LEIRIA & OESTE: AN ECOSYSTEM THAT CHALLENGES CONVENTIONS AND REINVENTS THE FUTURE

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ABSTRACT

Purpose: This article reports innovative ecosystem services' scaling-up processes using service-dominant logic. The study identifies key social, economic, and environmental barriers and drivers in Portugal's Leiria & Western Region (LWR). Based on the findings, an innovative conceptual framework identifies pilot projects to promote regional development. Pilot projects' scale-up to improve municipalities' socio-economic dimensions will be determined by their impact, local adaptation, resource alignment, and value resonance.

Design/methodology/approach: Inductive research design is applied in the Portuguese western region, i.e., 24 municipalities in LWR, to identify critical factors that allow innovative projects to scale up. An approach based on design thinking (DT) takes field observations, literature reviews, and discussions. Surveys were also conducted to determine target groups' perceptions of opportunities, threats, strengths, and weaknesses. As complementary datasets, meetings, surveys, archives, and local observations are triangulated for all municipalities. Several investigators collected, coded, and analysed the data.

Findings: Based on a framework of four main driving forces, an expanded conceptualisation of ecosystem services innovation was obtained: (I) The process of generating a value proposition through innovative socio-economic projects (ISEP) design, (ii) Recognizing and adapting ISEP to local contexts, (iii) Adapting resources and forms of collaboration between actors, and (iv) Resonant value for LWR. The achievement will be achieved through pilot ISEPs targeting the improvement of the socio-economic dimensions of the 24 municipalities.

Originality/value: This research is one of the first empirical studies to examine the factors influencing scaling up innovative ecosystem services by implementing ISEPs under DT scope. Besides contributing to understanding this innovation and the design of pilot ISEPs, this study deals with the active participation of 24 municipalities' target groups, from residents to politicians. As a result, several combinations of the four drivers can be identified, allowing the design of pilot projects and subsequent scale-ups.

KEYWORDS

Ecosystems Services; Service-Dominant Logic; Design Thinking; Leiria - IPLeiria

1. INTRODUCTION

Natural ecosystems and economic systems are closely interlinked and influence each other, and the relationship has a decisive influence on societies' general well-being. Understanding this relationship's dynamics makes it possible to develop strategies to protect and manage ecosystems and economies better (Li et al., 2023). Important

aspects illustrate the interplay between these systems. Natural ecosystems with protected areas, scenic landscapes, and wildlife reserves serve as primary sources of resources for profitable activities, mainly tourism and recreation, then creating economic opportunities afterward (Yin et al., 2021).

Moreover, they provide essential services such as water purification, climate regulation and soil fertility, influencing economic sectors such as agriculture, insurance, and infrastructure development. At the same time, ecosystem services such as pollination, water purification and climate regulation contribute directly to economic endeavours and impact agriculture and industry (Folke et al., 2021). Biodiversity in natural ecosystems increases economic resilience and provides adaptability to environmental change, mitigating climate change. Ecosystem services are the benefits nature provides to people and have become a significant concept in addressing environmental concerns and fostering sustainable development (Díaz et al. 2015).

However, economic activities can also pressure natural ecosystems, leading to environmental costs and externalities. Pollution, deforestation, and resource over-extraction can have long-term economic consequences. Still, while there is a growing demand for increased emphasis on sustainability in using and managing ecosystem services (Martinez-Harms et al., 2015), the intersection between ecosystem services and sustainability has not yet been fully explored. This is because most economic models focus on the short-term profit gains of exploiting natural resources without considering the long-term financial costs associated with environmental degradation and resource overexploitation. Also, there is a lack of understanding of the complex interactions between economic, social, and ecological systems (Gain et al., 2020), making it challenging to develop effective policies and ISEP that promote the sustainable use of ecosystem services in LWR. The goal of this article is to address this gap.

The essence of economic prosperity lies in the synergy of (social) actors who, through cooperative and competitive relationships, cultivate a balance that mirrors the complex dynamics of natural ecosystems. This interdependence promotes an environment that favours innovation, competitiveness and sustainable growth and creates an optimal framework for the in-depth study of economic and social interactions.

In line with this perspective, our paper introduces a paradigm shift by incorporating the Design Thinking (DT) concept defined by Kimbell (2009) in ISEP to be designed and

applied in LWR. This concept is accordingly our goal since it focuses on developing actions and tangible solutions to observe, measure and address key challenges in a geographical region. The main DT objective is to promote empathy and identify the specific needs and perceptions of individuals in the context of the development of the economic ecosystem and this fits in the LWR, considering the profound influence of the region's natural resources and various social, human, scientific and political factors. This innovative approach represents a departure from conventional methods and will seek to solve complex problems and create innovative solutions.

