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Territorial marginality: causes, methods and policies

Special Issue edited by **Bruna Vendemmia**, **Agim Kërçuku** and **Giovanni Vecchio**

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- *Redefining marginality on Italian Apennines: An approach to reconsider the notion of basic needs in low density territories* by Bruna Vendemmia and Giovanni Lanza was originally published in vol. 9, nr. 2, 131–148.
- *The THEMA tool to support heritage-based development strategies for marginal areas: Evidence from an Italian inner area in Campania Region* by Marco Rossitti and Francesca Torrieri was originally published in vol. 9, nr. 2, 109–129.
- *Italia di mezzo: The emerging marginality of intermediate territories between metropolises and inner areas* by Agim Kercuku, Francesco Curci, Arturo Lanzani and Federico Zanfi was originally published in vol. 10, nr. 1, 89–112.
- *Territorial Infrastructure Support Index (ISIT): A theoretical and empirical contribution to the analysis of lag zones in Chile* by Arturo Orellana Ossandón, Ricardo Truffello, Daniel Moreno, Héctor Altamirano, Mónica Flores and Isidro Puig was originally published in vol. 10, nr. 1, 45–66.
- *Ageing, therefore marginal: demographic trends and institutional capacity in marginal Chilean municipalities* by Giovanni Vecchio was originally published in vol. 9, nr. 2, 67–86.
- *Defining marginality in the periurban areas of Quito: A descriptive approach based on empirical and spatial data* by Riccardo Porreca, Nadia Rodriguez.Pazmiño, Vasiliki Geropanta and Paola Bracchi was originally published in vol. 10, nr. 1, 67–88.
- *Remote and connected: Negotiating marginality in rural coworking spaces and "tiers-lieux" in France* by Aurore Flipo, Patricia Lejoux and Nicolas Ovtracht was originally published in vol. 9, nr. 2, 87–107.

Editorials

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Territorial marginality: causes, methods and policies. Introduction to the Special Issue

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Abstract. What are the different factors that make a territory marginal? Are contextual features related to spatial, socio-economic, institutional, or cultural elements differently influencing marginality in different countries? These are the questions at the origin of this Special Issue. To explore the complexity of territorial marginality and the several dimensions that contribute to defining it, this Special Issue collects seven works that explore conceptual issues, possible conflicts, and challenges for developing marginal territories. We explore the conditions that cause or define marginality, the dimensions that should structure a definition, suitable quantitative and qualitative indicators to classify marginal territories, and the features of territorial policies and strategies to address them. The papers explore different meanings of marginality using diverse research methods: quantitative approaches address the use of cultural heritage, population ageing, the lack of infrastructures and the limitations of existing policy approaches; mixed-method approaches combine statistical indicators with qualitative methods to explore landscape features and workspaces in marginal areas; finally, qualitative approaches analyse causes and impact of marginality in everyday life.

1 Background

What are the different factors that make a territory marginal? Are contextual features related to spatial, socio-economic, institutional, or cultural elements differently influencing marginality in different countries? These are the questions at the origin of this Special Issue.

Marginal areas are traditionally defined as those far from the main urban centres, based on a core-periphery model (Cullen, Pretes 2000, Gatzweiler, Baumüller 2014, Herrschel 2012, Ferrau, Lopes 2004, Bock 2016). From this perspective, marginality is an intrinsic spatial condition rather than a transient feature. However, the geographic distance from the poles is only one among the many conditions that can help to define marginality, which could be better defined as a process deeply influenced by socio-economic changes (Máliková et al. 2016). Marginal regions can be peripheral in geographical location but advanced regarding their socio-economic situation. On the other hand, not every marginal region is necessarily peripheral: on the contrary, several studies suggest an interpretation of marginality as a lack of socio-economic and political connection (Leimgruber 2004, Pelc 2006, Bock 2016).

Moreover, in European countries such as Germany, France and Italy, the concept of marginality has often been associated with rural or mountainous areas. Still, different

contributions to this Special Issue show that marginal territories may have very diverse geographical and orographic conditions. In addition, the scale at which a region can be defined as marginal and the administrative borders may also significantly influence the definition of marginality itself.

The lack of a broad, shared definition of marginality affects the identification of marginal territories and the possibility of developing adequate territorial policies to rebalance their marginal condition. Europe shows different attempts at defining marginal territories before proposing devoted policies. For example, Italy refers to the concept of "inner areas" (Materiali Uval 2014), while the Espon (2017) project PROFECY refers to "inner peripheries". The different names given to marginal territories and the different definitions of marginality require exploring the meaning of considering the other features that may make a territory marginal. As a result, marginality should move from the core-periphery model that considers accessibility to services and goods and distance from central places, considering how a combination of physical, social, economic, institutional and cultural aspects defines marginal territories.

2 The Special Issue

To explore the complexity of territorial marginality and the several dimensions that contribute to defining it, this Special Issue collects seven works that explore conceptual issues, possible conflicts, and challenges for developing marginal territories. We explore the conditions that cause or define marginality, the dimensions that should structure a definition, suitable quantitative and qualitative indicators to classify marginal territories, and the features of territorial policies and strategies to address them. The papers explore different meanings of marginality using diverse research methods: quantitative approaches address the use of cultural heritage, population ageing, the lack of infrastructures and the limitations of existing policy approaches (Rossitti, Torrieri 2022, Vecchio 2022, Orellana Ossandón et al. 2023, Kercuku et al. 2023); mixed-method approaches combine statistical indicators with qualitative methods to explore landscape features and workspaces in marginal areas (Flipo et al. 2022, Porreca et al. 2023); finally, qualitative approaches analyse causes and impact of marginality in everyday life (Vendemmia, Lanza 2022).

The works analyse geographical and territorial contexts, including European and South-American countries. Rossitti, Torrieri (2022) and Vendemmia, Lanza (2022) investigate marginality in Italian inner areas, looking at two different Apennine contexts: Campania region in the South and Emilia Romagna in the North of the country; instead, Kercuku et al. (2023) focus on in-between territories, that is, those areas that are not considered either traditionally marginal or central. Flipo et al. (2022) provide an analysis of marginal territories in France. As for South America, Orellana Ossandón et al. (2023) and Vecchio (2022) analyse different dimensions of marginality in Chile, while Porreca et al. (2023) explore the suburban areas of Quito, Ecuador.

Some contributions focus on the definition of marginality. Vendemmia, Lanza (2022) reflect on the redefinition of essential services, using qualitative research methods to examine the effects of individual behaviours on the perception of marginality. Thanks to in-depth interviews and direct observation of a marginal area in the Emilia-Romagna region, the authors reveal that despite a statistical, demographic homogeneity, the population of rural areas is pretty heterogeneous (Moseley 1979), also in terms of available resources and motility. Moreover, an administrative mismatch (Herrfahrdt-Pähle 2014) has been detected in measuring accessibility and, consequently, designing policies to deal with marginality: transport and welfare services are planned according to municipality borders, while people move across borders to accomplish their everyday duties.

Rossitti, Torrieri (2022) developed a decision support tool named THEMA to help decision-makers in the SNAI context. The tool aids in defining local development strategies for Italian inner areas based on cultural heritage. The work departs from the observation that, despite the relevance of cultural heritage for inner areas, the subject is mainly considered a tourist opportunity. All information about heritage included in the definition of inner areas consider tourist flows but not the built heritage conditions.

Including this dimension in the analysis shows that intermediate municipalities, in accessibility terms, are affected by more severe marginality phenomena in economic, social, and heritage terms.

The idea that the territories in-between inner and metropolitan areas are becoming progressively marginal is at the base of the work of Kercuku et al. (2023) that sheds light on the importance of "intermediate territories". In Italy, such territories, named *Italia di mezzo*, embody extremely articulated geographies, including portions of twentieth-century urbanisation, medium-sized cities with different administrative and functional centrality levels, metropolitan belts, and a substantial share of rural areas in plains and hills.

Orellana Ossandón et al. (2023) and Vecchio (2022) present two different ways to analyse lagging areas in Chile. Vecchio (2022) explores the presence of older people, examining census data to define areas experiencing a demographic decline and observe if these correspond to the areas that national policies define as marginal. Moreover, he examines official documents to consider to what extent national policies and local development plans define ageing as an element of marginality. Population decline in Chile defines a geography of marginality that complements and expands the one defined in policy strategies, including a wider perimeter. In contrast, institutions at different levels are only partially prepared to deal with the socio-spatial implications of an increasingly older population.

Orellana Ossandón et al. (2023) developed an index called "Territorial Infrastructure Support Index" (ISIT), which considers six different infrastructure components: Water, Energy, Roads, Telecommunications, Logistics and Resilience, working on "material foundational economy" (Froud et al. 2018, p. 20). The index reveals that in Chile, infrastructures are relevant regarding accessibility to public and private goods and services for many urban and rural localities scattered throughout the national territory. Therefore, their development may help to deal with socio-territorial inequalities.

Porreca et al. (2023) overturn the idea of marginality, hypothesising that marginality might have a positive meaning and be beneficial for enhancing landscape values. This approach emphasises that there is no absolute and global exclusion or social marginality but rather a tension between rejection and integration. In the same direction and looking at a possible strategy to deal with marginality, Flipo et al. (2022) analyse the impacts of co-working spaces (CSs) on marginal territories, discovering that, despite a mainstream interpretation that supports the implementation of co-working spaces in rural areas to increase social diversity by promoting new inhabitants and new lifestyle, CSs strengthens the networks of like-minded individuals, bearing the risk of estranging themselves from the rest of the population and making them marginal concerning local communities. On the contrary, a wide range of inhabitants has appropriated "multifunctional third-places" that expand the idea of CSs, providing many services (such as printing, photocopy, and distribution of local newspapers). These spaces are thus an effective tool to attract new inhabitants while integrating them into the local community.

3 Avenues for future research

The seven papers in this Special Issue provide an overview of the multiple established and emerging research topics related to territorial marginality. While the contributions do not intend to provide an exhaustive discussion of marginality, some research issues appear transversally in the papers. These point to some possible avenues for future research and hopes to inspire further research on the topic referring to at least three dimensions:

- The *definitions of marginality*. The traditional core-periphery dichotomy has a different meaning depending on the setting and the territorial scale. It goes beyond a simple spatial definition based on the distance from main centres. More and more, social, economic and cultural specificities define marginal territories, leading to different approaches by scholars and policymakers. In this sense, it becomes crucial to explore such conceptual multiplicity further and stress it to question the traditionally negative implications of marginality.

- The *settings of marginality*. The issues of marginality have been at the centre of scholarly and policy debate in several European Union countries. However, other settings have also used similar concepts to identify areas with territorial specificities requiring devoted policy measures. As a result, it is essential to expand the territorial focus of the research on marginality (the papers of the Special Issue devoted to Chile and Ecuador are the first example in this sense). Moreover, it is relevant to provide comparative studies across different settings and dimensions that may shed new light on marginality.
- The *dimensions of marginality*. Quantitative approaches from disciplines such as geography and economy have often dominated the research on territorial marginality, privileging aggregate analyses that define marginal areas and their economic performances or demographic trends. As shown in the Special Issue, qualitative and mixed-method approaches can be relevant to grasp several other dimensions of the phenomenon and what it means for the everyday life of those who inhabit marginal territories. Moreover, by combining different methods, it is possible to gain deeper insights into marginal areas that can inform more robust policy proposals for these settings.

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Redefining marginality on Italian Apennines: An approach to reconsider the notion of basic needs in low density territories

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Abstract. The concept of basic needs and essential services evolves according to sociocultural parameters. Therefore, defining marginality based on the distance from a predefined set of services, institutionally considered essential for life, may lead to an unfocused representation of marginal and more fragile areas.

This work focuses on a territory located on the Apennine of the Province of Piacenza, northern Italy. These mountainous areas are characterized by significant shrinking processes, ageing population, low income and educational rate, unemployment, and by work/study-related mobility practices over long distances and at high speed, revealing low levels of attractivity and significant dependence on more dynamic areas of the region. Moreover, according to the National Italian Strategy for Inner Areas, they have been identified as inner areas because of the high distance from main services.

Starting from a previous research work aimed at mapping and assessing the availability, location, and accessibility to a set of services considered essential, the present work aims to reconsider and integrate this quantitative approach with an on-site qualitative survey, thanks to interviews with inhabitants and persons with special knowledge of the territory as well as participant observation.

The hypothesis is that, particularly in low density and peripheral areas, a mixed-methods research methodology that includes the accounts of populations and local stakeholders may help to extend the knowledge of their actual needs and their willingness to travel, thus reconsidering their accessibility to what they perceive as essential services and, consequently, redefining the notion of marginal and fragile territories.

Key words: marginality, accessibility, basic needs, qualitative data, mixed methods

1 Introduction

The concepts of basic need and essential service have been already addressed in mobility and accessibility studies and informed operational approaches and policy frameworks (Carrosio, Faccini 2018, Lucas 2012, Martens 2017), such as the Italian National Strategy for Inner Areas (SNAI). SNAI classifies the Italian territory according to the distances from three main services: education, health, and mobility[1]. According to this classification,

[1]SNAI classifies the Italian municipalities based on the level of accessibility to three citizenship rights: mobility, education, and health. According to the Strategy, the level of accessibility to these rights

the level of marginality of the Italian territory is inversely related to its physical level of accessibility.

Based on the definition of accessibility as "the capacity to reach a place, event, opportunity or social contact in a way that fulfils what people need" (Ferreira, Papa 2020), the paper discusses the limits of marginality assessments based on aggregate measures of accessibility to a predefined set of services and activities often arbitrarily considered essential. Notions of basic needs and essential services have been widely discussed in the literature (Froud et al. 2018). Concerning the selection of target services, some authors argue that the identification of basic needs is still "an unresolved challenge in the academic literature" (Pereira et al. 2017, p. 20) and that it is not possible to define a univocal and comprehensive list of essential needs (Nussbaum 2011).

In this work, we discuss the hypothesis that a mixed-methods research based on the listening of target populations and local stakeholders may help to both reconsider essential services, redefine the notions of marginal and fragile territories, and produce a basic knowledge for the design of more context-sensitive land use and mobility policies. As matter of fact, while quantitative data highlight general trends at larger scale, qualitative survey data help to show diversities in behaviors and to describe specific processes affecting the individual sphere. A combination of both quantitative and qualitative data may thus lead to unexplored directions of research.

However, existing literature suggests that qualitative methodologies may have some limits as it "still involve a form of aggregation and tend to lose the richness of individuals' lived experiences" (Preston, Rajé 2007), focusing on specific population groups (Titheridge et al. 2009, Shergold, Parkhurst 2012, Ryan et al. 2015) or target activities (Fransen et al. 2015, Mao, Nekirchuk 2013, Higgs et al. 2015, Materiali Uval 2014). For this reason, more sophisticated approaches based on individual accessibility are needed. Methodologies based on tools such as personal travel diaries (Kenyon 2006, Neutens et al. 2007, Chudyk et al. 2015), the collection of microstories (Vecchio 2020), or the use of disaggregated GPS, social networks, and telephone traffic digital data (Järv et al. 2014) respond to this challenge. Those methods may provide additional elements for the design of more effective policy actions as they detect features of the mobility experience that, despite their relevance for personal preferences and behaviors, are still difficult to be included in policy design using quantitative aggregated data.

The present work aims to reconsider and integrate a quantitative approach that analyzes the availability, location, and accessibility to a set of essential services with an on-site qualitative survey. Through interviews with groups of inhabitants and persons with special knowledge of the territory and participant observation, the work discusses how listening to the voices and stories of a territory can, despite some limitations, contribute to critically reconsidering the set of essential activities and services that should be available and accessible for improving the quality of life in these areas, reducing marginality. It also analyses how place-based policies and strategies may contribute to a fairer distribution and access to services and opportunities.

The approach is tested through empirical observation in a territory located on the Apennine of the Province of Piacenza in the Emilia Romagna region, northern Italy. These mountainous areas are characterized by significant shrinking processes, ageing population, low income and educational rate, unemployment, and work/study-related mobility practices over long distances and at high speed, revealing low levels of attractivity and significant dependence on more dynamic areas of the region (Vendemmia et al. 2021). Moreover, they have been defined as peripheral according to the Italian National Strategy for Inner Areas, thus representing an interesting case study to analyze the link between accessibility to basic needs and marginality.

After this introduction, in Section 2 we introduce an overview of basic needs and essential activities as well as of services for accessibility assessment. In Section 3, we outline the research design introducing the case study and the method. We then discuss the more

is proxied by the driving distance from three main services: "silver" railway station (small/medium size mainly served by local trains), secondary schools, and hospitals with an emergency room. The resulting classification further identifies three types of peripheral territories: intermediate, peripheral, and ultra-peripheral areas (Materiali Uval 2014).

relevant results (Section 4), arguing about the advantages of the applied methodology and its main limits (Section 5). Section 6 will outline the main conclusions.

2 Basic needs and essential services in accessibility: an assessment

The operational approaches informed by the concepts of basic need and essential services aims at measuring whereby people are able or not to access and participate in the fundamental activities of the economic, political, and social life of the community of belonging. Several conditions are relevant to this process: the spatial and temporal availability, the quantity/ quality of services and the activities required, and the capabilities related to the organization of one's movements on which individuals can rely on to reach spatial opportunities (Geurs, van Wee 2004, Moseley 1979) as for the concept of "motility" (Kaufmann et al. 2004). Reduced accessibility to opportunities, services, and social networks, due wholly or in part to insufficient mobility (Kenyon et al. 2002, Preston, Rajé 2007, Pucci, Vecchio 2019) may limit individual participation to essential activities and cause inequalities and potential social exclusion (Preston, Rajé 2007, Ryan et al. 2015).

Referring to the concept of basic needs means orienting mobility research towards the definition of a sufficient level of basic accessibility in order to allow participation to those essential activities also defined as activity participation (Martens 2017, Allen, Farber 2020). Accessibility thus takes on a normative value: a lower level of accessibility experienced by people will demonstrate society's duty to increase it (Farrington 2007) and to enable individuals' activities participation as a condition of basic agency, inclusion, and justice (Farrington, Farrington 2005, Lucas et al. 2016). Therefore, accessibility evaluation requires a detailed understanding of the basic needs of different social groups within a population, in the awareness that different people (if not individuals) express different needs that may vary in terms of space-time geographies and are influenced by their life chances (Martens et al. 2019, Cotella, Vitale Bovarone 2020).

Consequently, the assessment of needs is a complex task that involves a judgment about people's "wants and taste" (Handy, Niemeier 1997, p. 1175) and must be relative to the society in question (Farrington, Farrington 2005). Furthermore, it must be recognized as an embedded conflict due to the fact that essential needs are generally imposed by prevailing cultures. This is why many accessibility analyses consider a relatively limited array of activities of universal value such as healthcare, education, and transport as basic needs, refraining from an intrusive value-judgment and considering them instead as basic and instrumental conditions for the agency (Alkire 2005, Farrington, Farrington 2005).

As previously seen, a similar choice was made also in the case of SNAI, where accessibility has been measured at the national level to detect inequalities between different areas of the country to three basic rights: healthcare, education, and mobility. However, SNAI does not consider the population groups that may or may not need to reach those facilities and where they live, nor do they evaluate accessibility level according to different means of transport.

Clearly, there are more varied and representative sets of "opportunity types" (Van der Veen et al. 2020, p. 1362). In 2018, the Foundational Economy Collective, for example, defined goods and services necessary for everyday life, which are the ones whose limited access prevents living and limits its possibilities (Froud et al. 2018). Foundational economies are "material", that is consisting of "pipes and cables, networks and branches" (Froud et al. 2018, p. 20); "providential", that is inclusive of public-sector welfare activities providing universal services, such as health, instruction, public order, and public administration; and, finally, the "overlooked economy" that is inclusive of goods and services culturally defined as essential.

According to Preston, Rajé (2007), aggregate access mapping may be weak in describing accessibility levels considering varied needs and opportunity types as people living in the same spatial context with different demographic and social characteristics may have different levels and forms of motility (Kaufmann et al. 2004). Consequently, since they are specifically aimed at showing general trends and tendencies at an aggregate or national scale, those approaches risk overlooking the complexity and granularity of individual needs (Handy, Niemeier 1997) expressed by different populations in different socio-cultural

contexts, providing only a partial view of what can make a place marginal.

To assess the level of activity participation in a given place, many scholars started focusing on specific population groups, activities, territorial scales and transport means. One example is the interest in accessibility for elder people induced by ageing demographic trends. Kim et al. (2018), analyzing accessibility to private and public healthcare facilities in Seoul, recognize a negative relation between accessibility and income level and, consequently, identify low income among the main factor that influence accessibility level. Nevertheless, this work "arbitrarily defines the bottom 25% of accessibility to be the threshold for problematic" (Kim et al. 2018, p. 13), thus proposing policies guidelines that may be misleading in reducing inequalities. Fransen et al. (2015) analyze accessibility to daycare centers, also considering trip-chain, and reveal important spatial differences in accessibility compared to commuter-based versions. Mao, Nekirchuk (2013) also reached similar results by incorporating transportation modes into the accessibility estimation, even if their research still presents some limits, such as overestimating the demand for daycare. Stjenborg et al. (2014) analyze how becoming alone in the household may reduce the level of accessibility for older people, particularly focusing on the factors that influence active mobility. Shergold, Parkhurst (2012) focus on older people's accessibility in rural contexts concluding that the car-dependent nature of travel in these contexts increase the risk of mobility related social exclusion particularly amongst the old.

One of the most important limits of these works is the use of aggregated data collected for other purposes, exploring known hypotheses such as considering health care facilities as the most important destination for the elderly. Another critical point is the age of the elder. As a matter of fact, in some countries, elders are defined as people aged more than 65 y.o. while in other cases they are aged more than 60 y.o. (Titheridge et al. 2009). The age threshold mainly corresponds to the retirement age, which is different between different countries, and still defines a wide category that includes people with very different needs and abilities.

Accessibility of youth has not been deeply analyzed in the literature, except for some works considering the access to recreational spaces and sport facilities (Ogilvie et al. 2011, Higgs et al. 2015, Karusisi et al. 2013), as it has been taken for granted that high accessibility level of the caregiver is reflected on young people they take care of (Mattioli, Vendemmia 2021, Waygood et al. 2017). The main limits of these works are the neglect of age, ethnic grouping, socioeconomic circumstances, sporting preferences or gender of the local population and their interaction with the type of sporting facility being used.

Confirming that assuming some activities as essential can be misleading, research based on the use of travel diaries (Hägerstrand 1967) to analyze individual space-time behaviors (Neutens et al. 2007, Kenyon 2006) revealed unexpected results. Chudyk et al. (2015), demonstrated through an analysis based on travel diaries that the most relevant destination for older adults with low income were grocery stores, malls and restaurants or café. Other research based on National Travel Survey and focus group (Titheridge et al. 2009), aiming at establishing micro-level criteria to evaluate accessibility to various destinations, confirm that elder do more food shopping trips than average and twice the number of medical trips, affirming that "elderly people value just being able to get out and about" (Titheridge et al. 2009, p. 45).

Although travel diaries may not be completely reliable due to the level of accuracy required from the participant in recording different activities (Kenyon 2006), they allow exploring more innovative concepts that try to investigate accessibility as the ability to conduct activities and to reach opportunities.

