Periódico de Aragón. 2022. "EI CITA Apoya a Los Pequeños Productores de Miel," May 2.*
8. *El Periódico de Aragón. 2022. "De La Colmena a Casa Con La Certeza de Que La Miel Es 100% Natural," November 7.*
9. *Diario de Teruel. 2022. "El CITA Coordina Un Proyecto Para El Impulso a Pequeños Productores de Miel," May 2.*
10. *Diario del Alto Aragón. 2022. "El CITA coordina un proyecto de impulso a pequeños productores de miel," May 1. https://www.diariodelaltoaragon.es/noticias/comarcas/2022/05/01/el-cita-coordina-un-proyecto-de-impulso-a-pequenos-productores-de-miel-1571161-daa.html*
11. *Heraldo de Aragón. 2022a. "El CITA coordina un proyecto de impulso a pequeños productores de miel," May 1. https://www.heraldo.es/noticias/aragon/2022/05/01/cita-aragon-proyecto-productores-miel-innovacion-1571215.html*
12. *Heraldo de Aragón. 2022b. "El CITA Dirige Un Proyecto de 'blockchain' Del Sector de La Miel," May 2.*
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7-2- OTHERS MEDIA COMMUNICATION ACTIVITIES

Figure 33 : Facebook post by the Tunisian Association of Beekeepers about the Presentation of TECHONEY (June 8th, 2023).

Figure 34 : The radio interview of Dr. Yamna Erraach (INAT) in radio Falleh about TECHONEY and the workshop on the digitalization of honey value chain in Tunisia

(https://www.facebook.com/alfalleh.tn/videos/639911754710360)

7.2.1. FINAL TECHONEY CONFERENCE

The final dissemination event of the TECHONEY project was successfully organized on October 29 as the concluding milestone of the project's dissemination and communication activities. The event was held online via Microsoft Teams and lasted four hours, bringing together a wide range of stakeholders from the agri-food sector, research institutions, technology providers, and public administrations.

The event aimed to showcase the project's main results, technological innovations, and overall impact achieved throughout its implementation. It attracted significant interest, with 80 registered participants and more than 60 active attendees, representing over ten countries across the PRIMA region and beyond. The audience included beekeepers' associations, small honey producers, researchers, policymakers, and ICT experts, highlighting the multidisciplinary scope and international relevance of the TECHONEY project.

Figure 35: The agenda of TECHONEY final event

The event was organized according to the official agenda presented in the invitation (see figure below), which was broadly disseminated among project partners, stakeholders, and relevant networks to maximize participation and ensure wide visibility of the final dissemination activity.

