From Data Collection to a Cross-Cutting Analysis Visualisation: Territorial Complexity Overview to Foster Responsible Tourism in Rural Areas

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Abstract. In recent years, design expertise has become crucial for fostering connections between stakeholders and driving bottom-up processes to address complex challenges in fragile territorial contexts. This is evident in the struggles of both public and private organisations to strengthen collaborations and tackle territorial complexity issues faced by rural areas and fragile territories across Europe, such as depopulation, ageing populations, and unsustainable tourism patterns. While mass tourism threatens economic development in these regions, sustainable and responsible tourism strategies present an opportunity to enhance attractiveness and well-being. This paper focuses on using Systemic Design and Socio-Economic evaluation approaches to bolster responsible tourism development in rural areas by involving stakeholders within the tourism value chain and managing a structured enhancement process that starts with data collection and comes to cross-cutting analysis visualisation able to support co-design initiatives. Drawing insights from the SYSTOUR project, the paper explores ways to understand the intertwining of the elements of the system to find a balance between tourism-generated revenue and sustainable and even regenerative territorial development.

Keywords: Rural Areas development · Sustainable Tourism · Geographical Information System

1 Introduction

Design expertise has given rise to fostering connections among stakeholders, thereby catalysing value creation through bottom-up processes capable of bringing systemic change in tourism enhancement processes. This approach holds significant promise in addressing the intricate challenges inherent in fragile territories. Within these complex territorial contexts, both public and private organisations continue to grapple with the need to fortify collaborations in order to address issues related to rural areas and fragile territories effectively.

Rural areas across Europe are currently facing similar challenges. Depopulation, an ageing population, the closure of essential services, and in some cases, unmanageable

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picks in tourism and extremely seasonal visitor flows. Mass tourism is not a real opportunity for economic development in these places but rather a threat. Small villages and local communities lack the capacity to manage large influxes of visitors concentrated within limited time frames. Instead, they need to attract tourists, new inhabitants and investors who can increase the income of small businesses throughout the year, often complementing normal productive activities. Local governments agree on the promotion of strategies and actions for the implementation of sustainable tourism development policies, which could be a real driver for these territories to improve their attractiveness and well-being, not only as destinations to visit but also to live, work, and invest.

Recent literature faces the problem of practice-based and practice-led research methodologies in relation to artistic fields [52] where it is extensively discussed. While in the tourism field, there is very limited research on the methodological intricacies of practice-based research and knowledge development [8].

From these premises, this paper delves explicitly into using Systemic Design and Socio-Economic evaluation approaches to bolster responsible tourism development in rural areas by involving stakeholders within the tourism value chain and managing a structured enhancement process that starts with data collection and comes to cross-cutting analysis visualisation able to facilitate sustainable strategic planning through co-design initiatives.

In particular, critical synthesis emerges as a primary objective to be achieved also through visual elements and mapping, which act as a channel to provide an overall vision and narrative of territorial complexity. This integration complements traditional qualitative and quantitative analyses, facilitating a deeper understanding of the intricate interaction between the whole territorial system and the individual assets of the whole. By clarifying the relationships and connections inherent to the dynamics of rural territories, visual synthesis and mapping improve a holistic understanding of the territorial context. This approach has been tested in the context of the European interregional co-funded project SYSTOUR (2023–2027). Led by Politecnico di Torino (POLITO), the SYSTOUR project brings together researchers specialising in Systemic Design, Real Estate Appraisal and Economic Evaluation, collaborating with six diverse regions spanning North to South, East to West, and central Europe (https://www.interregeurope.eu/systourwebsite). Partnering with tourism regional departments (Hungary, Poland, Italy, and Finland), government foundations responsible for Tourism and Culture (Spain), and a technological centre for services related to transitions (France). Within the SYSTOUR partnership, the authors of the paper are experimenting with a research protocol to co-create data visualisation to jointly define strategies using a systemic approach for the regenerative transition of the Travel and Tourism value chain in rural areas. Specifically, the design-related component has core operational skills to combine and implement some methodologies and approaches applied in the context of the Systemic Design and Socio-Economic evaluation research fields. The approach used for this research recognises the effectiveness of a deep understanding of interconnected and interdependent elements in changes and transformation processes, often based on data, information and knowledge systems. The project expects to support territorial policies and strategies in close dialogue with stakeholders located within the selected regions.

