



Innovation GUIDE

D3.1 Common Problems and Needs: A transdisciplinary framework

Sanae Okamoto, UM

Serdar Türkeli, UM

Onurcan Mısır, TİM



Funded by
the European Union

GRANT AGREEMENT NUMBER: 101134854

PROJECT NAME: INTERCONNECTED EUROPEAN INNOVATION ECOSYSTEMS
FOR SUSTAINABLE GROWTH AND DEVELOPMENT

PROJECT ACRONYM: InnovationGUIDE

EXECUTIVE SUMMARY

This document explores the integration of resource exploration and ecosystem management for sustainable development. It draws insights from a literature review and regional workshops in Türkiye, Malta, Spain, and The Netherlands. By integrating diverse expertise from Q-helix representatives such as academia, industry, government, and local communities, we aim to create innovative solutions through transdisciplinary approaches, enhancing the effectiveness of policies and inclusive decision-making. We conduct a comprehensive literature review and analyze results from regional workshops to develop a transdisciplinary knowledge base that addresses common challenges and strengthens rural innovation ecosystems.

The literature underscores the need for a cohesive strategy balancing resource exploration with conservation, emphasizing alignment of agricultural policies with climate goals. Polycentric governance is proposed to enhance collaboration and adaptive management for sustainable bioeconomy practices. It highlights the interconnectedness of agriculture, fisheries, and sustainable tourism, promoting biorefinery techniques and social resilience. Participatory policies and multi-actor governance are crucial for effective solutions.

Regional workshops held in all four respective consortium countries (Türkiye, Malta, Spain, The Netherlands) reveal common challenges in tourism's economic benefits with environmental preservation, developing infrastructure, and managing regulatory barriers. Each country faces unique hurdles: Malta focuses on energy efficiency, Spain on rural tourism and digital integration, The Netherlands on local opposition to sustainable projects, and Türkiye on specialized education and government guidance. Addressing financial constraints, improved R&D funding, policy alignment, and fostering public-private partnerships are crucial for overcoming these issues and promoting sustainable development across diverse sectors.

In summary, our findings call for tailoring strategies that reflect each country's needs by emphasizing integrated transdisciplinary approaches, innovative technologies, and collaborative policies to achieve sustainable development in the tourism, bioeconomy, agriculture, and fisheries sectors both within the four countries and beyond.

Deliverable ID	D3.3 Common Problems and Needs: A transdisciplinary framework
WP number	WP3
Lead Partner	UM
Due date	10.07.2024
Date of submission	10.07.2024
Type of deliverable	R — Document, report
Dissemination level	PU

AUTHORS

Name	Organisation
Sanae Okamoto	UM
Serdar Türkeli	UM
Onurcan Mısır	TİM

REVISION HISTORY

Version	Date	Author	Document history/approvals
V1	28 June 2024	Onurcan Mısır	Created the document, compiled results from the recently finalized regional workshops.
V2	3 July 2024	Serdar Türkeli	Inputted results from the literature review.
V3	8 July 2024	Sanae Okamoto	Added the executive summary, did cross checks with the regional workshop notes.
V4	10 July 2024	Onurcan Mısır	Added the bibliography, corrected grammatical mistakes. Finalized the document.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

Contents

1 Introduction	6
2 Literature Review	6
2.1 Bioeconomy and Agriculture: Biorefineries and a Circular Bioeconomy	10
2.2 Bioeconomy and Fisheries: Food Security and Gender Dynamics	10
2.3 Bioeconomy and Sustainable Tourism: Renewable Resources and Nature-based Solutions	11
2.4 Integrated Policy and Governance Strategies	11
3 Common Problems and Needs: Results from InnovationGUIDE Regional Workshops	11
3.1 Malta	11
3.1.1 Sustainable Tourism	12
3.1.2 Bioeconomy	15
3.1.3 Agriculture	17
3.1.4 Fisheries	18
3.2 Spain	20
3.2.1 Sustainable Tourism	20
3.2.2 Bioeconomy	22
3.2.3 Agriculture	23
3.2.4 Fisheries	25
3.3 The Netherlands	27
3.3.1 Sustainable Tourism	27
3.3.2 Bioeconomy	29
3.3.3 Agriculture	30
3.3.4 Fisheries	31
3.4 Türkiye	33
3.4.1 Sustainable Tourism	33
3.4.2 Bioeconomy	35
3.4.3 Agriculture	36
3.4.4 Fisheries	38
3.5 Common and unique challenges across the four countries	39
3.5.1 Sustainable tourism	39
3.5.2 Bioeconomy	40
3.5.3 Agriculture	40
3.5.4 Fisheries	41
3.5.5 Summary	41
4 Conclusion	42
BIBLIOGRAPHY	44

Table Index

Table 1 - Main themes of bioeconomy, agriculture, fisheries, and sustainable tourism	9
Table 2 - Interactions	10
Table 3 - Key Quotes from NL Regional Workshop	32

Figure Index

Figure 1 – InnovationGUIDE Project and 17 UN SDGs	7
Figure 2 – InnovationGUIDE Sectors and the Number of Publications	8

1 Introduction

In this deliverable, we focus on Task 3.1 of the InnovationGUIDE project to identify common problems and needs in agriculture, fisheries, bioeconomy, and sustainable tourism in the rural ecosystems of four countries. Understanding the importance of transdisciplinary knowledge co-creation in advancing sustainable development initiatives, we integrate diverse expertise from academia, industry, government, and local communities, to create innovative solutions that address complex challenges holistically. Transdisciplinary approaches facilitate the synthesis of scientific research, traditional knowledge, and practical experience, fostering a deeper understanding of socio-ecological systems. This collaborative approach not only enhances the effectiveness of policies and strategies but also promotes inclusive decision-making processes that align with the diverse needs and aspirations of stakeholders across different sectors and regions.

In the first section, we conduct a comprehensive review of academic and grey literature concerning various framework conditions. Then, we go on to inspect the results from the InnovationGUIDE regional workshops physically held in all four of our consortium countries (Türkiye, Malta, Spain, The Netherlands) to identify the common problems and needs per country and respective sectors. The insights gained from both tasks are synthesized to develop a transdisciplinary knowledge base and further strengthen the understanding of the common challenges in facilitating rural innovation business ecosystems.

2 Literature Review

The bioeconomy, through its broad definition encompassing agriculture, fisheries, and sustainable tourism, supports the realisation of the European Union's Green Deal and the global Sustainable Development Goals (SDGs). The alignment of the bioeconomy with SDGs promotes the substitution of fossil fuels with biomass feedstock while preserving and/or regenerating ecosystem services. However, there are synergies and trade-offs between different SDGs, such as clean energy and ecosystem preservation versus agro-biodiversity and industrial developments (Ronzon and Sanjuan, 2020). Participatory public policies are needed to foster synergies and prevent trade-offs to ensure a cohesive approach to sustainability (D'Amato et al., 2017; M'barek and Wesseler, 2023).

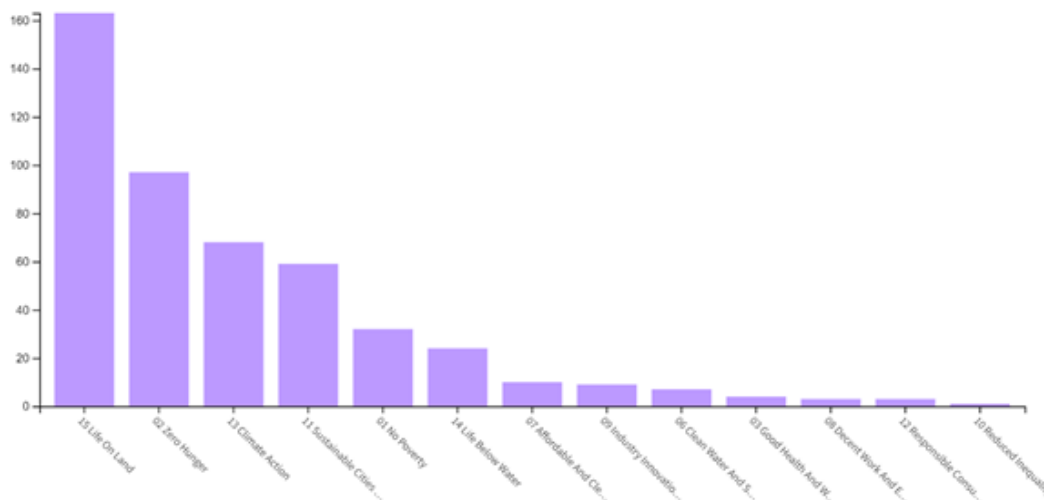
The literature¹ on bioeconomy, agriculture, fisheries and sustainable tourism, especially on rural innovation ecosystems and policy research, relate to a broad range of sustainable development goals (SDGs)²: SDG 15 Life on Land (n:163); SDG 2 Zero Hunger (n:97); SDG 13 Climate Action (n:68); SDG 11 Sustainable Cities and Communities (n:59); SDG 1 No Poverty (n:32); SDG 14 Life Below Water (n: 24); SDG 7 Affordable and Clean Energy (n:10); SDG 9 Industry Innovation and Infrastructure (n: 9); SDG 6 Clean Water And Sanitation (n:7); Good Health And Well Being (n:4); SDG 8

¹ Data source: Web of Science Core Collection; Query: Topic: "sustainable tourism" OR "bioeconom*" OR "agricultur*" OR fisher* OR Title: "sustainable tourism" OR "bioeconom*" OR "agricultur*" OR fisher* Refined By search within all fields: Rural AND Innovat* AND Ecosystem AND Policy, 327 results from Web of Science Core Collection, 1 July 2024

² [Sustainable-Development-Goals-in-Web-of-Science-1.pdf \(clarivate.com\)](#)

Decent Work And Economic Growth (n:3); SDG 12 Responsible Consumption And Production (n:3) and SDG 10 Reduced Inequality (n:1).

Figure 1 – InnovationGUIDE Project and 17 UN SDGs

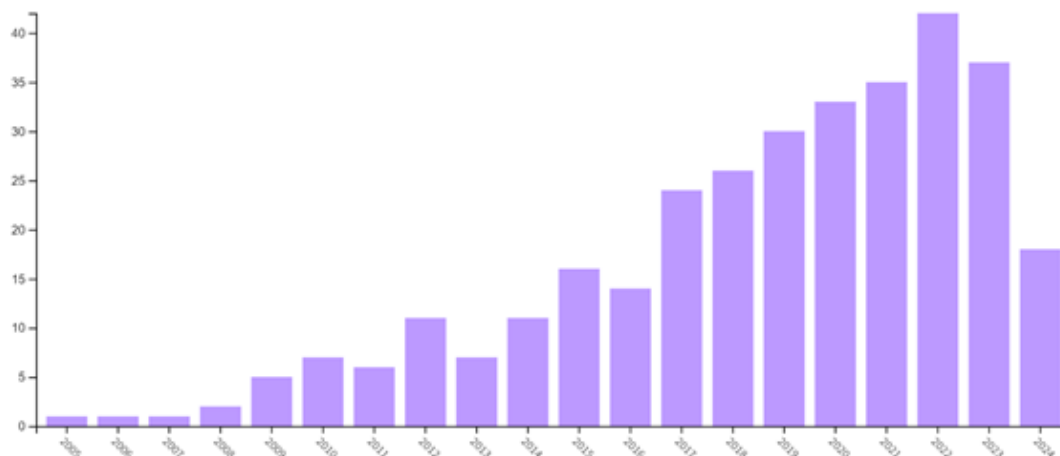


Source: Authors' work on Web of Science Data (30 June 2024)

Although the number of scientific publications is increasing in the last 20 years in the domains of InnovationGUIDE project (See Figure 2), the lack of research and implementation on SDG 4 Quality Education, SDG 5 Gender Equality, SDG 16 Peace, Justice and Strong Institutions and SDG 17 Partnerships for the Goals is still indicative for the compound gap that InnovationGuide project intends to address (See Figure 1). This ambition is pursued by connecting rural innovation ecosystems in a collaborative effort spanning four countries to empower communities and drive change, and more specifically, between diverse regions, working together to create a future in which rural communities thrive through innovation and entrepreneurship³.