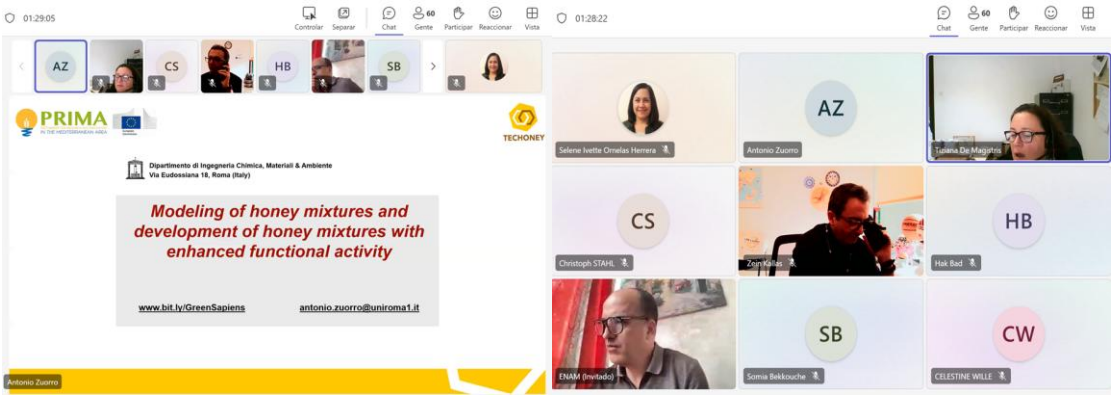
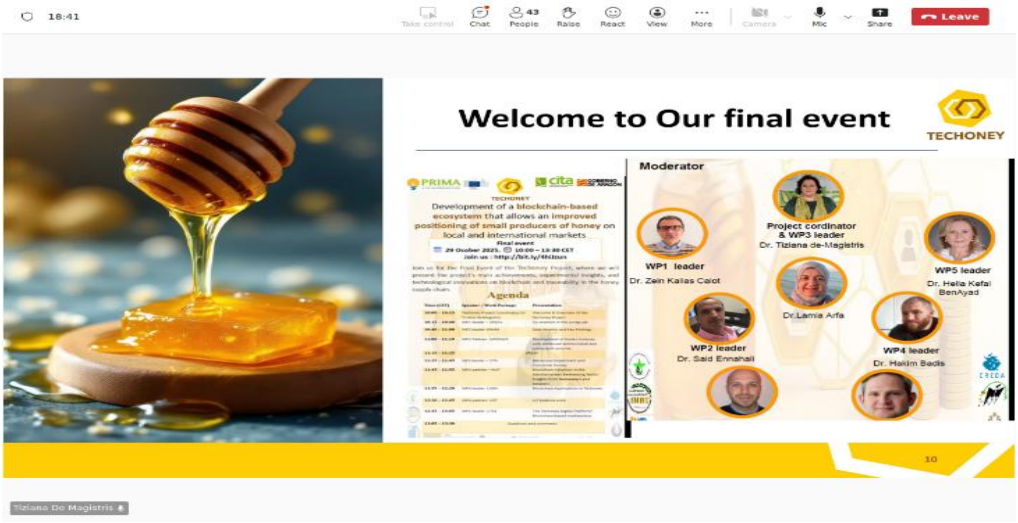


Figure 36: TECHONEY final event

The session opened with Dr. Tiziana de Magistris (CITA), who welcomed participants and introduced the objectives and structure of the event. She presented the TECHONEY consortium, emphasizing its multidisciplinary composition and geographical diversity, which brought together expertise from agriculture, economics, ICT, and consumer behavior.



Following the introduction, Prof. Zein Kallas (CREDA) presented the Living Lab approach adopted in TECHONEY to co-create the blockchain-based ecosystem. He explained that the Living Lab model placed stakeholders, such as beekeepers, wholesalers, consumers, and policymakers at the center of the innovation process. The approach relied on active participation, collaboration, and feedback collection to ensure that the technological solutions developed were practical, accepted, and sustainable.

Prof. Saïd Ennahli (ENAM) and **Prof. Antonio Zurro** (SAPIENZA) jointly presented the results of **Work Package 2**. The presentation subject focuses on a comprehensive, multi-faceted project dedicated to establishing the quality, authenticity, and functional value of honey sourced from the Mediterranean area, specifically involving Morocco, Tunisia, Spain, Italy, France, and Turkey. The core objectives include performing detailed physicochemical and biochemical characterization to ascertain the unique attributes of honey from each sampled country. This characterization is essential for developing a reliable traceability system that allows consumers to verify the geographical and floral origin of the honey. Crucially, the project seeks to prevent widespread fraud by identifying distinct quality markers that serve as a robust mechanism for preventing adulteration. Finally, the initiative aims to map the functional properties of the honey, with the specific

goal of exploring and formulating a honey mixture with enhanced antimicrobial activity to deliver added value to consumers.

.**Dr. Tiziana de Magistris** (CITA) and **Dr. Mario Amato** (UNINA) presented the outcomes of the **consumer behavior study**, which explored consumer perceptions, attitudes, and willingness to pay for traceable and authentic honey products. Their analysis revealed a growing consumer demand for transparency and trustworthy labeling in food products, validating the relevance of the blockchain solution developed within TECHONEY. The results demonstrated that providing consumers with verifiable information through QR codes not only increases trust and perceived quality but also enhances market opportunities for small producers.

The session continued with **Prof. Lamia Arfa (INAT),** who presented the findings from WP3, which assessed the acceptance and intention to adopt blockchain technology among beekeepers and retailers. Prof. Arfa highlighted that beekeepers are more likely to adopt blockchain if they feel confident in their ability to manage it and hold a positive perception of the technology. She emphasized that adoption depends on the expected benefits outweighing the effort required and that both technology design and usability are as crucial as its potential advantages.