Already in 2003, Schönfelder, Axhausen worked on the concept of activity space to identify persons at risk of social exclusion. According to the authors, "activity space is that part of the environment, which a traveler is using for his/her daily activities" (Schönfelder, Axhausen 2003, p. 274) and can be considered as cognitive or mental maps of the traveler. On the same direction, Perceived Activity Set' (PAS) is a concept used to analyze the set of out-of-home activities a person considers relevant (Le Vine et al. 2013). The PAS is not based on an a priori judgment of which activity locations a person considers important, rather it makes use of empirical observations, such as travel diaries and statistical methods to draw such inferences. In the same direction, Allen, Farber

(2020) analyze participation deserts, which are areas "where residents have lower than expected rates of daily activity participation" (Allen, Farber 2020, p. 13), making use of travel diaries. Other authors focused on the opportunities offered by digital data for the spatiotemporal mapping of individual activity spaces. Techniques such as digital positioning data analysis or mobile phone data tracking can produce information that can be used as digital travel diaries through which the set of out-of-home activities participated by individuals can be inferred and lists of individual as well as context-sensitive needs can be defined in order to feed accessibility evaluation models (Järv et al. 2014).

Finally, micro stories (Vecchio 2020) and in-depth interviews (Vendemmia 2020, Bahrami, Rigal 2021) are also useful to integrate more established approaches to accessibility measures and understand factors of choice related to the mobility experience that may be difficult to read with aggregate evaluations.

Definitely, in order to analyze the availability, location, and accessibility to essential services in rural and marginal territories, the recourse to research methodologies aimed at proposing a context and population-sensitive basic needs assessment, such as the involvement of local people through interviews, micro stories, focus groups and other forms of participation, can be an interesting way to enrich or rethink the list of basic needs to be considered and according to what kind of social and territorial profiles (Levinson 1998). Participation of the local community has been already recognized in the health sector as a key strategy for effectively reducing health disparities in underserved communities (Ahari et al. 2012). Also, considering accessibility planning, Preston, Rajé (2007) suggest supplementing top-down solutions with bottom-up community participation, while Martens (2017) suggests a participatory process that involves citizens and specially informed people through focus groups and interviews to define minimum accessibility thresholds. Moreover, they can reflect the features that facilitate or impede individual mobility and show how each person shapes his own activity space, offering a more varied and granular picture of many different forms of territorial marginality.

3 Research design

The present work integrates the result of a previous quantitative research that analyzes the availability, location, and accessibility to a set of essential services conducted to develop the Piacenza Provincial Plan (PTAV) [2] with an on-site qualitative survey. The authors believe that this method may also give important results for urban planning and territorial policies, helping to better identify the different factors that have a negative impact on accessibility level, and reduce territorial inequalities in remote and marginal territories.

The selected method forecasts direct observation through site visits of specific areas and interviews with inhabitants and key informants.

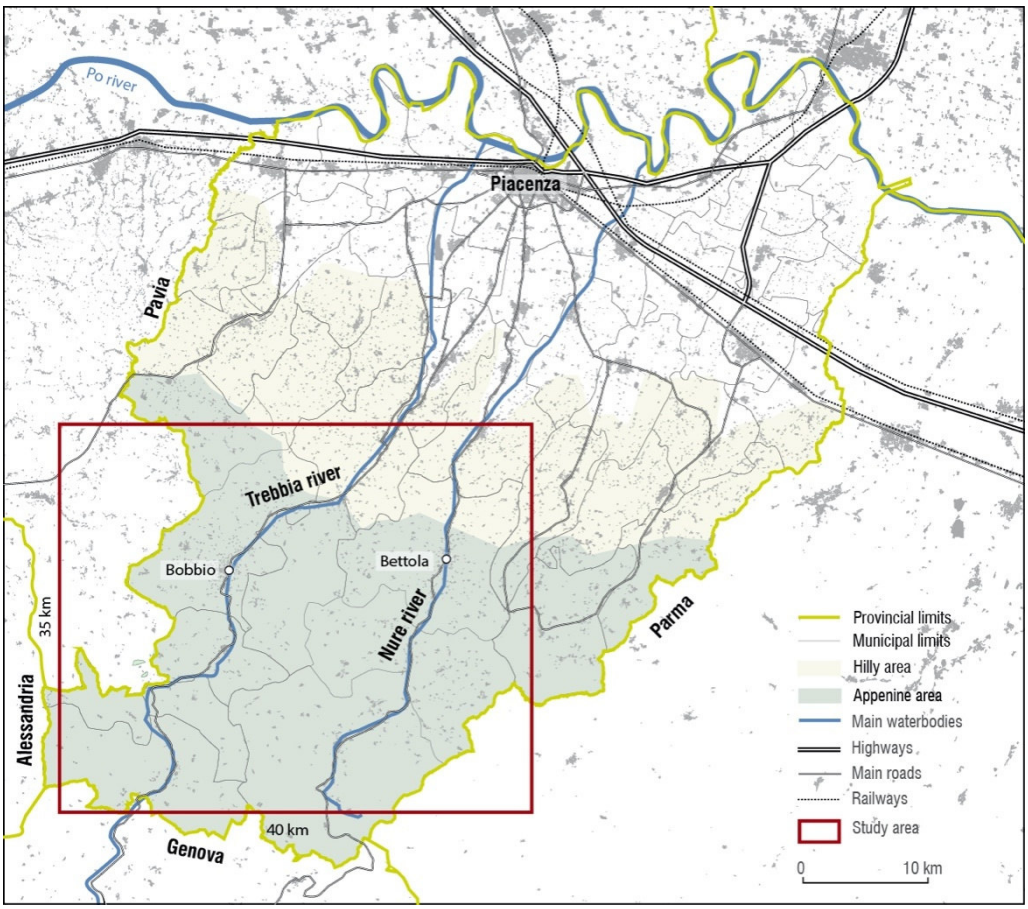
3.1 Introduction to the case study

The case study proposed in this work concerns the Apennine belt of the province of Piacenza, on the west border of Emilia-Romagna Region. The area of about 2,200 km^2 extends from the main city and the plains along the Po River towards the southwest, up to the borders with Liguria, Piemonte, and Lombardia. The area is also called the "Four Provinces" for its peculiar administrative position and historical and cultural heritage at the intersection among four different Regions and Provinces (Tarpino 2016) (see Figure 1).

Going away from Piacenza following the course of Trebbia and Nure rivers along the homonymous valleys, one crosses at first a gently hilly territory which, little by little, becomes more and more rough and wooded.

The roads at the valley floor run along the rivers while crossing little populated centers. Some of these centers, such as Bobbio and Bettola, were particularly important

[2]The accessibility analysis has been conducted by a research group lead by P. Pucci in 2020 for the General plan of the Province of Piacenza (PTAV) cfr. (PTAV 2020) Dotazione di Servizi, accessibilità e rango dei centri in Piano Territoriale di Area Vasta Piacenza – Quadro conoscitivo. pp. 157 -164. Source: https://ptavpiacenza.it/wp-content/uploads/2021/05/2021-05-PTAV-Quadro-ConoscitivoWEB.pdf



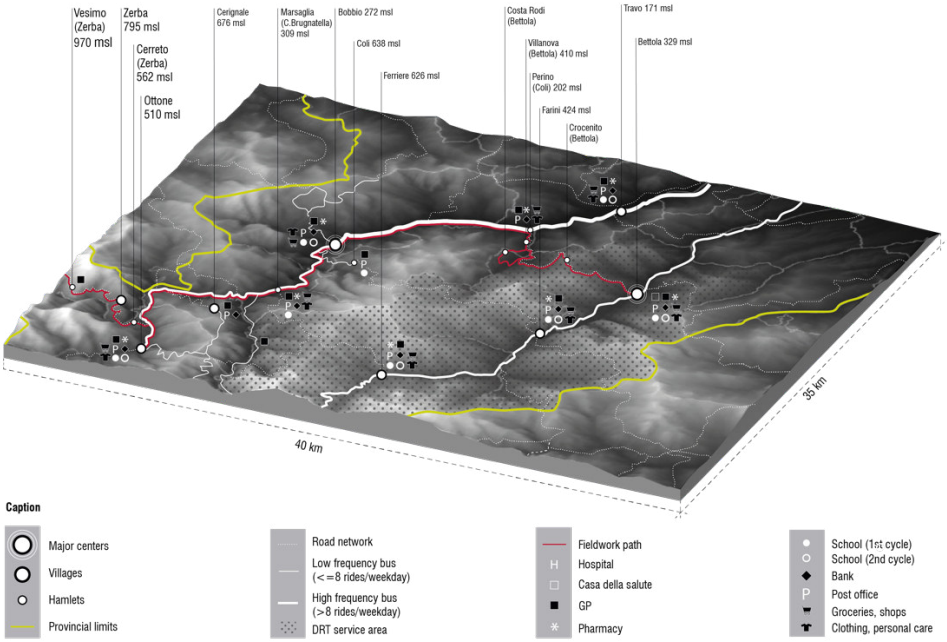
Source: our elaboration.

Figure 1: The province of Piacenza and the study area

from a historical point of view because they were the seat of small local power centers, monasteries, and abbeys. Today, they still fulfill their role as reference centers for the Trebbia and Nure valleys, respectively, and host numerous services at local and territorial scales such as the Hospital of Bobbio and the "casa della salute" (health house) in Bettola. They are almost the only villages that, since the post-war period, have developed a productive industry made of small manufacturing and related services alongside the more traditional agricultural activities.

For these reasons, Bobbio and Bettola still maintain a central role in the social and economic dynamics of the valley and represent nuclei that offer an almost complete range of commercial activities and proximity services, as shown in the analysis of accessibility of PTAV (PTAV 2020). Moreover, the analysis showed a significant inequality in terms of access to services by public transport (PT) between the mountain area and the hills and plains of the province, as the structure of the PT network, mainly facilitates the bus rides from the valley floor toward the city of Piacenza. On the contrary, bus rides are often low frequency or absent on the hilltop, and in some areas they are activated according to a Demand Responsive Transport (DRT) system[3]. Here, considerable travel times are required both to reach essential and rare services (e.g., hospitals) and to access proximity services, making the hamlets poorly accessible and isolated. Figure 2 illustrates the system of the two valleys with villages and hamlets and the public transport.

[3]In some municipalities of the Nure Valley (Farini, Ferriere and Bettola) since 2019 an experiment has been carried out trying to foresee the conversion of traditional bus lines in on-demand services. The user needs to book the trip by telephone, requesting the transit of the bus and the return to the closest stop according to a timetable defined by the operator. In this way, the routes can be modulated according to users' requests.



Source: our elaboration

Figure 2: The System of Val Trebbia and Val Nure with the main centers, the villages, the mountain hamlets, and the system of PT

The history of the Trebbia and Nure valleys is common to many Apennine areas in Italy that have undergone a progressive depopulation process starting from the post-war period up to the present day, as a consequence of the low presence of services and the migration flows toward territories with higher standards of welfare (Colucci 2018).

In the mountain villages, the process of internal migration has only been partially contrasted by the arrival of young inhabitants, the return of the elderly after retirement, and the strenuous resistance of those who have always remained here. Statistical data shows increasing depopulation that can reach a decline of 15% in the municipalities on the hilltop (see Figure 3), an employment rate under 20%, especially for youth with a percentage of NEET up to 20% in the municipalities of Cerignale and very low average income (under €17,500 per year). People aged more than 65 y.o. represent the 25% of the total population in the province of Piacenza, although this percentage is much higher in the mountainous municipalities.

This demographic homogeneity reflects a long-lasting trend, already pointed out by Moseley in 1979, highlighting the aging process as the main trend among rural populations. The sparse distribution and poor availability of proximity services and local welfare, which is also the reason why those areas have been defined as peripheral and ultra-peripheral by the SNAI (Materiali Uval 2014), is mainly due to the absence of sufficiently significant demand, and this is also one of the main reasons for internal migration. For those living in the most remote and isolated areas, this means having to travel significant distances to reach any services the person may need in their daily lives. In many cases, these complex journeys can only be made using a private vehicle.

3.2 Research method: site visit, selection of the sample, and interviews

The empirical analysis focuses on two areas in the province of Piacenza: the Val Nure and the Val Trebbia. For the Val Trebbia, the focus was on the municipalities on the high valley as those were identified as the most remote and poorly accessible according to the desk-based analysis. For the Val Nure, the municipality of Bettola and its many dispersed hamlets were investigated.

Figure 3: Abandoned rural constructions in the municipality of Zerba

Different tools have been used for the investigation: direct observation, face-to-face semi-structured interviews with key informants, surveys to various members of the community, and mapping.

The fieldwork was conducted in September 2020 by two investigators; the period has been chosen according to the interviewees' availability and to the occurrence of a local event that allows meeting as many people as possible. In addition, the visit coincided with a time when the low incidence of the Covid-19 pandemic allowed the possibility to move and interact with the respondents. The journeys were made by car due to the low presence of PT and the significant distances to be traveled.

Key informants have been contacted previously and interviewed with semi-structured interviews. In the beginning, two interviews were planned with the majors of Bettola and Cerignale. However, we had the chance to interview also other key informants while visiting the site. In Bettola, we interviewed a city councilor working as a nurse at the local health house, and we had a telephonic interview with the local health authority manager, sharing his knowledge and data about home assistance programs.

Concerning the survey, at the first stage, the focus was set on old adults by selecting a small purposive sample of six elders aged more than 65 y.o., which is the retirement age in Italy, although, as highlighted before, this threshold may change from country to country. This choice was initially made considering the results of the desk-based analysis from which it emerged that the elderly population was particularly significant in demographic terms. In addition, elderlies are a demographic group that can ideally dispose of a more limited mobility capital, as also highlighted in the bibliographic review, producing forms of potential disadvantage and marginality. The sample was selected thanks to direct knowledge. However, while travelling around the context, we enlarged our sample by including five other younger subjects that allowed us to better understand the territory and the needs of its inhabitants. Interviewing younger people made it possible to identify how conditions of marginality in an Apennine reality do not only concern older people. Depending on the individual possibility and ability to move, other age profiles can experience limitations in activity participation and basic needs fulfillment due to low availability and accessibility to valuable opportunities. As will be seen below, this limited motility particularly concerns people who do not own a private vehicle or a driving license in a context of low population density and high car dependency.

Table 1: The interviewees: age, place of residence and work, type of work and household composition

Name	Year of birth	Place of residence	Place of work	Job	Household composition
Tiziana	1928	Cerignale	Cerignale	Hotel Owner	Widow
Emanuela	1936	Cerignale	-	retired	Widow
Antonio	1936	Bettola	-	retired	Widow
Giovanni	1927	Cerignale	-	retired	Unmarried
Palmira	1951	Cerignale	-	retired	Married, 3 sons
Pamela	1931	Cerignale	-	retired	Married, 3 sons
Raffaele	1939	Piacenza	GroppaVisdomo	beekeeper	Married, 1 son
Cesare	1960	Zerba	Zerba	Hotel Owner	Married, 2 sons
Sara	1977	Zerba	Zerba	Public employee	Married, 2 son
Loredana	1965	Piacenza	Piacenza	nurse	Married, 2 sons
Claudio	1980	Bettola	Bettola	Farmer, restaurant owner	Single
Francesco	1978	Bettola	Bettola	Farmer, restaurant owner	In couple, 3 sons

The sample is listed in Table 1. Names are pseudonymized to protect the privacy of the interviewees.

After collecting data on their social and economic condition, the interview focused on understanding their basic needs, preferred means of transport, how often they need to travel to reach these opportunities and how far they need to go.

The interview was composed of different sections: 1) general information on the subject; 2) family conditions; 3) economic conditions and the context of living; 4) activities and mobility: work, grocery, health care, other activities such as visiting friends and relatives, sport, personal care, leisure; 5) use of the internet. The interviews were conducted face-to-face because on the one hand, most of the interviewees, in particular the elderly, were not even reachable over the phone or via e-mail as they had no accessibility to a landline, mobile phone, or ADSL connection; on the other hand, because of their general fragility and Covid-19 disease, we were introduced to them via younger family members or close friends.

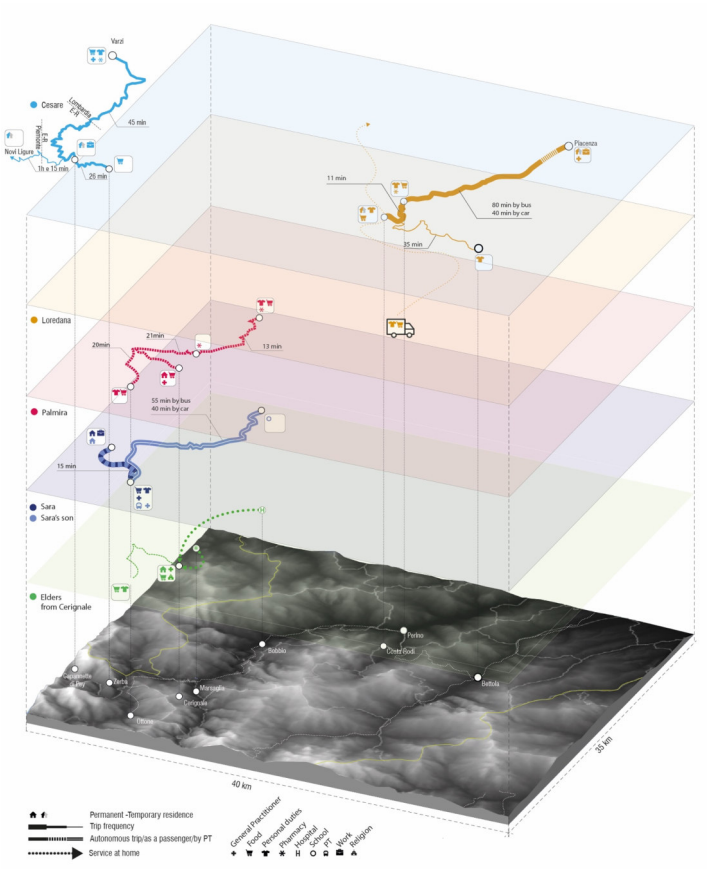
The results have been mapped using a Digital Elevation Model of the Area (DEM) to show the complexity of everyday path for those living in small hamlets located up to the mountain (Figure 4). In these cases, the distances as the crow flies between residences and activities are only a far-distant proxy of the effective distance because of the slope and the winding pathways.

4 Results

The site visit and interviews highlight some important territorial dynamics. Concerning the use of territory and services (Subsection 4.1), the interviews reveal a much-differentiated use of the territory that is also dependent on individual characteristics and capabilities (4.2). Moreover, important findings are also related to the implementation and relevance of local policies and bottom-up practices based on mutual help (4.3).

4.1 Use of territory and services. How far do I need to travel to reach my essential needs? Reinterpreting municipal borders according to basic needs

The interviews confirm low accessibility to shopping, education, and health services, often reachable only by car. Nonetheless, interviewees revealed that the most important services to be reached are not only education and health, but also food and personal services, above all considering that there are no food stores in many villages and hamlets. This condition characterizes the case of Zerba, where the grocery store is only open during summer. Sara, a resident working for the municipality as employee, reported that the closest shop is in Ottone, a village at 15 minutes driving distance and 330 meters of difference in altitude, or within 2 hours walking distance. Furthermore, when the streets are covered by snow during winter, even the car may not be an easy option, and driving



Notes: Each layer corresponds to an interviewee or to a small group of interviewees: the elder people living in Cerignale (over 80 y.o.); Sara and his sons; Palmira; Loredana; Cesare. In some cases, we group them on the same map to show the chain of linked displacements or because of the similarity of their paths. In other cases, the overlapping between the different paths allow to highlight the heterogeneity of needs, capacities, and thresholds.

Figure 4: Map of activity space

time may extend. To the inhabitants of Zerba, reaching Ottone means also finding the closest primary and middle schools, pharmacy, and public transport.

At the moment of the survey, Sara's son had just started high school in Bobbio, which is the closest to Zerba but still at about 40 minutes by car or 80 minutes by bus. Every morning, Sara brings her son to the bus stop in Ottone before returning to work in Zerba. Her son will then take the bus on the valley floor to reach Bobbio (see Figure 4). When asked about the difficulties of living in a remote village, Sara explained to us that the moment of life when children go to high school might correspond, for some families, to residential migration toward more served and accessible places, especially if parents have no strong local ties.

Similar conditions have also been found in Costa Rodi, a hamlet which is part of the municipal territory of Bettola, although located 40 minutes driving far from the center. Loredana was born in Costa Rodi, where she grew up, and from where she moved to Piacenza to attend the secondary school, confirming a migration path due to educational reasons from the mountain to the valley. She is a nurse and works for the hospital in Piacenza. Now that her husband retired, she spends six months/year in Piacenza and the other six in the family house in Costa Rodi, commuting 45 minutes by car daily to reach her job place. Costa Rodi is connected to Bettola and the Nure valley with Demand Responsive Transit (DRT), but it would take much longer for Liliana to reach Piacenza via Bettola through PT, so she travels by car via Perino and the Trebbia Valley. Furthermore, according to Loredana, DRT is not working properly, as the bus stops are

far from the hamlets, along the main roads. In the case of Costa Rodi, the closest stop is located at 4 km, 260m below. Loredana told us that Costa Rodi and Villanova inhabitants prefer to go to Perino, in the municipality of Coli, Trebbia Valley, for shopping, food, pharmacy, bank, hairdresser, and beautician, as it is just 10 minutes by car from the village. Furthermore, a shuttle bus managed by the municipality of Coli is available for bringing people from Costa Rodi to the market of Coli on Monday morning.

The interviews show that it is not unusual that inhabitants' activity spaces create geographies that often disregard administrative boundaries, suggesting the existence of an administrative mismatch. In Zerba, for example, the use of extended activity spaces is even more accentuated as some people find it more convenient to travel to other regions, such as Lombardy or Piedmont, for the doctor, the school, or the bank, also because the streets are more comfortable and the trip is shorter, as reported by Cesare (see Figure 4).

4.2 Accessible for whom? Reconsidering categories and basic needs

The interviews reveal a great complexity of the individual conditions, confirming that despite a statistical demographic homogeneity, the population of rural areas is pretty heterogeneous (Moseley 1979, p. 9).

First of all, each interviewee has different access conditions to services and amenities. Not only has the availability of a car but also the ability to drive it impacted on accessibility level. Palmira, for example, has a car but she is not driving because she doesn't have a driving license; this is also the case for Sara's son who is not in legal age and, more generally for younger residents.

Furthermore, the interviews clarify that people aged more than 65 y.o. are not a homogeneous category and basic needs may vary according to capacities and expectations. People aged more than 80 y.o., such as Tiziana, Emanuela, Giovanni, and Pamela, described a very restricted activity space often limited in everyday life to the home and the food store and extended to the church and the doctor's office, once or twice a week (see Figure 4); occasionally they need to reach the centers on the valley floor for specific needs such as medical exams or the hairdresser. According to the interviews, their PAS (Le Vine et al. 2013) coincides with the space of the village, mainly thanks to the provincial home care system (see Subsection 4.3), but also thanks to caregivers from other countries[4], as in the case of Giovanni, or family members that decided to move back at the family village also to assist their parents, as in the case of Emanuela and Pamela. Different is the case of Raffaele, a resident of Piacenza that, despite his age, took advantage of retirement to run a beekeeping activity reusing an old family house in the Apennines and who travels along all the province to sell his products. Nevertheless, Antonio and Raffaele who are over 80 y.o. still drive the car to move around, showing that each individual has his own ability to move – motility – independently from age category.