See Figure 2 - Next Page

³ [About the project | InnovationGUIDE \(innoguide.eu\)](http://innoguide.eu)

Figure 2 - InnovationGUIDE Sectors and the Number of Publications


Source: Authors' work on Web of Science Data (2024 numbers is until 30 June 2024)

At macro level, top 10 domains of research fall under *Environmental Sciences Ecology* ($n: 208$; 63.609%); *Science and Technology* ($n: 59$; 18.043%); *Agriculture* ($n: 53$; 16.208%); *Biodiversity Conservation* ($n: 27$; 8.257%); *Business Economics* ($n: 20$; 6.116%); *Geography* ($n: 20$; 6.116%); *Food Science Technology* ($n: 16$; 4.893%); *Engineering* ($n: 13$; 3.976%); *Public Administration* ($n: 11$; 3.364%); *Water Resources* ($n: 8$; 2.446%). This is indicative of **interdisciplinary and transdisciplinary research** (e.g. natural and social sciences) and implementation (e.g. **multi-actor policy design, programming and governance**) needs. Specific funding sources such as Department for Environment, Food & Rural Affairs (DEFRA) (UK); Consultative Group for International Agricultural Research (CGIAR); companies, such as ARCADIA, SYNGENTA, and charitable foundations such as Wellcome Trust, Leverhulme Trust reemphasize the multi-actor interest and governance needs in these domains. At meso level, we can observe the issue domains attention and interest with *Forestry* ($n: 100$; 30.581%); *centrality of Agricultural Policy* ($n: 71$; 21.713%); *advancements in Soil Science* ($n: 30$; 9.174%); *Marine Biology* ($n: 23$; 7.034%); *Climate Change* ($n: 21$; 6.422%); *Entomology* ($n: 17$; 5.199%); *Paper & Wood Materials Science* ($n: 7$; 2.141%); *Sustainability Science* ($n: 5$; 1.529%); *Economic Theory* ($n: 5$; 1.529%) and *Management approaches* ($n: 4$; 1.223%). At micro level, results indicate the centrality of *Farmers* ($n: 62$; 18.960%); *Ecosystem Services* ($n: 55$; 16.820%); *Deforestation* ($n: 27$; 8.257%); *Fisheries* ($n: 20$; 6.116%); *Climate Change Adaptation* ($n: 15$; 4.587%); *Apis Mellifera (Honey Bee)* ($n: 14$; 4.281%); *Maxent⁴* ($n: 13$; 3.976%); *Microbial Biomass* ($n: 8$; 2.446%); *Urban Agriculture* ($n: 8$; 2.446%); and *Bioenergy* ($n: 6$; 1.835%).

⁴ The MaxEnt software package is one of the most popular tools for species distribution and environmental niche modeling, with over 1000 published applications since 2006, Source: <https://nsojournals.onlinelibrary.wiley.com/doi/pdf/10.1111/j.1600-0587.2013.07872.x>

Table 1 - Main themes of bioeconomy, agriculture, fisheries, and sustainable tourism

Bioeconomy	Agriculture	Fisheries	Sustainable Tourism
The bioeconomy supports sustainable growth by utilizing renewable biological resources.	Innovative development in agriculture involves scientific support and financial investment.	Small-scale fisheries are vital for food security and employment in developing countries.	Sustainable tourism integrates local processes and biosecurity to promote environmental sustainability.
Global perspectives on the bioeconomy include initiatives in the US, South America, and Africa.	Agricultural policies are crucial for climate change mitigation.	Participatory studies highlight the vulnerability of fisheries to climate change.	Marine Protected Areas (MPAs) balance the needs of fisheries and tourism.
Bioeconomy aligns with the EU's Green Deal and UN SDGs.	Sustainable farming practices are evaluated by projects like LIFT.	Enhancing social resilience in fisheries involves considering the roles of women.	Eco-tourism supports the preservation of biodiversity and local economic growth.
Promotes circular economy by substituting fossil fuels with biomass.	Barriers and motivations for adopting ecological practices include technical and institutional factors.	Effective fisheries management uses ecosystem-based approaches to maintain fish populations.	Adaptive management strategies are necessary to address climate change impacts.
Sources: Baumber (2017); M'barek and Wesseler (2023).	Dearing et al. (2019); Bourmaris et al. (2021); Rega et al. (2022); Boix-Fayos and de Vente (2023);	Ebun et al. (2022); Asche et al. (2022)	Spacek et al. (2022)

Sectoral domain interactions for bioeconomy are sequenced as agriculture (~10%), fisheries and then sustainable tourism. For agriculture domain, interactions with fisheries and bioeconomy domains approach equal weights (~%0.5) followed by the domain of sustainable tourism. For fisheries, initially agriculture, then bioeconomy and finally sustainable tourism interaction is detected. For sustainable tourism, agriculture is the most central interaction domain (n: 191), followed by fisheries, and lastly bioeconomy.

Table 2 – Interactions

InnovationGUIDE	Bioeconomy	Agriculture	Fisheries	Sustainable tourism	n
Bioeconomy					36,053
Agriculture	3732				676,585
Fisheries	1140	3763			85,938
Sustainable tourism	3	191	46		6,012

Source: Authors'work on Web of Science: Query keywords: (bioeconom* OR "bio econom*" OR bio-econom* OR biobased OR bio-based), (agricultur* OR agro*); (fishery OR fisheries), "sustainable tourism" combinations in Title OR Topic; (n: Number of Scientific Publications)

The interaction between bioeconomy, agriculture, fisheries, and sustainable tourism is multifaceted. This forms a complex network that drives sustainable development across various sectors.

2.1 Bioeconomy and Agriculture: Biorefineries and a Circular Bioeconomy

The bioeconomy significantly intersects with agriculture through **biorefineries**. Biorefineries utilize agricultural feedstock to produce a variety of bio-based products such as biofuels and bioplastics. This fuels the bioeconomy and promotes sustainable farming practices and rural development. The innovation in biorefinery techniques has expanded the range of feedstocks available, leading to the production of higher-value derivatives and supporting a circular economy. Policies and market developments further support this ecosystem by encouraging eco-friendly alternatives, creating a competitive and healthy environment (Slamová et al., 2021; Clifton-Brown et al., 2023; Wagh et al., 2024).

2.2 Bioeconomy and Fisheries: Food Security and Gender Dynamics

Small-scale fisheries play a crucial role in **food security** by providing nutritious food and employment. Sector faces challenges such as environmental changes. Studies using participatory methods have highlighted the importance of fisheries in livelihoods and their vulnerability to climate change. Public policies aimed at increasing social resilience within fishing communities often overlook the broader social context,

particularly the gender dynamics. Enhancing the social resilience of fisheries involves considering **women's roles and wellbeing** (Biffi et al., 2021; Szaboova et al., 2022).

2.3 Bioeconomy and Sustainable Tourism: Renewable Resources and Nature-based Solutions

Sustainable tourism, particularly **eco-tourism**, is an emerging area within the bioeconomy framework. It integrates local processes, biosecurity, and rural policies, aiming to achieve environmental sustainability while promoting local economic growth. Sustainable tourism supports the preservation of biodiversity and ecosystems, aligning with the principles of a circular economy. The interaction between sustainable tourism and the bioeconomy also encourages the use of **renewable resources and nature-based solutions**, which contribute to a greener economy (D'Amato et al., 2017; Plieninger et al., 2020).

2.4 Integrated Policy and Governance Strategies

An integrated approach is essential for balancing **resource exploration** and **ecosystem management**. Strategies should promote crosscutting institutional and policy linkages to optimize the use of bioresources and support green growth. This involves aligning agricultural policies with climate change mitigation and adaptation policies to promote low-emission rural development. The concept of polycentric governance, which emphasizes vertical and horizontal integration and learning-by-doing, can be instrumental in achieving these goals (de Wit, 2018; van Noordwijk, 2019).

In summary, the bioeconomy interconnects with agriculture, fisheries, and sustainable tourism to drive sustainable development. By leveraging innovative biorefinery techniques, promoting social resilience in fisheries, and integrating sustainable tourism, the bioeconomy supports a circular and green economy. Participatory public policies and multi-actor governance strategies that foster these interactions and address the associated challenges are crucial for achieving a sustainable, inclusive and circular bioeconomy.

3 Common Problems and Needs: Results from InnovationGUIDE Regional Workshops

3.1 Malta

On May 14, 2024, the InnovationGUIDE Regional Workshop convened at MCAST Main Campus in Malta, drawing together 38 participants representing a diverse array of stakeholders including the education sector, management and accelerator companies, ecological startups, agricultural enterprises, consultancies, the Ministry of Agriculture, Malta Food Agency, YES Europe, EU project consultancy firms, and venture capital entities. The workshop was dedicated to exploring and fostering

rural innovation, emphasizing collaborative efforts to enhance sustainability, productivity, and resilience within Malta's agricultural and rural sectors. Key discussions and presentations centered on innovative strategies, technological advancements, and policy frameworks aimed at promoting economic growth and environmental stewardship in rural communities across Malta. The results from the discussions around each four of InnovationGUIDE focus sectors are given below.

3.1.1 Sustainable Tourism

Malta, a gem in the Mediterranean, is experiencing a significant influx of tourists each year. While this surge in tourism boosts the economy, it also brings forth challenges that necessitate sustainable approaches to ensure the long-term viability of the sector. One critical area that demands attention is the need for finance to promote sustainable tourism. Sustainable tourism is not merely an environmental concern; it encapsulates economic and social dimensions that collectively ensure a balanced growth trajectory for Malta.

The hospitality sector in Malta needs to prioritize the development of energy-efficient building services. This includes investing in technologies and practices designed to minimize energy consumption and maximize the use of renewable energy sources. For instance, energy-efficient HVAC systems, solar panels for electricity and water heating, automated motion sensors for lighting, water-saving systems, air temperature monitoring sensors, and double glazing in glass installations are essential. These technologies not only reduce the environmental footprint but also contribute to long-term cost savings for hospitality businesses.

Conducting capacity studies is another crucial step towards sustainable tourism. These studies help determine the optimal number of tourists that can be accommodated without straining resources or degrading the environment. Sustainable tourism models, which integrate environmental, economic, and social considerations, provide a framework for policymakers to make informed decisions. These models can guide the formulation of governmental strategies, supported by the EU, to meet Malta's specific needs and promote economic evolution.

All hotels, accommodations, and companies linked to the tourism sector must align their policies with a green approach. This involves focusing on two main areas: environmental targets and social effects. Environmentally, hotels need to reduce their reliance on fuels and electricity, optimize water consumption, and adopt renewable energy sources such as photovoltaic systems and wind turbines. Socially, there is a need for dedicated training programs for employees to impart local traditions to guests and enhance customer satisfaction. Respecting local communities by avoiding overcrowding and minimizing waste, noise pollution, and carbon footprint from transportation is equally important.

Implementing green initiatives, such as planting trees and creating garden spaces on roofs, facades, and balconies, can significantly improve air quality and promote healthier environments. These green spaces absorb pollutants, produce oxygen, and reduce urban heat, contributing to a more sustainable urban landscape.

Currently, electrical energy in Malta is subsidized, making it crucial for companies to improve their energy efficiency. Additionally, there is a need to enhance the quality of

staff education through initiatives and programs that promote a tourist-centric approach and environmental awareness. These efforts should target both locals and foreigners living in Malta, fostering a culture of sustainability.

Malta faces significant challenges in managing capacity within the hospitality sector. The local workforce is insufficient to meet the demand, necessitating the employment of foreign nationals, often from third-world countries and other EU member states. This situation has led to issues with skills mismatches and the need for extensive training. The Government's initiative to introduce a skills card linked to the level of experience and education for foreign workers is a positive step. However, the disparity between minimum wages and the high cost of living, especially in terms of rent, creates social issues and potential abuses.

To address the current issues in hospitality, Malta should also consider shifting towards luxury hospitality. Investing in high-end tourism can reduce the overall volume of tourists, lessening the strain on infrastructure and resources while generating higher revenue. This approach aligns with sustainable tourism goals by focusing on quality over quantity, thereby mitigating the negative impacts of mass tourism.

Malta's small size and limited infrastructure pose significant challenges. The influx of low-cost tourists arriving via budget airlines exacerbates issues such as traffic congestion, pollution, and overstretched public services. A strategic shift towards attracting luxury tourists, who are fewer in number but spend more, can help alleviate these problems. Enhancing public transport efficiency through technology can also improve the overall tourist experience and reduce the environmental footprint.

In the context of sustainable tourism, innovation goes beyond simply replicating existing technologies. While technological advancements are inherently beneficial, their application must be tailored to the specific needs of different regions. For Malta, a southern European country, the primary focus of energy efficiency should shift from heating solutions, which are prevalent in colder northern countries, to cooling solutions. Cooling systems constitute the highest energy consumption in Maltese hotels, and there is a significant opportunity to deploy innovative technologies to enhance energy efficiency.