2. ECONOMIC ECOSYSTEMS: THE INTERCONNECTED DYNAMICS OF REGIONAL ECONOMIES

“Ecosystem” concept is closely intwined with economic theories in today's debate and the ecosystem metaphor has been applied to economics to describe the complex web of interactions between different economic actors (Auerswald and Dani, 2018). This integration/adoption aims to capture the dynamic and interconnected nature of economic systems, like natural ecosystems.

In economic theories, the concept of Ecosystem emphasises the interdependence of businesses, industries, consumers, and other stakeholders within a given environment. This perspective recognises that economic agents are not isolated entities, but rather part of a broader system in which their actions and decisions influence and are influenced by others (Herfeld, 2021).

Moreover, this Ecosystem approach to business and to Economy also emphasises the importance of collaboration, innovation, and sustainable practices. Economic actors are seen as interconnected nodes in a network where collaboration and knowledge sharing lead to mutual benefit and overall system resilience (Helm et al., 2020). This perspective is consistent with the idea that a healthy economic ecosystem promotes long-term growth, adaptability, and innovation (Gong et al., 2023). Thus, the concept of Ecosystem in the economy recognises the role of external factors such as government policies, technological advancements and global trends that shape the economic landscape. These external forces are considered as elements that can influence the overall health and functioning of the economic ecosystem.

Integrating the Ecosystem concept into economic theories reflects a shift towards a more holistic and interconnected perspective of socioeconomic systems that emphasises the need for sustainable, collaborative, and adaptive approaches to promote societal and economic prosperity (Snower, 2020). Economic flourishing and prosperity depend on interaction mechanisms between (social) actors that maintain equilibrium through cooperative and competitive interactions. In regions such as LWR, this balance is characterised by a diverse economic landscape that includes traditional sectors, namely agriculture and fishing, and emerging sectors such as tourism, manufacturing, and renewable energy.

As in a natural ecosystem, the regional players interact, influence, and depend on each other to live and grow (Chan et al., 2006). For instance, the symbiotic relationship between agriculture, tourism and manufacturing creates a dynamic interplay that fosters economic resilience. This interdependence creates an environment where innovation, competitiveness and sustainable growth can emerge, and the future can be reinvented. Economic ecosystems provide an ideal framework for studying and understanding economic and social interactions in regions (Herfeld, 2021; Snower, 2020). In LWR there are examples of economic activities' complexity mirroring natural ecosystem complexity.

A healthy economic ecosystem fosters collaboration, knowledge sharing, resource exchange, and synergy creation, which drives regional growth, development, and resilience. This ecosystem's seamless flow of ideas and resources is critical for economic prosperity and the region's cultural and social well-being. However, stakeholders may migrate or face decline if resources in the LWR are misused, depleted, or ignored or if ecosystem services are scarce. This can affect the economy and lead to job losses, poverty, and quality of life decline. It is, therefore, essential to protect and manage resources in these regions to ensure a healthy economic ecosystem.

The challenge in this case is to operationalise this concept meaningfully, leading to sustainable socio-ecological systems management. Local decision-makers must manage the balancing act between preserving cultural heritage, promoting innovation, and ensuring economic development is consistent with the region's unique identity.

The development of the economic ecosystem in LWR depends not only on natural resources but also on social, human, and political factors specific to the region. These

include: (i) long-term fiscal and labour market policies tailored to LWR's unique economic mix, recognising the role of traditional sectors alongside emerging industries, (ii) policies that encourage innovation, entrepreneurship and access to capital in the regional context, recognising the importance of saving cultural heritage while fostering innovation, (iii) a skilled and demand-driven workforce shaped by an education that should be tailored to meet the needs of both traditional and emerging sectors, (iv) policies that promote cooperation between local stakeholders, taking into account the historical and cultural aspects of the region and (v) produce breakthrough knowledge that fits into the ecosystem of LWR, aligning research and development activities with the region's economic dynamics.

These actions should be regularly monitored and evaluated to ensure their effectiveness. Finally, all stakeholders in these regions should be actively engaged in developing the economic-social ecosystem to ensure its success. By fostering a shared sense of responsibility among local businesses, community leaders, and residents, supported by academic knowledge (brought by the Polytechnic Institute of Leiria – IPLeiria), the economic ecosystem can thrive and adapt to changing circumstances to guarantee sustainable prosperity for future generations.