Additionally, over 65 y.o. is a very large category and may include very different conditions. Palmira was born in Cerignale, where she moved back after retiring. Due to her age, she may be among the elders even if it is possible to appreciate important differences between the activities needed by the over 80s and hers (see Figure 4). Indeed, the set of activities Palmira is looking for, although retired, is more extended than the eldest, as well as the places she reaches to fulfill these activities, which are not always chosen according to the distance and to personal preferences: for example, she prefers to go to Bobbio for buying medicines because she finds that the nearest pharmacy, located in Perino, doesn't meet her needs as well.

On the other side, younger residents, which are almost absent in statistic data, emerge as the category with lower accessibility to their basic needs, as the schools, sport, social, and leisure activities are located in the villages of the valley floor, and so they are inaccessible without a car, as shown in the case of Sara's son. Also, Francesco, owner of a farmhouse and a restaurant in Crocenito, a small hamlet in the municipality of Bettola, 10km from the center of the village with a 320 m drop, has three children and organizes his mobility according to a complex mobility chain that pivots around school schedule.

[4]In some cases, elder were assisted by caregivers coming from Eastern Europe countries or Latin America.

The brothers Claudio and Francesco decided to live in Crocenito because of available land and natural resources. Here they settled their business, opening a farmhouse and self-producing all their products. They are representative of a growing group of inhabitants in these territories that can be defined as amenity migrants (Moss 1994) or mountaineers by choice (Dematteis 2011). During the study trip, we met Federico and his girlfriend, who recently moved to live in Crocenito respectively from Piacenza and Genova and are involved in homeschooling projects. Also, the community Tempo di Vivere[5] attracts new residents in the area. In this case, all basic needs seem to be satisfied at the local scale, and geographical marginality is considered an important value, as affirmed by Claudio, who says that if he were living in a city, he would probably miss almost all his needs.

4.3 Bottom-up practices, local centralities, and strategies. From people to services to services to people

The interviews also allow to recognize bottom-up strategies developed to cope with low accessibility to services and activities, such as individual practices adopted by citizens or local entrepreneurs and informal caring practices as well as more institutional local policies currently implemented at different levels of territorial governance. With reference to individual practices implemented by local entrepreneurs, the site visit has highlighted that, in some cases, food shops or farmhouses work as local centralities. The farmhouse in Crocenito in the municipality of Bettola attracts tourists from all over Italy and works at the same time as a local centrality for residents. The farmhouse also sells homemade products, such as bread, pasta, cheese, and meat, and represented an important reference point during the Covid-19 lockdown between March and May 2020. In the case of Costa Rodi, the lack of local shops is balanced by the presence of travelling salespeople that bring different goods: foods fresh and frozen, houseware and, occasionally, clothing. These mobile bazars are difficult to map, as they are spontaneous and not institutionalized. Nevertheless, they are important elements to improve accessibility to basic needs in remote territories, reducing their marginality.

In Cerignale, *la Bottega della Bruna*, a food shop recently reopened thanks to the support of the municipality, provides a place for social aggregation. Bruna lives in the Trebbia valley floor with her husband and two children. She arrived in Cerignale as a waitress for the local restaurant (the *hotel del Pino*) and then started her own business. Due to the age and im-mobility of some clients, *La Bottega* also delivers goods directly at client's home. Those practices may also be connected to informal caring based on mutual assistance, that were particularly visible in Cerignale. For example, while travelling from home to work, Bruna brings other goods from the bottom of the valley up to Cerignale, such as medical supplies from the pharmacy in Marsaglia.

During the Covid-19 lockdown in March and April 2020, the younger inhabitants of Zerba were going for shopping food and essential goods in Ottone and they delivered them to the elders' homes, since they couldn't go out from their homes.

The site visit also highlighted the existence of many actions at different levels of governance, from more institutionalized initiatives at the provincial scale to more spontaneous bottom-up ones at the municipalities scale in an effort to close the gap between people and services by bringing the latter to the former. In Cerignale, at the municipal level the major Massimo Castelli implemented several bottom-up actions to protect the community and reinforce the sense of belonging, such as the delivery of the daily newspaper for elders and a self-organized delivery service for medical products organized by the pharmacists and the younger villagers in agreement with family doctors. The municipality also offers a service of "Social taxi". The social taxi is a public car driven by a voluntary from Auser[6] providing a demand-based transport service that helps the inhabitants of more remote territories to reach special and far services such as the hospital or the doctor, and the weekly market. Palmira says that she often goes to Bobbio or Marsaglia, on the valley floor, for the pharmacy, the weekly market, or the hairdresser. On these occasions, she takes advantage of the social taxi if someone is already going

[5] https://www.tempodivivere.it/

[6] Auser is a national volunteer association to promote active ageing and to enhance the role of elder in society. https://www.auser.it/

out. She would like to use regular public transport, but the schedule is based only on the school timetable, and it is not very comfortable for short commissions in the valley. In her case, the use of bottom-up services at the municipal scale somehow balances the lack of services and efficient public transport.

At the provincial level, the interviews revealed the existence of an institutional system of integrated home care. Home care is addressed mainly to elders who have low accessibility levels to health services due to the remoteness of their home and the difficulty of driving and moving autonomously. Home care includes both social and health support. Social workers, doctors, and nurses take care of patients in their own homes traveling among the different villages and valleys, establishing different programs and frequencies of visits according to the conditions of patients. Data collected during an interview with the local Health Authority shows that 8,6 % of the population over 65 y.o. officially subscribed to a home care contract, the percentage rises to 14,4% if we consider the population over 75 y.o. Yet, it is worth noting that in mountainous municipalities percentage of subscription double, rising to 17% for the population over 65 y.o. and 27% for the population over 75 y.o. highlighting that these policies are quite efficient, particularly in remote and low accessibility territories.

5 The contribution of qualitative research methods in the definition of marginal territories

From the methodological point of view, direct observation and interviews offer interesting perspectives to understand the reasons behind marginality, as they integrate and critically question existing approaches based on statistical data.

Firstly, concerning population categories based on age, gender, income, nationality, this approach allows a focus on the individual sphere (Preston, Rajé 2007), questioning the same criteria that brought to the configuration of those categories. In particular, it has been already highlighted that retirement age may differ from country to country according to national law, although the interviews outlined the non-effectiveness of a category that considers all the people aged more than 65 y.o in the same way. Indeed, this is a wide category including people with very different motilities, and this may lead to adaptive preference in the selection of basic needs and essential services for people aged more than 80 y.o., as demonstrated by the interviews and the maps which show a considerably reduced activity space compared to younger people in the same category. Consequently, also Perceived Activity Sets (Le Vine et al. 2013) may differ significantly. In this case, identifying a univocal set of activities and target spaces may be misleading and may drive to ineffective policies. While it is not possible to design policies based on individual experience, a deeper knowledge of these dynamics may help to better understand the reasons of marginality and design more inclusive territories, as also reported by Vecchio (2020).

Secondly, direct observation and interviews also enable the overcoming of traditional boundaries between disciplines, taking into account welfare and health policies that even though not directly related to transport and mobility may still significantly affect accessibility level. At the same time, this method highlights bottom-up practices and self-serving networks, the impacts of which are difficult to measure through more aggregated data and to simulate in accessibility measurement. Nonetheless, these policies and practices shorten the distances between people and services and generate new forms of accessibility contrasting marginality. By making these "hidden" dynamics visible, this method enriches the representation of low dense, scattered, marginal territories provided by more traditional accessibility analysis. Nevertheless, we recognize that though these approaches can be individually useful and relatively inexpensive for the planner, they can hardly be a turning point for an entire territory as they completely depend upon individual resources and motility. That is why more efforts need to be done to systematize these actions and create a framework that allows a general increase of accessibility level.

Thirdly, the use of qualitative data directly questions some characteristics of the operative tools implemented for accessibility assessment. In mountainous and low dense territories, the interviews and the maps allow a better understanding of the distances

and paths covered to reach destinations, which cannot be weighted only by the distances between municipality centroids or the distance between the center of the municipality and the main target destination. This is even more important in an area where around 55% of the total population (8.300 out of 15.000 inhabitants) is not living in the central villages, as registered by the Italian National Institute of Statistics (ISTAT), and the orographic conditions oblige to long travels. For example, in the case of Bettola, people living in the hamlets of Crocenito, Villanova and Costa Rodi are at a distance of 30 minutes driving from the center of the village.

Moreover, even if accessibility thresholds are generally established and measured with reference to municipal and provincial borders, the interviews reveal that those boundaries are not always observed when looking for essential services: for example, at municipality scale, Villanova and Costa Rodi, both under the municipality of Bettola, refer to Perino in the municipality of Coli for everyday duties; instead, Zerba and the municipalities on the regional border may refer even to centralities located in other regions such as Varzi in Lombardy region. These dynamics suggest the existence of an administrative mismatch in measuring accessibility, as already observed, for example, in the case of management of natural resources (Herrfahrdt-Pähle 2014). Considering this mismatch in the design of public transport and mobility would help to design a mobility system more respondent to people needs, thus improving accessibility levels.

At a more geographical level, qualitative data also pinpoint that some minor centralities should still be considered as relevant destinations in an accessibility measurement, even if they only provide some more mundane services than most important centers such as Bobbio and Bettola. This is the case for example of Ottone, Coli, or Corte Brugnatella that represent important reference points in everyday life for many of the interviewees living in small villages on the mountain, as they are intermediate centralities for shopping and everyday duties and are major points to shift from individual private transport to the public transport lines on the valley floor. The information collected thanks to site surveys and interview may definitely help to guide spatial planning and territorial design, suggesting reinforcing the role of those middle size centralities at provincial scale as service providers and mobility transfer points.

In conclusion, a mixed-methods approach that includes interviews and direct observation reveals important resources that may be used to ameliorate operative tools for accessibility assessment, such as the actual distance and travel time between people and services. In terms of governance, it could also inform and redirect multi-sectorial policy design toward a more context-sensitive approach reconsidering valued destinations, time thresholds, and modal choice going beyond a predefined set of services and places considered as main target, as claimed by the PAS approach (Le Vine et al. 2013).

It should also be noticed that this approach has some limits. First, it is time and money consuming for the researcher. Then, due to the specificity of each territory and the research technique, results may not be generalized. Furthermore, the low density of the area and the average population age also influenced the number of respondents, and the information collected is a very deep representation of the needs and capacities of the population and the places they refer to. Improvement may be done on the criteria of selection of the interviewees, that may conduct to some biases on the lecture of territorial dynamics as well as adaptive preference (Vecchio 2020), that may be the consequence of lack of services and infrastructure.

6 Conclusion

In this paper, we analyzed a marginal territory located in the province of Piacenza in the Emilia Romagna Region, northern Italy. The area has been classified as marginal according to SNAI. A quantitative analysis elaborated for the Territorial plan of the province of Piacenza reports this area among the less accessible and served of the provincial territory because of the lack of services and low density and frequency of public transport.

To better understand the factors that define the marginality of this area, we performed a qualitative analysis based on direct observation, interviews with key informants, a survey of inhabitants and mapping.

Despite some limits, the emerging qualitative data seems to be very helpful to better understand different factors of marginality, allowing to complement and reconsider aggregated accessibility evaluations, adding elements based on the individual perspective towards the design of more inclusive systems of accessibility. The use of interviews and qualitative data in low dense and mountainous areas, marginal by definition, appears particularly helpful in highlighting the diversity of basic needs and the presence of territorial centralities at different scales, while 3D mapping of activity space seems to unveil the complexity of the path due to orographic configuration. Moreover, interviews allow a reconsideration of the very definition of marginal territory through the direct accounts of local daily experiences from the local population that, in many cases, also cooperates in a more or less spontaneous way to overcome the difficulties they encounter daily.

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The THEMA tool to support heritage-based development strategies for marginal areas: Evidence from an Italian inner area in Campania Region

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Abstract. The ongoing forced reflection on the leading urbanization models' crisis has led to greater attention to marginal areas. In Italy, the scientific and media debate has focused on inner areas that, since 2014, have represented the target of an innovative national cohesion policy aimed at tackling their shrinking dynamics: the National Strategy for Inner Areas (SNAI). Indeed, Italian inner areas are endowed with extraordinary natural capital and settlement models far from urban density. Thus, they seem to respond perfectly to the new raised living needs.

However, leaving aside the optimistic rhetoric, strong political and administrative choices are necessary to trigger a 'return process' based on this broader attention toward inner areas, thus countering humankind's natural tendency to concentrate on urban realities.

In this light, the paper proposes a tool to support SNAI in designing and implementing heritage-based local development strategies to address inner areas' real needs. After a critical reading of the new challenges for planning posed by the pandemic and SNAI's role within them, the contribution moves to frame the THEMA (Tool for Heritage-based Enhancement of Marginal Areas) tool, focusing on specificities of the inner areas as cultural heritage. Finally, the tool's application to a case study, an inner area in Campania Region, allows to outline and discuss its possible benefits for SNAI implementation and its limits.

Key words: Marginal areas, inner areas, public policies, decision support, local development

1 Introduction

The ongoing forced reflection about the leading urbanization model's crisis (Sharifi, Khavarian-Garmsir 2020) has led to a focus on marginal areas and their possible role in addressing this crisis (Pinto et al. 2020). This reflection has resulted in growing attention toward territorial cohesion policies that, starting from the Lisbon Treaty in 2007, are at the core of European programs to reduce disparities between and within EU member states (Atkinson, Pacchi 2020). In the Italian context, the emerging debate has focused on inner areas, which, since 2014, are the core of the National Strategy for Inner Areas (SNAI), an innovative national policy representing one of the most interesting laboratories toward EU territorial cohesion (Cotella, Vitale Brovarone 2020). The SNAI aims to tackle

the negative demographic trends affecting some Italian marginal areas by promoting actions for local development and rebalancing welfare services (Lucatelli 2015). This national policy focuses on Italian inner areas defined and identified as (Barca et al. 2014):

- Significantly distant from the main centers offering essential welfare services (education, healthcare, and mobility);
- Endowed with significant environmental resources (water resources, agricultural systems, natural and human-made environment) and cultural resources (historical villages, craft centers);
- A diversified territory as a result of the different natural systems' dynamics and human activity.

In operational terms, inner areas are identified by dividing the national territory into five zones (centers, peri-urban areas, intermediate areas, peripheral areas, and ultra-peripheral areas) according to an accessibility indicator (Calvaresi 2015).

This accessibility indicator is measured in minutes needed to reach the closest center, defined as a municipality or a cluster of neighboring municipalities, offering simultaneously: all the secondary education provisions, hospitals with I level DEA, and at least a Silver railway station, according to RFI classification (DPS 2014). According to this classification, inner areas include all the municipalities resulting in intermediate (20-40 minutes needed to reach the closest center), peripheral (40-75 minutes required), and ultraperipheral (more than 75 minutes required). Among them, seventy-two project areas, including several municipalities classified as inner areas, have been chosen for the SNAI implementation.

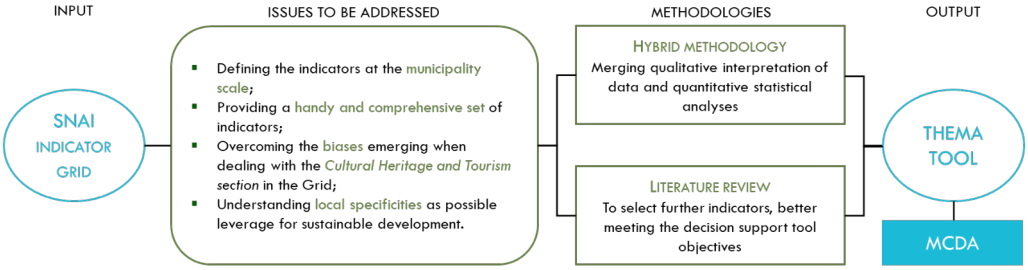
Thanks to their endowment of natural and cultural resources and their settlement model, far from urban density, inner areas seem to be a good response to the new living needs raised by the Covid-19 pandemic (Bruni 2021). However, leaving aside the optimistic rhetoric, looking at inner areas as the new centers of territorial development, strong political and administrative choices are necessary to trigger a 'return process', thus countering humankind's natural tendency to concentrate on urban realities (Lucatelli 2020). In this light, there is an urgent need to provide decision-makers in the SNAI perspective with effective decision-support tools. On the one hand, it is essential to leverage inner areas' specificities and potentialities, thus shunning prepacked and ineffective development models. On the other hand, it is important to overcome the limited vision, identifying a territory's marginalization degree merely with its peripherality level and ground development strategies for inner areas on a more in-depth and aware analysis of their dynamics. Indeed, defining marginality as "an involuntary position and condition of an individual or group at the margin of social, political, economic, ecological, and biophysical systems, that prevent them from access to resources, assets, services, restraining freedom of choice, preventing the development of capabilities, and eventually causing extreme poverty" (Gatzweiler et al. 2011, Gatzweiler, Baumuller 2014), it seems evident that it cannot be reduced to an accessibility issue, but must be addressed through a broader perspective. Furthermore, some virtuous experiences in inner areas show that the peripherality level does not necessarily index the area's weakness (Barca et al. 2014, Martinelli 2020).

Based on these premises, the research proposes a decision-support tool, named THEMA (Tool for Heritage-based Enhancement of Marginal Areas), to help decision-makers in the SNAI context defining local development strategies for Italian inner areas based on one of their primary, even if undervalued, sources: the cultural heritage (Rossitti, Torrieri 2021). Indeed, even if cultural heritage is widely recognized as territorial capital for sustainable development (Camagni et al. 2009, Foster 2020) and included within local development priorities, heritage-based actions in the SNAI implementation Strategy are often missing or reduced to tourism-oriented interventions. This is evident by looking at the planned interventions within the Area Strategies and the Framework Program Agreements (Agenzia per la Coesione Territoriale 2017, 2019, 2021a,b) of the four selected inner areas in the Campania Region. Indeed, by analyzing the data about the incidence of funding for cultural heritage interventions on the total of local development funding, it emerges how the built cultural capital is not adequately considered. This incidence is around 5% for three inner areas. The only exception is represented by the Alta Irpinia

Table 1: Planned cultural heritage fundings by the four inner areas in the Campania Region

Inner Area	Total Local Development Funding	Cultural Heritage Funding	% of Cultural Heritage Funding on Local Development Funding	% of Tourism oriented funding on Cultural Heritage Funding
Alta Irpinia	€20,579,482	€7,000,000	34.01%	100.00%
Cilento Interno	€10,779,280	€520,000	4.82%	100.00%
Tammaro – Titerno	€17,443,370	€860,100	4.93%	12.77%
Vallo di Diano	€13,756,900	€646,600	4.70%	100.00%

Source: Authors' elaboration on data provided by the Framework Program Agreements of Campania Region's inner areas



Source: Authors' elaboration

Figure 1: The methodological path towards the THEMA definition

inner area, but in its Strategy, all the interventions are limited to tourism promotion (Table 1).

After describing the complex methodological path leading to its definition, the THEMA tool is implemented through a case study: Tammaro-Titerno inner area in the Campania Region. Finally, the tool's value as a cognitive and operative device for SNAI implementation is discussed.

2 The methodological path towards the THEMA tool for heritage-based local development strategies in inner areas

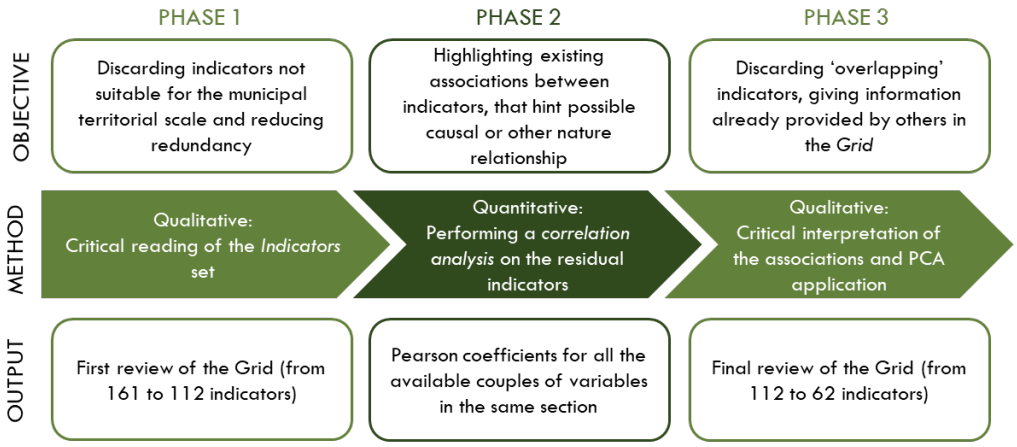
The complex challenges in territorial planning and the need to reduce disparities among and within territories call for proper tools to support policies and strategies toward territorial cohesion and local development, as the SNAI is. Such tools must consider the multiple dimensions of local development, recognize the differences among territories and provide objective data as a reference for decisions.

In this light, the SNAI Indicator Grid, used by the Technical Committee for Inner Areas in selecting project areas, represents a valuable starting point for the THEMA tool definition. However, its application as a decision-support tool for heritage-based local development strategies brings along some issues that need to be detected and solved. With this aim, the research integrates a hybrid methodology, merging qualitative data interpretation and statistical analyses with a literature review process to meet the THEMA tool objectives (Figure 1).

The two methodologies' integration returns a comprehensive tool for heritage-based local development strategies in inner areas that can be used as a cognitive tool or integrated with Multi-Criteria Decision Analysis (MCDA) techniques to support decisions in the SNAI perspective effectively.

2.1 2.1 The SNAI Indicator Grid

The SNAI Indicator Grid, used by the Technical Committee to evaluate the candidacies to inner areas submitted by the different Regions, represents the starting point for the THEMA tool definition.



Source: Authors' elaboration

Figure 2: Hybrid methodological approach toward SNAI Indicator Grid's review

It is a matrix to understand inner areas' characteristics through quantitative indicators. It includes both context variables (i.e., productive specialization indexes, demographic indicators) and result variables, measuring essential services' quality (i.e., share of population reached by broadband) or specific activities' economic success (number of visitors per 1000 inhabitants) (Carlucci, Lucatelli 2016). The Grid is divided into nine sections:

- Main characteristics;
- Demography;
- Agriculture and sectoral specialization;
- Digital divide;
- Cultural heritage and tourism;
- Health;
- Accessibility;
- School;
- Cooperation among municipalities.

Each section includes several indicators, which return an exhaustive and objective overview of the project areas' conditions to be integrated with qualitative considerations and the evidence from on-field activities.