Innovations in cooling systems can lead to substantial energy savings. For example, advanced air conditioning systems with higher energy-star ratings, automated controls, and efficient refrigerants can reduce energy consumption significantly. Furthermore, the integration of renewable energy sources such as solar panels for electricity generation and water heating can offset the high energy demand for cooling. Implementing smart building technologies, such as automated motion sensors for lighting, air temperature monitoring systems, and intelligent HVAC systems, can optimize energy use based on occupancy and environmental conditions. Technologies that promote water conservation, such as low-flow fixtures and greywater recycling systems, are essential for reducing the overall environmental impact of tourism facilities. Incorporating green building design principles, such as improved insulation, natural ventilation, and the use of sustainable building materials, can enhance the energy efficiency of tourism infrastructure.

The traditional view of tourism, where visitors simply stay in hotels, dine at restaurants, and visit local attractions, needs to be expanded. A more holistic approach is required, which involves building diverse tourist profiles and offering a mix of options to cater to different interests and activities. This can include:

- **Heritage Tourism:** Focusing on cultural and historical sites.
- **Adventure Tourism:** Offering activities like tracking and cycling.
- **Religious Tourism:** Highlighting Malta's religious landmarks and events.
- **Eco-Tourism:** Promoting nature-based activities like swimming and hiking.
- **Wellness Tourism:** Providing health and relaxation services.

A key component of these new models is the improvement of public transport. Efficient and reliable public transport systems are crucial for supporting diverse tourist activities, reducing traffic congestion, and minimizing environmental impact. This includes investments in sustainable transport options such as electric buses, bike-sharing programs, and improved scheduling and connectivity.

To support these diverse tourist profiles, it is necessary to create economic models that cater to different tourism mixes. This involves:

- **Infrastructure Investment:** Despite a halt in recent investments, there is a need to resume and focus on infrastructure that supports various types of tourism, such as cycling paths, heritage site restorations, and eco-friendly transport options.
- **Funding Opportunities:** Current funding mechanisms pose several challenges. They are often directed towards SMEs, leaving larger hotels without necessary support. Additionally, the bureaucratic nature and timing of funding applications do not align with the urgent needs of businesses. To address this, funding opportunities should have more frequent and flexible application periods, ideally every 2-3 months or even monthly, to accommodate the specific timelines and business plans of applicants.

Thus, innovative tourist models and diversified tourism profiles can significantly enhance the appeal of Malta as a destination. By improving public transport and developing tailored economic models, Malta can better support these varied tourist activities. Addressing funding challenges through more accessible and timely opportunities will also play a crucial role in enabling businesses to adopt sustainable practices and technologies.

To enhance access to innovation in the tourism sector, it is crucial that all stakeholders are made aware of the available innovation infrastructures. This includes both small and large entities within the tourism industry. Direct communication and education are essential to keep stakeholders informed about innovation-based opportunities. Continuous education programs can help stakeholders remain updated with the latest advancements and best practices.

One significant barrier to accessing innovation funding is the complex and redundant application process. Applicants often have to resubmit the same documents multiple times, which is inefficient and time-consuming. To address this, a centralized system

should be implemented where all submitted documents are stored and can be reused for future applications. This would reduce the administrative burden on applicants and streamline the funding process.

The enforcement of the 'skill card' system for foreign workers is necessary to ensure that all personnel involved in the tourism sector are qualified and capable. Without proper enforcement, efforts to increase innovation and improve services may not be as effective. The skill card system should be rigorously implemented to maintain high standards across the industry.

Often, applicants find themselves more knowledgeable about funding details than the front-line staff responsible for processing their applications. To mitigate this issue, comprehensive training programs for front-line staff are essential. These programs should focus on enhancing their understanding of the funding processes, eligibility criteria, and the specifics of available grants and support programs.

Funding opportunities in Malta are often limited to SMEs, excluding larger entities that also need support. Additionally, the legal clauses and the amount of funding available are sometimes insufficient to meet the needs of stakeholders. To overcome these challenges:

- **Inclusive Funding Programs:** Develop funding programs that are inclusive of both SMEs and larger entities, ensuring that all stakeholders have access to necessary resources.
- **Adequate Funding Amounts:** Ensure that the funding provided meets the actual needs of the stakeholders, rather than offering nominal amounts that are not practical.
- **Frequent Funding Calls:** Introduce more frequent and flexible funding calls, ideally every 2-3 months, to better align with the timelines and business plans of applicants.

Innovation in tourism must also consider health and safety aspects. For example, in activities like diving and sailing (blue tourism), ensuring the health and safety of participants is crucial. This includes mandatory medical tests for divers to obtain certificates proving their fitness for the activity. Education, discipline, and enforcement are key to promoting safe practices and preventing potential abuses by trainers prioritizing profit over safety.

To conclude, increasing access to innovation in the tourism sector requires a multifaceted approach. Raising awareness, streamlining application processes, enforcing skill standards, improving staff knowledge, addressing funding limitations, and incorporating health and safety measures are all critical steps. By implementing these strategies, Malta can foster a more innovative, efficient, and sustainable tourism industry.

3.1.2 Bioeconomy

The bioeconomy sector in Malta stands at a crossroads, poised between significant challenges and promising opportunities for innovation and sustainable

development. In the workshop focused on this burgeoning field, a comprehensive assessment of the current landscape revealed critical issues and potential pathways for growth.

At the forefront of discussions was the pressing need for enhanced financing across various facets of the bioeconomy. Participants highlighted the necessity to support innovation and startups through strategic investment in research and development (R&D). This includes developing innovative products and services that meet both environmental sustainability goals and market demands. Moreover, there was a consensus that financing should prioritize areas such as bio fertilization to address soil erosion on arable lands, thereby rehabilitating soil properties crucial for agricultural sustainability.

Government policies came under scrutiny, with concerns raised about their short-term orientation and inadequate support for long-term bioeconomy objectives. Participants stressed the importance of aligning policy frameworks with thematic innovation priorities and ensuring robust quality standards and certifications. There was a clear call for a more strategic approach to infrastructural development, R&D, and education to create an enabling environment for bioeconomy advancements.

Financial constraints emerged as a significant barrier hindering the growth of bioeconomy initiatives. Current funding mechanisms often favor tech and AI sectors over bioeconomy ventures, leading to higher operational costs and reduced competitiveness. To address this, novel financing models were proposed, including agreements between public funding organizations and stakeholders, tax incentives for private sector investment in Environmental, Social, and Governance (ESG) compliant projects, and increased access to funding for low Technology Readiness Level (TRL) businesses.

Access to innovation infrastructures remains another critical issue, particularly for small businesses operating in the bioeconomy sector. Participants advocated for better externalization of existing schemes, collaboration between stakeholders, and facilitated access to research facilities through initiatives like Contract Research Operations (CRO). These measures are seen as essential for fostering a collaborative ecosystem that supports innovation and technological advancement.

Central to discussions was the imperative to strengthen public-private sector-small business cooperation. Participants underscored the need for incentives and tax benefits to encourage private sector engagement with smaller enterprises. They emphasized the role of the public sector in leading through cohesive strategies that facilitate partnerships and collaborations aimed at fostering innovation and sustainable growth.

In addressing these challenges, the role of digitalization and green transformation emerged as pivotal. Participants highlighted ongoing efforts to digitalize monitoring systems and automate processes in bioeconomy-related research facilities. These innovations not only improve operational efficiency but also pave the way for sustainable practices in resource management and production.

Despite these advancements, several obstacles persist, including administrative inefficiencies, insufficient funding channels, and a lack of local infrastructure and skills for testing innovative solutions. Overcoming these challenges requires concerted efforts to streamline funding opportunities, enhance regulatory frameworks, and promote education and training in bioeconomy-related fields.

Looking ahead, opportunities abound for Malta to position itself as a leader in sustainable bioeconomy innovation. By prioritizing strategic investments, fostering public-private partnerships, and leveraging digital technologies, Malta can unlock the full potential of its bioeconomy sector. This includes enhancing market connectivity, scaling up production capabilities, and aligning with global trends towards a more sustainable and resilient economy.

In conclusion, while the road ahead is fraught with challenges, the prospects for Malta's bioeconomy sector are promising. With collaborative efforts and strategic investments, Malta can carve out a niche in the global bioeconomy landscape, driving economic growth, environmental sustainability, and social well-being for years to come.

3.1.3 Agriculture

Malta, a country with limited arable land and scarce water resources, faces significant challenges in its agriculture sector, necessitating a robust focus on innovation to ensure sustainable food production and economic growth. In the regional workshop discussing the state of agriculture in Malta, several critical themes emerged, highlighting the urgent need for financial support, technological advancement, and strategic partnerships to foster innovation.

One of the foremost concerns voiced was the acute need for financial investments to enhance agricultural practices, particularly in securing water sources for irrigation and adopting sustainable technologies. Participants emphasized the necessity for direct investments, subsidies, and funding initiatives aimed at promoting the adoption of organic farming methods and improving food storage facilities. The fluctuating demand patterns in the market were identified as contributing significantly to food waste, highlighting the importance of financing mechanisms that support resilience to market fluctuations and promote sustainable farming practices.

A consensus among stakeholders was the need to prioritize innovation across various facets of agricultural production. This includes piloting and adopting innovative solutions in soil management, water conservation, integrated pest management, and crop rotation. A call was made for increased investment—potentially up to 10% of funding allocations—towards innovation activities aimed at enhancing productivity and sustainability in farming practices. Participants suggested exploring unconventional funding models such as a meat tax or reallocating subsidies from larger farms to support innovation in smaller, more sustainable operations.

To ensure small farmers can benefit from technological advancements, participants advocated for stronger links between farmers and innovators, facilitated through partnerships with research centers, incubators, and agricultural fairs. It was proposed that farmers should have a more significant role in setting innovation priorities and

testing new technologies through demo farms and pilot projects. Moreover, streamlining access to existing innovation infrastructures and aligning farmer needs with government priorities and funding opportunities were seen as crucial steps in fostering innovation adoption.

The importance of public-private sector collaboration was underscored as pivotal for driving agricultural innovation forward. Suggestions included establishing Environmental, Social, and Governance (ESG) programs, public-private partnerships (PPPs) for extension services, and communication campaigns promoting the benefits of locally grown organic food, particularly in school canteens. Enhancing incentives for private sector investments in agriculture and leveraging public support to prioritize nutrition and organic farming were identified as potential strategies to strengthen collaboration.

Despite these aspirations for innovation, participants acknowledged several obstacles hindering progress. These include fluctuating market demands leading to food waste, insufficient outreach and implementation following networking events, and the complexity of accessing funding due to stringent requirements. Addressing these challenges requires tailored approaches, including clearer funding models, enhanced market intelligence, and practical, farmer-oriented training and networking activities.

Looking ahead, the path to advancing agricultural innovation in Malta lies in fostering a supportive ecosystem that integrates financial support, technological innovation, and collaborative partnerships. This includes expanding educational initiatives on agriculture from an early age, establishing robust knowledge-sharing networks, and leveraging digital platforms for information dissemination and market access. By prioritizing sustainability, innovation, and collaboration, Malta can position its agriculture sector as a model for resilience and efficiency in the face of evolving global challenges.

In conclusion, while Malta faces unique challenges in its agriculture sector, the commitment to innovation and sustainability showcased in the regional workshop provides a promising foundation for future growth. By addressing financial needs, enhancing technological adoption, and fostering collaborative partnerships, Malta can navigate towards a more resilient and prosperous agricultural future.

3.1.4 Fisheries

Workshop discussions on Malta's fisheries sector highlighted critical areas for improvement, with a particular emphasis on innovation to address current challenges. The discussion centered around the need to modernize education, ensure sustainable practices in fish feed production, and explore innovative financing models.

One of the primary concerns raised was the outdated nature of educational programs in fisheries. Participants emphasized the urgent need to invest in updating bachelor's and master's programs to align them with contemporary industry standards. Modernizing the curriculum not only aims to attract more individuals to the field but also equips them with relevant skills for sustainable fishing practices.



The reliance on small fish from Africa and South America for fish feed emerged as a pressing issue. Participants stressed the importance of transitioning towards sustainable alternatives to alleviate pressure on global fish stocks. This shift not only supports ecological balance but also promotes local economic resilience by reducing dependency on imports.

Stakeholders identified several critical areas within the fisheries sector that require substantial financial investment:

- **Aquaculture Development:** Enhancing infrastructure and technology to boost production efficiency.
- **Human Resources:** Addressing skill gaps through training and capacity building.
- **Standardization:** Establishing uniform practices and certifications to ensure quality and compliance with international standards.

Participants debated the optimal allocation of funding towards innovation activities. Suggestions ranged from dedicating 3% to 5% of total funds specifically to innovation-driven initiatives within the fisheries sector. This allocation is intended to foster research and development of sustainable practices, technology adoption, and market diversification.