After an international literature review (Sect. 2) on the main investigated topics (translational design, big data, geo-referenced data, GIS, and visual narrative) that brings out the lack of proper methodologies on practice-based research in the tourism field, Sect. 3 introduces the methodological approach, which was applied on Leartibai territory as a case study. Some exploratory results are illustrated in Sect. 5, while possible future developments are discussed in the conclusion, which points out the flexible use and adaptability of the proposed approach also in other contexts.

2 Background

With the aim of highlighting the methodological perspectives recently adopted by scholars to investigate sustainable territorial enhancement in rural areas by means of indicators-based analyses and translational design [15, 26, 34] a synthetic literature review is presented here.

In facilitating the integration of the design discipline, an undoubtedly crucial element, as stated by translational design [32], is to establish iterative dialogues and assess the design intervention through the active involvement of stakeholders in the process, promoting a holistic approach based on a systemic way of thinking. Synthesis turns out to be one of the main goals to be achieved through visual elements capable of mapping the territorial complexity, as integrated to pure data analysis, which helps to manage the components while understanding the whole and the parts, along with the relationships and connections that make up the dynamics of the whole [4]. Through meticulous use of data visualisation techniques and a research-though design approach, the paper demonstrates how design research can provide valuable insights into the complexity of actors that shape the tourism value chain to implement policy strategies for a sustainable and regenerative transition. This approach allows stakeholders to understand the complexities within their operational environments, enabling them to establish meaningful connections with the sector in which they work or collaborate with.

The increase of big data, coupled with high-performance computing and advanced machine learning techniques, presents unprecedented opportunities to capture the latent characteristics of territories, spanning regions, neighbourhoods, and individual buildings [18, 46, 47]. Recent studies have witnessed an exponential increase in the volume and diversity of geo-referenced data, both actively generated by users or passively collected [2, 21, 35, 44], providing deeper insights into the representation of socio-economic environments [22]. In the age of Volunteered Geographic Information (VGI) [9, 11, 16–19] and the proliferation of big geo-data [49, 50], platforms hosting user-uploaded photographs offer invaluable resources for tourists and visitors to shape their expectations, understand local landscapes, explore various routes, and unearth hidden gems [13, 14]. Moreover, the use of multi-sourced harmonised open data allows to better understand and visualise territorial features belonging to different domains [6]. This nuanced understanding of the relationship between these dimensions and visitor satisfaction rates holds big potential for policymakers to enhance the quality of tourist experiences and foster socio-economic equilibrium in rural areas [20, 36]. A wide range of literature underscores the indispensable role of Geographical Information Systems (GIS) in analysing and visualising diverse local features such as green spaces, local activities, public amenities, and touristic attractions. GIS facilitates the integration of spatial attributes, travel

times, and mobility patterns, offering insights beyond conventional databases. Proximity to positive territorial attributes yields benefits and positive impacts, while proximity to negative attributes poses vulnerabilities and threats [51]. The spatial organisation of environmental variables and community-driven processes undelights spatial correlations, co-variances, and multiplicative effects arising from the intersection of various interventions, policies and risks.

Data visualisation can be an effective communication and decision-making tool that helps people discern, distinguish, learn and understand specific topics even complex ones, in achieving this, the design and production processes are not trivial [30] they need to be planned and organised by rules to create stories. The visual narrative is what the visualisation represents to fulfil the intent of defining a story to tell someone else [39]. This allows a visual narrative to be constructed around that information combination, selection and hierarchy. Space, colour, layout, typography and annotations are all used to guide the users through the experience of processing the information [24].

By analysing specific literature and case [24] studies, which refer to the co-design data visualisation process, territorial geospatial analysis in rural areas and practice-based research in the tourism sector, some research gaps emerged. First, recent literature faces the problem of making the process of co-design strategic intervention with the support of technical experts to stakeholders more democratic, especially in the tourism sector and in geographical contexts like the rural ones where is tougher to generate change.