3. DESIGN THINKING

Design thinking (DT) moves beyond the traditional research approach of focusing only on the economic implications of natural resources. Instead, it considers the broader social, human, and political context of the communities in which it is used (Kembell, 2009). In the present work, by utilizing a bottom-up approach to design research, it is possible to better understand the individual-level needs that shape the larger economic ecosystem. This approach helps to identify the specific needs of individuals/actors in a way that economic models cannot and helps update the development of more effective strategies for LWR economic ecosystem development.

DT is a problem-solving approach that emphasises understanding and considering end users' needs and preferences in contrast to rational problem solving, which focuses on critical thinking. Thus, DT it is a human-centred and iterative process that promotes creativity, innovation (Foster, 2019) and critical thinking when solving a problem. DT includes empathising with users, defining the problem, developing ideas for possible

solutions. DT process utilises discovery, interpretation and ideation processes to explore or expand a problem space. Rapid prototyping, experimentation and feedback cycles are then used to refine and develop ideas and narrow down the problem space (IDEO, 2012; Razzouk & Shute, 2012. This methodology is used in various fields, including product design, service development and problem-solving in complex, dynamic environments. The central principle is developing a deeper understanding of users' experiences and perspectives, ultimately leading to more effective and user-friendly solutions.

Economic ecosystem development traditionally relies on established practices characterised by policies and resource allocations. DT brings a novel approach by strongly emphasising understanding the actor's perspective and incorporating empathy into the development process.

In economic ecosystems, this means moving away from purely resource-orientated models towards models that comprehensively consider economic actors' needs, preferences, and experiences. By incorporating DT principles, the development of economic ecosystems becomes more adaptable and more responsive to the complex interplay between natural resources, social dynamics, human behaviour, and policy frameworks. This user-centred approach fosters innovation, collaboration, and sustainable practices and aligns economic growth with holistic well-being and resilience (Foster, 2019; Razzouk & Shute, 2012).

Policymaking practices evolve. Over time, various research and analytical techniques are incorporated into the frameworks that inform policy analysis. The embrace of better evidence offers an updated perspective of societal and economic ecosystems, as does the focus on behavioural insights (Nogales-Muriel, & Nyssens, 2021). DT could likewise inform policymaking more broadly. For example, governments have long recognised the value of public input in policy development (Polasky et al, 2022). In LWR, the difference between what has always been true of the best policymaking processes and DT is a heightened emphasis on the user perspective.

4. METHODOLOGY APPROACH

The research methodology for the conceptual design of the LWR economic Ecosystem Management Model is based on the DT concept of applied research according to Kembel (2009). This involves designing an appropriate societal approach, with strategies and

rules based on existing practical problems and evaluating them in the context of LWR ecosystem. The initial phase of the study involved conducting a systematic literature review aimed at comprehensively understanding the societal, economic, and environmental conditions of the LWR. This process included an extensive examination of relevant business and municipal reports, as well as consultation of municipalities websites and statistical databases. The objective was to gather comprehensive insights that address the region characteristics and the way to apply DT.

DT is crucial to tackling economic and social challenges in LWR, offering a collaborative and people-centred way to solve problems. This approach argues for increased empathy and encourages creativity and collaboration, which are essential for successful and sustainable problem-solving. Because of that, and based on DT, a civic and regional alliance emerged and broke established norms by listening to LWR actors' needs and difficulties. It intends to present and validate solutions according to the collective vision of the ecosystem's players.

The alliance, called the Mission Structure for the Development of the LWR Ecosystem (EM@IPLeiria), has the Polytechnic Institute of Leiria as this ecosystem's driving force and aggregator. To operationalize EM@IPLeiria, 24 working groups were formed, composed of individuals from each municipality, municipal representatives, IPLeiria faculty members, and a strategic committee consisting of mayors, CCDR (Regional Coordination and Development Commissions), competitiveness clusters, intermunicipal communities, entities supervised by the Ministry of Economy, former government officials, and other individuals with experience and knowledge of the region, totalling 818 people.

Subsequently, the second phase of the study involved a series of meetings in all 24 municipalities in the LWR. These sessions were strategically convened with stakeholders previously identified in the initial literature review and accomplished by IPLeiria faculty members. The main objective of these sessions was to elicit stakeholders' perspectives on the strengths, weaknesses, opportunities, and threats in their respective regions. This qualitative data collection process served as the basis for the subsequent application of the design thinking approach in the study.