Innovative financing mechanisms were also proposed to sustainably fund fisheries sector advancements:

- **Sustainability Taxes:** Introducing taxes on fish and fish farms to create a revenue stream dedicated to environmental conservation and industry modernization.
- **Public-Private-Small Business Cooperation:** Strengthening collaboration between government entities, private enterprises, and small businesses was emphasized as crucial. This cooperation could be facilitated through more transparent policy processes, increased participation from civil society in decision-making, and streamlined regulatory frameworks.

Enhancing cooperation between public and private sectors, along with small businesses, is seen as pivotal for the sector's growth:

- **Policy Transparency:** Governments should adopt more open policy processes to encourage greater involvement from stakeholders.
- **Civil Society Participation:** Engaging civil society in decision-making ensures diverse perspectives are considered.
- **Business Engagement:** Encouraging businesses, particularly small enterprises, to participate in collaborative projects and initiatives fosters innovation and shared expertise.

In conclusion, the workshop underscored the urgent need for innovation in Malta's fisheries sector to address educational reform, sustainable practices, and financing challenges. By modernizing education, diversifying fish feed sources, and implementing innovative financing mechanisms, Malta can position itself as a leader in



sustainable fisheries management while fostering economic growth and environmental stewardship.

3.2 Spain

On June 20, 2024, the InnovationGUIDE Regional Workshop convened at Edificio FEUGA in Santiago de Compostela, Spain, attracting more than 50 stakeholders from diverse sectors including agriculture, fisheries, sustainable tourism, and the bioeconomy. Participants represented institutions such as rural development foundations, accelerators for food sector innovation, cooperative associations, universities specializing in forestry and applied economics, and organizations focused on promoting entrepreneurship and sustainable land management. Discussions centered on advancing rural innovation through collaborative strategies aimed at bolstering economic resilience and environmental sustainability across the region. The results from the discussions around each four of InnovationGUIDE focus sectors are given below.

3.2.1 Sustainable Tourism

The discourse in the regional workshop revolved around identifying the needs, opportunities, and potential strategies for positioning Spain's rural and sustainable tourism on the global stage, comparing it with other European counterparts like France, Italy, and Norway. This detailed analysis aimed to foster collaboration, enhance brand positioning, and explore innovative ecosystems to bolster Spain's sustainable tourism industry.

One of the primary needs identified is the necessity for effective brand positioning of Spain's rural and sustainable tourism products in the international market. Currently, Spain lags behind other European regions such as France, Italy, and Norway, which have established strong brand identities in the sustainable tourism sector. There is an urgent need to create a compelling narrative and marketing strategy that highlights the unique offerings of Spain's rural landscapes, cultural heritage, and sustainable practices. This would not only attract more international tourists but also position Spain as a leading destination for sustainable tourism.

The tourism sector in Spain is highly fragmented, with numerous small-scale operators working independently. This atomization hampers the ability to create a cohesive and unified tourism experience. There is a pressing need for collaboration schemes that can bring together various stakeholders, including local businesses, government bodies, and tourism operators, to work towards common goals. By fostering partnerships and creating networks, Spain can offer more integrated and holistic tourism experiences that appeal to modern travelers seeking sustainable and diverse options.

Another critical need is the adoption of best practices from more innovative ecosystems. Spain can benefit immensely by studying and integrating successful models from other regions known for their innovation in sustainable tourism. For example, looking at how Norway leverages its natural resources for tourism can



provide valuable insights. Learning from these models can help Spain develop unique and competitive tourism products that emphasize sustainability and innovation.

Over the past decade, Spain has seen significant improvements in general entrepreneurship and the development of entrepreneurial ecosystems. This positive trend presents a ripe opportunity for fostering innovation within the sustainable tourism sector. By encouraging entrepreneurial ventures and supporting startups focused on sustainability, Spain can drive new ideas and solutions that enhance the tourism experience while preserving the environment.

One of the notable success stories from the region is the establishment of digital coworking spaces in rural areas of Galicia, aimed at attracting digital nomads. These coworking spaces have not only revitalized rural areas but also provided a model for integrating digital and sustainable tourism. This example underscores the potential for rural regions to tap into the growing market of digital nomads who seek both connectivity and natural beauty.

Investment in sustainable tourism projects offers a dual benefit of increasing knowledge about the region and promoting population settlement, thereby contributing to the economic development of the area. Such investments can lead to the creation of sustainable infrastructure, conservation projects, and educational programs that attract tourists while preserving the natural and cultural heritage of the region.

Galicia has emerged as one of the main tourist destinations in Spain, with a record number of several million tourists last year. This growth highlights the region's potential and provides a foundation upon which to build more innovative and sustainable tourism models. Capitalizing on this momentum can further establish Galicia as a leader in sustainable tourism, attracting both domestic and international visitors.

There is significant opportunity in developing new tourism business models based on the region's natural resources, particularly in river and mountain tourism. These segments are not yet fully developed in Galicia, presenting a chance to create unique and appealing tourism products. By learning from the good practices of regions like Norway, which has successfully integrated its natural landscapes into its tourism offerings, Galicia can create sustainable and attractive tourism options that differentiate it from other destinations.

The workshop concluded with a consensus on the importance of innovation and collaboration in advancing Spain's sustainable tourism sector. Addressing the identified needs through strategic brand positioning, fostering collaboration, and learning from innovative ecosystems can position Spain as a premier destination for sustainable tourism. The opportunities presented, including leveraging entrepreneurial ecosystems, success stories, and untapped natural resources, provide a robust framework for future growth. By embracing these strategies, Spain can enhance its tourism offerings, promote sustainability, and drive economic development in its rural and natural regions.

3.2.2 Bioeconomy

The bioeconomy sector in Spain is rapidly evolving, aiming to integrate sustainable practices and innovative solutions to bolster rural economies. The regional workshop focused on addressing the needs, challenges, and opportunities within this sector, particularly emphasizing the importance of talent acquisition, infrastructure, communication, cooperation, and the role of academia. The goal is to drive innovation and support rural enterprises, ensuring their competitiveness and sustainability in the global market.

One of the primary needs discussed is the promotion of talent arrival to rural companies. Rural areas often struggle to attract and retain skilled professionals due to inadequate mobility models and infrastructure. Adapting appropriate mobility solutions is crucial to make these areas accessible and appealing to talent. This includes improving transportation networks, digital connectivity, and essential services like healthcare and education. By addressing these infrastructural gaps, rural companies can become viable and attractive options for professionals seeking new opportunities.

Another significant need is to improve communication and dissemination of opportunities in rural areas. This involves creating awareness about the potential and advantages of rural enterprises. There is a need to reach out to various educational levels, starting from schools, to instill an understanding and appreciation of rural opportunities among children. Furthermore, leveraging media platforms to raise awareness about rural initiatives and successes can play a pivotal role in changing perceptions and encouraging more people to consider rural employment and entrepreneurship.

A major challenge identified is the necessity of cooperative or associative models. Without these models, it becomes difficult for rural enterprises to thrive in the competitive market. Sharing resources such as delivery logistics, client bases, production facilities, and branding efforts can significantly reduce costs and increase efficiency. Encouraging businesses to form alliances and cooperatives can foster a more resilient and robust rural economy.

The importance of holding events to generate cooperation and associationism was emphasized. These events can serve as platforms for networking, knowledge exchange, and showcasing innovations. They can also highlight the value of rural resources and prevent the loss of ecosystem services. Such events can galvanize community efforts and enhance collective problem-solving capabilities, making rural enterprises more competitive and sustainable.

There is a lack of capacity among intermediary support organizations to effectively reach the most rural areas. To address this, there should be a greater focus on encouraging collaboration between various entities, including intermediate organizations. These collaborations can help extend the reach of support services, ensuring that even the remotest areas have access to the resources and guidance needed for innovation. Developing new initiatives that support the existing agro-industrial fabric in its transition to innovation is crucial, as this sector is strategic and vital for rural economies.

Academia holds significant potential to support rural enterprises. Universities and research institutions can collaborate with rural businesses to address specific needs and challenges. By connecting academic research and practical applications, innovative solutions can be developed and implemented, benefiting both urban and rural areas. Encouraging academic institutions to engage with rural enterprises can lead to the development of new technologies, processes, and products that enhance rural economic growth.

The reconfiguration of value chains in the global economy presents a unique opportunity for rural areas. As the world shifts away from fossil fuel-based economies towards more sustainable practices, there is a growing trend towards primary systems and circularity. Rural areas, with their rich natural resources and agricultural potential, can play a pivotal role in this transition. By embracing circular economy principles, rural enterprises can create sustainable value chains that contribute to environmental conservation and economic resilience.

Despite the predominantly urban focus of universities, there is a valuable opportunity to link students' practical experiences to the rural environment. Internships, field studies, and collaborative projects can provide students with hands-on experience while contributing to rural development. This not only enhances the students' learning experiences but also brings fresh perspectives and innovative ideas to rural enterprises. Establishing strong connections between academic institutions and rural businesses can create a pipeline of skilled professionals who are well-equipped to drive rural innovation.

The regional workshop underscored that by addressing the needs of infrastructure and talent, overcoming challenges through cooperation and enhanced support, and seizing opportunities in academia and value chain reconfiguration, rural enterprises can thrive. The collaborative efforts of various stakeholders, including businesses, academic institutions, and support organizations, are essential in fostering a sustainable and competitive rural bioeconomy. As Spain continues to innovate and adapt, the bioeconomy sector can become a cornerstone of rural economic development, contributing significantly to the nation's overall growth and sustainability.

3.2.3 Agriculture

Spain's agricultural sector is at a pivotal juncture where innovation can play a crucial role in addressing existing challenges and harnessing new opportunities. The regional workshop notes shed light on various facets of the agricultural sector, focusing on needs, opportunities, barriers, and challenges. This essay explores these aspects in detail, offering insights into potential solutions and the future of agricultural innovation in Spain.

The agricultural and livestock sectors in Spain face significant regulatory and administrative burdens. The proliferation of suppliers and the multitude of procedures required for administrative and management tasks create a complex and often inefficient system. One proposed solution is the establishment of a single window for managing related procedures, a concept that has not yet been effectively implemented in the region.

At the regional level, particularly in Galicia, initiatives like the establishment of rural offices aim to support entrepreneurs. However, these offices are understaffed and not functioning optimally. There is a pressing need for more workforce in these rural entrepreneurship offices to provide timely and effective support.

A critical issue is the lack of generational change in agriculture and fishing. The average age of workers in these sectors is between 50 and 60 years, leading to a digital disconnect and insufficient knowledge of financing programs. This demographic trend threatens the sustainability and innovation potential of the sector.

Furthermore, rural areas suffer from a significant lack of talent. This talent drain is exacerbated by inadequate infrastructure and essential services, such as transportation, shops, and leisure facilities, which are necessary to attract young graduates. The disconnection between numerous public and private initiatives supporting rural entrepreneurship also hinders cohesive progress. A unified framework and standardized methodology for rural support entities are urgently needed.

Financial support mechanisms also pose a challenge. There is often a significant gap between the need for subsidies or financial aid and their actual receipt. The conditions for accepting and the regulatory frameworks governing financial aid need thorough review to ensure timely and effective support for rural businesses.

The role of agricultural advisors is currently limited to administrative assistance for managing CAP funds. Expanding their role to include a broader range of support and financing mechanisms, involving academia and research, could significantly benefit the agrifood system.

Higher education programs focused on entrepreneurial skills and rural development are lacking. Promoting such programs and initiatives like Living Labs in rural areas can transfer knowledge and highlight the daily realities and needs of rural life, fostering a better understanding and appreciation of rural areas.

Several innovative initiatives present opportunities to rejuvenate the agricultural sector in Spain. One such initiative is the development of rural shared workspaces. These workspaces provide entrepreneurs with shared infrastructure, such as facilities for honey and derived products, non-alcoholic beverage cellars, and pastry spaces. By reducing infrastructure costs and fostering an entrepreneurial ecosystem, these shared spaces can significantly benefit rural entrepreneurs.

Another promising initiative is the Land Banks. These banks aim to prevent the abandonment of agricultural land by making it available for agricultural, livestock, forestry, nature conservation, and heritage uses, or other socially beneficial purposes. Despite its potential, the demand for this solution remains low, and further investigation is needed to understand and address this issue.

New business models, such as gastronomic tourism, offer innovative ways to diversify and internationalize the agricultural sector. Tourist routes that highlight the journey of food from farm to table can add value to the agricultural experience, showcasing the farmer's role and the process of food production, preparation, and tasting.