3 Methodological Approach

The methodological approach proposed in this paper is designed to support the territorial complexity analysis through Holistic Diagnosis [32] and to stimulate an active and effective involvement of stakeholders in different European rural contexts (Fig. 1). To this aim, it is necessary to manage data, knowledge and relationships with a diverse array of stakeholders involved in operational discussions regarding the research findings. This collaborative approach focuses primarily on the perspectives, interests, and needs of stakeholders, requiring that these participants influence the entire research process, from project design, data collection, and data analysis to the visualisation of results [23].

Despite this active participation of the stakeholders, it is crucial that the researchers organise and mediate co-design sessions to work with all the stakeholders by establishing a common language around data visualisation.

The experience in the holistic understanding of the territories [33] and dialogue with stakeholders in highlighting policy gaps, as well as good practices in terms of sustainability and regenerative territorial transitions, will provide to the experts' elements for policy roadmaps for regional models.

The first step of the methodological approach, shown in Fig. 1, includes the definition of the domain and the objective of the analyses (Phase 0), starting from a theoretical background that enables each team of the singular regional department to understand the characteristics and hidden potential of rural areas. In this phase, the technical team of researchers plays the role of practitioners by sharing practical competencies developed and coordinating the stakeholders to establish and validate a shared domain for the research.

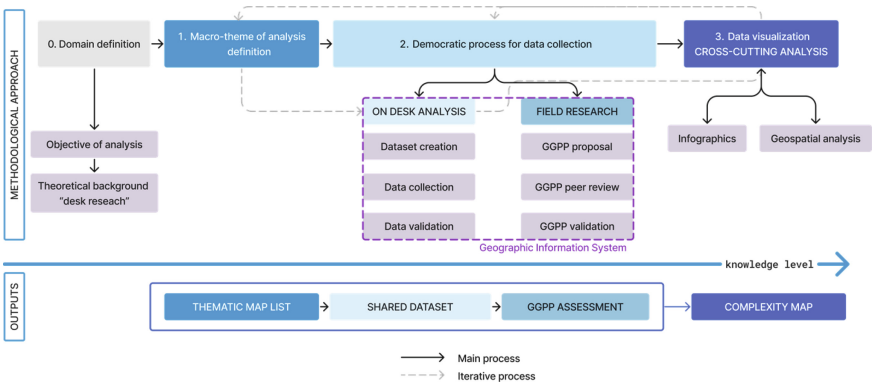


Fig. 1. SYSTOUR methodological approach (Source: Authors' elaboration)

The proposed methodological approach follows three main steps of analysis. The "Macro-themes of the analysis definition" (Phase 1) sets which kind of spatial analysis has to be carried on for understanding each specific territorial context. Based on the domain of the analyses, the macro-themes selection allows the Holistic Diagnosis method of analysis [5] by considering in parallel different fields of analysis to understand the relationship between each element and its environment.

The definition of the macro-themes of the analysis draws from two distinct approaches: the Holistic Diagnosis analytical framework [1], integrated with a selection of spatial analyses defined in the context of the Exploration phase within the "Branding 4 Resilience" national project[1] [10, 12, 25, 29, 37, 38, 43, 45]. Subsequently, for each macro-theme, it is necessary to consider the unique geographical partitions and hierarchical structures inherent to each territory involved in the investigative process. Starting from a set of indicators it is necessary to build up a list of required data at different territorial levels (e.g. national, regional, municipal). The output of this phase is the Thematic Map List, including the specific list of information, indicators, and geospatial data that needs to be collected.

In the final Thematic Map List (O1), indicators and data need to be shared with stakeholders to get their feedback and reviewed through a time of discussion on what may be elaborate, too detailed, or superfluous to activate the process of interest and involvement. Once the macro-themes of analysis are defined, the democratic process of data collection starts, which is articulated in two main parts: desk research and field research.

The democratic process of data collection (Phase 2) embodies steps and features of a participatory process aimed at fostering inclusivity and collaboration. It operates on a bottom-up principle, empowering key stakeholders to engage directly with researchers,

[1] "B4R - Branding4Resilience. Tourist infrastructure as a tool to enhance small villages by drawing resilient communities and new open habitats" is a research project of national interest (PRIN 2017 - Young Line) funded by the Ministry of Education, University and Research (MIUR) with a three-year duration (2020–2023). More information available at https://www.branding4resilience.it.

thereby facilitating the exchange of knowledge, valuable insights and the articulation of pertinent issues. Through this dynamic interaction, the outcome is not merely dictated but rather negotiated, ensuring that diverse perspectives are considered, and consensus is achieved.