2.2 The SNAI Indicator Grid: which issues to address?

The awareness of the Grid's potential in yielding a picture of inner areas' conditions hints at its use as a reference for a decision-support tool to guide heritage-based local development strategies. However, this new application field brings out some issues to be addressed towards improving its effectiveness. They can be listed as follow:

- The high number of indicators (161 indicators) makes it cumbersome to collect the necessary information to update the Grid or to apply it at the municipality scale to understand the power balances among municipalities within an inner area;
- The Grid contains much information, which is not always easily accessible, while it requires cooperation among different public institutions. The related effort to access data, if appropriate for the Grid's original use, which is the project areas selection, can discourage its extensive use as practical support for decisions;
- Both the large amount of information to manage and the difficulties in accessing data sources hinder the process of comprehensive qualitative analysis aimed at investigating the relations among different variables;
- The Cultural Heritage and Tourism section in the Grid reflects a partial and limited vision of cultural heritage as a tourism attraction. Indeed, all the indicators

Table 2: Selected indicators for the Cultural Heritage and Tourism section after the critical analysis of the indicators set

E. CULTURAL HERITAGE AND TOURISM			
e.6	Number of state and non-state cultural sites in 2015	e.7	Number of visitors in 2015
e.8	Number of visitors per 1000 inhabitants in 2015	e.10	Accommodation rate – bed places for 1000 inhabitants in 2016
e.11	Tourism rate – number of presences per 1000 inhabitants in 2016	e.13	Arrivals in 2016
e.14	Percentage variation in arrivals 2014-2016	e.16	Presences in 2016
e.17	Percentage variation in presences 2014-2016	e.18	Percentage of presences in hotel facilities in 2016
e.19	Percentage of presences in extra-hotel facilities in 2016	e.20	Percentage of arrivals in hotel facilities in 2016
e.21	Percentage of arrivals in extra-hotel facilities in 2016		

belonging to this section are measures of tourist flows, and there is no variable providing information about built heritage conditions. In addition, indicators in the Cooperation among municipalities section are limited to describing the relations among municipalities without considering the existence of associative forms within local communities;
- Applying some indicators to the municipality scale is impossible since they are only conceived for the inner area's territorial dimension.

To overcome these issues, raised from the willingness to adapt the Grid to different needs, the research resorts to the integration of two different methodologies:

- a hybrid methodology, merging statistical analysis and qualitative data interpretation to reduce redundancy in the indicators set and keep only the relevant variables for the SNAI purposes;
- a literature review aimed at identifying other indicators to fill the existing knowledge gaps in the reviewed Indicator Grid.

2.3 The hybrid methodology for the SNAI Grid review

The hybrid methodology addresses the Grid's most relevant limit, which is the high number of indicators. This methodology finds its logical basis in the law of briefness that, when applied to data science, results in parsimonious models, allowing a significant explanatory power of a dataset by using the minimum number of variables (Daganzo et al. 2012). Indeed, it is geared toward reducing redundancy and keeping only the relevant variables in the Indicator set through a methodological path structured into three phases (Figure 2) (Rossitti et al. 2021):

1. The first qualitative phase is based on a critical analysis of the indicator set. This preliminary step has a dual purpose. On the one hand, it aims at discarding indicators referring to the inner area territorial scale, thus allowing to turn the Grid into a tool applicable at the municipality scale. Indeed, the Grid application to the municipality scale can help understand power balances among municipalities, thus providing an in-depth knowledge of its dynamics. On the other hand, it is oriented to reduce the Grid's redundancy, intended as the presence of more than one indicator providing the same piece of information (Huang et al. 2015). More in detail, this task mainly addresses temporal redundancy and, thus, rejects indicators occurring twice with different time horizons when their simultaneous presence doesn't pitch in understanding the ongoing territorial dynamics (Table 2). Thanks to this first phase, the number of indicators in the Grid drops from 161 to 112.
2. A second qualitative phase, grounding on the statistical analysis of the selected indicators. This step allows highlighting relationships among variables that hint at

Table 3: Correlation matrix for the selected indicators in the Cultural Heritage and Tourism section

	e.6	e.7	e.8	e.10	e.11	e.13	e.14	e.16	e.17	e.18	e.19	e.20	e.21
e.6	1.00												
e.7	0.40	1.00											
e.8	0.48	0.85	1.00										
e.10	0.16	-0.04	0.21	1.00									
e.11	0.06	-0.02	0.19	0.93	1.00								
e.13	-0.01	0.10	0.27	0.59	0.77	1.00							
e.14	-0.17	0.06	0.12	0.01	0.01	-0.02	1.00						
e.16	-0.09	0.05	0.16	0.51	0.71	0.94	-0.02	1.00					
e.17	-0.20	0.00	0.06	0.01	0.02	-0.01	0.83	-0.01	1.00				
e.18	-0.21	0.24	0.18	0.08	0.17	0.18	-0.19	0.10	-0.07	1.00			
e.19	0.21	-0.24	-0.18	-0.08	-0.17	-0.18	0.19	-0.10	0.07	-1.000	1.00		
e.20	-0.30	0.19	0.12	0.08	0.17	0.23	-0.15	0.15	-0.06	0.97	-0.95	1.00	
e.21	0.30	-0.19	-0.12	-0.08	-0.17	-0.23	0.15	-0.15	0.06	-0.97	0.95	-1.00	1.00

Table 4: Selected indicators after the review of the Cultural Heritage and Tourism section of the SNAI Indicator Grid

E. CULTURAL HERITAGE AND TOURISM			
e.6	Number of state and non-state cultural sites in 2015	e.8	Number of visitors per 1000 inhabitants in 2015
e.10	Accommodation rate – bed places for 1000 inhabitants in 2016	e.11	Tourism rate – number of presences per 1000 inhabitants in 2016

possible causal or other nature associations. More in detail, a Pearson correlation analysis is performed among each couple of variables within each Grid category (Table 3) (Archdeacon 1994). The correlation analysis rests on the numerical data, referred to the 72 project inner areas, provided for each indicator by the Technical Committee for Inner Areas and updated in 2017 (Agenzia per la Coesione Territoriale 2017).

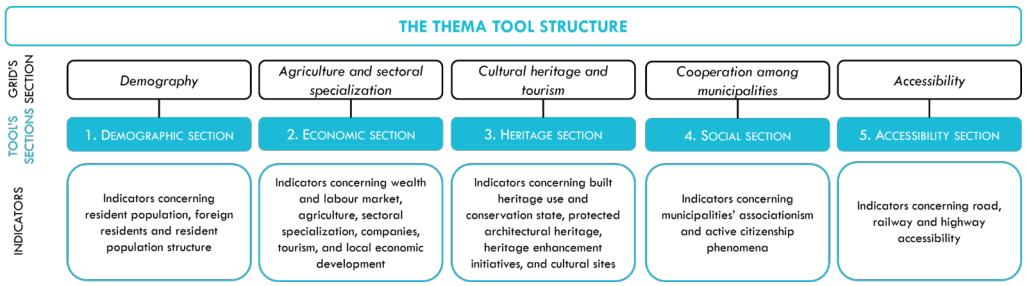
3. The third and last phase moves from the results of the correlation analysis to a refined list of indicators. Since high correlation values among variables hint at causal or other nature associations, a critical interpretation of these associations is necessary (Table 4). After evaluating each relationship, it is possible to discard 'overlapping' indicators ultimately providing the same information eventually, or to combine them into fewer composite indicators by resorting to a Principal Component Analysis (PCA) (Hair et al. 2006).
   Through this last phase, the number of selected indicators in the Grid decreases from 161 to 62.

2.4 The literature review process

Applying the hybrid methodology to the SNAI Indicators Grid allows its significant review with a reduction of the number of indicators from 161 to 62 without losing its information and complexity level. Furthermore, it enables to deal with some of the Grid's detected issues for its application as a decision-support tool at the municipality level:

- the large number of indicators is dramatically reduced (from 161 to 62), thus turning the Grid into a handier indicator set;
- all the indicators can be defined at the municipality scale, thus allowing the Grid's application at the municipality level and a better understanding of the ongoing dynamics among municipalities within an inner area.

However, some issues still exist, whose solution is crucial for the Grid application as an effective decision-support tool. Indeed, the Grid still requires collecting much information that, together with the difficulties in accessing some required data, discourages its extensive use as practical support for knowledge and decisions and its application to



Source: Authors' elaboration

Figure 3: THEMA tool's structure

different territorial realities. Furthermore, some sections in the Grid, such as the Cultural Heritage and Tourism and the Cooperation among municipalities, include indicators unable to describe territorial dynamics' complexity.

In this light, the research addresses these remaining shortcomings towards framing a handy and effective tool. First, to overcome the high amount of information needed, it proposes an 'optimized' version of the Grid, including only the relevant sections for the addressed decisional issue. Thus, considering the research's objective to support local development strategies in inner areas, focusing on their cultural heritage, universally acknowledged as a key source for sustainable development (Fusco Girard, Gravagnuolo 2017), the tool structure is limited to five sections:

- The Demographic section, since the main SNAI objective is to tackle abandonment processes and hinder depopulation (Tantillo 2015);
- The Economic section, since economic dynamics cannot be dismissed in any local development issue (Jay et al. 2020);
- The Heritage section, finding its reason for considering cultural heritage as leverage for local development processes (Capello et al. 2020);
- The Social section, advocated by the acknowledged importance of social involvement for strategies aiming at tackling depopulation and for heritage issues (Bartocci, Picciaia 2020);
- The Accessibility section, since accessibility stands as a fundamental requirement for each territorial transformation process (Chacon-Hurtado et al. 2020)

Furthermore, to address the need to fill gaps in the indicator set, thus providing a complete picture of the municipalities' conditions and power balances, the research delves into a literature review process to identify accurate indicators for the THEMA tool's purposes. This literature review process examines European and national Indicators databases, official websites, and documents, providing indicators or relevant information to define indicators for the public policies' domain. Table 5 displays the different reference sources for each section of the THEMA tool.

Thanks to this process, it is possible to obtain a comprehensive decision-support tool (Figure 3) whose indicators, defined for the different sections, provide a multi-dimensional picture of the conditions and ongoing dynamics of different municipalities within an inner area (Table 6). Indeed, besides updating some existing indicators in the Grid with the most recent available values, the data sources consultation process enriches the THEMA tool with valuable references for gaining comprehensive knowledge and grounding decision. More in detail:

- The Demographic section in the tool keeps the selected indicators in the Demography section from the SNAI Grid and completes them with the Ageing index as a dynamic and synthetic indicator of the population's structure;
- The Economic section also keeps the well-structured indicators set in the reviewed Agriculture and sectoral specialization section of the SNAI Grid. However, the existing set is integrated with other variables, capturing relevant phenomena. Firstly, it includes tourism indicators belonging to the Cultural heritage and Tourism

Table 5: List of consulted sources for the definition of additional relevant indicators in each section

Tool's Section	Sources
Demographic	ISTAT – Population and Household Census
Economic	MEF (Finance Department) – Open data ISTAT – Agricultural Census ISTAT – Atlante Statistico dei Comuni (ASC) ASIA Register of Companies CERVED Register of Companies Region official documents SNAI official documents
Heritage	ISTAT – Population and Households Census ISTAT – 8milaCensus MIBACT Registers https://borghipiubelliditalia.it/ https://www.borghiautenticiditalia.it/ http://www.borghinrete.it/ http://www.borghidellamemoria.it/ https://www.eventiesagre.it ISTAT – Atlante Statistico dei Comuni (ASC)
Social	SNAI official documents Regional Register of Third Sector entities
Accessibility	Google maps Transport companies' websites

section in the SNAI Grid. Secondly, it is enriched with several indicators capturing municipalities' involvement in local economic development processes;

- The Heritage section markedly distances itself from the structure of the Grid's Cultural Heritage and Tourism section, which meets a vision of cultural heritage as a mere touristic attraction. Indeed, the Heritage section includes indicators concerning built heritage use and conservation state, protected architectural heritage, cultural sites, and the presence of heritage enhancement initiatives. Thus, through the THEMA tool's lens, it is possible to obtain a broader picture of the heritage dimension.
- The Social Section resumes some indicators concerning municipalities' associationism, already present in the Cooperation among municipalities section of the SNAI Grid and adapts them to the municipality scale definition. Furthermore, it includes other indicators capturing active citizenship realities, which are essential for place-based local development strategies.
- The Accessibility Section takes the existing indicators in the homonymous section from the SNAI Grid and adapts them to the need to be defined at the municipality scale and easily updated.

Table 6: Complete list of indicators for each section in the THEMA tool

1. DEMOGRAPHIC SECTION			
1.1 Resident population			
POP_VAR_71-01	Percentage variation in the resident population 1971-2001	POP_VAR_01-11	Percentage variation in the resident population 2001-2011
POP_VAR_11-20	Percentage variation in the resident population 2011-2020		
1.2 Resident foreigners			

continued below

Table 6: Complete list of indicators for each section in the THEMA tool (continued)

FOR_VAR_01-11	Percentage variation in the resident foreigners 2001-2011	FOR_VAR_11-20	Percentage variation in the resident foreigners 2011-2020
FOR_PER_20	Percentage of resident foreigners in 2020		
1.3 Resident population structure			
AGE_20	Aging index in 2020		
2. ECONOMIC SECTION			
2.1 Wealth and labor market			
PCI_18	Per capita income in 2018	EMP_18	Employment rate in 2018
2.2 Agriculture			
UUA_VAR_82-10	Percentage variation in the Utilized Agricultural Area 1982-2010	FARX1000_10	Number of farms per 1000 inhabitants in 2010
FAR_VAR_82-10	Percentage variation in the number of farms per 1000 inhabit. 1982-2010	AGR_IMP_10	Importance of the agricultural sector in 2010
2.3 Sectoral specialization			
SP_IND_E&W_1	Specialization index for the 'Energy, Water and Gas' sector in 2017	SP_IND_MAN_17	Specialization index for the 'Manufacturing' sector in 2017
SP_IND_CON_17	Specialization index for the 'Construction' sector in 2017	SP_IND_T&T_17	Specialization index for the 'Trade and Transport' sector in 2017
SP_IND_SER_17	Specialization index for the 'Other services' sector in 2017		
2.4 Companies			
COMX1000_20	Number of active companies per 1000 inhabitants in 2020	COM_GRO_20	Companies stock growth rate in 2020
COM_VAR_15-20	Percentage variation in the active companies 2015-2020		
2.5 Tourism			
ACC_RA_19	Accommodation rate in 2019		
2.6 Local economic development			
QU_PRO_16	Producers and processors of DOP/IGP/STG quality products in 2016	FOOD_DEV	Local development based on food and high-quality agriculture
INDU_DEV	Local development based on productive specialization	TOUR_DEV	Local development based on tourism
RES_DEV	Local development based on the attraction of new residents		
3. HERITAGE SECTION			
3.1 Built heritage			
DIS_RATE_11	Building disuse rate in 2011	HIS_RATE_11	Rate of residential building up to 1945
BAD_INC_11	Incidence of residential building in bad conservation state in 2011		
3.2 Protected architectural heritage			
PRO_ARC_HER	Protected architectural heritage		
3.3 Heritage enhancement			
VIL_ENH	Historical villages enhancement initiatives	EX_REG_EVE	Events of extra-regional importance in 2019
LOC_EVE	Events of local importance in 2019		
3.4 Cultural sites			
VISX1000_18	Number of visitors per 1000 inhabitants in 2018		

continued below

Table 6: Complete list of indicators for each section in the THEMA tool (continued)

4. SOCIAL SECTION			
4.1 Municipalities' associationism			
UNI_MUN	Municipality's membership in a Union of Municipalities	MCOM_MUN	Municipality's membership in a Mountain Community
LAG_MUN	Municipality's membership in a LAG (Local Action Group)		
4.2 Active citizenship			
APS_20	Social promotion associations	ODV_20	Voluntary organizations
OTH_20	Other local associations	SCOP_20	Social cooperatives
5. ACCESSIBILITY SECTION			
5.1 Road accessibility			
CEN_DIS	Average distance from the nearest centers in minutes	CEN_LPT	Road LPT (Local Public Transports) offer to connect with the local centers
5.2 Railway accessibility			
RAIL_DIS	Average distance from the nearest railway station in minutes		
5.3 Highway accessibility			
HIGH_DIS	Average distance from the nearest highway tool booth in minutes		

Colourcodes:

Indicators already present in the SNAI Grid	Indicators already present in the SNAI Grid with a different year/time span of reference	Indicators selected after the literature review process

3 The THEMA tool implementation in Tammaro-Titerno inner area in Campania Region

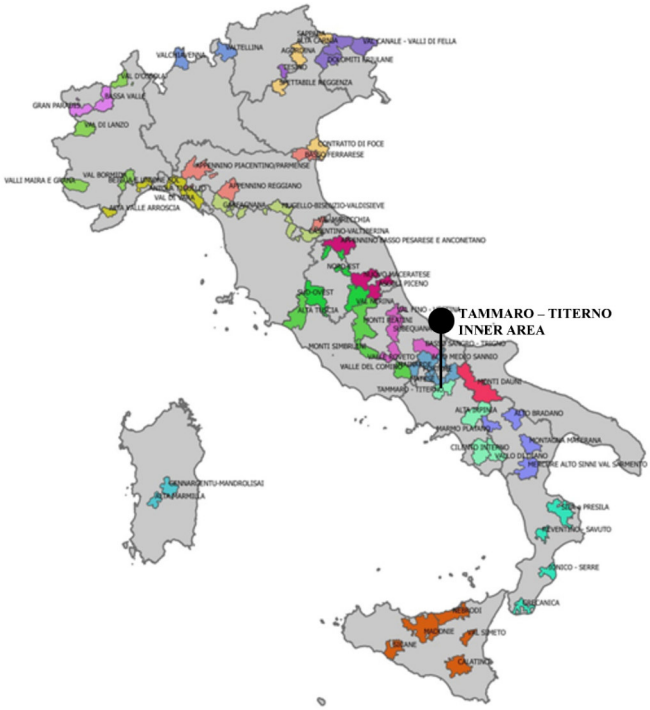
Once the THEMA tool's structure is defined, implementing it in a case study is crucial to understand its potentialities, limits, and room for improvement. For this reason, the tool is tested on one of the 72 SNAI inner areas: Tammaro–Titerno inner area in the Campania Region (Figure 4).

This area, located in the north-eastern part of Benevento Province, includes 24 municipalities. It is affected by demographic shrinking and marginalization dynamics common to all Italian inner areas. One of the main criticalities is accessibility: a mountain ridge stands as a natural barrier, dividing the area into poorly connected parts, the Tammaro and the Titerno (Figure 5).

Furthermore, the analysis of Tammaro-Titerno's inner area Framework Program Agreement returns a low incidence of funding devoted to cultural heritage interventions on the total funding for local development initiatives (4,93%) (Agenzia per la Coesione Territoriale 2021b).

However, it shows a solid agricultural vocation, a good associationism tradition, and an array of distinctive heritage elements, from the tangible to the intangible dimension, making it prone to undergo heritage-led local development processes (Associazione Sannio Smart Land 2020).

The tool's implementation to Tammaro-Titerno inner area requires calculating the different indicators' values assigned to each municipality within the area. These values represent useful references to understand the municipalities' conditions concerning specific phenomena and the existing power balances within them. In this sense, a significant advantage can stem from integrating the indicators set in a GIS environment (Figure 6), thus allowing an easier comprehension of data based on a graphical representation of the indicators' values (Duhr, Muller 2012, Oppio et al. 2021).



Source: Cnai's elaboration on ISTAT administrative boundaries data, 2015

Figure 4: Tammaro-Titerno inner area in Campania Region

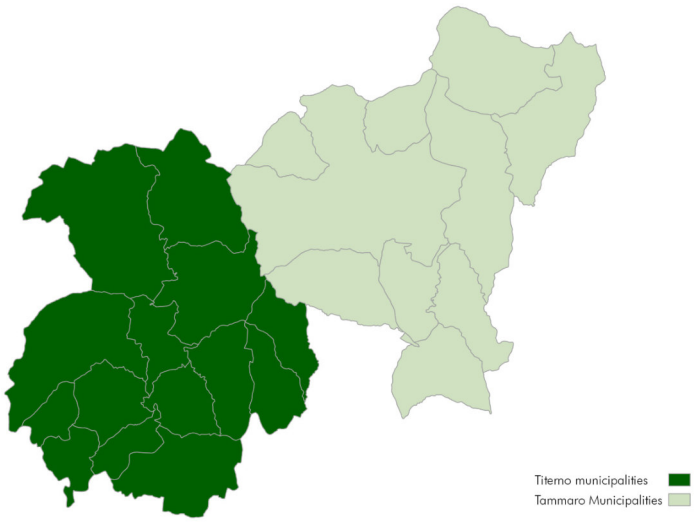
The indicators' values, calculated for each municipality, also allow investigation of some ongoing dynamics in the area through the graphical representation and qualitative interpretation of the relationships among variables (Figure 7).

Furthermore, the multi-dimensional nature of the decision-support tool fits the integration with an MCDA methodology aimed at drawing out a ranking of municipalities according to their need or potentialities in the different considered dimensions (Kiker et al. 2005, Falcao et al. 2021). In this light, among the different MCDA methodologies, the research applies the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) directly in a GIS environment thanks to the QGIS plugin VectorMCDA (Massei 2018). The TOPSIS is a MCDA ranking method that has received much interest and application in decision-making related to different fields (Behzadian et al. 2012). It allows ranking alternatives by privileging the ones having the shortest distance from the positive ideal solution and the farthest distance from the negative ideal solution (Yoon, Hwang 1995).

Concerning the practical application of the TOPSIS methodology to the case study, it requires the definition of the ideal point and the worst point for each indicator in the decision-support tool. More in detail, the two points are defined by referring to the values provided by scientific literature or to the average Italian performance for the considered indicators. When, for an indicator, the reference to these values is not meaningful, the ideal and the worst points are placed equal respectively to the best and the worst score within the ones given to Tammaro-Titerno municipalities for that indicator. Table 7 shows an example of the definition of the ideal and worst points, propaedeutic to the TOPSIS application, regarding the indicators belonging to the Heritage section: the consequent value functions are shown in Figure 8.

After this step and essential for score standardization, the municipalities' scores within each tool's section are aggregated through an indifferent system of weights, thus providing the municipalities' overall performance for any of the five dimensions (Figure 9).

Finally, the five overall scores related to the five sections in the tool are aggregated in a unique score, expressing the municipalities' inclination to undergo heritage-led local



Source: Authors' elaboration on ISTAT administrative boundaries data, 2021

Figure 5: The distinction between Tammaro and Titerno municipalities

development processes (Figure 10).