Several barriers impede the progress of entrepreneurial initiatives in rural areas. The longer duration required for rural entrepreneurial projects compared to urban ones necessitates tailored business support services. These services must accommodate the extended timelines and specific needs of rural projects.

There is also a dichotomy between the sale of artisanal, ecological, and value-added products and the purchasing power of the local society. This economic barrier limits the market size for such products, affecting the viability of rural entrepreneurial initiatives.

The lack of basic services in rural areas, a consequence of decades of depopulation, poses a significant barrier to attracting entrepreneurial initiatives and the general population. The absence of essential services such as banks, supermarkets, and transportation hinders the development of a vibrant rural economy. A comprehensive rural digital strategy is also lacking. Enhancing connectivity and leveraging digitalization to meet logistics needs are critical steps towards modernizing rural economies. The high average age of rural business promoters further complicates the adoption of innovative practices.

Additionally, the social perception of rural living and working is not favorable. Changing this perception is crucial to attracting new talent and fostering a culture of innovation in rural areas.

One of the significant challenges is the potential for collaboration between universities and rural entrepreneurship. Although numerous initiatives have emerged, there is a lack of awareness about these collaborations. Effectively communicating inspiring examples, methodologies, and best practices can help lay the foundation for a robust rural industrial fabric. There is also a substantial amount of financial aid available for rural entrepreneurship that remains unknown to many potential beneficiaries. Improving the dissemination of information about these aids, their requirements, and the necessary procedures is a critical challenge that needs to be addressed.

Thus addressing the identified needs, leveraging opportunities, overcoming barriers, and tackling challenges requires a concerted effort from all stakeholders. By fostering innovation, enhancing support structures, and improving communication and education, Spain can revitalize its agricultural sector and ensure its sustainability and growth for future generations.

3.2.4 Fisheries

The fisheries sector in Spain, characterized by its rich maritime heritage, faces numerous challenges as it navigates the contemporary demands of innovation and sustainability. The regional workshop discussions highlight the demographic challenges, gender disparities, the dearth of innovative practices, the valorization of local products, and the integration of academic internships, alongside the essential role of public policy tailored to rural contexts.

The average age of business promoters in the fisheries sector is notably high. This demographic reality poses a significant challenge to innovation, as older entrepreneurs may be less inclined or less capable of adopting new technologies and practices. This

trend results in a sector that is often resistant to change, relying on traditional methods that may no longer be efficient or sustainable.

The lack of innovation is a critical concern as the global market increasingly demands more efficient, sustainable, and competitive fisheries practices. To address this, there is an urgent need to introduce mechanisms that encourage younger generations to enter the sector. This could involve offering incentives for younger entrepreneurs, facilitating access to modern technologies, and providing training programs that emphasize the importance of innovation in maintaining the sector's viability and competitiveness.

Gender disparities within the fisheries sector are also pronounced, with women often occupying lower-status roles and facing limited opportunities for advancement. This inequality not only affects the social fabric of fishing communities but also limits the sector's potential for innovation and growth. Addressing gender disparities requires a multifaceted approach. Policies and programs must be designed to empower women, providing them with equal access to resources, training, and leadership opportunities. By promoting gender equality, the fisheries sector can benefit from a diverse range of perspectives and talents, fostering a more innovative and resilient industry.

Small-scale fisheries initiatives, which form a significant part of the sector, often lack the resources and support needed to innovate. These initiatives are typically run by local communities with limited access to capital, technology, and expertise. As a result, they struggle to implement modern practices that could enhance productivity and sustainability.

To overcome this barrier, it is essential to create supportive ecosystems that facilitate innovation in small initiatives. This could involve establishing innovation hubs, providing grants or low-interest loans, and offering technical assistance. By empowering small-scale fisheries with the tools and resources they need, the sector can unlock new opportunities for growth and sustainability.

The concept of Km 0 products, which emphasizes the consumption of locally sourced goods, is gaining traction across various sectors, including fisheries. However, the fisheries sector in Spain has yet to fully capitalize on this trend. There is a pressing need to valorize local fish products, promoting short value chains that reduce the environmental impact and support local economies. Promoting Km 0 products requires coordinated efforts to educate consumers about the benefits of locally sourced fish, develop marketing strategies that highlight the unique qualities of these products, and create infrastructure that supports short value chains. By doing so, the fisheries sector can enhance its sustainability and strengthen local communities.

There is a significant opportunity to bridge the gap between academia and the fisheries sector through university internships. By linking degrees and master's programs to rural areas, students can gain hands-on experience while contributing to the sector's innovation and development. Encouraging internships in rural fisheries can be achieved by creating partnerships between universities and local fisheries businesses, offering incentives for students to participate in rural internships, and ensuring that academic curricula are aligned with the practical needs of the sector. These internships can serve as a catalyst for innovation, bringing fresh ideas and energy into the industry.

One of the most significant barriers to innovation in the fisheries sector is the disconnect between public policies and the realities of rural communities. Often, policies are formulated in urban centers without a thorough understanding of the unique challenges faced by rural fisheries. This urban-centric approach can result in policies that are not only ineffective but also detrimental to the sector.

To address this barrier, it is essential for policymakers to engage directly with rural communities, involving them in the policy-making process. This can be achieved through consultations, participatory planning, and continuous dialogue. Policies should be tailored to the specific needs of rural fisheries, considering factors such as access to technology, infrastructure development, and local economic conditions. By aligning public policies with the realities of rural fisheries, the sector can be better supported in its efforts to innovate and thrive.

To conclude, addressing the high average age of business promoters, gender disparities, the lack of innovation in small initiatives, the need to valorize Km 0 products, and the integration of academic internships are crucial steps toward fostering innovation. Moreover, ensuring that public policies are attuned to the realities of rural communities is essential for creating a supportive environment for the sector. By tackling these needs and barriers head-on, the fisheries sector can not only enhance its sustainability and competitiveness but also contribute to the broader goals of economic development and social equity. The path forward requires a collaborative effort involving stakeholders from all levels, from local communities to policymakers, to create a vibrant and innovative fisheries sector in Spain.

3.3 The Netherlands

On June 21, 2024, from 13:00 to 16:45, the InnovationGUIDE Regional Workshop took place at Stichting Qeske in Maastricht, Netherlands, gathering 17 participants from municipalities, academia, local businesses, and students. Hosted in collaboration with stakeholders from tourism, bioeconomy, and agriculture sectors, the session featured three keynote presentations delivered by representatives from the municipality, academia, and a local matured business entrepreneur. The presentations were followed by a moderated panel discussion engaging the audience, aimed at exploring innovative strategies and collaborations to enhance sustainability, economic development, and community resilience in rural areas. Networking concluded the event, fostering further dialogue and partnership opportunities among participants. Here are the results combining the presentations and the discussions:

3.3.1 Sustainable Tourism

Sustainable tourism in The Netherlands, an integral component of the broader sustainable development goals, involves creating a balance between economic growth, environmental conservation, and social equity. However, the policy and regulatory environment within municipalities often poses significant challenges to exploration and innovation. The regional workshop studied the details of these challenges and outlined strategies for fostering sustainable tourism at the local level.

Municipal regulations often restrict innovative developments while allowing traditional, large-scale activities, such as extensive farming operations. This contradictory stance

hampers the growth of sustainable tourism. For instance, local government officials frequently raise objections to new, innovative projects under the guise of protecting taxpayer interests. This opposition persists despite active involvement and interest from local citizens, especially those living adjacent to potential development sites. Such regulatory hurdles stifle creativity and prevent the realization of community-driven tourism initiatives that could bolster local economies.

It is argued that for sustainable tourism to thrive, financial opportunities must align with individual ambitions. Encouraging investment in local projects can stimulate the local economy and foster a culture of innovation. Municipal spaces can be better utilized by collaborating with local residents to address pressing needs such as flood management and the promotion of renewable energy sources. Initiatives like communal vegetable gardens and providing meals for kindergartens exemplify how local resources can be leveraged to create sustainable tourism opportunities.

Sustainable tourism is vital for local economies, especially for the small and micro family firms that constitute a significant portion of SMEs and drive local employment. These enterprises, despite the strategic, tactical, and operational benefits of transitioning to sustainable practices, face numerous bottlenecks. These include market limitations, regulatory burdens, and restricted access to finance. The long-term commitment required for sustainable initiatives, often extending beyond four years, can be daunting without immediate market opportunities.

The COVID-19 pandemic exacerbated existing challenges in the tourism, food, and hospitality sectors, reducing tourism by 60% and intensifying regulatory burdens. SMEs faced conservative banking practices and higher interest rates, complicating access to finance. Enhancing managerial competencies and embracing digitalization are critical steps in mitigating these challenges. Risk perception and attitude significantly influence entrepreneurial actions, suggesting that reducing the risk-adjusted cost of capital through tax allowances and promoting cooperative, democratic models can mitigate risks.

Education also plays a crucial role in supporting transitions to sustainable tourism. Emphasizing education on Sustainable Development Goals (SDGs) can foster a deeper understanding and commitment to sustainable practices. This educational focus is essential for building the managerial competencies required to navigate the complexities of sustainable tourism and for promoting a culture of innovation and resilience.

In conclusion, by aligning financial opportunities with local ambitions, adopting eco-friendly practices, and enhancing managerial competencies, municipalities can create a conducive environment for sustainable tourism which paves the way for further blueprints on sustainability in all sectors. This requires a collaborative approach involving local residents, SMEs, and larger corporations, all working towards the common goal of sustainable development. Emphasizing education and promoting innovative, community-driven initiatives can pave the way for a thriving, sustainable tourism sector that benefits local economies and contributes to global sustainability efforts.

3.3.2 Bioeconomy

The regional workshop in the Netherlands also illuminated significant insights into the bioeconomy sector, underscoring both the challenges and opportunities in navigating policy and regulatory landscapes, fostering sustainable practices, and leveraging community cooperation.

The policy and regulatory environment within municipalities often poses substantial challenges for innovation in the bioeconomy sector too. Municipal regulations tend to favor traditional agricultural practices, such as large-scale livestock farming, over more innovative and sustainable activities. This regulatory bias creates legal barriers and obstacles for new initiatives, which can stifle creativity and hinder the adoption of sustainable practices. The contradiction is stark: while civil servants raise doubts about innovative developments, local governments actively involve and monitor the interests of village residents adjacent to proposed project sites. This misalignment between regulatory frameworks and community involvement needs to be addressed to foster a more conducive environment for bioeconomic innovation.

Financial opportunities for individuals and small enterprises should align with their ambitions to encourage investment in local projects. The workshop emphasized the importance of creating financial frameworks that support sustainable initiatives. Municipal spaces can be better utilized by collaborating with local residents to address various community needs, such as flood management and solar energy utilization. For instance, communal vegetable gardens and meal provision for kindergartens are practical examples of how local initiatives can align with broader sustainability goals.

Transitioning to sustainable practices in the bioeconomy sector involves adopting modular, eco-friendly construction methods and utilizing the best available technologies. This gradual, demand-driven growth fosters independence and cooperation among local small and medium-sized enterprises (SMEs). In sustainable food production and innovative building practices, scaling up in a modular way—such as constructing a barn with progressively better materials, technologies, and designs—demonstrates the benefits of learning by doing. This approach also encourages finding new combinations between residents and initiatives, enhancing community engagement and innovation.

Financial considerations play a significant role in the transition to sustainable practices. There is a need to shift towards cooperative models and community-driven initiatives to circumvent the limitations of traditional financing mechanisms. Criticism of current financial systems highlights their inadequacies in supporting long-term sustainable projects, despite substantial investments in traditional sectors like real estate. A shift towards cooperative models can better support innovative endeavors without excessive risk aversion.

Public policy and financial support are crucial but often misaligned with the needs of innovative projects. Better allocation of funds towards sustainable and socially beneficial innovations is necessary. Financial systems should support long-term sustainable projects and address the regulatory burdens that inhibit innovation.

Subsidies and incentives should be aligned with sustainability goals to encourage broader adoption of eco-friendly practices.

To conclude, the regional workshop highlighted the importance of aligning policy and regulatory environments with the needs of innovative projects, supporting financial frameworks that encourage sustainable practices, and fostering community-driven initiatives. Education and cultural shifts are also essential to create a supportive ecosystem for bioeconomic innovation. By addressing these challenges and leveraging opportunities, the Netherlands can advance its bioeconomy sector, promoting sustainability and resilience in local economies.

3.3.3 Agriculture

The Netherlands, renowned for its advanced agricultural practices, faces a unique set of challenges and opportunities as it seeks to innovate and transition towards more sustainable models. The regional workshop made highlights on critical issues and potential strategies to enhance the agricultural sector's sustainability, resilience, and community integration.