It is noteworthy to mention that the technical team needs to supervise this phase in order to collect, harmonise and validate the data that the stakeholders provide during the process; moreover, it is necessary to find the right balance between the objective of the analyses and the availability of data in the different countries (O2). The outputs of Phase 3 are infographics, georeferenced maps and new spatial databases of Good Governance Practices (GGPP) scouted, mapped and assessed by stakeholders in each region (O3).

All the structured datasets are organised in a Geographic Information System (GIS) with the aim of supporting local authorities and sharing specific knowledge on each territorial context [3]. While the existence of open-access WebGIS in specific geographic regions is recognised, the proposed democratic process presents an invaluable opportunity to not only guide the acquisition of knowledge but also to shape the specific outcomes towards the focal points of analysis.

In the cross-cutting [43, 44] analysis [7, 37] visualisation (Phase 3) all the previously collected elements (territorial data, GGPP, and local stakeholders' vision) are joined to create a collective overview of the different regions with a combination of infographics and geospatial analyses to visualise the complexity of the contexts [41] in a Territorial Complexity Overview (O4).

Lastly, the aspect of democratisation of the process is again emphasised by the incremental iteration of the process itself, in which steps are being continuously refined and improved and where the outcomes of one phase informing revisions to preceding ones. This iterative approach ensures better alignment with the stakeholders' intentions and the analytical objectives [28]. The level of knowledge on the focused territorial context will increase as the process continues: it could potentially be repeated for all macro-themes of interest for future analyses.

4 Results: The Data Collection Process for Visualising and Interpreting the Territorial Complexity in SYSTOUR Project

According to the aim of SYSTOUR project, the proposed methodological approach has been implemented to address sustainable strategic planning and investments for services to improve employment and growth rates by focusing on European rural areas. This initiative seeks to increase the development of responsible tourism opportunities and the number of inhabitants (Phase 0). In this specific case, the objectives of the analyses have been addressed to identify and develop strategies in the field of sustainable tourism, a driver to improve the attractiveness and well-being of fragile territories, not only as destinations to visit but also as places to live, work, and invest.

At this time, the SYSTOUR partners are actively engaged in finalising the data collection and visualisation efforts. In light of this, the current proceedings aim to provide a preview of the final indicators for the Territorial Complexity Overview. This preview

will focus on presenting the two representative macro-themes, namely Demography and Tourism.

4.1 The Thematic Map List

To streamline project coordination and ensure the integration of project outputs into research design, the authors (POLITO) developed a protocol. This protocol, as outlined by Nanda & Wingler [31], serves as a roadmap for crafting a theoretical framework and a set of practice-based tools. It employs a dual methodology, encompassing both qualitative and quantitative approaches to data collection and cross-cutting analysis visualisation. Crucially, the protocol emphasises active involvement of stakeholders throughout the process, by fostering collaboration and ensuring comprehensive input.

The Thematic Map List (O1) in Tab. 1 is the result of the application of Phase 1 of the proposed methodological approach with the aim of stimulating an active engagement of stakeholders and creating new economic flows in different European rural contexts (Italy, France, Spain, Poland, Finland, Hungary). This outcome represents a possible result of the application of the methodological approach, but the set of indicators and spatial data can vary during the process to better match the objectives of the analyses.

The set of indicators in Table. 1 was set up assuming that the collected data would be represented through a combination of infographics and geospatial maps, hence the shared dataset (O2) includes both data for different kinds of graphs and spatial data according to the stakeholders' contribution and the open-data availability.

In SYSTOUR, the POLITO research team set up the macro-themes and indicators list (Phase 1), by assuming the results achieved in other studies [12, 37], with a combination of different open data sources such as the National Institutes of Statistics (ISTAT, INSEE, INE, etc.), Tourism Observatories and other specific dataset obtained thanks to the stakeholders' volunteer contribution (VGI).

The Thematic Map List has been provided to the European partners from the initial phases to discuss the topic of the analyses and to check the available data: this step has triggered the starting of the Democratic process for data collection (Phase 2). It began by providing a structured and shared dataset designed to collect data within the framework of several macro-themes, such as Geography, Demography, Economy, History and Culture, Tourism, and Education.