In this second phase, the Mission thrives to bridge the gap between LWR actors, Academia, and research centres, promoting promotes collaboration and knowledge-

sharing among ecosystem players. Finally, it is committed to creating an environment of collaboration and partnership and creating a LWR ecosystem sustainable model, encouraging the design of innovative solutions towards region sustainable development. Capitalizing on the identified strengths, opportunities, and resources within LWR through the DT approach, it is possible to identify critical factors that allow the design of several ISEPs to further enhance the diversification of the economic ecosystem and understand how these innovations can be scaled up.

Figure 1. Depicts the conceptual model of the DT approach, implemented by EM@IPLeiria, highlighting the five methodological steps. Additionally, an explanation and summary of the approaches considered in each step are provided.

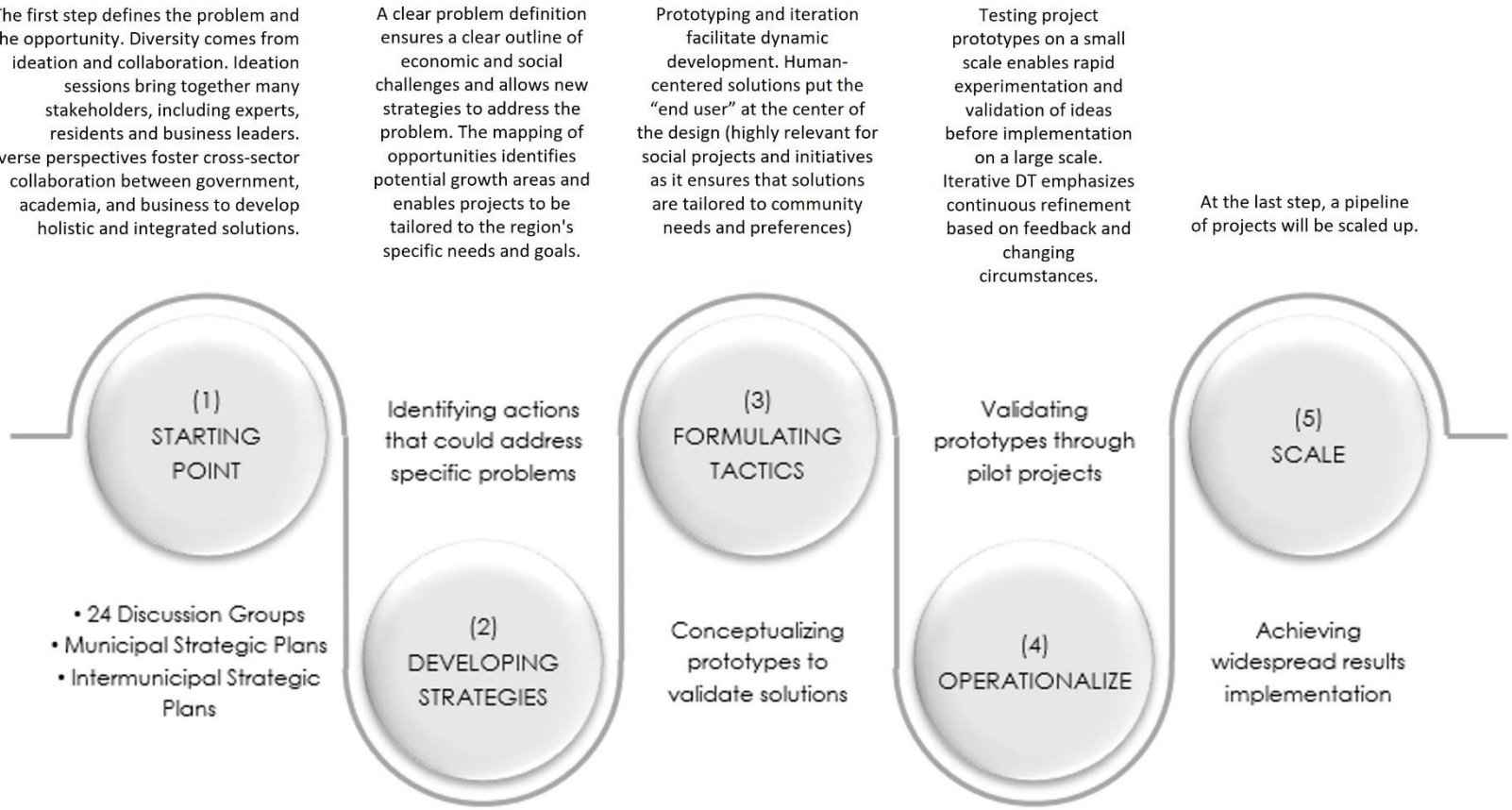

Figure 1. Conceptual model of the DT approach as implemented by EM@IPLeiria, showcasing the five methodological steps that have been drawn.