The financial landscape for agricultural innovation requires alignment with the sector's ambitions. Small and micro family farms, which make up a significant portion of agricultural SMEs, face challenges in accessing finance. Financial institutions are often conservative, with strict regulations and high-interest rates that impede investment in sustainable agricultural practices. The workshop stressed the importance of developing financial mechanisms that support long-term investments in sustainable agriculture. This includes creating funds specifically for sustainable transformation and providing incentives for banks to offer lower interest rates for eco-friendly projects.

Very similar to the environment in the bioeconomy sector, community involvement is crucial in driving agricultural innovation. The workshop highlighted several successful community-driven initiatives that serve as models for integrating local needs with sustainable practices. For instance, communal vegetable gardens not only provide fresh produce but also foster community spirit and engagement. Additionally, initiatives like providing healthy meals for kindergartens sourced from local farms emphasize the potential of agricultural projects to meet local needs while promoting sustainability.

Effective communication and networking are essential for the agricultural sector's innovation ecosystem. A robust local digital platform can facilitate information sharing and collaboration among farmers, suppliers, and other stakeholders. This platform should be kept current and accessible, ensuring that all participants in the agricultural sector can benefit from shared knowledge and resources. The workshop emphasized the importance of visualizing stakeholder maps and showcasing successful case studies to inspire and guide new projects.

Several case studies presented at the workshop highlighted successful models of sustainable agriculture:



- **Gulpener Bier:** This brewery in Gulpen uses local agricultural products and focuses on sustainable energy use, demonstrating how agricultural practices can align with broader sustainability goals.
- **Geedeelde Weelde:** A shared store ecosystem supported by local suppliers showcases the benefits of community-based agricultural models.
- **Locotuinen:** This initiative involves both volunteers and professional farmers in community gardening, emphasizing the importance of local involvement in sustainable agriculture.

These examples illustrate how integrating community needs with innovative agricultural practices can lead to successful and sustainable outcomes.

The workshop emphasized the potential of cooperative models in mitigating risks associated with agricultural innovation. Cooperative models can provide a supportive framework for small farms, allowing them to share resources and knowledge. Additionally, promoting risk mitigation strategies such as reducing the risk-adjusted cost of capital through tax allowances can encourage investment in sustainable agriculture. These strategies can help create a more resilient agricultural sector capable of adapting to changing conditions and demands.

A shift in education and culture is necessary to support innovation in agriculture. Integrating sustainability into educational curricula can foster a mindset that values long-term impact and community collaboration. The workshop called for educational systems to incorporate real-world agricultural challenges and practical experiences, preparing the next generation to lead in sustainable practices. Encouraging entrepreneurial spirit and risk-taking among young people is essential for driving agricultural innovation.

Thus the regional workshop once again underscored that by addressing regulatory barriers, enhancing financial support, promoting community-driven initiatives, and adopting modular and eco-friendly practices, the Netherlands can advance its agricultural sector towards greater sustainability. Networking, education, and cooperative models are crucial in creating a supportive ecosystem for agricultural innovation. By embracing these strategies, the agricultural sector can become more resilient, sustainable, and integrated with community needs, leading to long-term benefits for both the economy and the environment.

3.3.4 Fisheries

Although the fisheries sector was not the primary focus of the regional innovation workshop due to the unavailability of the key panellists, the discussions revealed that many of the challenges and strategies for sustainability in other sectors are applicable to fisheries.

Similar to agriculture, the fisheries sector in the Netherlands faces significant policy and regulatory challenges. Local governments often have stringent regulations that can impede innovative practices. These regulations tend to prioritize traditional methods over new, sustainable approaches, creating barriers for fisheries aiming to adopt more



eco-friendly practices. Just as in agriculture, there is a need for more flexible regulatory frameworks that support innovation and sustainability in fisheries.

Dutch fisheries are unique in their historical reliance on traditional methods and their integration into local and international markets. Popular fish products in rural businesses across the Netherlands include eel, perch, pike, and trout, which are well-suited to both marine and freshwater aquaculture systems. The sector's emphasis on high-quality, sustainable seafood has led to a reputation for excellence, but also imposes specific regulatory and financial constraints. In particular, the southern region of the Netherlands, with its rich coastal ecosystems, plays a crucial role in shellfish farming and sustainable aquaculture, contributing significantly to the national seafood output. Meanwhile, the Limburg region, although less prominent in traditional marine fisheries, has developed a niche in freshwater aquaculture, leveraging its inland waterways and innovative practices to produce high-quality fish products.

Financial opportunities are crucial for fostering innovation in the fisheries sector. Small-scale fishers, much like small and micro family farms, can struggle with accessing finance due to conservative banking practices and high-interest rates. The workshop highlighted the importance of aligning financial mechanisms with the sector's ambitions. Developing funds specifically for sustainable fisheries and providing incentives for banks to offer favorable terms can encourage investment in innovative practices.

Transitioning to sustainable fisheries involves adopting modular and eco-friendly practices. This approach allows for gradual improvements and integration of the best available technologies. For example, modular aquaculture systems can be designed to minimize environmental impact and improve efficiency over time. Learning by doing, a concept emphasized in the workshop, is equally applicable to fisheries, enabling continuous adaptation and improvement.

Effective networking and communication are essential for scaling up sustainable practices in fisheries. A digital platform accessible to fishers, suppliers, and other stakeholders can facilitate the sharing of information and resources. Keeping such a platform up-to-date ensures that all participants can benefit from the latest knowledge and innovations. This strategy aligns with the workshop's emphasis on robust communication networks in the bioeconomy sector too. Furthermore, cooperative models can provide a supportive framework for small-scale fishers, allowing them to share resources and knowledge. Promoting risk mitigation strategies, such as reducing the risk-adjusted cost of capital through tax allowances, can encourage investment in sustainable fisheries. These strategies, discussed in the context of agriculture, are equally relevant for the fisheries sector.

Key quotes from the workshop panel discussion:

Type	Quotes
Collaboration and Connection	- "Needs to cooperate more, make connections to survive." - "Find out specific needs, create ownership."- "Don't tell what needs to be, but connect yourself, open up and make trust."

Risk Perception and Management	- "Circular economy - there are more risks, linear economy there are not much risk perception."- "Not enough risk appetite among young people now, this should be changed." - "What is good risk or bad risk?" - "Benchmarks for risk should be changed not only by books but by field."
Education and Mindset	- "Bring students to show a different way of life."- "Students are free to learn, theories are just tools." - "Sustainability is ecology." - "Success can not be short run, mindset of success should be changed."
Sustainability and Growth	- "Sustainability should be in harmony, patients have an organic role, build up from the bottom, organic growth needs time, you can't be a giant quickly."
Local Economy and Human Capital	- "As a start-up, you need early capital, you need to know what level you need to be." - "Once start-ups become self-independent, they sometimes go to Eindhoven (a bigger ecosystem) and leave Limburg (and Limburg loses these human capital)." - "Local products such as milk for babies should come from this region."

3.4 Türkiye

On June 28, 2024, the InnovationGUIDE Regional Workshop convened at the Foreign Trade Complex in Istanbul, hosted in the VIP Room at TIM Headquarters. The workshop brought together 32 participants representing Türkiye's largest food companies, universities, ecological startups, municipalities' agriculture directorates, transportation firms, and consultancy agencies. The event centered on rural innovation, featuring project presentations followed by intensive workshops that spanned nearly three hours. Discussions and activities focused on fostering innovative solutions to enhance sustainability, productivity, and competitiveness within Türkiye's rural sectors, highlighting collaborative efforts among diverse stakeholders to drive local economic development and environmental stewardship initiatives. Some of the key results are detailed below.

3.4.1 Sustainable Tourism

The sustainable tourism sector in Türkiye is a burgeoning field with immense potential. To realize this potential, InnovationGUIDE regional workshop in Türkiye highlighted several key points, emphasizing the need for tailored education, mentorship, gender inclusion, effective digital platforms, organic financial growth, exemplary practices, and a cohesive innovation ecosystem.

The concept of educational inflation refers to the overabundance of generic training programs that often fail to meet the specific needs of participants. The workshop underscored the importance of moving beyond these one-size-fits-all solutions. Instead, there is a call for more specialized and segmented educational offerings. By tailoring education to the unique demands of the sustainable tourism sector, stakeholders can ensure that the training is relevant and impactful.

For instance, the workshop highlighted the success of long-term, end-to-end projects like **InoSuit**, implemented by the Türkiye Exporters Assembly (TİM). These projects assign mentors to small businesses, providing continuous, personalized support rather than sporadic, short-term programs. This mentorship model allows for deeper engagement and more meaningful development, helping businesses to implement sustainable practices effectively.

Furthermore, public institutions can play a crucial role by offering one-on-one mentorship across various domains within the tourism sector. This personalized approach can address specific challenges faced by businesses and ensure that the support provided is comprehensive and applicable to real-world scenarios.

A significant emphasis was placed on the role of women in the sustainable tourism sector. Women, especially those in rural areas, are pivotal to the success of sustainable tourism initiatives. The workshop participants noted that training and empowering women can lead to substantial improvements in rural livelihoods. By equipping women with the necessary skills and knowledge, they can contribute significantly first to their families, then to their neighbourhoods, and finally to sustainable tourism practices, thereby fostering economic development and social cohesion in their communities.

Educational programs targeted at women can cover areas such as eco-friendly hospitality management, sustainable agricultural practices, and the promotion of local culture and heritage. Such targeted training not only enhances the capabilities of women but also ensures that the benefits of sustainable tourism are distributed more equitably across different segments of society.

In the digital age, the efficient matching of supply and demand is also crucial for the success of the sustainable tourism sector. The workshop highlighted the importance of digital platforms in achieving this goal. Properly leveraging digital tools can ensure that tourism services and products meet the needs of consumers while promoting sustainability. For example, platforms like "**Ask Türkiye**," which facilitates the buying, selling, and promotion of products, can be expanded and optimized to better serve the sustainable tourism sector. Furthermore, websites can be further enhanced by including geographical indicators (Tr. Coğrafi İşaret) of products. Through such a labeling, these platforms can also serve to be a key point of agricultural tourism, which is currently not endorsed enough by the policy makers. By integrating such platforms, businesses can reach a wider audience, streamline their operations, and enhance their market presence.

The workshop participants advocated for organic growth using internal financial resources rather than relying heavily on external investments. This approach emphasizes sustainability not just in environmental terms but also in financial health. By focusing on organic growth, businesses can build a more stable and resilient economic foundation. In situations where financial strain is evident, the workshop suggested that it might be necessary for businesses to scale down and reduce costs. This strategy ensures that businesses can maintain their operations sustainably without overextending their financial capabilities.

To unify the innovation ecosystem, the workshop proposed organizing hackathons. These events can serve as a collaborative platform where diverse stakeholders come together to address challenges and develop innovative solutions. By focusing on physical interactions complemented by digital processes, hackathons can foster a sense of community and collective effort. The establishment of a common framework where these innovative ideas can be integrated and developed further is crucial. Such a framework ensures that the outcomes of hackathons are not isolated but rather contribute to the broader goals of sustainable tourism development.

The insights from the regional workshop in Türkiye provide a comprehensive roadmap for advancing the sustainable tourism sector. By addressing educational inflation with tailored programs, empowering women, optimizing digital platforms, prioritizing organic financial growth, promoting exemplary practices, and integrating the innovation ecosystem, Türkiye can harness the full potential of sustainable tourism. These strategic approaches not only enhance the sector's sustainability but also contribute to the overall economic and social well-being of the country.

3.4.2 Bioeconomy

One of the primary challenges facing the bioeconomy sector in Türkiye is the difficulty in financing new generation agricultural technologies. Innovations such as vertical farming and intensive agriculture using IoT are being sidelined in favor of traditional farming methods. This focus on conventional farming is problematic as it stifles the growth of more efficient and sustainable agricultural practices. There is a noticeable lack of accessible grants and funding pathways for these advanced agricultural technologies, which hinders their development and implementation. The problem extends to a lack of dissemination of these technologies, leaving many unsure of where to start and without clear roadmaps to guide their progress.

The areas most in need of financial support are research and development (R&D), production planning, and consultancy services. Effective financial mechanisms need to be traceable and follow an end-to-end approach to ensure accountability and proper use of funds. Without robust financial backing in these areas, it is challenging to drive innovation and improve productivity within the sector.