To enhance the depth and scope of data compilation, the protocol foresees intermediate reviews with advisors, enabling the inclusion of additional subcategories that stakeholders, actively involved in the process, identified as relevant [48].

This collaborative effort (Fig. 2) ensured that the dataset comprehensively reflected the complexity of the subject matter. Once the Excel spreadsheet has been fully populated by the regional project partners and stakeholders involved, the POLITO research team reorganised and analysed the collected data and indicators to create graphs, geospatial analyses and infographics that follow a precise logic by referring to their expertise and consulting "The Data Visualisation Catalogue" [42].

Table. 1 Thematic map list from the macro-theme selection. (Source: Authors' elaboration)

Macro-theme	Theme	Spatial data type	Territorial level
GEOGRAPHY	land use	polygon	regional
	rivers	polygon/line	regional
	orography	polygon	regional
	streets/connection	line	regional
	population density	polygon	municipal
DEMOGRAPHY	migration balance	polygon	municipal
	middle age	polygon	municipal
ECONOMY	employment rate	polygon	municipal
	real estate market (sales prices)	point/polygon	municipal
	GDP	polygon	municipal
HISTORY-CULTURE	Museums	point/polygon	national
	UNESCO sites	point/polygon	regional
	National parks	polygon	national
	Natura 2000 sites	polygon	national
	Protected areas no-UNESCO	point/polygon	national
TOURISM	Average stay	polygon	municipal
	Accommodation	point	municipal
	Tourist classification of municipalities	polygon	municipal
	Touristic flows	polygon	municipal
	Sport and leisure points of interest	point	municipal
	Other points of interest	point	local/national
	SYSTOUR Scouted/selected/visited best practices	point	local/regional
EDUCATION	Schools	points	local/municipal
	University districts	polygon	municipal
	Average level of education	polygon	municipal

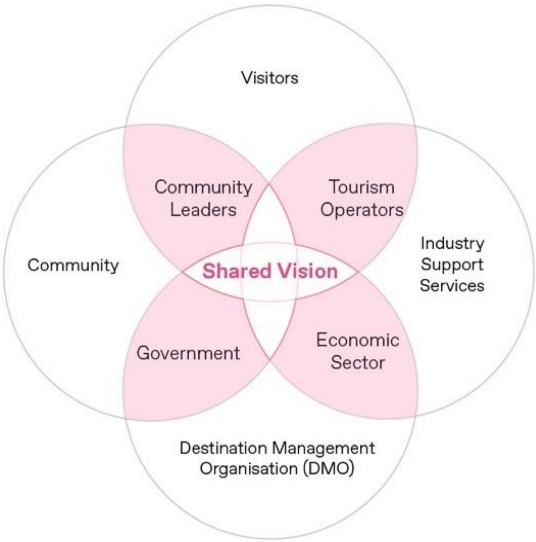


Fig. 2. Defining a shared and democratic multi-stakeholders' vision (Source: Authors' elaboration)

4.2 Shared Dataset and GGPP Assessment

After the definition of the Thematic Map List (O1), the process continues with the collaborative input from the partners (Fig. 3).

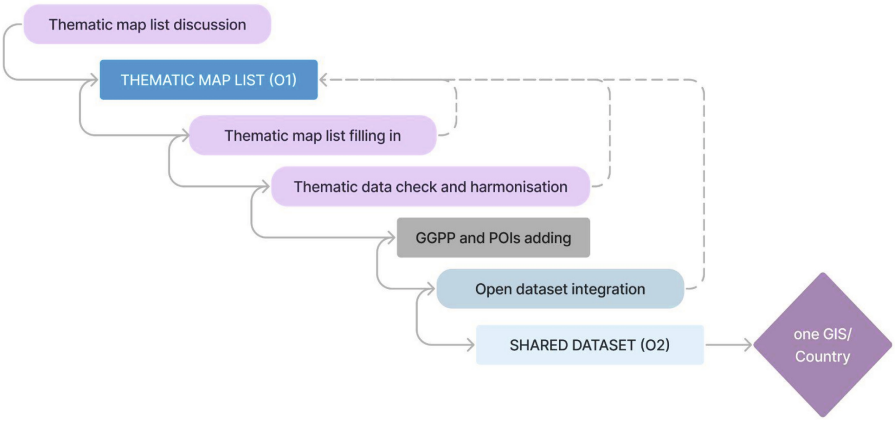


Fig. 3. Shared dataset (O2) achievement (Source: Authors' elaboration)