FORESEEING RESULTS

The objective of the present work, as stated before, is to identify existing opportunities able to address a holistic management of societal and economic business ecosystems in LWR. Based on this and considering the half part of the project already established, it is possible to recognise that the appropriate deployment and utilisation of critical resources in LWR can contribute significantly to regional development and economic growth.

Nevertheless, the preliminary findings on strengths and opportunities derived from the ongoing consultations across the 24 municipalities provide valuable insights into the potential implementation and utilization of key resources identified in the LWR. Although these provisional results are yet to undergo final discussion with the LWR's stakeholders, they hint at the feasibility of initiating various new economic and social projects. These projects, if realized, have the potential to enhance the diversity of the economic ecosystem and align with the mission's proposed objectives. To illustrate, several ideas have been proposed and discussed during meetings, underscoring the promising prospects for future initiatives. Here are some potential focus areas for new economic and social projects, to further diversify the business ecosystem, that could be developed and scaled up:

- Innovation and Technology Incubators: Establishing innovation and technology incubators to support start-ups and small businesses in emerging sectors such as clean energy, biotechnology, and information technology. This can foster a culture of innovation and entrepreneurship.
- Agro-Tech Initiatives: Implementing agricultural technology initiatives to modernise farming practices, increase productivity and promote sustainable agriculture. This could include precision farming, the use of drones and smart farming technologies.
- Cultural and Creative Industries Hub: Creating a hub to support the cultural and creative industries, including art, design, and crafts. This could include setting up co-working spaces, providing training programmes and organising events to showcase local talent.

- Ecotourism and Adventure Tourism: Developing ecotourism and adventure tourism projects to capitalise on the natural beauty of the region. This may include the creation of hiking trails, adventure sports facilities and eco-friendly accommodation.
- Marine and Coastal Areas Development: Leveraging the coastal location for marine-related projects such as sustainable fisheries, aquaculture, and marine biotechnology. This could also include research facilities and marine conservation initiatives.
- Renewable Energy Parks: Expanding renewable energy projects, including wind and solar parks, and investing in research into new sustainable energy solutions. This can contribute to Portugal's goal of becoming a leader in the renewable energy sector.
- Education and Research Centres: Establishing education and research centres focused on key industries and promote collaboration between academia, namely IPLeiria, Municipalities, and businesses. This can enhance the knowledge base and skills of the labour force in the region.
- Health and Wellness Resorts: Developing health and wellness resorts that cater to tourists seeking relaxation and holistic well-being experiences. This can attract visitors and contribute to the growth of the hospitality sector.
- Waste-to-Energy Initiatives: Implementing projects that convert waste into energy promoting a circular economy. This can address environmental concerns while creating opportunities in the renewable energy and waste management sectors.
- Smart City Initiatives: Implementing smart city solutions to improve urban living, infrastructure, and energy efficiency. This can include the use of smart technologies for transport, waste management and public services.
- Food Innovation Cluster: Creating a food innovation cluster to support the development of new food products, sustainable farming methods and agri-food technologies. This can boost the local food industry and contribute to exports.

- Skills Development Programs: Initiating skills development programmes in emerging industries to ensure that the workforce is equipped with the necessary skills. This can attract businesses looking for skilled labour.

However, it is important that these projects are aligned with local needs, environmental sustainability, and community interests. In addition, fostering co-operation between the public and private sectors and involving local communities is critical to the success of these initiatives.

FINAL REMARKS

This study of ecosystem services in Portugal's Leiria & Western Region through service-dominant logic and design thinking presents a groundbreaking framework. Identifying key drivers and obstacles in 24 municipalities, we aim to formulate an innovative conceptual framework to drive a pipeline of pilot projects for regional growth in a scaling-up process.

The Mission Structure for LWR Ecosystem Development (EM@IPLeiria) is pivotal in fostering collaboration among academia, research centres, and local actors. Therefore, the active involvement of various stakeholders ensures the applicability and relevance of our findings and paves the way for further research and practical applications. Ultimately, the study promotes the understanding and implementation of strategies for sustainable regional development.

The proposed focus areas for upcoming initiatives reflect a comprehensive strategy for diversifying the business ecosystem. The outlined potential focus areas for further ISEPs, ranging from innovation and technology incubators to waste-to-energy initiatives, reflect a comprehensive strategy for diversifying the business ecosystem. However, it is crucial to emphasize that the success of these initiatives lies in alignment with local needs and contexts. It also lies in environmental sustainability and the active involvement of the public and private sectors.

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