During the workshop, it was highlighted that a **Vertical Farming Museum** was recently opened in İstanbul at Maslak 42, managed entirely by the private sector and partnered with a local agricultural tech company. Similarly, the establishment of an **Innovation Center by the İzmir Chamber of Commerce** was emphasized, noting the need for more active use of laboratories and centers.

Collaboration was a recurring theme. It was stressed that joint innovation efforts are crucial, noting that failure to collaborate can lead firms towards bankruptcy. For instance, in the IoT sector, firms faced significant challenges because each was developing its own technology independently. To address this, the concept of "Rekaberlik" (Tr. Rekabet: Competition. Tr. Beraber: Together, a blend of these two words) in agriculture needs to be strengthened.

Further, the upcoming establishment of the **İzmir Agricultural Technologies Center** was mentioned, with a focus on becoming operational soon. There was a suggestion that the number of such centers should increase and foster partnerships with universities. A consensus emerged on the need to develop a culture of collaboration and create environments, both digital and physical, that promote cooperative efforts.

Sustainability in bioeconomy practices is another critical issue. It was discussed that the high costs associated with removing plastic from products to achieve sustainability. Creating truly sustainable products is expensive, and plastic components still present in products pose significant challenges. Moreover, measuring sustainability efforts accurately is difficult, leading to issues with greenwashing.

The importance of certification and accreditation in addressing these challenges was underscored. International verification processes are crucial for ensuring that sustainability claims are valid and reliable. Without proper certification, distinguishing genuinely sustainable products from those falsely claiming to be environmentally friendly becomes difficult.

The intersection of agriculture and technology is underdeveloped in Türkiye, presenting a significant obstacle to progress. It was mentioned that the scarcity of professionals in plant biotechnology and the need to start certification programs. There is a noticeable gap in education and training in this field, which needs to be addressed to foster innovation. For example, a graduate from a local university who specialized in this area left for the Netherlands due to better opportunities, indicating a brain drain issue. The necessity for sustainable incentive programs to retain qualified personnel was thus highlighted. Continuous support for exporters to maintain a skilled workforce is essential for the sector's growth and stability.

Effective market entry strategies were also discussed. It is more practical to secure customers first before entering the market. Acting as if one has already entered the market to find customers can be a better approach. Incorporating matching platforms into this process can facilitate direct agreements with distributors, making market entry smoother.

Integrated projects that bring together various sectors were suggested as a way to enhance the bioeconomy. For instance, combining agriculture with livestock farming, utilizing manure for electricity generation, and producing biofuels can create synergies that benefit multiple industries. It was highlighted that these integrated projects encompassing various economic sectors can optimize resource use and enhance overall innovation capabilities.

3.4.3 Agriculture

The regional workshop in Türkiye highlighted several critical aspects and challenges within the agricultural sector. Participants mainly focused on financing, sustainability, state incentives, cooperative movements, mentorship, local education initiatives, and more. The goal was to provide a comprehensive understanding of the current state and potential future directions for agricultural innovation in Türkiye.

In the realm of agriculture, financing is a crucial component for operations and growth. However, the workshop noted that financial transactions often serve primarily commercial purposes, with limited focus on fostering innovation. The pressing concerns of debt and financial stability make it difficult for agricultural firms to experiment with new products or practices. This highlights the need for more targeted financial support that directly encourages innovation and development within the sector.

State incentives and **European Union (EU)** projects were identified as potential game-changers for agricultural firms. However, for these benefits to be realized, there must be individuals or teams dedicated to following up on such projects. Direct interaction with firms, including visits from public institutions, has been shown to yield positive responses. This underscores the necessity for governmental bodies to engage more actively with agricultural enterprises.

The Ministry of Agriculture, the Ministry of Industry, and municipalities offer various incentives that need to reach small producers effectively. To facilitate this, pioneering small businesses should be educated first, as they can subsequently train others in the field. Non-governmental organizations (NGOs), municipalities, and technology incubators could play a vital role as integrators for these small enterprises.

One of the key insights from the workshop was the difficulty farmers face in managing support and grants due to a lack of personnel. Cooperatives present a viable solution, enabling farmers to collectively oversee financing processes. However, the cooperative movement in Türkiye is notably underdeveloped, with a low participation rate compared to countries like the Netherlands, where over 90% of agricultural producers are involved in cooperatives. Learning from successful models abroad could help enhance the cooperative framework in Türkiye.

The workshop highlighted the necessity for a robust advisory system. Although agricultural directorates have a substantial workforce, they lack organizational structure and planning. There is a pressing need for strategic planning that ensures farmers receive social support and assistance in research and development (R&D) processes for new products. Direct monetary support is currently provided to farmers, but converting this support into discounted inputs like fuel and fertilizer could have a more direct impact on production and prevent funds from being diverted elsewhere.

The implementation of digital matching platforms and procurement offices, along with government oversight, is crucial for ensuring the proper functioning of cooperatives. Successful examples from international fairs, such as the **Trade Nest** platform, suggest that widespread adoption and activation of similar platforms in Türkiye, like **Ask Türkiye**, could significantly benefit the agricultural sector. These platforms can streamline operations, connect farmers with markets, and enhance overall efficiency.

Mentorship emerged as a vital component for agricultural innovation. However, the current approach often involves one-time mentorship sessions, which are insufficient. Continuous and comprehensive mentorship, covering all aspects of a venture, is essential. This could involve not only domestic experts but also global consulting firms, although the latter should be streamlined to avoid prohibitive costs.

Educating local populations is challenging due to their existing workloads. Hence, it is crucial to bring education to the farmers rather than expecting them to attend centralized sessions. Utilizing local leaders like muhtars (village headmen) to organize and promote these educational initiatives can be effective. Furthermore, projects like **Trendyol's "Yarının Köyleri"** demonstrate the potential benefits of private sector involvement in education and training initiatives, which could be further incentivized through rewards for participants.

Finding and retaining workers is not just a matter of wages but also involves improving social conditions. For instance, in the hazelnut sector, another successful project by **Pikolo Foundation** provided childcare solutions like playgrounds for workers' children, that significantly enhanced productivity and worker satisfaction. This concept of social innovation, where small adjustments lead to substantial improvements in efficiency, should be applied across various agricultural sectors depending on workers' needs. In a similar issue, restoring the reputation of rural life and agriculture is imperative. Encouraging reverse migration by ensuring job opportunities and improving the social status of farmers can make agriculture an attractive and respectable profession. This involves not only providing financial incentives but also elevating the social and professional standing of farmers.

Finally, logistical challenges, including theft and highway robberies that pose significant threats to agricultural produce were also discussed. Ensuring traceability and security through digital channels and intergovernmental policies is essential. Speed and safety in transporting perishable goods, such as poultry and fish, are critical to minimising losses. It was suggested that companies could be brought together with such problems in a hackathon environment to try and find sustainable solutions.

3.4.4 Fisheries

One of the predominant themes of the workshop was the observation that companies are more inclined to pursue sustainability and innovation only when they see clear profitability benefits. This pragmatic approach underscores the need for demonstrating successful case studies and best practices within the industry. By showcasing examples of companies that have achieved both profitability and sustainability, other businesses can be motivated to follow suit.

Identifying and promoting role models within the fisheries sector can have a profound impact, especially in rural areas where people may be more resistant to change. The workshop emphasized the importance of connecting these role models with local entrepreneurs to foster a culture of innovation and sustainability. Such interactions can inspire rural communities to adopt new practices and technologies, ultimately leading to a more sustainable and profitable fisheries sector.

Another significant issue highlighted was the lack of strategic planning and social support mechanisms for farmers and fishermen. Unlike other sectors where structured planning and social support are more prevalent, the fisheries sector often lacks clear guidelines and support systems.

In the fisheries sector, the absence of comprehensive planning means that fishermen often do not have access to the necessary resources and support to make informed

decisions about their practices. This lack of planning is particularly detrimental when it comes to diversifying fish species. High costs often prevent the introduction and promotion of new fish varieties, limiting the sector's growth potential. Currently, certain traditional species like sea bass (levrek) and gilt-head bream (çupra) receive substantial backing, while other potentially lucrative species do not receive comparable support, thus can not even find a chance to emerge. To address this issue, it was proposed that the government should play a more active role in supporting the R&D of new fish species. State-backed initiatives can help reduce the financial risks associated with developing and marketing new products, encouraging innovation and diversification within the sector.

Thus, the need for profitability-driven sustainability, strategic planning, and enhanced support for new products were stressed in the workshop. By addressing these challenges, the fisheries sector in Türkiye can unlock its full potential, driving economic growth and ensuring long-term sustainability.

3.5 Common and unique challenges across the four countries

In the following section, we will outline both common challenges shared among the four countries and unique challenges specific to each country or region, based on insights gathered from respective regional workshops.

3.5.1 Sustainable tourism

Common Challenges: Common challenges in sustainable tourism across Malta, Spain, The Netherlands, and Türkiye include balancing economic benefits with environmental and cultural preservation. Each country faces the task of managing tourism growth sustainably, which involves integrating renewable energy, reducing environmental impact, and preserving local culture. Capacity management and sustainable infrastructure development are crucial for coping with increased visitor numbers while minimizing negative effects on natural resources and community life. Regulatory hurdles, such as opposition to new projects and financial barriers for SMEs, are prevalent, hindering innovation and broader economic inclusivity.

Unique Challenges: However, each country also faces unique challenges. Malta, amidst its tourism boom, focuses on energy efficiency and diversifying offerings like heritage and eco-tourism. Spain aims to enhance its rural tourism sector against European counterparts, emphasizing branding, stakeholder collaboration, and digital integration. The Netherlands grapples with local government opposition to sustainable projects despite community support, necessitating greater investment in local initiatives and overcoming regulatory barriers. In Türkiye, growth potential in sustainable tourism is underscored by the need for specialized education and mentorship, particularly for women in rural areas, alongside digital innovation and collaborative hackathons to drive sectoral development effectively. These observations highlight both shared challenges and distinct strategies tailored to each country's context in advancing sustainable tourism.



3.5.2 Bioeconomy

Common Challenges: The bioeconomy sectors in Malta, Spain, the Netherlands, and Türkiye encounter several common challenges despite their geographical diversity. These include financial constraints hindering research and development (R&D), policy frameworks that often do not align with sustainable bioeconomy goals, and limited access to necessary innovation infrastructures. Regulatory hurdles also pose significant barriers, favoring traditional practices over innovative, sustainable initiatives in agriculture and technology adoption. Each region emphasizes the importance of improving funding mechanisms and fostering public-private partnerships to overcome these hurdles and promote sustainable practices across their bioeconomy sectors.

Unique Challenges: While common challenges prevail, each region faces unique obstacles shaping its bioeconomy trajectory. In Malta, the focus lies on enhancing financing for R&D and innovative products amidst policy alignment issues. Spain highlights the need to bolster rural economies through talent acquisition and cooperative models among rural enterprises. The Netherlands confronts regulatory barriers favoring traditional agricultural practices, advocating for local project support and community-driven initiatives. In Türkiye, challenges center on financing and innovation in agricultural technologies, compounded by the dominance of traditional farming methods and sustainability concerns such as plastic use and greenwashing. Each region's distinct challenges underscore the tailored strategies required to foster growth and sustainability within their bioeconomy sectors.

3.5.3 Agriculture

Common Challenges: Across the four countries, common challenges in their agricultural sectors include limited arable land, water scarcity, and the imperative for sustainable practices amidst varying degrees of regulatory complexity. Each faces pressures to innovate for resilience and economic growth, necessitating financial support, technological adoption, and stronger partnerships between stakeholders. However, their unique circumstances shape additional hurdles: Malta struggles with its small size and severe water constraints, Spain contends with demographic shifts and infrastructure deficiencies, the Netherlands faces banking conservatism and small farm sustainability, while Türkiye navigates financing constraints and underdeveloped cooperative movements. Despite these differences, all strive to enhance productivity while ensuring long-term environmental sustainability through tailored strategies and collaborative efforts.

Unique Challenges: Each country also exhibits distinctive strengths and approaches: Malta emphasizes educational initiatives and digital platforms for agricultural resilience, Spain explores shared workspaces and generational succession in rural areas, the Netherlands promotes communal engagement and cooperative models for sustainable farming, and Türkiye focuses on state incentives and EU projects to bolster innovation amidst financial challenges. These diverse approaches reflect their unique contexts and aspirations to overcome obstacles and foster thriving agricultural ecosystems that align with global sustainability goals.