Currently, the SYSTOUR partners are actively engaged in finalising the data collection process, ensuring the completion of all data tables and sheets. Following this crucial step, the POLITO research team will work to check and review the data's completeness

in order to ensure that all the countries' datasets are comparable by harmonising data and standardising their specific ontologies.

The original contribution of each GIS project is the inclusion of the two new spatial databases. The GGPP, discussed and approved by all the partners trough a peer review process of assessment, and the mapping of Point of Interest (POIs) mostly related to the Tourism topic. Lastly, the POLITO team would provide some integration by consulting online open datasets and new geographic data. The final result of the shared dataset (O2) process is the creation of six GIS (one for each country) that could be bequeathed to local authorities to guarantee the equity of information between the different territorial contexts.

4.3 Territorial Complexity Overview

To address specific analyses, a list of indicators for each macro-theme has been developed by providing a mix of data to be represented both with the use of images or graphs (infographics) and maps thanks to the GIS developed for each country of the project.

At this moment, the SYSTOUR partners are working to finalise the data collection and the cross-cutting analysis visualisation; so the Territorial Complexity Overview (O4) here presented is a draft, focused only of on two main representative macro-themes: Demography and Tourism (Tab. 2).

Table 2 highlights the complementarity between infographics and maps: it is not possible to represent each singular indicator by the use of graphs due to the necessity of showing the spatial relationship between the elements as could be done with maps; meanwhile, the use of infographics allows to light up the dependency between the different territorial levels.

Tab. 2. Territorial Complexity Overview: focus on selected data for Tourism and Demography analysis. (Source: Authors' elaboration)

Macro-theme	Theme	Spatial data type	Infographic	Map	Sources
MAP BASE	Administrative boundaries of the region, comarcas, municipalities	polygon		X	Eu Commission
	Buildings	polygon		X	Regional WebGIS
	Railway lines networks	line		X	
	Main and secondary road network	Line		X	
	Pedestrian and cycling lane network	Line		X	
	Blue infrastructures	Line/polygon			

(*continued*)

Tab. 2. (*continued*)

Macro-theme	Theme	Spatial data type	Infographic	Map	Sources
	Digital Terrain Model	Tiff		X	OpenDem
	Land Cover	Polygon		X	Corine
	Parks	Polygon		X	
	Natura 2000 sites	polygon		X	Eu Union
DEMOGRAPHY	population density	polygon	X		National institute of statistic
	Migration balance	polygon	X		National institute of statistic
	middle age	polygon	X		National institute of statistic
TOURISM	Avarage stay	polygon	X	NA	National institute of statistic
	Accomodations	point	NA	NA	-
	Tourist classification of municipalities	polygon	NA	NA	-
	Touristic flows	polygon	X	X	National institute of statistic
	Sport and leisure points of interest	point		X	Regional online GIS
	Other points of interest	point		X	Partners survey
	SYSTOUR Scouted/selected/visited best practices	point		X	Partners survey

The issues and potential of an area are highlighted by the intersection of geospatial elements and the integration of infographics with specific focuses that emerge from the data provided by the stakeholders who live, administer, and know the area.

The narrative approach is employed to craft a compelling storytelling component for the Territorial Complexity Overview, making the findings more accessible and meaningful to a broader audience [27]. The research Protocol defined also emphasises the importance of sharing the results with stakeholders, dedicating specific moments for feedback and involvement. To gather valuable insights and ensure a well-rounded analysis, several moments of review within multi-stakeholder group sessions are being conducted