4 Results

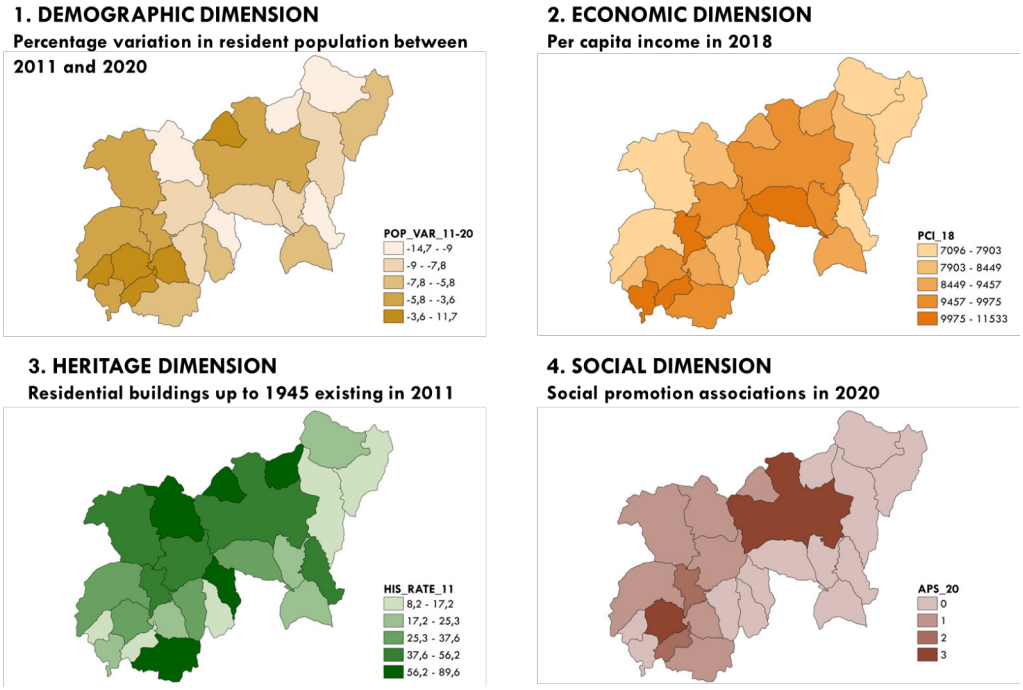
The tool's application to the Tammaro-Titerno inner area highlights its potentialities, limits, and room for improvement in supporting heritage-based development strategies for marginal areas. The value maps produced for each indicator allow understanding of the municipalities' minor or major inclination to transformation, according to the dimensions considered. Concerning Tammaro-Titerno inner area, the value maps with municipalities' overall score for each dimension (Figure 9) hint that Titerno municipalities show a higher disposition to transformation, according to most of the considered development dimensions. Furthermore, Telese Terme stands as an outlier since it seems not to be affected by the ongoing marginalization dynamics in the area.

The qualitative and graphical interpretation of the relationships among the selected variables reveals some interesting phenomena in the area (Figure 7). For instance, it is possible to state that:

- the increase in the foreign population doesn't seem to hinder the buildings' disuse rate;
- there seems to be a positive relationship between the number of third sector entities and the increase in foreign population;
- the resident population decline appears to affect the buildings' conservation state;
- the existing relationship between agricultural quality products and the number of local events per municipality makes the areas' strong agricultural vocation evident.

The tool's integration with a MCDA methodology allows to draw out a ranking of municipalities (Figure 10), according to their need or potentialities in the considered dimensions, that can be used as good support for grounding decisions. For instance, it can serve the choice of a pilot cluster of Tammaro-Titerno municipalities to implement heritage-based development strategies by leveraging their inclination to transformation and considering their proximity in light of a systemic and integrated approach to local development (Figure 11) (Salvia, Quaranta 2017).

Finally, the decision-support tool proposes complimentary reading keys to the one proposed by SNAI, based on the accessibility indicator, in understanding the municipalities' marginalization conditions. Indeed, such multi-dimensional reading provides a more detailed and comprehensive definition of the marginalization phenomena than the



Source: Authors' elaboration on ISTAT administrative boundaries data, 2021

Figure 6: Value maps for different indicators belonging to four sections (demographic, economic, heritage, and social) of the decision-support tool

one based only on the accessibility indicator. This reading's importance is evident by comparing the classification of Tammaro-Titerno municipalities provided by SNAI with the ones grounded on the overall performances obtained for each dimension of the tool through the MCDA methodology (Figure 9). Classifications are defined on a five-point scale (from 1 for the worst performances to 5 for the best ones) by grouping municipalities in five quantiles according to the overall score obtained for each dimension.

Table 8, displaying the comparison among these different classifications, clearly shows the limits of a definition of marginalization merely based on accessibility. Indeed, there are some municipalities (i.e. Cerreto Sannita, Morcone, San Lorenzello), classified as peripheral by SNAI, performing better than others classified as intermediate (i.e. Amorosi, Pontelandolfo, Puglianello). The broader perspective towards marginality shows that these intermediate municipalities in accessibility terms are affected by more severe marginality phenomena in economic, social, and heritage terms. Furthermore, even focusing on the accessibility definition, its extension to other factors than only the distance from the closest center, as the offer of local public transport, determines some differences with the classification provided by SNAI. Furthermore, declining the marginalization notion to the different relevant dimensions for local development allows for defining systemic policies by addressing each municipality's specific need.

5 Discussion and conclusions

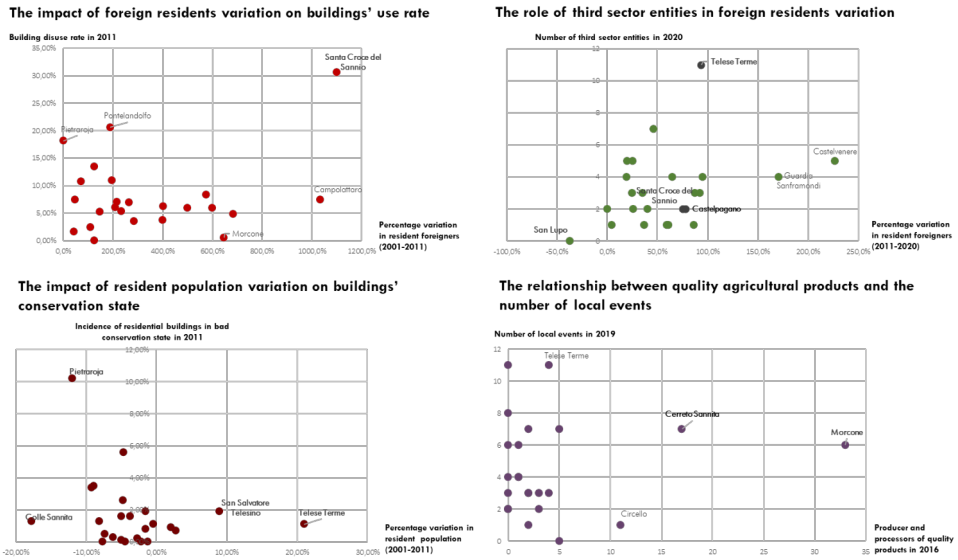
The paper proposes a tool to support SNAI in designing and implementing heritage-based local development strategies to address marginal areas' real needs. The analysis of the tool's application to a case study, represented by the Tammaro-Titerno inner area, clearly reveals its potential for SNAI implementation. Indeed, the THEMA tool, also through the integration with proper methodologies such as MCDA, can help SNAI decision-makers in public and private spheres in:

Table 7: Ideal and worst point definition method for the indicators belonging to the Heritage section

Id	Indicator	Ideal and worst point definition method	Ideal	Worst
DIS_RATE_11	Building disuse rate in 2011	Reference to the best and worst scores gained by Tammaro-Titerno municipalities	0%	30,6%
HIS_RATE_11	Rate of residential building up to 1945	Reference to the average Italian performance for the ideal point. The worst point is placed equal to zero.	25,9%	0%
BAD_INC_11	Incidence of residential building in bad conservation state in 2011	Reference to the best and worst scores gained by Tammaro-Titerno municipalities	0%	10,2%
PRO_ARC_HER	Protected architectural heritage	Reference to the best and worst scores gained by Tammaro-Titerno municipalities	18	0
VIL_ENH	Historical villages enhancement initiatives	The nature of the indicator (binary) automatically determines the ideal and worst points	1	0
EX_REG_EVE	Events of extra-regional importance in 2019	Reference to the best and worst scores gained by Tammaro-Titerno municipalities	2	0
LOC_EVE	Events of local importance in 2019	Reference to the best and worst scores gained by Tammaro-Titerno municipalities	11	0
VISX1000_18	Number of visitors per 1000 inhabitants in 2018	Reference to the cumulative Italian performance for the ideal point. The worst point is placed equal to zero.	2150	0

Table 8: Comparison between the SNAI classification of Tammaro-Titerno municipalities and the classifications based on the overall performances obtained from the THEMA tool

Municipality	SNAI classif.	Demographic	Economic	Heritage	Social	Accessibility
Amorosi	Intermediate	4	1	2	1	4
Campolattaro	Intermediate	4	1	2	2	5
Castelpagano	Peripheral	2	2	1	2	1
Castelvenere	Intermediate	5	5	3	4	2
Cerreto Sannita	Peripheral	4	4	5	4	2
Circello	Peripheral	2	3	1	3	2
Colle Sannita	Peripheral	2	2	2	3	1
Cusano Mutri	Peripheral	4	1	4	4	1
Faicchio	Intermediate	3	3	4	4	2
Fragneto l'Abate	Intermediate	1	2	4	1	5
Fragneto Monforte	Intermediate	4	5	3	1	5
Guardia Sanframondi	Intermediate	3	4	5	4	3
Morcone	Peripheral	2	4	5	5	3
Pietraroja	Peripheral	1	5	1	5	1
Pontelandolfo	Intermediate	1	4	1	2	4
Puglianello	Intermediate	5	1	2	1	3
San Lorenzello	Peripheral	3	5	5	5	1
San Lorenzo Maggiore	Intermediate	5	2	1	2	5
San Lupo	Intermediate	1	5	3	3	5
San Salvatore Telesino	Intermediate	5	4	3	5	4
Santa Croce del Sannio	Peripheral	3	3	2	2	2
Sassinoro	Peripheral	1	1	4	3	4
Solopaca	Intermediate	2	3	5	1	3
Telese Terme	Intermediate	5	2	4	5	4



Source: Authors' elaboration

Figure 7: Graphical representation of some relationships among the selected variables in the decision sup-port tool

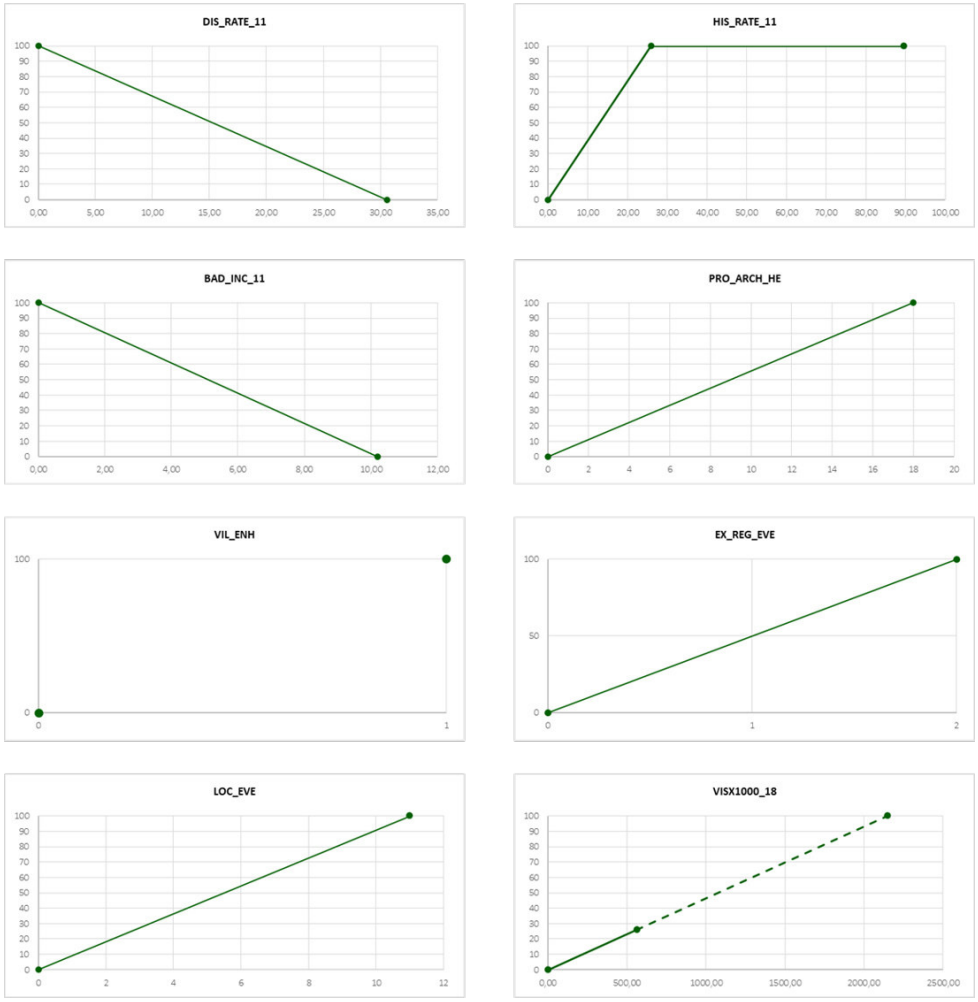
- Gaining a comprehensive and multi-dimensional knowledge of territorial dynamics and power balances thanks to the values defined for each indicator in the tool and available for each municipality. Value maps, in this sense, can offer valid support for the detected phenomena comprehension and communication;
- Defining interventions and allocating resources according to the municipalities' actual needs in the considered dimensions;
- Setting goals to be reached related to local development, in terms of performance, to monitor the effectiveness of the implemented policies;
- Prioritizing actions within a project inner area or selecting additional territories for SNAI relaunch.

More in detail, in the public sphere, the tool can address local and regional administrators' needs to properly manage limited financial resources by grounding investment decisions on a solid knowledge of territorial dynamics. For national administrators, if applied to the whole national context, it can stand as a powerful instrument for the planning agenda. Instead, the tool can support private actors in assessing different territorial investment opportunities.

Furthermore, regarding the possible role for SNAI project areas selection, the THEMA tool offers complementary reading to the one proposed by SNAI, based on the accessibility indicator, to understand the municipalities' marginalization conditions. Indeed, the proposed multi-dimensional reading provides a more detailed and comprehensive definition of the marginalization phenomena than the one based only on the accessibility indicator. This declination of the marginalization notion to the different relevant dimensions for local development allows for defining systemic policies by addressing each municipality's specific need.

Thanks to its objective and transparent framework, the decision-support tool can play a significant role in SNAI implementation through its application to the different inner areas. However, in exporting the tool to other territorial contexts, the need for a place-based perspective on local development (Barca et al. 2012) requires adapting its structure to the inner area under study by eventually discarding not representative indicators or including new ones, able to capture its specificities.

The importance of adopting a place-based approach to marginal areas' local development (Cotella et al. 2021) opens some considerations on the limits of the THEMA tool application and how to overcome them.

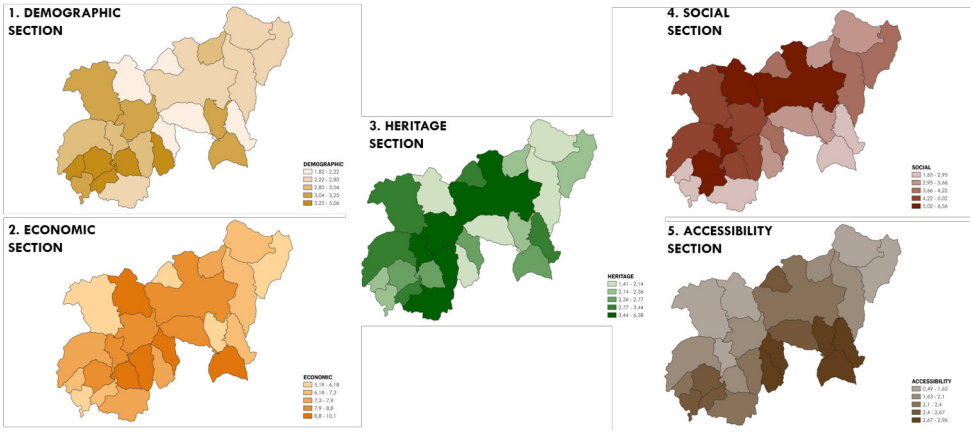


Source: Authors' elaboration

Figure 8: Value functions for the standardization of the scores, related to the Heritage indicators, stemming from the ideal and worst point definition

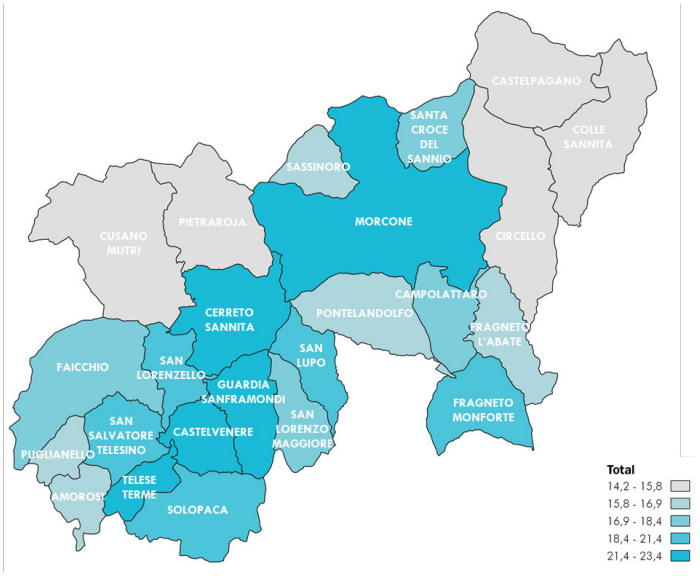
Indeed, territorial dynamics can fully be captured only through direct contact with the territorial context under study and its community. In this sense, the decision-support tool cannot stand as the exclusive basis for decisions. Its data must be integrated with the values stemming from the interaction with local communities, their system of preferences, and expectations (Oppio et al. 2021). In practical terms, this integration can be pursued by involving key local stakeholders in applying participatory weighting methodologies for the MCDA implementation, such as the Swing, the SMARTER, or the SRF (Edwards, Hutton Barron 1994, Figueira, Roy 2002, Dell'Ovo et al. 2021), or placing the results of the tool's application at the core of an informed dialogue with them based on participatory tools like focus groups, semi-structured interviews, questionnaires, and workshops.

Another challenge towards the tool implementation as adequate support in the decision arena is related to its practical use by local technicians or private. However, this limit can be overcome by developing a user-friendly online platform to be consulted and by setting specific training programs for local technicians to access data for updating it and interpreting its results.



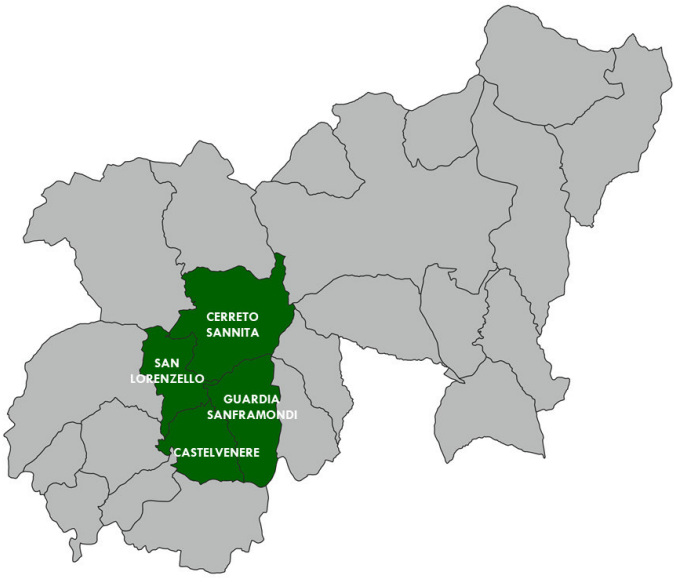
Source: Authors' elaboration on ISTAT administrative boundaries data, 2021

Figure 9: Value maps with municipalities' overall score for any of the five dimensions considered in the decision-support tool



Source: Authors' elaboration on ISTAT administrative boundaries data, 2021

Figure 10: Tammaro-Titerno municipalities' overall ranking according to their inclination to undergo heritage-led local development processes



Source: Authors' elaboration on ISTAT administrative boundaries data, 2021

Figure 11: A pilot cluster of municipalities for the implementation of heritage-based development strategies

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Italia di mezzo: The emerging marginality of intermediate territories between metropolises and inner areas*

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Abstract. The Italian debate concerning the relationship between cities and inner areas polarized around a few dichotomous – and somehow simplifying – positions. On the one hand exists the rhetoric addressing the "villages", intended as remote places to re-inhabit, escaping from the pandemic. On the other hand is the narrative of the metropolis, envisioned as a place-fulcrum from which to start again – following the already-known patterns of growth and concentration – despite the fragilities made explicit by Covid. In order to overcome these juxtaposed approaches, our work wants to shed light on the importance of "intermediate territories" intended as priority places to rethink within a new geography of marginality. In Italy, such intermediate territories, named *Italia di mezzo*, occupy half of the national surface and host more than half of the population. Moreover, they embody extremely articulated geography: they include portions of twentieth-century urbanization (such as coastal settlements, industrial districts, various traits of "città diffusa"), medium-sized cities with different administrative and functional centrality levels, sectors of metropolitan belts and a substantial share of rural areas in plains and hills. Faced with the radical risks and uncertainties that characterize the contemporary condition, it is essential to take care of these territories not only because they urgently need investments aimed at solving forgotten critical issues (from the necessary reconversion of production chains to the impact of climate change). These territories can also play a strategic positive role in the face of crisis phenomena thanks to their characteristics of elasticity and plasticity. If we look at them from a relational point of view – and not only from a topological one – these intermediate territories can play the role of two-sided "intermediaries" and "hinges." On the one hand, they can be prepared to provide assistance and support to the inner and less densely populated areas; on the other hand, by taking advantage of their infrastructural and social capital, they can offer decongesting opportunities for most polluted metropolitan areas and more accessible living and working conditions.

*The authors shared the contents and the general layout of the essay. However, the first (Introduction), third (Defining and mapping l'*Italia di mezzo*) and last (Conclusion) chapter must be attributed to the four authors together, the second (A multi-faceted debate) to Arturo Lanzani, the fourth (An introductory profile of *Italia di mezzo*) to Federico Zanfi, the fifth (*Italia di mezzo* and the geography of socio-economic and environmental fragility) to Francesco Curci and the sixth (A recent contraction) to Agim Kërçuku.

1 Introduction

In Italy the geography of marginal territories has changed cyclically. It continuously includes some areas and populations while cutting out others. It shrinks and expands constantly. Being marginal territories means being forgotten by public policies, excluded from plans and projects, overlooked by research and studies and ignored by public opinion and cultural institutions. But being marginal also has to do with the processes of territorial and social stigmatization, both exogenous and endogenous to the territory in question. It is possible to be a marginal territory if the socioeconomic and cultural development processes are always decided elsewhere. And one can feel forgotten, marginal or belonging to second-class regions while being at the centre of the public debate. Being marginal is a complex and unobvious condition that has substantial social, economic, political and spatial implications for societies and territories.

Since the second half of the twentieth century, a constant dichotomy has characterised the process of marginalization of the Italian territory. The margin was defined through a fracture and constantly alludes to an oppositional recognition. And at several moments, the different marginal territories were described almost exclusively within three large homogeneous images: the Mezzogiorno (Southern Italy), the peripheral and the inner areas. These images define three physical and conceptual spaces, unable to welcome and foresee anything else. Our work intends to shed light on the importance of "intermediate territories" and *Italia di mezzo* intended as priority places to rethink as a new geography of marginality.