3.5.4 Fisheries

Common Challenges: The fisheries sectors in Malta, Spain, the Netherlands, and Türkiye face several common challenges, notably the need for innovation to enhance sustainability and competitiveness. Each country highlights the urgency of updating educational programs and fostering a culture of innovation to attract younger generations. Financial constraints are a significant barrier, with small-scale fishers struggling to access capital due to conservative banking practices and high-interest rates. The sectors also emphasize the importance of effective networking, communication, and cooperative models to scale up sustainable practices. Aligning financial mechanisms with sector ambitions and promoting risk mitigation strategies are universally recommended to support sustainable fisheries.

Unique Challenges: The workshops revealed that each country faces unique challenges. In Malta, there's a critical need to modernize educational programs and transition to sustainable fish feed sources to reduce import reliance. Spain grapples with demographic challenges, gender disparities, and limited resources for small-scale fisheries, emphasizing the valorization of local fish products and tailored public policies for rural areas. The Netherlands faces stringent regulations that prioritize traditional methods, impeding eco-friendly innovations, and highlights the potential of modular, eco-friendly practices. Türkiye's fisheries sector is driven by profitability, with a need for showcasing successful case studies, strategic planning, and government support for R&D and diversification to reduce financial risks and promote new fish species.

3.5.5 Summary

Across Malta, Spain, The Netherlands, and Türkiye, sustainable tourism presents common challenges and unique considerations. Commonly, all four countries grapple with balancing economic gains from tourism with environmental and cultural preservation. They face the imperative of sustainable infrastructure development, managing tourist influxes, and overcoming regulatory hurdles that hinder innovation and inclusivity. Unique challenges include Malta's focus on energy efficiency and diversifying tourism offerings, Spain's emphasis on enhancing rural tourism and digital integration, The Netherlands' struggle with local opposition to sustainable projects, and Türkiye's need for specialized education and government guidance in all four sectors.

In all sectors, these countries encounter common obstacles such as financial constraints and regulatory barriers favoring traditional practices over sustainable innovations. Each country seeks to improve R&D funding, policy alignment, and public-private partnerships. Unique challenges include Malta's policy alignment issues, Spain's focus on rural economic development and cooperative models, The Netherlands' advocacy for community-driven agricultural initiatives, and Türkiye's emphasis on financing, digitalization and government guidance amidst sustainability concerns like workplace conditions and innovation for new products.

These distinct challenges underscore the need for tailored strategies to foster sustainable development across tourism, bioeconomy, agriculture, and fisheries,



reflecting each country's unique circumstances and aspirations for growth within global sustainability frameworks.

4 Conclusion

This document provides a synthesis of insights from a comprehensive literature review and the results of regional workshops conducted across Türkiye, Malta, Spain, and The Netherlands. It highlights the critical interaction between resource exploration, ecosystem management, and sustainable development, emphasizing the need for an integrated approach to optimize bioresource use and foster green growth through strategic institutional and policy linkages.

The literature review underscores the importance of integrated resource management, advocating for a cohesive strategy that balances resource exploration with ecosystem conservation. It is emphasized that aligning agricultural policies with climate change mitigation and adaptation efforts is essential for promoting low-emission rural development. This alignment supports the broader goals of green growth and sustainability.

A key concept introduced in the literature is polycentric governance, which emphasizes both vertical and horizontal integration in governance structures and a learning-by-doing approach. This governance model is vital for achieving sustainable bioeconomy practices, as it promotes multi-level collaboration and adaptive management strategies.

The review further highlights the interconnectedness of the bioeconomy with agriculture, fisheries, and sustainable tourism in driving sustainable development. Innovative biorefinery techniques, enhancing social resilience in fisheries, and integrating sustainable tourism are identified as crucial elements in supporting a circular and green economy. The literature calls for participatory public policies and multi-actor governance strategies to address associated challenges, promoting a sustainable, inclusive, and circular bioeconomy.

Across various locations and sectors, the InnovationGUIDE Regional Workshops have successfully convened multiple stakeholders to advance rural innovation in Pan-European area. Four events in different countries have collectively engaged over 137 participants from diverse backgrounds including municipalities, academia, local businesses, and industry leaders across tourism, bioeconomy, agriculture, and other related sectors. Each workshop featured dynamic formats such as keynote presentations, panel discussions, and focused workshops, aimed at fostering collaborative strategies to promote sustainability, economic resilience, and technological advancement in rural communities. These initiatives underscore a global commitment to driving forward-thinking solutions that address contemporary challenges and opportunities in rural development.

The regional workshop results provide a practical perspective on the challenges and opportunities faced by Türkiye, Malta, Spain, and The Netherlands. Despite diverse geographical and socio-economic contexts, these countries share common challenges

in balancing economic gains from tourism with environmental and cultural preservation. They all grapple with the need for sustainable infrastructure development, managing tourist influxes, and overcoming regulatory hurdles that inhibit innovation and inclusivity.

Each country, however, also faces unique challenges. Malta focuses on energy efficiency and diversifying its tourism offerings, alongside issues of policy alignment. Spain emphasizes enhancing rural tourism, digital integration, and cooperative models for rural economic development. The Netherlands struggles with local opposition to sustainable projects while advocating for community-driven agricultural initiatives. Türkiye needs specialized education and government guidance across sectors, with a particular focus on financing, digitalization, and improving workplace conditions amidst sustainability efforts.

Across all sectors, common obstacles include financial constraints and regulatory barriers that favor traditional practices over sustainable innovations. Each country seeks to improve R&D funding, policy alignment, and public-private partnerships as means to overcome these challenges and foster sustainable development.

In conclusion, the findings from both the literature review and regional workshops underscore the necessity for tailored strategies that reflect each country's unique circumstances while aligning with global sustainability frameworks. A holistic, multi-sectoral approach, involving innovative technologies, adaptive governance models, and collaborative policies, is crucial for advancing sustainable development in tourism, bioeconomy, agriculture, and fisheries. By fostering cross-cutting institutional and policy linkages, countries can optimize the use of bioresources and support a transition towards a sustainable, inclusive, and circular economy.

BIBLIOGRAPHY

Asche, F. , Eggert, H. , Oglend, A. , Roheim, CA & Smith, MD. (2022). Aquaculture: Externalities and Policy Options. *REVIEW OF ENVIRONMENTAL ECONOMICS AND POLICY* , 16 (2), 282- 305. 10.1086/721055

Baumber, A. (2017). Enhancing ecosystem services through targeted bioenergy support policies. *ECOSYSTEM SERVICES* , 26 (), 98- 110. 10.1016/j.ecoser.2017.06.012

Biffi, S. , Traldi, R. , Crezee, B. , Beckmann, M. , Egli, L. , Schmidt, DE. , Motzer, N. , Okumah, M. , Seppelt, R. , Slabbert, EL. , Tiedeman, K. , Wang, HL & Ziv, G. (2021). Aligning agri-environmental subsidies and environmental needs: a comparative analysis between the US and EU. *ENVIRONMENTAL RESEARCH LETTERS* , 16 (5), - 0. 10.1088/1748-9326/abfa4e

Boix-Fayos, C. & de Vente, J. (2023). Challenges and potential pathways towards sustainable agriculture within the European Green Deal. *AGRICULTURAL SYSTEMS* , 207 (), - 0. 10.1016/j.agsy.2023.103634

Bournaris, T. , Moulogianni, C. , Vlontzos, G & Georgilas, I. (2021). Methodologies used to assess the impacts of climate change in agricultural economics: a rapid review. *INTERNATIONAL JOURNAL OF SUSTAINABLE AGRICULTURAL MANAGEMENT AND INFORMATICS* , 7 (4), 253- 269. 10.1504/IJSAMI.2021.121926

Clifton-Brown, J. , Hastings, A. , von Cossel, M. , Murphy-Bokern, D. , McCalmont, J. , Whittaker, J. , Alexopoulou, E. , Amaducci, S. , Andronic, L. , Ashman, C. , Awty-Carroll, D. , Bhatia, R. , Breuer, L. , Cosentino, S. , Cracroft-Eley, W. , Donnison, I. , Elbersen, B. , Ferrarini, A. , Ford, J. , Greef, J. , Ingram, J. , Lewandowski, I. , Magenau, E. , Mos, M. , Petrick, M. , Pogrzeba, M. , Robson, P. , Rowe, RL. , Sandu, A. , Schwarz, KU. , Scordia, D. , Scurlock, J. , Shepherd, A. , Thornton, J. , Trindade, LM. , Vetter, S. , Wagner, M. , Wu, PC. , Yamada, T & Kiesel, A. (2023). Perennial biomass cropping and use: Shaping the policy ecosystem in European countries. *GLOBAL CHANGE BIOLOGY BIOENERGY* , 15 (5), 538- 558. 10.1111/gcbb.13038

D'Amato, D. , Droste, N. , Allen, B. , Kettunen, M. , Lahntinen, K. , Korhonen, J. , Leskinen, P. , Matthies, BD & Toppinen, A. (2017). Green, circular, bio economy: A comparative analysis of sustainability avenues. *JOURNAL OF CLEANER PRODUCTION* , 168 (), 716- 734. 10.1016/j.jclepro.2017.09.053

de Wit, FCA. (2018). Low-Emission Rural Development in the Amazon. *INCREASE* , 0 67- 83. 10.1007/978-3-319-70272-8_5

Dearing, JA. , Wang, R. , Zhang, K. , Dyke, JG. , Haberl, H. , Hossain, MS. , Langdon, PG. , Lenton, TM. , Raworth, K. , Brown, S. , Carstensen, J. , Cole, MJ. , Cornell, SE. , Dawson, TP. , Doncaster, CP. , Eigenbrod, F. , Floerke, M. , Jeffers, E. , Mackay, AW. , Nykvist, B & Poppy, GM. (2014). Safe and just operating spaces for regional social-ecological systems. *GLOBAL ENVIRONMENTAL CHANGE-HUMAN AND POLICY DIMENSIONS* , 28 (), 227- 238. 10.1016/j.gloenvcha.2014.06.012

Ebun, A. , Achilleas, V. , Laura, S. , Elena, P. , Maria, N. , Valentino, MG. , Phoebe, K & Alkis, K. (2022). Social innovation for developing sustainable solutions in a fisheries sector. ENVIRONMENTAL POLICY AND GOVERNANCE , 32 (6), 504- 519. 10.1002/eet.2022

M'barek, R., & Wesseler, J. (2023). The Rapid Development of Bioeconomy Policies in the EU and other Regions of the World. EuroChoices, 22(3), 5-12.

Plieninger, T. , Muñoz-Rojas, J. , Buck, LE & Scherr, SJ. (2020). Agroforestry for sustainable landscape management. SUSTAINABILITY SCIENCE , 15 (5), 1255-1266. 10.1007/s11625-020-00836-4

Rega, C. , Thompson, B. , Niedermayr, A. , Desjeux, Y. , Kantelhardt, J. , D'Alberto, R. , Gouta, P. , Konstantidelli, V. , Schaller, L. , Latruffe, L & Paracchini, ML. (2022). Uptake of Ecological Farming Practices by EU Farms: A Pan-European Typology Die Anwendung ökologischer Anbaumethoden in EU-Betrieben: Eine pan-europäische Typologie. EUROCHOICES , 21 (3), 64- 71. 10.1111/1746-692X.12368

Spacek, M. , Melnykovich, M. , Kozová, M. , Pauditsová, E & Kluvánková, T. (2022). The role of knowledge in supporting the revitalisation of traditional landscape governance through social innovation in Slovakia. ENVIRONMENTAL POLICY AND GOVERNANCE , 32 (6), 560- 574. 10.1002/eet.2026

Slamová, M. , Kruse, A. , Belcáková, I & Dreer, J. (2021). Old but Not Old Fashioned: Agricultural Landscapes as European Heritage and Basis for Sustainable Multifunctional Farming to Earn a Living. SUSTAINABILITY , 13 (9), - 0. 10.3390/su13094650

Szaboova, L. , Gustavsson, M & Turner, R. (2022). Recognizing Women's Wellbeing and Contribution to Social Resilience in Fisheries. SOCIETY & NATURAL RESOURCES , 35 (1), 59- 74. 10.1080/08941920.2021.2022259

van Noordwijk, M. (2019). Integrated natural resource management as pathway to poverty reduction: Innovating practices, institutions and policies. AGRICULTURAL SYSTEMS , 172 (), 60- 71. 10.1016/j.agsy.2017.10.008

Wagh, MS. , Sowjanya, S. , Nath, PC. , Chakraborty, A. , Amrit, R. , Mishra, B. , Mishra, AK & Mohanta, YK. (2024). Valorisation of agro-industrial wastes: Circular bioeconomy and biorefinery process - A sustainable symphony. PROCESS SAFETY AND ENVIRONMENTAL PROTECTION , 183 (), 708- 725. 10.1016/j.psep.2024.01.055