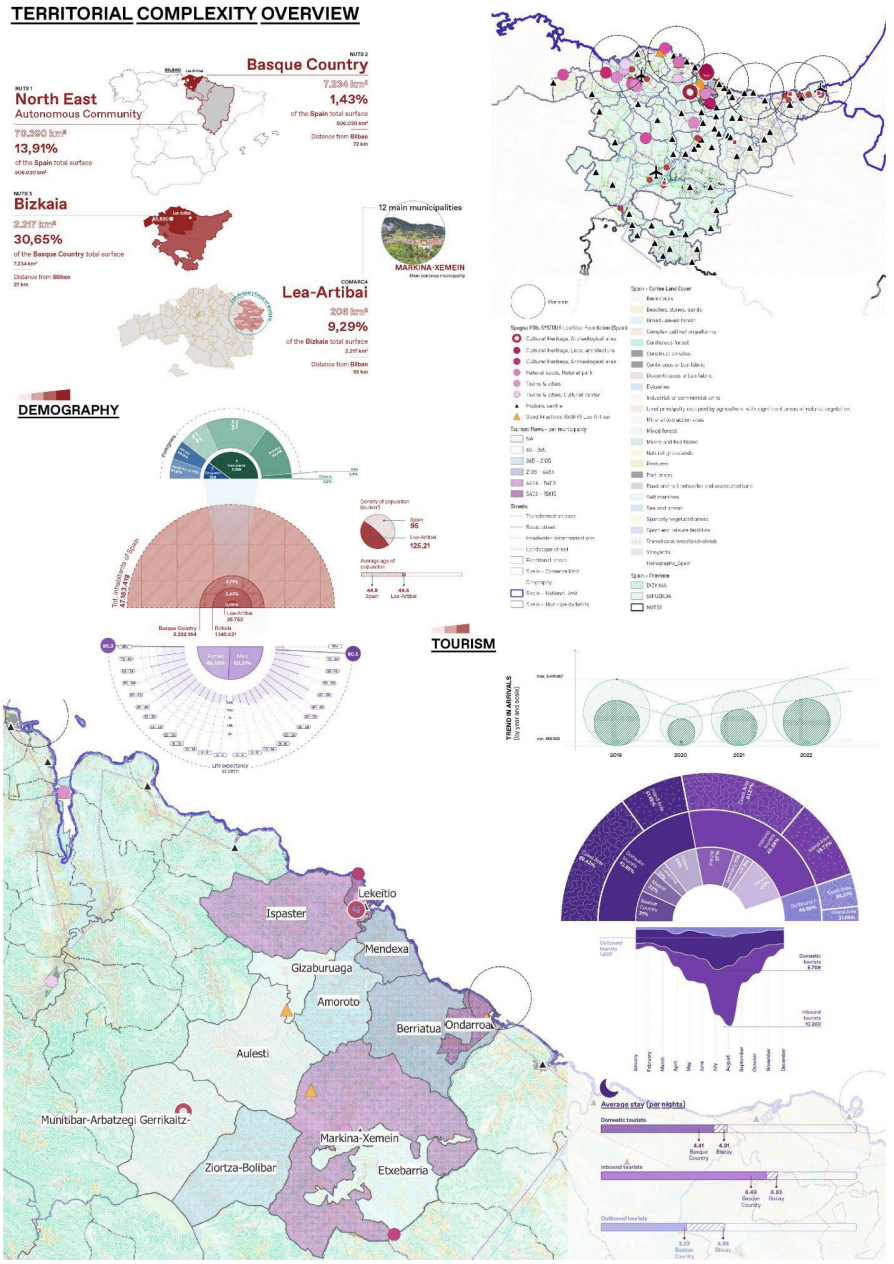


Fig. 4. Preliminary Territorial Complexity Overview of Lea Artibai - Spain. (Source: Authors' elaboration)

to integrate their feedback and foster a democratic and inclusive approach to the study. This comprehensive Protocol ensures that the research process is structured, inclusive, and well-informed, leading to robust and meaningful results.

The Territorial Complexity Overview example reported in Fig. 4 shows preliminary results elaborated for the Spanish territorial area, specifically afferent to the Basque Country (NUT 2), the Biscay region (NUT 3), in the rural area of Lea Artibai. The selection of representing this context stems from the fruitful collaboration, selection, and sharing of information and data, which demonstrates a very high level of propensity to access the data itself, which should be considered when designing using local, regional, and national data. The partner, Lea Artibai Foundation, contracted an external agency qualified in tourism industry data analysis to support them in acquiring the data and information required by the POLITO research team.