During the final WP4 presentation, **Dr. Hakim Badis** showcased the design and implementation of Techoney, an IoT-Blockchain-based honey supply chain platform. The deployment architecture was presented in detail, featuring the frontend hosted on Vercel, the backend managed through Appwrite Cloud, and the blockchain network deployed on Hostinger Cloud. A major emphasis was placed on data privacy, outlining the strategies and cryptographic methods employed to ensure the confidentiality of stakeholder identities and transactions within the network. Overall, the presentation reflected the culmination of our WP4 research efforts, transforming a relatively immature and complex set of technologies into a usable, privacy-preserving, and inclusive platform that empowers small-scale beekeepers and fosters trust and transparency across the honey supply chain. While Dr Christopf Stahl (LIST) Christopf Stahl (LIST) outlined the development of affordable, open-source smart beehives (target price under €200). He presented CNC-milled wooden hives compatible with the Dadant standard to reduce colony disturbance, and the HoneyPI platform running on Raspberry Pi/Linux for wireless sensor monitoring.

For WP5. Dr Hella Keffal Ben-ayad (UTM) has mapped the business processes involving beekeepers and other stakeholders, detailing both functional and non-functional requirements. It describes the implementation of on-chain smart-contract logic and off-

chain database/services, featuring a mobile app and web stack with Next.js/React frontend and NestJS backend. Key modules include listings, requests, real-time messaging, ratings/reviews, and role-based dashboards

The event concluded with the coordinator's closing remarks, formally acknowledging all attendees and expressing gratitude to the entire project team for their contributions and collaboration.

8-CONCLUSION

Over the past three and a half years, TECHONEY has evolved from an initial concept into a dynamic initiative connecting stakeholders, knowledge, and technology across the honey value chain, actively addressing the sector's key challenges. From the outset, communication and dissemination activities (WP7) have played a central role, building on strong foundations established during the project's first two years.

In its first year, partners focused on sharing early findings, raising awareness of TECHONEY's objectives, partners, activities, and expected impacts, and engaging a broad range of stakeholders, beekeepers, consumer associations, researchers, retailers, and public authorities, at both local and national levels. By the second year, the project expanded its outreach through active participation in scientific and technical events, including congresses, workshops, and conferences, producing communication materials (posters, flyers, roll-ups) and generating knowledge outputs for wider dissemination.

The project consistently communicated key themes such as blockchain, honey quality, traceability, Living Labs, IoT, sustainability, resilience, digitalization, and TECHONEY innovations. A wide range of channels were employed, scientific conferences, congresses, workshops, Living Labs, focus groups, national forums, training sessions, press releases, radio interviews, social media, peer-reviewed journals, and even a book chapter.

Through these concerted efforts, TECHONEY successfully transformed limited awareness of digital technologies, such as blockchain, QR codes, and IoT in honey traceability, into a broad understanding of their potential applications and benefits.

In summary, TECHONEY's dissemination and communication activities have fostered strong networks, enhanced awareness of innovative solutions, and maximized the practical impact of project results, laying a robust foundation for continued collaboration and knowledge exchange across the honey value chain.

ANNEXES 1 : THE PROJECT EVENTS

Title of the event	Type of event	Date	Title of contribution	Type (oral/ poster)	Authors	Partners	location
International Congress on Natural Resources and Sustainable Development (RENA25	International Congress	Dec, 2025	1.Quality Profiling and Volatile-Biochemical Characterization of Mediterranean Honeys from Diverse Regions	Oral	Nadia Massoudi, À. Ajal, À, Bajoub, M.F.Ortiz, S.Ennahli	ENAM	El Jadida, Morocco
XVIII EME Colloque International AREFI	International coloquio	Oct, 2025	2.La technologie blockchain pour la sécurité alimentaire et la gestion des risques de la chaîne de valeur du miel en Tunisie	Oral	Arfa L., Erraach Y., Ouertani E., Mlayah T., Kallas Z., & De Magistris T.	INAT CREDA CITA	Hammammet, Tunisia
XVIII EME Colloque International AREFI	International coloquio	Oct, 2025	3.Vers une apiculture plus résiliente : facteurs influençant l'adoption de stratégies d'adaptation climatique	Oral	Ouertani E, Erraach Y, Arfa L, Ornelas Herrera, S.I. De Magistris, T., Kallas Z		Hammammet, Tunisia