At first, the North-South duality marked the marginality of the South (i.e., about one-third of the country) and fuelled a vital policy to reduce regional gaps. Subsequently, although the gap between Northern and Southern Italy persists and has worsened in recent years, the peripheral neighbourhoods within the metropolitan areas will be considered marginal compared to the centres, becoming a field of experimentation for new integrated urban policies. In recent years, a new series of studies and policies has given rise to the experience of the Strategia Nazionale per le Aree Interne (National Strategy for Inner Areas). This strategy identifies the geography of marginality in inland mountain areas and other areas at risk of depopulation. The geography of the Aree Interne (spatially extended but of limited demographic weight) is based on the criterion of the distance of these areas from the centres that provide essential services for a citizen: a hospital equipped with high-level first aid (DEA), high schools and a silver level railway station. Silver is one of the four station classification levels introduced by the RFI. In Italy, there are 594 silver stations. These are medium/small facilities, often unattended, equipped only with urban / suburban / metropolitan services (Ministero delle Infrastrutture e Trasporti 2014). As part of this strategy, a place-based policy was consequently developed to innovatively promote access to these essential services and introduce new economic initiatives capable of retaining and attracting the population.

However, there is a fuzzy part of the geography of marginalisation in Italy. This is a large portion of the Italian territory that does not belong to the suburbs of the metropolitan areas or even to the inner areas, that lies in the middle of these two polarities that we find both in the North and South of the country. *Italia di mezzo* (in-between Italy) is a substantial part of Italy; it comprises about half of the total area in which 55% of the Italian population lives. It is a part of Italy rarely subject to integrated policies and projects. Also, it is on the fringes of scientific research and political experimentation. This Italy needs an update to its representation and a substantial redefinition of territorial policies because of the ongoing processes of marginalisation and fragilization that could reach critical levels in the coming years, affecting the fate of the entire country system. This paper intends to help respond to the first of these urgencies through the conviction that this other Italy needs a new representation that considers its evolutionary dynamics and, above all, its possible differentiated futures. Such representation will have to focus on multiple aspects. It will have to recognise recurring social, cultural, economic, demographic and environmental elements and the internal spatial articulation of these territories. It will have to show how variety of life frameworks can host different populations and how it has given (even during the recent pandemic crisis) plasticity and

resilience to the country. It will have to interpret the complex geography of the dynamics of shrinkage and growth, investigating its numerous potentials and criticalities.

After presenting the hypothesis that moves our reflection on the introduction, in the first part of the article, some trajectories of study on the Italian specificity and the international context of the intermediate territories are reconstructed. It is a reconstruction that has guided us in the perimeter and mapping of that part of the territory called *Italia di mezzo*. And in the choice of indicators, in which we have caught a robust spy capable of offering some elements of reflection on the social, economic, cultural, and environmental relevance of *Italia di mezzo* within the Italian territory. In the second part of the paper, we illustrate the criteria that helped us define a new map of *Italia di mezzo*. The third, fourth and fifth parts describe an introductory profile, illustrate the socioeconomic, socio-demographic, real estate, and environmental conditions, and introduce recent shrinking processes. The last part summarizes the dynamics and the main challenges in the territories of *Italia di mezzo*.

2 A multi-faceted debate

Except for the production of Bruno Menegatti, contained in the results of the survey initiated in 1980 by the working group Rivalorizzazione della aree marginali (Menegatti 1986) of the Association of Italian Geographers (AGEI), *Italia di mezzo* has never been treated as a single subject, neither in terms of physical and socioeconomic features nor in terms of public policies. Several studies have, however, partially explored in-between Italy from five specific perspectives. It is a multi-faceted debate made up of many coexistences and overlaps that involve different contents, places, and types of settlement. It is a partial picture. The choices are linked to the need for research and to treat a comprehensive view with constantly accumulating literature.

The first group of studies focuses on the industrial and post-industrial territories in which small and medium enterprises and then the "pocket multinationals" were born and developed (Fua, Zacchia 1983, Garofoli 1991, Becattini et al. 2009, Calafati 2009, Lanzani et al. 2016, Bianchetti 2019, Tosi Tosi).

The second group of studies focuses on the spread of urbanised spaces beyond metropolitan fringes (different from urban sprawl) and their recent transformations and shrinking (Indovina 1990, 2009, Clementi et al. 1995, Munarin, Tosi 2001, Lanzani 2003, 2011, Bonomi, Abruzzese 2004, Fabian et al. 2012, De Rossi 2018, Curci et al. 2020). More specific studies can be subdivided according to three areas of focus: land-take dynamics, which strongly affect *Italia di mezzo* (Crcs 2017, Ispra 2020); unauthorised urbanisation processes, particularly in southern Italy (Zanfi 2013, Curci et al. 2017); and hybrid and fragile landscapes and recurrent building materials (Ingersoll 2004, Navarra 2017, Gioffre 2018, Ippolito 2019), expressly within peri-urban spaces (Magnaghi, Fanfani 2010, Mininni 2012) and coastal areas (Mininni 2010, Zanchini, Manigrasso 2017).

The third group concerns the polycentric systems of medium-sized cities and their role in the Italian spatial and economic structure (Camagni 1993, Dematteis, Bonavero 1997, Trigilia 2014, Ifel 2019, Mascarucci 2020). More limited is the literature that focuses on the evolution of intensive agricultural areas, mainly located within *Italia di mezzo*, and their ecological and environmental impacts (Cannata 1989, Basile, Cecchi 2003, Marangon 2006, Bocchi 2018, Bevilacqua 2018).

A final and more recent group of studies focuses on the different forms of unease and discontent among communities in *Italia di mezzo* and the political implications thereof (Vallerani, Varotto 2006, Bonomi 2008, Viesti, Simili 2017, Di Matteo, Mariotti 2021, Carrosio 2020).

In the international context, the issue of in-between areas has been tackled from different perspectives, with significant differences concerning the way in-betweenness is defined and interpreted, also due to the objective differences existing between the national and regional contexts under study. In France, the territoires intermédiaires have long been the subject of reflections and conceptualizations that have emerged in the debate on rural territories and in that on the forms of intercommunality: Ville émergente (Dubois-taine, Chalas 1997), Métapolis (Ascher 1995), Tiers espace (Vanier 2000). The Swiss

case is also interesting in which, looking outside the urban agglomerations, it is customary to distinguish between territoires intermédiaires and régions périphériques (Ruegg, Deschenaux 2003). All attempts to define in-betweenness still discount a dependence on the city-countryside gradient.

However, in addition to the tradition of Franco-Swiss studies, we can mention the works conducted on German and Dutch territories. The Dutch term Tussenland (middle land) was used by the Dutch National Agency for the Environment to identify those territories in which different actors interact outside the logic of spatial planning that in previous decades had focused everything on containing urban expansion and the safeguarding of green spaces, without, however, paying attention to the network organization and the connective potential, and not only of the intermediate territories (Wandl 2020). With the German term Zwischenstadt (middle city), Sieverts, on the other hand, told of intermediate spaces that are the result of multiple rationalities and the action of different actors (Sieverts 2003), with interesting hybridizations, both from the physical-settlement point of view, and from an economic point of view, between local roots and globalization, but also between planned and unplanned spaces, between static and dynamism, between investments and disinvestments, between growth and contraction. Furthermore, in Germany, by articulating the concept of peripheralization, it is possible to put a crisis on the various spatial categorizations based on structural distances. These are somewhat vague categorizations that do not capture the local realities of the territories considered in-between or non-core regions (Leick, Lang 2018). These works aim to claim the need for more studies on areas that are still little explored today, but deserve to be qualified through more accurate knowledge and targeted projects (Wandl 2020).

For this reason, Sieverts' work has aroused particular interest in post-suburbanization studies, for scholars such as Keil, Young (2010) and Nüssli, Schmid (2016). It is a line of research that aims to build new interpretations of the suburban by recognizing in these spaces, in addition to some intrinsic qualities from an environmental point of view, also their own positive identity, which can be emancipated from the urban one, but also an attractive and innovator. According to these approaches, the suburban area is not only the field of rescaling traditional social and environmental questions, but is also the heart of a new political tension (Fedeli 2017). Also for this reason the theme of the in-between territories has crossed the work of scholars who are involved in investigating the correlations between the geography of (electoral) discontent and places – often too hastily defined as peripheral – in which the perception of geographical disparities is stronger (McCann 2020) and in which socioeconomic and environmental conditions are condensed such as to induce some scholars to define them as places that don't matter (Rodríguez-Pose 2018).

Another area in which it is possible to find suggestions on in-betweenness is that of critical urban studies. The theories on planetary urbanization push towards an interpretation of urbanization as a phenomenon without limits; dynamic, complex, in which forces that push towards concentration co-act (concentrated urbanization) and forces that push towards extension (extended urbanization) (Brenner, Katsikis 2020). These theories decree the definitive dissolution of the hiatus between urban and non-urban to stop understanding urbanization as city growth but rather as a process that is actively supported by non-city spaces (Soja 2000). According to these authors, urban agendas should therefore start from a re-articulation of the suburbs free from city-centric logic, starting by recognizing, for example, that today it is no longer possible to associate a suburb with a single city and vice versa.

This body of studies constitutes a fundamental basis of knowledge for the research we propose but simultaneously allows two limits to emerge. Italian research has mainly focused on specific themes and territories of Italian di mezzo, failing to build an overall portrait in which demographic, socioeconomic, and mobility aspects are integrated. Italian and international research has maintained a predominantly oppositional approach, in which the presence of a relational perspective that these territories have with metropolitan and inner areas is scarce. The proposed essay intends to advance scientific knowledge by bridging these two limits and understanding the in-between space as a relational space.

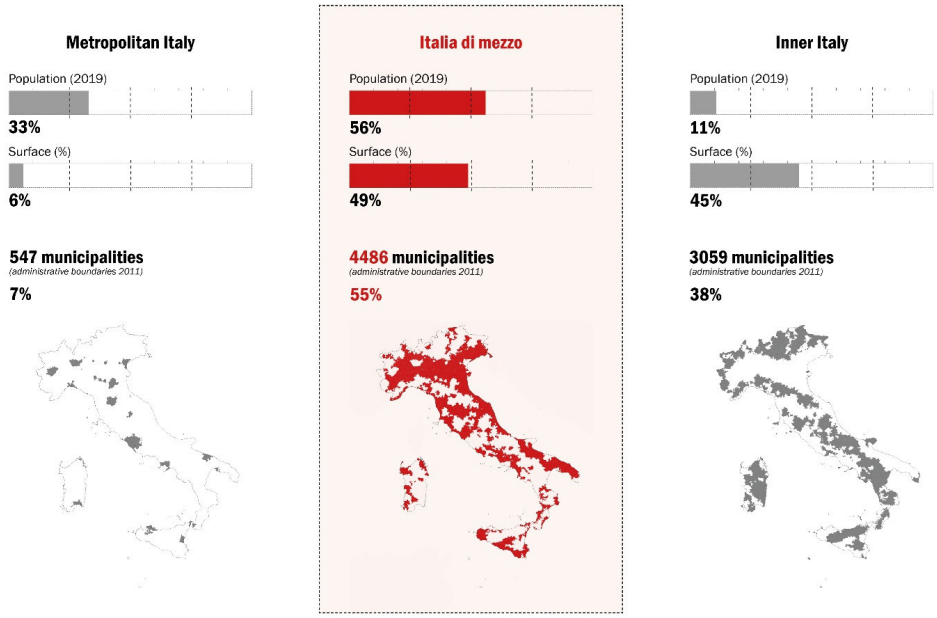

Figure 1: A significant portion of Italy

3 Defining and mapping *Italia di mezzo*

A first 'negative' delimitation of Italia Mezzo derives from the exclusion of the entirely mountainous ultra-peripheral, peripheral, and intermediate areas defined by the National Strategy for Inner Areas (SNAI). This deep or mountainous inland part of Italy represents 10% of the total population and 44% of the national area, as shown in Figure 1. Not even the de jure and de facto metropolitan cities, namely Milan, Rome, Naples, and Turin, are part of *Italia di mezzo*. Also excluded are the central municipalities of some functional metropolitan areas, as indicated by the OECD research (Brescia, Padua, Parma, Reggio Emilia, Modena, Prato, Pescara, and Taranto). Not even the de jure and non de facto metropolitan cities are part of it, as in the case of Messina and Reggio Calabria. Metropolitan Italy represents 33% of the population and 6% of the national surface, as shown in Figure 1. This is the first definition that, by subtraction, reveals a significant portion of the Italian territory, which has remained amid the dualism between inner areas and metropolitan cities.

A second 'positive' description can be made by portraying the Italian territory's settlement structure and urban-rural relationship. A spatially articulated reality emerges. Within it, at least three major types of situations can be identified.

The first is defined di mezzo of medium-sized cities with different centrality levels. These are the 'Cities' of medium and small OECD-FUAs, the traditional medium-sized cities and some minor poles. Trieste, Foggia, Sassari, Ravenna, Ferrara, Rimini, Trento, Salerno, and Monza also belong to the second type of situation, which hosts 17% of the national population and covers 10% of the total national expanse, as shown in Figure 2.

The second type of situation is represented by Italia *Italia di mezzo* of metropolitan fringes. The de facto but not de jure metropolitan areas are part of this first situation, as in the case of the extra-provincial areas of the Milanese and Neapolitan metropolises, the non-metropolitan territories of the provinces of Turin, Bologna and Bari and the entire functional areas of Reggio Calabria and Messina. About 12% of the national population lives in this territory, which represents 7% of the national surface area, as shown in Figure 2.

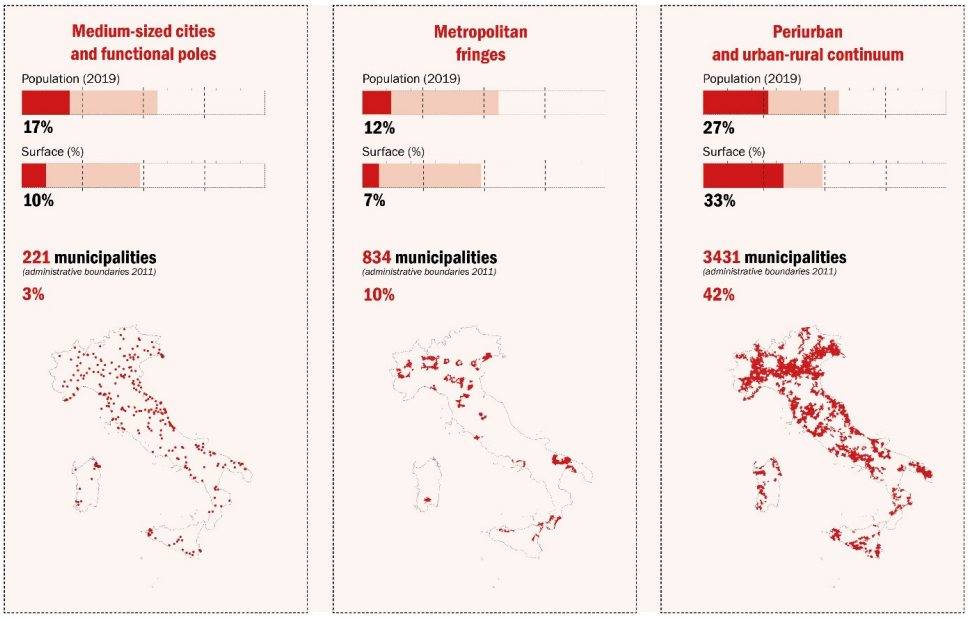

Figure 2: An articulated reality in which we can distinguish at least three settlement typologies

Finally, the third type of situation is composed of *Italia di mezzo* of the urban-rural continuum characterised by suburban belt municipalities and intermediate municipalities, with an average size of 5,000 inhabitants. *Italia di mezzo* of the suburbs and the rural-urban continuum of plains and hills are characterized by a widespread, linear, comb or reticular urbanisation. It represents 27% of the national population and covers 33% of the national surface area, as shown in Figure 2.

Adding up the three major situations, *Italia di mezzo* takes on a decisive role if we consider its weight on a national scale: 56% of the Italian population lives here and it comprises 50% of the entire national surface area.

4 An introductory profile of *Italia di mezzo*

To observe the specific characteristics and trends of *Italia di mezzo*, it is necessary to consider some specific data. With the help, above all, of the vast national and international literature observed and briefly described in the second part of this essay, we have selected 39 indicators capable of recounting the socioeconomic, socio-demographic, real estate, and environmental conditions of this part of Italy.

This investigation results from intensive research carried out to prepare a public intervention for the seminar Ricomporre i divari. Politiche e progetti territoriali contro le disuguaglianze held at Politecnico di Milano on February 2020[1]. For this reason, we used the latest available data on that date, including those of the fifteenth general census of the Italian population and dwellings (October 2011) ISPRA, Copernicus, DiPE Urbanindex, INGV, AdE-MEF, ISTAT (A misura di comune), DemoISTAT and 8milaCensus ISTAT, as shown in Table A.1. While realizing the limits of this temporal distance, we still decided to use these data for their statistical relevance and homogeneity. To facilitate

[1]Public presentation: L'*Italia di mezzo.* tra metropoli e aree interne, together with A. Lanzani, F. Curci e D. De Leo. On the occasion of the Prima sessione – Periferie in Italia: processi, geografie e risposta delle politiche of the public seminar, Ricomporre i divari. Politiche e progetti territoriali contro le disuguaglianze. Organized by A. Coppola, M. Del Fabbro, A. Lanzani, G. Pessina e F. Zanfi. DAStU, Politecnico di Milano

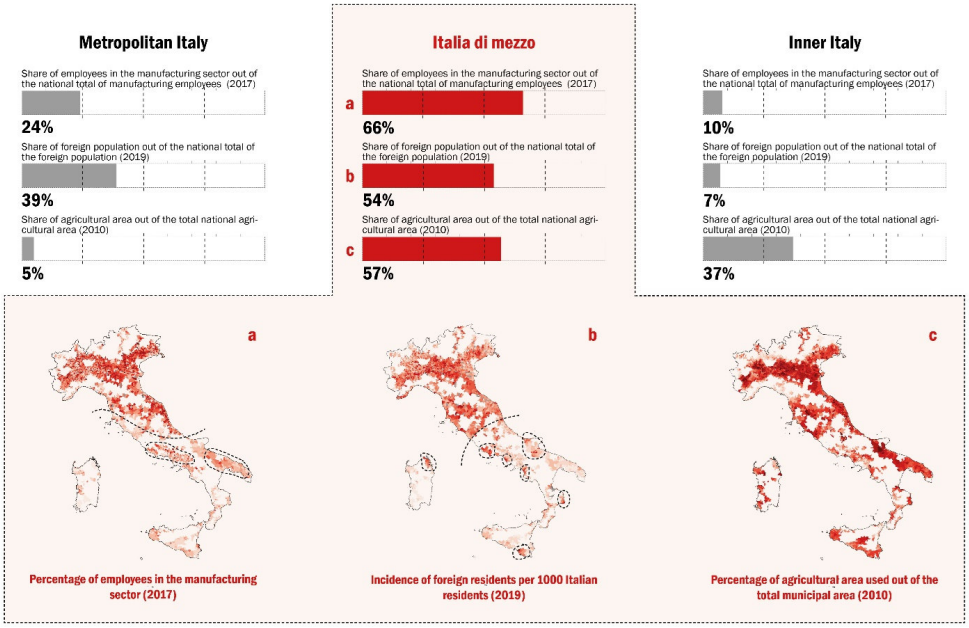

Figure 3: Common features of *Italia di mezzo*

the reading of the essay, we have inserted a summary table of the selected indicators at the end of the paper (Table A.1).

Strong manufacturing and agricultural profiles emerge if we look at the socioeconomic connotation of *Italia di mezzo*, as shown in Figure 3. In fact, this is where, in 2011, the most significant number of municipalities in the industrial district are located. About 90% of the municipalities included in the Italian industrial districts are part of *Italia di mezzo*. However, this district characterisation is more limited in the region of Piedmont, Liguria, and Friuli-Venezia Giulia, in the Tyrrhenian area of central Italy, in the south and in the islands. Furthermore, a more significant presence emerges in metropolitan fringes and urban-rural continuum if we look at the percentage of employees in the manufacturing sector in 2017. The manufacturing sector employees' rate is significantly reduced in medium-sized cities. If we examine the spatial distribution, we observe a stronger manufacturing connotation in the whole of the centre-north and along the Adriatic coast than in the rest of the country. However, looking at the number of large active companies per 1,000 employees in the municipality in 2017, we can see an inverted trend. The maximum values are reached in medium-sized cities and metropolitan Italy. A more pronounced presence of large companies emerges in the territories of *Italia di mezzo* along the Piedmont–Lombardy–Veneto foothills axis, along the Via Emilia and along the Adriatic route. On the other hand, the presence is limited along the course of the Po River, along the Tyrrhenian coast, in the south and on the islands. Alternatively, or sometimes in combination with manufacturing, there is also a solid agricultural connotation of *Italia di mezzo*, as shown in Figure 3. To confirm this, it can be noted that the percentage of the agricultural area used of the total municipal area in the urban-rural continuum is 56.6%. The geography on a municipal basis is complementary to manufacturing, with higher values in the lower Po Valley and some areas of Apulia and Sicily.

As for the socio-demographic connotation, a not-so-evident trend in the presence of immigrants must be pointed out. If we look at the incidence of foreign residents, in 2011, the highest values can be found in *Italia di mezzo* and not in metropolitan Italy, as one would imagine, as shown in Figure 3. Although the presence of immigrants increased in 2019, especially in metropolitan Italy, *Italia di mezzo* is still the area where

the greater incidence of foreigners can be observed. This data can be justified by more significant employment of the immigrant population in less skilled commercial, personal services, manufacturing, and agricultural jobs. The location pattern of foreign residents in Italy is higher in metropolitan Italy but lower in the metropolitan fringe. It returns to be higher in the urban-rural continuum and decreases in inland areas. A significant element concerns the change from 2011 to 2019 in the localisation of immigrants in large geographical areas. If the homogeneous distribution was evident in 2011, a more significant presence in the country's north could be revealed in 2019.