The region's online geoportal (https://www.geo.euskadi.eus/inicio/) boasts an extensive array of data, offering the opportunity to access specific geospatial datasets for map creation. This resource not only identifies existing gaps but also facilitates ongoing work to address them, in accordance with the outlined methodological approach.

The ultimate outcome is a comprehensive territorial complexity overview of the region, empowering readers to meticulously examine and analyse the multifaceted issues that define a specific geographic area or region.

The preliminary Territorial Complexity Overview in Fig. 4 delves into two key dimensions: demographic and touristic factors, which collectively shape the complexity of the territory. This approach involves examining the relationships, interconnections, and contradictions within the region. The spatial aspect of data allows for a detailed analysis at a local level, while also presenting a broader regional perspective, also demonstrating the presence of hierarchical relations between different areas.

This panoramic overview provides valuable information on the challenges, opportunities, and trends within a region, creating a solid foundation for informed decision-making processes, long-term planning, and the development of sustainable growth strategies.

5 Conclusion, Discussion and Limits

Rural communities across Europe face common challenges such as aging populations, depopulation, closure of essential services, and unsustainable tourism picks. While tourism offers economic potential, mass tourism often overwhelms small towns and villages. To thrive, these communities need sustainable and responsible tourism approaches that support local businesses year-round, rather than seasonal spikes in visitor numbers.

Local authorities concur to foster plans and initiatives for implementing sustainable and responsible tourism development policies. This could be a major factor in making these regions more attractive places to live, work, and invest in addition to being popular sustainable travel destinations.

To support these processes, different research profiles within academia, can explore the territorial complexity and better understand users' needs and behaviour, going beyond mere data retrieval. The [52]cross-pollination among design and non-design research

fields in studying a complex territorial context is based on the integration between qualitative and quantitative approaches, to analyse and visualise different contexts, stories, human and non-human needs, addressing solutions better suited to real-world circumstances [40]. Moreover, as a collaborative discipline, design is particularly suited to these challenges by translating complex messaging, meanings, and narratives of experience. The objective is, therefore, to understand the intertwining of the elements of the system to find a balance between tourism-generated revenue and sustainable and even regenerative territorial development.

This research emphasises that initiating this transition process requires a collaboration with the stakeholders involved in data collection and cross-cutting analysis visualisation. This collaborative effort gives rise to comprehensive and nuanced interpretations of the context in which actions are undertaken, fostering the holistic and complex view of transition dynamics.

The present research has shown the first results of the territorial complexity overview with an explanation of the overall methodological approach to data collection, analysis and visualisation through a democratic process. The collaboration between the POLITO research team and the local partners during the definition of the macro-theme and the data structuring has allowed to combine open online data with other new data provided directly by the stakeholders (VGS).

The Territorial Complexity Overview is the examination of the intricate and multilayered aspects that characterise the SYSTOUR geographic areas. This assessment examines various dimensions such as geographical, economic, cultural and educational issues that make up the territorial complexity. On this regard, the results of this research try to understand the connections, interconnections, and contradictions between the different layers of analyses (macro-themes) within the analysed territorial contexts, by taking into account the state of the art and future developments to provide insights into the challenges, opportunities and dynamics for informed decision-making processes.

At this aim, the six GIS projects - one for each SYSTOUR country - would be delivered to the partners to guarantee a baseline for future analyses concerning rural areas and opportunities for responsible tourism development. The provision of a geographical information system on sustainable tourism with common ontologies could encourage stakeholders to identify solutions and develop guidelines for new policies and strategies not only at municipal but at regional or national scales. Moreover, the SYSTOUR GIS projects can provide knowledge bases for all countries that do not have any open access to online information systems, in order to guarantee fairness in data organization.

Despite this crucial result, the gap between the objective of the analyses and the availability of information at the different territorial levels needs to be mentioned: future developments could try to improve the GIS in the different countries by adding new macro-themes of analysis or improved indicators to better compare the countries.

The current paper underscores the significance of engaging stakeholders through the utilisation of co-design practices and participatory approaches. By embracing alternative and cross-disciplinary methodologies, such as the Territorial Complexity Overview, the research endeavours to catalyse impactful and enduring change, thereby paving the way for fresh perspectives in the strategic development of European rural areas.

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