XV Congress of Agri-Food Economics	International Congress	Sep. 2025	4.Factores determinantes de la adopcion de un sistema de trazabilidad blockchain en el sector apícola.	Oral	Erraach, Y.; Ouertani, E.; Arfa, L.; Ornelas Herrera, S.I.; Mlayah, T.; Kallas, Z.; Mutlu Çamoğlu; S.; De Magistris, T.	INAT CREDA UNOR CITA	Ganada, Spain
XV Congress of Agri-Food Economics	International Congress	Sep. 2025	5.Transparencia y Autenticidad en la Industria de la Miel: El Impacto del Blockchain en la Intención de Compra de los Consumidores del Mediterráneo	Oral	Erraach, Y.; Ouertani, E.; Arfa, L.; Ornelas Herrera, S.I.; Kallas, Z.; Erraach, Y.; Ouertani, E.; Arfa, L.; De Magistris, T.	CREDA INAT CITA	Ganada, Spain
XV Congress of Agri-Food Economics	International Congress	Sep. 2025	6.Mapping the Adoption of Digitalization in the Food Supply Chain to Improve the Traceability: A Scoping Review	Oral	Bekkouche, S., Halimi, J., De Magistris, T.	CITA	Ganada, Spain
XVII EAAE Congress Food System Transformation in challenging times.	International Congress	Aug. 2025	7.Framing Effects on Willingness to Pay for Blockchain Traceability Systems and Origin Label : the Case of Honey Across MED Countries	Poster	Belinda López-Galán, Pilar Uldemolins, Mario Amato, Zein	CITA CREDA UNINA	Bonn, Germany

					Kallas, Fabio Verneau, Tiziana de Magistris.		
SIDEA-SIEA-CESET Conference	National conference	Jul. 2025	8.Bridging the Transparency Gap: Blockchain's Impact on Consumer Perceptions of Honey Supply Chains	Oral	Amato, M., La Barbera, F., De Magistris, T., Verneau, F.	UNINA CITA	Benevento, Italy
JS-PATIO'S 2025 – 7th Edition Innovative Trends for Sustainable Foods	National symposium	May, 2025	9.Are Retailers Ready for implementing Blockchain Traceability Systems in the Honey Supply Chain	Oral	Erraach, Y., Mlayeh T., Ouertani E., Arfa, L., Kallas, Z., Ennahli, S., Mutlu Çamoğlu S., Di Magistris, T.	INAT CREDA ENAM UNOR CITA	Tunis, Tunisia
21st International Wireless Communications & Mobile Computing Conference	International conference	May, 2025	10.Energy-Aware IoT based solution for smart Beehives	Oral	Nourhene Ellouze, Cyrine Bouallegue, and Hella Kaffel Ben Ayed	FST-UTM	Abu Dhabi, UAE
4th Edition of the Research Days	National	May, 2025	11.Rapid and Accurate Detection of Honey Adulteration Using Artificial Intelligence and FTIR	Oral - First Prize	Nadia Messaoudi, À. Ajal, À. Bajoub, and S. Ennahli	ENAM	Rabat, Morroco

			Spectroscopy: A Lever for Sustainable Agriculture				
JS-PATIO'S 2024 – 6th Edition	National symposium	April, 2024	12.Towards the digital transformation of the honey value chain in Tunisia: Diagnostic study	Oral	Arfa, L.; Erraach, Y.; Ouertani, E.; Kallas, Z.	INAT CREDA	Tunis, Tunisia
Forum: Innovative agricultural research: a lever for sustainable development.	National Forum	Dec. 2023	13.Quel rôle pour l'innovation digitale dans le développement de la chaîne de valeur du miel en Tunisie ?	Poster	Erraach Y., Arfa L., Ouertani E. Mlayeh T. & Kallas, Z., De Magitris T	INAT CREDA CITA	Tunis, Tunisia