Let us consider the percentage of employees in the advanced services sectors, and social and health sectors in 2017. There is a more significant presence in metropolitan Italy and medium-sized cities compared to other parts of *Italia di mezzo* and inland areas. There is no notable regional variability, and this returns a homogeneous distribution within the national territory. A similar spatial distribution can also be found in the indicator of the average purchase and sale value of residential properties in 2019, affecting the cost of living for residents. This indicator has maximum values in metropolitan Italy and minimum values in inland areas. It ranks medium-low values in the three components of *Italia di mezzo*. The geographical representation shows a hold on the real estate values of *Italia di mezzo* affected by tourist phenomena, as in the case of the Liguria, Marche, Romagna, and Sardinian coasts and in the case of the territories around the great lakes in the north and in Tuscany. A similar trend is also found for the percentage of real-estate units reached by ultra-broadband 30Mb in 2016, with higher values in metropolitan Italy and medium-sized cities, followed at a great distance by the metropolitan fringes, inland areas, and urban-rural continuum. The latter has even lower values than inland areas. A further significant element is the better endowment in *Italia di mezzo* of the Tuscan territories and southern Italy compared with northern Italy. This may be influenced by the availability of structural funds for ultra-broadband investments in the south and by the presence of some critical tourist areas with high demand. Artificial land cover per capita 2018 reaches maximum values in inner areas due to urbanisation models and the value of second homes, and minimum values in metropolitan Italy. The land consumption per capita 2018 in *Italia di mezzo* assumes intermediate values. Geographically, a greater land consumption is found along the Po River, in Friuli-Venezia Giulia and Tuscany. The percentage of use of buildings 2011 is, on the other hand, minimal in inner areas and highest in metropolitan Italy. The picture of *Italia di mezzo* is not homogeneous. Minimum values similar to those of inland areas can be found in the geographical contexts of *Italia di mezzo* marked by tourism and migration, as in the case of the south, Sardinia, western Liguria, Valle d'Aosta, Abruzzo and also in the northern territories between Piedmont and Lombardy and in Friuli-Venezia Giulia. Let's also look at the data relating to the percentage of use of real estate owned by municipalities in 2016. It is possible to find a classic distinction between northern Italy and southern Italy, where the values are lower.

A final element that can help us understand the introductory profile of *Italia di mezzo* is its morphological-environmental character. In fact, *Italia di mezzo* is characterised by three settlement situations. The first situation concerns those portions of the territory with a Christallerian geography of medium-sized cities and small rural-urban centres connected through many urbanised strands. Two exemplary cases of this first situation of *Italia di mezzo* are the territories of the lower Po Valley and Apulia. However, a similar condition is also found in Tuscany, Lazio, and south-eastern Sicily. The second situation contains those complex linear urbanisations that incorporate many medium-sized centres on the coasts of peninsular Italy and Liguria. Furthermore, this second settlement situation can also be traced in some Apennine and Alpine valley bottoms. The third situation relates to widespread urbanisation outside the metropolitan areas. This is the most varied morphology of the urbanised area in terms of urbanisation density. In fact, the north of Milan metropolitan area, the widespread Lombard-Venetian Piedmont urbanisation and the sparser one of southern Piedmont, Friuli-Venezia Giulia, the Umbrian valley, and the Tiber around Perugia fall into this situation. The third situation also includes a wide variety of urbanised figures: filaments, comb, and reticular urbanised plates.

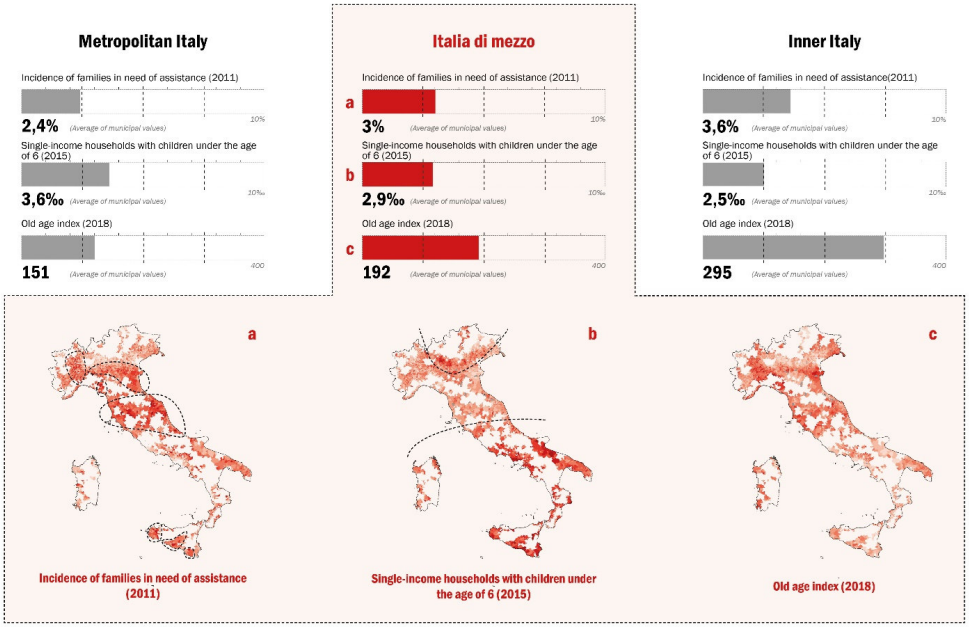

Figure 4: *Italia di mezzo* "in the middle" for some social hardships

5 *Italia di mezzo* and the geography of socioeconomic and environmental fragility

Overall, concerning the socio-demographic, socioeconomic, real estate, and environmental indicators that we have observed, *Italia di mezzo* has at least three main profiles. For some indicators, *Italia di mezzo* is in a lower fragile situation. For others it seems to be in the middle, and for some other indicators it is at greater fragility and discomfort than metropolitan Italy and inland areas.

A less problematic situation in *Italia di mezzo* than in the rest of the country seems to emerge if we look at the incidence of families with potential economic hardship in 2011. In this case, the highest values are found in metropolitan Italy, albeit with significant variance between the different municipalities, and the lowest in the urban-rural continuum, while in the average values, the medium-sized cities, inland areas, and metropolitan fringes are placed in decreasing order. Observation of the spatialized data confirms a clear distinction between the country's north and south, with a very problematic profile in the south, where only Apulia and Sardinia have lower values. Another critical spatial pattern can also be highlighted in the 'dust' of municipalities about 50km from Milan, Turin, Rome, and Naples: a sign of expulsive dynamics and long-term commuting growing solidly after 2011. A further indicator that confirms the lesser problems faced by *Italia di mezzo* concerns the incidence of young people outside the labour market and training in 2011. In this case, the maximum values can be found mainly in metropolitan Italy and the territories of inland areas. The lowest values are recorded in the three components of *Italia di mezzo*. The geographic representation presents a greater criticality in the south, where, however, Apulia – excluding the Tavoliere – Sardinia and Abruzzo report fewer problematic profiles. A particularly critical situation is recorded between Biella and Alessandria, and in lower Brescia area.

Italia di mezzo finds itself in the middle of the geography of fragility and discomfort concerning the incidence of families in need of assistance in 2011, as shown in Figure 4. In this case, the maximum value is recorded in inland areas and the minimum in metropolitan Italy. There are very high values in medium-sized cities and urban-rural

continuum. At the same time, the values of metropolitan fringes approach those of the metropolitan areas. In this case, the regional geography inside *Italia di mezzo* does not propose a condition of maximum criticality in the south, as the population remains younger, and it is rarer for the elderly to live alone. Instead, the critical conditions occur along the Po riverbank, central Italy, and medium-sized cities in general. Similarly, the old-age index in 2018 is also relatively homogeneous in *Italia di mezzo*, halfway between the higher values of inland areas and the lowest of metropolitan Italy, as shown in Figure 4. It is possible to distinguish a higher old-age index in Piedmont, along the axis of the Po River, in Friuli-Venezia Giulia and central Italy, whereas the lower levels are found in the new Lombardy-Veneto-Emilia "industrial triangle" and in the south.

Another indicator that shows an inverted trend but maintains the median value of *Italia di mezzo* is the indicator of single-income households with children under the age of six. In this case, the highest values are found in metropolitan Italy rather than in inland areas, as shown in Figure 4. In *Italia di mezzo*, major criticalities are in the metropolitan fringes with high values recorded in the south and the lower Po Valley. Another significant indicator is the per capita gross income 2015, where the lowest values are found in deep inland areas, as shown in Figure 5. The urban-rural continuum also has similar values, whereas the values in the metropolitan fringes and medium-sized cities are higher. These are the values with the most significant variation between south and north, with the maximum in Emilia-Romagna, Trentino, and Lombardy and slightly lower in Veneto and Aosta Valley. A similar trend is also recorded in the differences in income and taxes within the municipalities, in the gaps in pre-tax income, as shown in Figure 5. The gaps are more remarkable for metropolitan Italy and minimal in inland areas with medium-sized cities that tend to resemble metropolitan Italy more. Conversely, the metropolitan fringes and the urban-rural continuum resemble inland areas more. In *Italia di mezzo*, the gaps are more significant in the south than in the centre-north and occur in the outer metropolitan fringes and the urban-rural continuum of metropolises such as Milan, Naples, Genoa, Modena, Reggio Emilia, and Parma. The gaps also arise in the widespread and rural Tuscan urbanisation. Finally, the incidence of adults with a diploma or degree also has an urban profile with higher values in metropolitan Italy and medium-sized cities. Observation of the data at the municipal level indicates higher values in the Emilia, Marche, Umbrian, and Tuscan territories of *Italia di mezzo*. In the south, the lowest values are reached in Calabria, Sicily and Sardinia.

The highest disadvantage and fragile profiles in *Italia di mezzo* emerge on the environmental and settlement-territorial terrain. If we examine the percentage of municipal area occupied by sites of national interest (SIN) in 2014, we can observe randomized geography with leopard spots. We find a more significant presence mainly in urban-rural continuum and medium-sized cities. Their presence in metropolitan fringes and metropolitan Italy is lower. It is almost absent in inland areas. The Number of industrial plants with relevant risk of accident (RIR) in 2015 also shows high values in *Italia di mezzo*, as shown in Figure 6. Also in this case, there is randomized geography where the sites of Brindisi, Porto Torres, Ravenna, Alessandra, Novara, Ferrara, Cremona, Gela, some municipalities between Frosinone and Latina and the province of Terni are reported. An analogy in the spatial distribution is also found in the percentage of the resident population at risk in areas with moderate hydraulic hazards in 2017, as shown in Figure 6. Also in this regard, we can see randomized geography with a maximum criticality in medium-sized cities. As for air pollution, Pollutants Particulate Matter 10 microns (PM10) and Matter 2.5 microns (PM2.5) are highest in metropolitan areas and metropolitan fringes, as shown in Figure 6. We can highlight the particularly critical situation in the Po Valley, especially in those of Lombardy and Veneto. In this case, the contribution of the Milanese metropolitan areas, in particular the province of Monza, is decisive. We also find high values in the medium-sized cities and the urban-rural continuum of Campania, south-eastern Sicily, and central Apulia. A clearer gradient emerges from metropolitan Italy to the inland areas if we consider the pollutant's nitrogen dioxide (NO2) values instead. In this case, the intensity of urbanisation and the presence of infrastructural beams are relevant to determining the value of the pollutants. Therefore, the exceptionally high values are found in the Piedmont-Veneto area, along the axis of

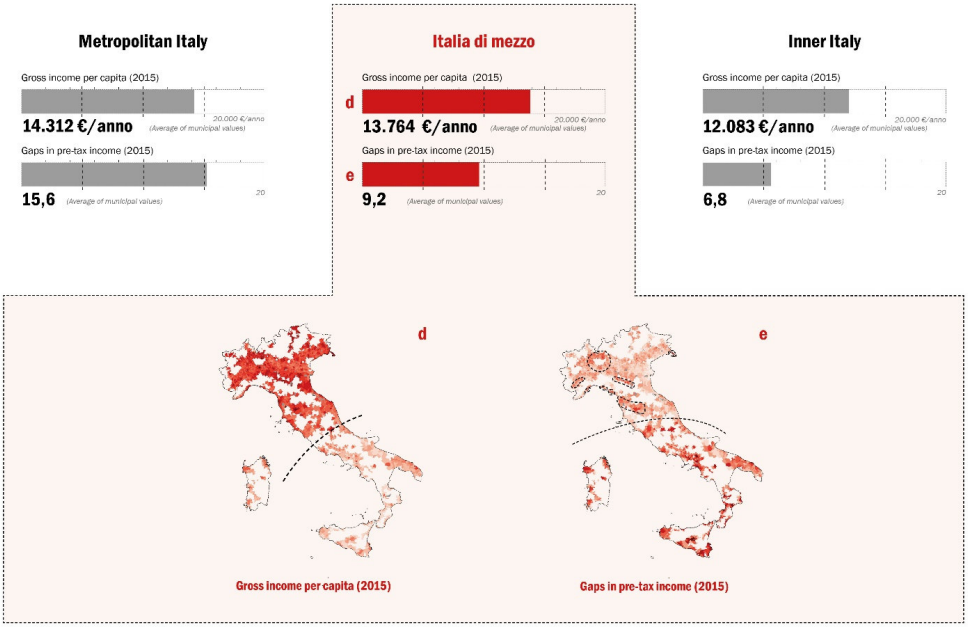

Figure 5: *Italia di mezzo* "in the middle" for some social hardships

the Via Emilia, in the highly urbanised area of Naples, in the highly urbanised oval between Pisa, Pistoia, Prato and Florence, in the urban archipelago around Rome and finally in the Emilia-Marche coastal strip of the Adriatic Sea. Ozone pollutants (O3), on the other hand, have an overturned geography, with maximum values in inland areas and minimum values in metropolitan Italy.

6 A recent shrinking

The simplest yet most significant indicator to capture the demographic contraction remains the percentage change in resident population, which in this case was between 2011 and 2019. It effectively signals how substantial portions of *Italia di mezzo* are now flanking inland areas in the dynamics of demographic contraction. The inland areas of Italy are confirmed as territories of contraction par excellence. However, the high internal variance indicates some counter-history. Cartographic observation allows us to capture anomalous positive demographic trends in many Alpine municipalities of Trentino-Alto Adige and some municipalities of Lombardy and Piedmont. After years of growth, urban-rural continuum, especially in the suburban municipalities, has entered a contraction process. Medium-sized cities and metropolitan fringes grew but presented a significant variance. In particular, medium-sized cities in the south and the belt municipalities of Messina and Reggio Calabria are decreasing, while the de facto and non de jure municipalities in the northern metropolitan area have positive dynamics. Some medium-sized non-coastal cities in southern Italy are also in decline. If we look at the map of the three components of *Italia di mezzo* in northern Italy, four areas in contraction emerge. The first one can be observed in the Piedmont Biella-Asti axes, the second one in the Po River Delta, the third one in the Friuli-Venezia Giulia region and the fourth one in the municipalities of the Liguria coastal arc. In peninsular Italy, the population still grows in most coastal municipalities – albeit in contained forms. However, some contraction processes are beginning to be seen on the Tyrrhenian coast of Calabria, Sicily, and Sardinia. The demographic contraction is more limited on the Apulian and Abruzzese shores. Instead, it is the valleys perpendicular to the sea, the municipalities in the second line of the

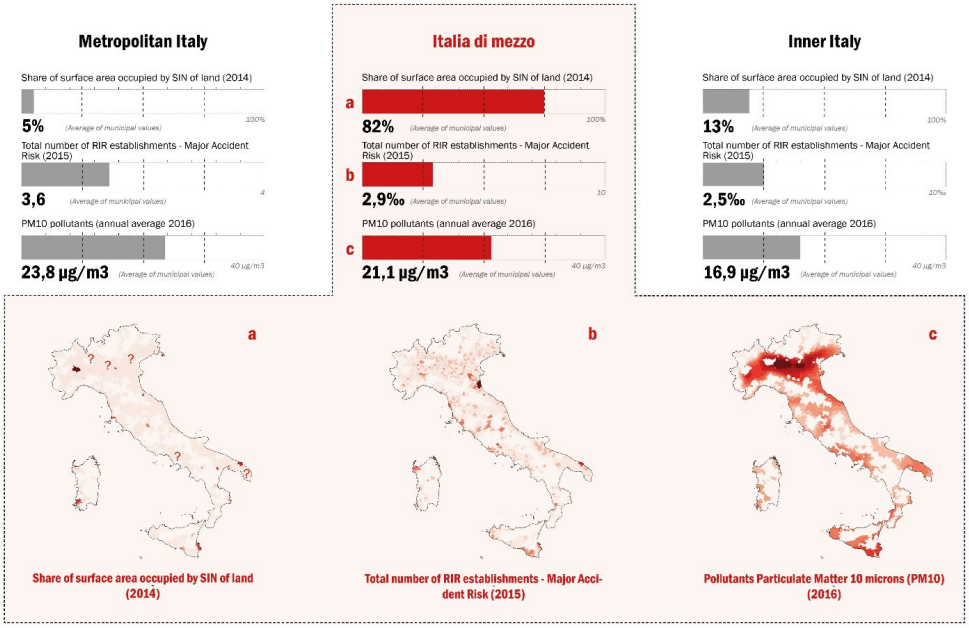

Figure 6: *Italia di mezzo* with strong environmental problems, sometimes higher than metropolitan Italy

coastal strip and the internal basins that record strong contraction dynamics, such as in the valleys and hills of Marche, across the Umbria region, in Irpinia, in the Daunia and some inland basins of southern Italy. The population of southern Italy is the only one to grow significantly but not homogeneously. The de jure and de facto metropolitan areas of Turin, Genoa and Venice are negative, and the metropolitan areas of Bari and Naples and the cities of Perugia and Taranto are stagnant.

On the other hand, if we look at the trends in the natural balance 2011–2018 per 100 initial residents, a negative value is recorded everywhere. It should be noted that the natural balance reaches maximum negative values in inland areas and minimum negative values in metropolitan Italy and metropolitan fringes. The migratory balance 2011–2018 per 100 initial residents that records long- and short-range movements of the Italian and foreign population is moderately positive everywhere, even in inland areas. Instead, the maximum values are reached in metropolitan Italy and medium-sized cities. The metropolitan fringes and urban-rural continuum achieve slightly lower values. The best trends are recorded along the entire Milan-Udine axis, in Trento, in the Parma-Bologna axis, in the Cuneo area, in Costa Smeralda, in the province of Latina, in the Neapolitan area and in the Foggia-Bari axis. The Change in the old-age index 2011–2019, on the other hand, shows us an ageing process of the population that is particularly relevant in inland areas but also significantly present in the urban-rural continuum and metropolitan fringes.

Of considerable interest is the evolutionary profile that emerges from the data on the percentage variation of employees. However, this confirms the trend towards territorial centralisation which is underway in Italy. Between 2012 and 2017, only metropolitan Italy and medium-sized cities saw an increase in employees, whereas other parts of Italy contracted. The maximum contraction is not recorded in inland areas, however, but in the urban-rural continuum. The geography of contraction always sees the Biella-Alessandra axis and the Po River axis emerge. Overall, the *Italia di mezzo* of Umbria and Calabria have a negative trend as well as the Marche-Abruzzo Adriatic axis and the Campagna region. Such dynamics are the product of a decline in manufacturing. In metropolitan

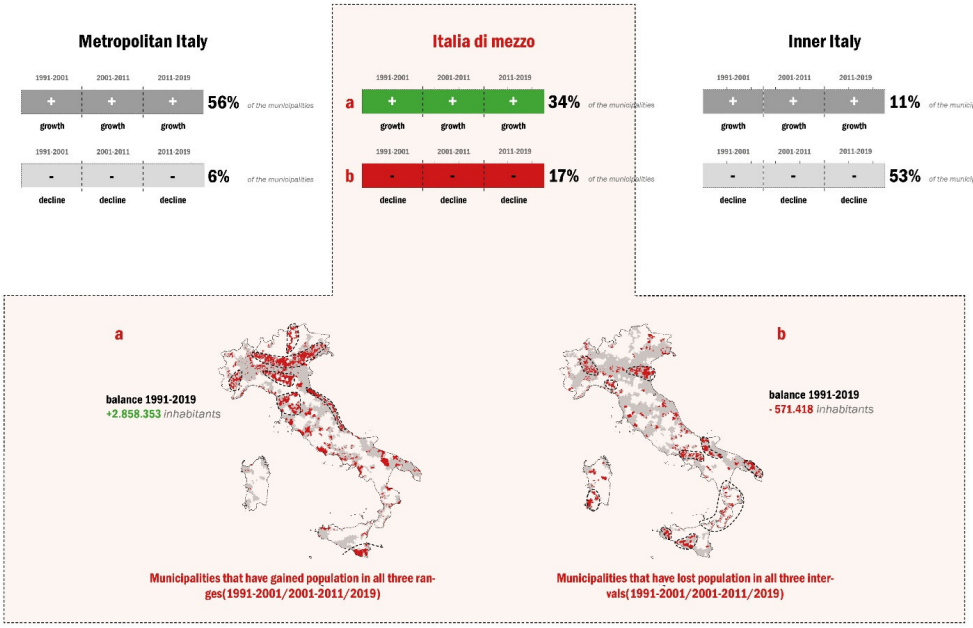

Figure 7: In many of its parts Italy is entering contraction processes after experiencing growth

Italy and some areas of *Italia di mezzo* with strong manufacturing traditions, such as in Piedmont and Friuli-Venezia Giulia, there are significant reductions of percentage change in the manufacturing sector 2012–2017. On the other hand, if we look at the percentage change in the advanced services sector for production and business 2012–2017, we can find favourable percentage variations, with maximum values in the urban-rural continuum. On the other hand, the change in percentage variation of employees in the social and health sectors 2012–2017 is positive everywhere, with high values in inland areas, following the metropolitan fringes and metropolitan Italy. But growth is more contained in medium-sized cities.

A further indicator that helps us describe a recent contracting condition is the percentage change in the average purchase and sale value of residential properties. Between 2012 and 2019, in the context of contraction in general sales prices, the slightest significant contraction is recorded in inland areas, in urban-rural continuum and in metropolitan fringes. This fact might seem to be in contrast with the demographic and employment dynamics; however, it can be explained by the still-present effects of the pre–2011 real-estate "bubble" in Italy in medium-sized cities and metropolitan Italy. There are extreme contractions in the Turin area, in Friuli-Venezia Giulia, in the Piacenza area, in the Caserta-Neapolitan area, in Tuscany, and throughout the Marche Adriatic coast south of Ancona. The latest indicator of the geography of the recent contraction concerns the per capita land take in the period 2012–2018. A high soil consumption is confirmed in inland areas and urban-rural continuum due to the robust construction production of second homes, the low-density building types, and the coexistence between abandoned and newly built properties following a land-use policy distorted by fiscal intent.