ANNEXE 2: TECHNICAL WORKSHOPS

Type of event	*Date*	*Title of contribution*	*Type (oral/poster)*	*Authors*	*Partners*	*location*
National workshop	April 17, 2024	Digital maturity and intention to adopt a traceability system based on "blockchain" in the honey value chain in Tunisia	oral	Erraach, Y.; Arfa, L.; Ouertani, E.; Kallas, Z., Di Magistris, T.	INAT CREDA CITA	Beja, Tunisia
Research Night Event	26-27th of September 2025	sharing our research goals through interactive activities	poster	Di Magistris, T.	CITA	Zaragoza, Spain
The 18th Edition of the International Agriculture Show	April 20 – 26	Project presentation Honey exhibition Scientific poster: "display Quality Assessment of Honey from Different Botanical and Geographical Origins of the Mediterranean Region"	poster	Saïd Ennahli	ENAM, Meknes	Morocco
Innovation Fair	October 22-23, Brussels	• Pitch presentation for investors • Exhibition of project results	oral	Christoph Stahl	LIST	Brussels

		• Networking with other PRIMA projects				
92nd German-Speaking Beekeeping Congress	5th-7th September 2024	Exhibition of project TECHONEY to Beekeepers	poster	Christoph Stahl	LIST	**Strasbourg**

ANNEXES 3 SCIENTIFIC PUBLICATIONS

Title of the publication	*Author(s)*	*Partner(s)*	Date of publication	Journal OR book	Publisher	DOI	Open Access (Yes/No)	Peer reviewed publication (Yes/No)
1.Exploring consumer preferences and policy implications in local food systems: Does taste or labeling matter in honey?" in Agricultural and Food Economics **(IF=4.5)**	Belinda Lopéz-Galán & Tiziana de-Magistris	CITA	Jan, 2025	Agricultural and Food Economics	Springer	DOI: 10.1186/s40100-025-00347-9	Yes	Yes
2.Blockchain Adoption in Beekeeping: Application of Theoretical Models and Their Effectiveness **(IF=3.1)**	Ornelas Herrera SI, Baba Y, Erraach Y, Ouertani E, Arfa L, Çamoğlu SM, de-Magistris T	CREDA INAT UNOR CITA	March, 2025	Frontiers in Sustainable Food Systems	Frontiers	DOI: 10.3389/fsufs.2025.1566341	Yes	Yes
3.Beekeepers' intentions to adopt resilience strategies for climate change: a comparative and integrated approach using the theory of planned behavior and protection motivation theory **(IF=4.1)**	Ouertani E, Erraach Y, Arfa L, Kallas Z, De Magistris T and Ornelas Herrera SI	INAT CREDA CITA	Aug, 2025	Frontiers in Climate	Frontiers	DOI: 10.3389/fclim.2025.1	Yes	Yes
4.Moisture adsorption characteristics of freeze-dried royal jelly: thermodynamic properties, modeling, and	Rachida Ouaabou, Lahcen Hssaini ,	ENAM	Accepted	Journal of Food Engineering **(Q1, IF 5.9)**	Elsevier		Yes	Yes

assessing microstructural changes (**Q1**, **IF 5.9)**	Abderrahim Alahyane , Lahrach Abdessamad, Jalal Isaad a , EL amine Ajal f , **Said Ennahli**							
5.Preprocessing-Dependent Machine Learning Models Enhance Mid-FTIR Detection of Honey Adulteration	Lahcen Hssaini and **Said Ennahli**	ENAM	Accepted	Journal of Food Composition and Analysis. (Q1, IF.4.6)	Elsevier		Yes	Yes
6. Secure and Transparent Agri-Food Supply Chain Traceability with SSI and Blockchain-Enabled IoT.	Khoualdi, J., Abedlmoula, I., Kaffel, H., Bensedrine, D.	FST-UTM	202	Book : Advanced Information Networking and Applications. AINA 2025.	Springer	https://doi.org /10.1007/978-3-031-87775-9_33	No	Yes