7 Conclusion

A fragment of Italy is blurred on the margins of scientific research, which is rarely the subject of integrated policies. National and EU policies have often represented an overly simplified description of Italy's territorial and urban articulation, almost solely through

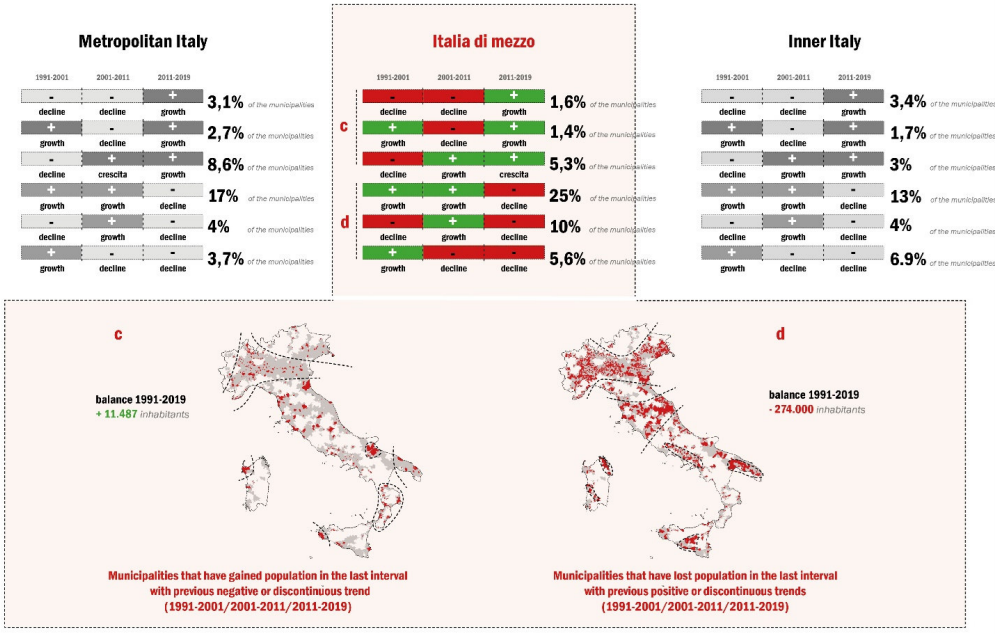

Figure 8: Contraction in non-homogeneous performances

the orientation towards inland and mountain areas on the one hand, sometimes reductively rethought as places suitable for a possible different domicile thanks to quality villages (see the recent announcement on villages by the Ministry of Culture linked to PNRR - National Recovery and Resilience Plan). On the other hand, there is a much stronger orientation towards metropolitan cities on which the country's possible progressive destinies tend to rely, thus sanctioning an apparent flaw in the territory. Within this fragmentation, in our opinion the question of *Italia di mezzo* arises, which is little observed and even less represented in its spatial, social and economic expressions and which offers alternative geography in its articulation, characterised by new imaginaries and policies for the territory.

From the socioeconomic point of view, a solid manufacturing and agricultural profile emerges as well as a significant presence of services that are suitable for people and businesses. More specifically, *Italia di mezzo* is the territory in which we can find the most important number of municipalities in the de jure industrial districts, although the significant presence of immigrants who have settled there is less obvious. Immigration is a strong presence linked to the employment of medium-low labour offered by the manufacturing / agricultural industry and personal services. A further common connotation is of a morphological-environmental type, far from the images of metropolitan polarities and those of sparsely populated inner areas. Overall, this very Italy is characterised by three settlement patterns: the first one encompasses territorial portions where a geography of urban nuclei, medium-sized or urban-rural cities and small towns is combined with many urbanised strands connected to each other. The second pattern relates to complex linear urbanisations (which incorporate various medium-sized coastal centres), whereas the third one refers to territories of widespread urbanisation (outside metropolitan areas).

In the various "Italies" investigated in this paper, two dynamics are combined: social polarization and the consolidated and recent demographic contraction. At the same time, being both in metropolitan Italy and inland areas, each of these dynamics in *Italia di mezzo* takes on its own specificity. Looking at social and economic indicators, *Italia di mezzo* has different profiles. A portion of the territory ranks in national average values such as the index of families in need of assistance, that of single-income families with

children under the age of six and the old age index. In some more limited cases, the values of social indicators reflect situations of lesser or greater discomfort; however, they maintain significant internal differences (especially with the classic distinction between north and south, where social distress is more concentrated with some exceptions). Following a long season of population and construction growth, which affected the metropolitan fringe territories to the detriment of metropolitan Italy and medium-sized cities, this process was reversed after 2011, highlighting a return to the centre. Most of the widespread urban-rural continuum seem to bring their behaviour closer to inland areas, marking the beginning of a new contraction that can be read in the trend of the population, employees, and value of the real-estate market. This contraction is undoubtedly linked to a re-centralisation of employment itself but is partly related to the residential preferences of urban inter-municipal markets. It is not a matter of homogeneous behaviours, especially since there are different critical situations in contrast to these dynamics: sometimes tourist filling, replacing residential filling, or actual depopulation.

Italia di mezzo has within it a little-recognised but fairly widespread combination of environmental discomfort and settlement malfunction. Above all, it becomes a critical issue because of its internal environmental problems. In this regard, it should be noted that this fragment of Italy records the highest percentage of the surface area occupied by polluted sites of environmental interest and the number of industrial plants with relevant risk of accident (RIR). The values of PM10, PM2.5 and NO2 reach very high indices, sometimes similar to those of some highly polluted metropolitan cities, especially those of the Po Valley. To these critical issues, the increased land consumption is added, albeit not with as relevant values as in the past. Still, substantial for already highly urbanised contexts, characterised by a strong dependence on cars for mobility.

What is perhaps the most perceived fragility condition in these territories remains to be explored. It is not a matter of the environmental-settlement condition, and it is not related to given socioeconomic patterns, but it is linked to an evolutionary trajectory. We are witnessing a transition from thirty years of solid growth (1960s–1990s) to twenty years of stagnation to more recent years which, although not everywhere, are marked by processes of relegation. A significant indicator is the unprecedented demographic contraction and perhaps a reduction in income from dependent and self-employed work, which is a hypothesis yet to be verified. Against this background, favouring multi-sectoral policies more attentive to socio-cultural and urban-environmental aspects is needed. We are witnessing a socio-demographic transition of the *Italia di mezzo* and the formation of new social fractures and differences within it. The increasingly different situations require new interdisciplinary analyses and interpretations. Producing scientific evidence becomes, then, fundamental also to support the initiatives of local authorities, increasingly faced with structures of municipal governance unable to address issues that are systemic, exogenous and conjunctural. It is also essential to connect a topological gaze, such as the one developed so far in this article, to a relational gaze in order to configure the *Italia di mezzo* territories no longer as simply middle or in-between, but as a possible intermediary and hinge between metropolitan areas and inland areas. On the one hand, they can provide assistance and support to less densely populated areas; on the other hand, by exploiting their infrastructural, social and accessibility capital, they can offer opportunities for decongesting the densest metropolitan areas.

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A Appendix:

Table A.1: List of indicators

Indicators	Year	Unit of measure	Source	Description
socio-demographic				
Old-age index	2018	index	ISTAT (A misura di comune)	Percentage ratio of the population aged 65 and over to the one aged 0-14
Incidence of adults with a diploma or degree	2011	%	8milaCensus ISTAT	Percentage ratio between the resident population aged 25-64 with a high school diploma or university degree and the resident population aged 25-64
Incidence of foreign residents	2011	‰	8milaCensus ISTAT	Incidence of foreign residents per 1,000 Italian residents as of 9 October 2011
Incidence of foreign residents	2019	‰	DemoISTAT	Incidence of foreign residents per 1,000 Italian residents as of 1 January 2019
Incidence of families with potential economic hardship	2011	%	8milaCensus ISTAT	Percentage ratio between the number of families with children with the reference person aged up to 64 in which no member is employed or retired from work and the total number of families
Incidence of young people outside the labour market and training	2011	%	8milaCensus ISTAT	Percentage ratio of residents aged 15-29 in a non-professional status other than students to residents of the same age
Incidence of families in need of assistance	2011	%	8milaCensus ISTAT	Percentage ratio between the number of families with at least two members, without cohabitants, with all members aged 65+ with at least one member aged 80+, and the total number of households.
Percentage change in resident population 2011–2019	2011–2019	%	ISTAT	Percentage change in resident population 2011 (9 October) – 2019 (31 December).
Natural balance 2011–2018 per 100 initial residents	2011–2018	%	DemoISTAT	Natural balance 2011 (9 October) – 2018 (31 December) per 100 initial residents
Migratory balance 2011–2018 per 100 initial residents	2011–2018	%	DemoISTAT	2011– 2018 migratory balance (9 October) – 2018 (31 December) per 100 initial residents

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Table A.1: List of indicators (continued)

Indicators	Year	Unit of measure	Source	Description
Change in the old-age index	2011–2019	index	ISTAT	
socio-economic				
Per capita gross income	2015	€/year	ISTAT (A misura di comune)	Total gross income of registry families / number of members of registry families.
Number of large active companies per 1,000 employees in the municipality	2017	‰	ISTAT-Asia	
Percentage of employees in the manufacturing sector 2017	2017	%	ISTAT-Asia	Percentage ratio between the number of employees in the Ateco C sector and the total number of employees in active Uls (Unità Locali– Local units)
Percentage of employees in the advanced services sectors	2017	%	ISTAT-Asia	Percentage ratio between the number of employees in the Ateco J, K, M sectors and the total number of employees in active Uls (Unità Locali– Local units)
Percentage of employees in the social and health sectors	2017	%	ISTAT-Asia	Percentage ratio between the number of employees in the Ateco P, Q sectors and the total number of employees in active Uls (Unità Locali– Local units)
Municipality in an industrial district	2011	0/1	ISTAT	Municipality that is or is not part of one of the 2011 industrial districts defined by ISTAT
Percentage of real-estate units reached by ultra-broadband 30Mb	2016	%	ISTAT (A misura di comune)	Real-estate units reached by the broadband / Total real-estate units per 100
Single-income households with children under the age of 6	2015	‰	ISTAT (A misura di comune)	Households in which there is at least one minor under the age of 6 and a single income earner / Single-income households per 100

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Table A.1: List of indicators (continued)

Indicators	Year	Unit of measure	Source	Description
Gaps in pre-tax income	2015	index	ISTAT (A misura di comune)	Ratio of the income of the richest households to the income of the poorest households. Total equivalent pre-tax income owned by 20% of those registered in the registry with the highest income / Total equivalent pre-tax income owned by 20% of those registered in the registry with the lowest income
Percentage variation of employees	2012–2017	%	ISTAT-Asia	
Percentage change in the manufacturing sector	2012–2017	%	ISTAT-Asia	
Percentage change in the advanced services sector for production and business	2012–2017	%	ISTAT-Asia	
Percentage variation of employees in the social and health sectors	2012–2017	%	ISTAT-Asia	
Percentage of agricultural area used (SAU) of the total municipal area	2010	%	Istat Censimento Agrocultura	
real estate				
Percentage of use of buildings	2011	%	Censimento ISTAT	Percentage ratio between unused buildings and total buildings
Percentage of use of real estate owned by municipalities	2016	%	AdE-MEF	Percentage ratio between the sum of unusable properties and unused properties owned by the municipality and the total buildings owned by the municipality
Average purchase and sale value of residential properties	2019, I sem.	€/m^2	AdE-MEF	Average purchase and sale values (max + min / 2) of properties in normal condition of all residential types

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Table A.1: List of indicators (continued)

Indicators	Year	Unit of measure	Source	Description
Percentage change in the average purchase and sale value of residential properties	2012–2019, I sem.	%	AdE-MEF	Percentage change between the first half of 2012 and the first half of 2019 in the municipal average purchase and sale value of residential properties
environmental				
Artificial land cover per capita	2018	m^2/ resident	ISPRA	
Percentage of municipal area occupied by "sites of national interest" (SIN)	2014	%	Ministero dell'Ambiente e della Tutela e del Mare (from Atlante web dei territori post-metropolitani)	
Maximum value of the maximum ground acceleration of the values of the grid points falling within the municipal area	2004	cm/s2	INGV (from ISTAT-Casa Italia: Mappa dei rischi dei Comuni Italiani)	Maximum ground acceleration (50th percentile) calculated on a grid with 0.02° step: maximum (MAX) of the values of the grid points falling within the municipal area
Percentage of resident population at risk in areas with average hydraulic hazard - P2	2017	%	ISPRA (from ISTAT-Casa Italia: Mappa dei rischi dei Comuni Italiani)	
Total number of industrial plants with relevant risk of accident (RIR)	2015	num	Ministero dell'Ambiente e della Tutela e del Mare (from DiPE: Urbanindex.it)	
Ozone pollutants (O3)	2016	µg/m^3	Copernicus	Average value for the ozone (O3): AOT40, AOT60, SOMO35, T40, T50, T80, T120, T240
Pollutants Nitrogen dioxide (NO2)	2016	µg/^{3}	Copernicus	Average value for nitrogen dioxide (NO2): T40, T200, T400
Pollutants Particulate Matter 10 microns (PM10)	2016	µg/^{3}	Copernicus	Average value for Particulate Matter 10 microns (PM10): T40, T50, T80.

continued on the next page

Table A.1: List of indicators (continued)

Indicators	Year	Unit of measure	Source	Description
Pollutants Particulate Matter 2.5 microns (PM2.5)	2016	$\mu g/^3$	Copernicus	Average value for Particulate Matter 2.5 microns (PM2.5): T25
Per capita land take in the period 2012–2018	2012–2018	m^2/ resident	ISPRA	Artificial land cover 2018 - Artificial land cover 2012 / Resident population 2018

Table A.2: Descriptions of the Italian municipalities

Municipalities	Description
ultra-peripheral municipalities	The municipalities that are part of the classification: SNAI Ultra-Peripheral Municipalities with more than 5,000 inhabitants; SNAI Ultra-Peripheral Municipalities with 5,000 or fewer inhabitants. Considered peripheral are the municipalities that are part of the classification: SNAI Peripheral Municipalities with more than 5,000 inhabitants; SNAI Peripheral Municipalities with 5,000 or fewer inhabitants. Considered intermediate are the municipalities that are part of the classification: totally mountainous SNAI intermediate municipalities with more than 10,000 inhabitants; Totally mountainous SNAI intermediate municipalities with 10,000 or fewer inhabitants.
large de facto and de jure metropolitan areas	The municipalities that are part of the classification: Municipalities in Cities of FUA Large Metropolitan OECD capitals of Metropolitan Cities (Naples, Rome, Turin, Milan); Municipalities in Cities of FUA Large Metropolitan OECD, not capital cities; Municipalities in Commuting zones of FUA Large Metropolitan OECD included in Metropolitan Cities.
de facto and de jure metropolitan areas	The municipalities that are part of the classification: Municipalities in Cities of FUA Metropolitan OECD included in Metropolitan Cities (Cagliari, Palermo-Bagheria, Catania, Bari-Bitonto-Molfetta, Florence, Genoa, Bologna, Venice); Municipalities in Commuting zones of FUA Metropolitan OECD included in Metropolitan Cities.
de facto or de jure Metropolitan Area Centres	Considered de facto or de jure Metropolitan Area Centres are the municipalities that are part of the classification: Municipalities in Cities of FUA Metropolitan OECD not included in Metropolitan Cities (Bergamo, Brescia, Verona, Padua, Parma, Reggio Emilia, Modena, Perugia, Prato, Taranto); Municipalities in Cities of FUA Medium OECD capitals of Metropolitan Cities (Messina, Reggio Calabria)

continued on the next page

Table A.2: Descriptions of the Italian municipalities (continued)

Municipalities	Description
de facto but not de jure metropolitan areas	The municipalities that are part of the classification: Municipalities in Cities of FUA Large Metropolitan but outside Metropolitan Cities (valid only for Milan); Municipalities in Commuting zones of FUA Large Metropolitan but outside Metropolitan Cities; Municipalities in Commuting zones of Metropolitan FUA but outside Metropolitan Cities; Municipalities in Commuting zones of FUA Medium included in Metropolitan Cities; Other Municipalities with more than 50,000 inhabitants in Metropolitan Cities; Other Municipalities with populations between 20,001 and 50,000 inhabitants in Metropolitan Cities; Other Municipalities with populations between 5,001 and 20,000 inhabitants in Metropolitan Cities; Other Municipalities with 5000 inhabitants or less in Metropolitan Cities.
cities with functional centrality	The municipalities that are part of the classification: Municipalities in Cities of FUA Medium and Small OECD provincial capitals (Alessandria, Asti, Novara; Como, Cremona, Lecco, Pavia, Varese; Treviso, Vicenza; Bolzano, Trento; Savona, La Spezia; Ferrara, Forlì, Piacenza, Ravenna, Rimini; Pordenone, Udine, Trieste; Arezzo, Grosseto, Livorno, Massa, Pisa; Terni; Ancona, Pesaro; Latina; L'Aquila, Pescara; Campobasso; Avellino , Caserta, Salerno; Andria, Barletta, Brindisi, Foggia, Lecce with Surbo, Trani; Matera, Potenza; Catanzaro, Cosenza; Gela, Ragusa, Syracuse, Trapani; Sassari); Municipalities Cities of FUA Medium and Small OECD that are not provincial capitals (Gallarate, Carpi, Sassuolo, Battipaglia, Cerignola, Bisceglie, Gela).
traditional medium-sized cities	The municipalities that are part of the classification: Capital cities with more than 50,000 inhabitants (Cuneo, Rovigo, Cesena, Lucca, Pistoia, Siena, Viterbo, Benevento, Teramo, Chieti, Agrigento, Caltanissetta, Crotone, Olbia); Non-regional centres with more than 50,000 inhabitants (Sanremo, Faenza, Fano, Carrara, Viareggio, Foligno, Cava de 'Tirreni, Manfredonia, San Severo, Lamezia Terme, Marsala, Modica, Vittoria); Provincial capitals with between 20,001 and 50,000 inhabitants (Aosta, Biella, Verbania; Vercelli, Sondrio, Mantua; Belluno; Gorizia; Imperia; Ascoli, Macerata, Fermo; Rieti, Frosinone; Vibo Valentia; Enna; Nuoro, Carbonia, Iglesias, Oristano).
minor poles	The municipalities that are part of the classification: Other municipalities Polo SNAI with 50,000 or fewer inhabitants; Other municipalities SNAI inter-municipal hub with 50,000 or fewer inhabitants.
suburban belt municipalities	The municipalities that are part of the classification: Other municipalities SNAI belt with more than 10,000 inhabitants; Other municipalities SNAI belt with 10,000 or fewer inhabitants.
intermediate municipalities	The municipalities that are part of the classification: Other SNAI intermediate municipalities with more than 10,000 inhabitants; Other municipalities Intermediate SNAI with 10,000 or fewer inhabitants.

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Territorial Infrastructure Support Index (ISIT): A theoretical and empirical contribution to the analysis of lag zones in Chile

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Abstract. Through a review of the literature on infrastructure, a study of international experiences, expert knowledge, and the elaboration of a Territorial Infrastructure Support Index (ISIT), this paper provides a comparative analysis of the development conditions – regarding infrastructure and services – for the location of productive economic activities, at the regional and provincial level in Chile. The results show contrasts between regions and within them, revealing the state of the current situation for each of the six dimensions: Water, Energy, Telecommunications, Roads, Logistics, and Resilience, as well as for their synthetic indicator ISIT. The results of the ISIT have been contrasted with the recent definitions made by the Government of Chile regarding the definition of lag zones, finding important coincidences at the provincial level that allow validating the ISIT as a tool for the analysis of gaps in infrastructure and equipment for development of economic and productive activities in Chile.

Key words: Infrastructure, region, lag zones and indicators

1 Introduction

The objective of this work is to investigate the possible impacts that infrastructure has on socio-territorial development in Chile, for which it is posed as a question how the gaps in productive economic development are related to the declared lag zones in the country. In particular, an index called Development of the Territorial Infrastructure Support Index (ISIT) is applied, which considers six dimensions: Water, Energy, Roads, Telecommunications, Logistics, and Resilience at a provincial scale and is contrasted with the geostatistical results provided by the information on lag zones.

The hypothesis of this work is that a lag zone is deprived of infrastructure for socio-territorial and productive development, deepening the conditions of isolation and widening the gaps with respect to zones that are provided. Although geographical conditions that isolate a territory are decisive for the definition of a lag zone, we believe that infrastructure represents the opportunity to overcome these conditions and improve the quality of life of its inhabitants and the productivity of their economic activities.

For this purpose, two work objectives are proposed: (1) Analyze and compare the gaps in infrastructure for the economic-productive development existing in the country

in a multidimensional way based on the ISIT; (2) Compare the level of coincidence with the definition of lag zones established by the Chilean state.

First, the article provides some background on the theoretical and empirical framework used, from the review of international literature and working documents of the Chilean state. Then, what characterizes the lag zones is defined and it is explained how the ISIT was elaborated, to subsequently analyze its cartographic representation at a provincial scale and its contrast with the resulting cartography of the lag zones. Finally, some conclusions are delivered that reflect on its scope in terms of decentralization and regionalization in the current context of political and institutional transformations in which the country finds itself.

2 Theoretical framework

The economic literature on infrastructure began with research efforts to explain the positive correlation between infrastructure development and rapid economic growth of the industrial economies (Banerjee et al. 2020). Agénor (2010) suggests that an increase in the share of public spending on infrastructure leads to a steady high growth state. This is because infrastructure affects the production and public services such as health and, therefore, labor efficiency.

In this direction, different authors have argued that infrastructure reforms geographic connectivity and contributes to the agglomeration of economic activities (Fujita, Krugman 2004). Likewise, infrastructure reduces costs and trade flows, thus positively influencing economic development (Cohen 2010). Therefore, prosperity and regional growth depend primarily on the indirect effects of infrastructure (Chen, Haynes 2015).

Recent studies have shown that infrastructure provides the necessary services that support economic growth by increasing the productivity of labor and capital, thereby reducing production costs and increasing profitability, output, income, and employment. (Zolfaghari et al. 2020). Additionally, it is increasingly recognized that infrastructure plays a vital role in promoting growth and reducing poverty in under-developed countries (Gramlich 1994).

Empirical evidence on regional inequality and investment in infrastructure has shown, for example, that improving road infrastructure can help increase labor force participation to reduce income inequality (Calderon, Servén 2004). Similarly, other types of infrastructure, such as communications, drinking water, and electricity networks, can promote income growth in rural sectors and reduce the gap between rural and urban areas (Wan, Zhang 2015). Similarly, Straub (2008) points out that investment in infrastructure directly affects the increase or decrease of the gaps between rich and poor regions within the same countries.

Based on these facts, governments, institutions, and the research community recognize the importance of infrastructure in economic and territorial development. However, the distributional effects of infrastructures have not been sufficiently explored (Wan, Zhang 2015), revealing that one of the main problems is the unequal distribution of infrastructure provision in the territories (Zhang et al. 2017).

The infrastructure is relevant to connect all kinds of territories, especially those lagged or with peripheral conditions. These zones usually are isolated from other zones because of physical and human factors (Farole 2013, Hanks 2011). In other words, they are separated from the leading zones and circuits both physically and economically (Brad et al. 2015). The infrastructure represents a critical opportunity for improving lagging conditions, allowing more accessibility to and from the lag zones.

In the case of Chile, although there has been significant increase of infrastructure development in recent decades, some gaps continue to be observed in the form of regional inequalities, quality of local infrastructure, and the population's exposure to negative externalities derived from economic growth (OECD 2017), such as the contamination, and decrease of hydric resources due to the mining industry. Additionally, it is still necessary to overcome existing infrastructure deficiencies (MOP 2007) and contribute to a more homogeneous distribution of their provision, particularly in terms of roads, telecommunications, and water reserves. In this sense, the Ministry of Public Works

(2007) indicates that it is necessary to increase the country's competitiveness, improve the population's quality of life, and concentrate public investment in sectors and territories where social profitability[1] is higher, with social and territorial equity. This vision is inserted in the Infrastructure Director Plan 2010-2025.

Chile is a unitary and centralized country, (OECD 2017), in particular, concerning the issues of decentralization and public investment, Orellana Ossandón et al. (2021) argue that when clear and transparent rules do not regulate the criteria that control the allocation of these types of public investment, they do not have a significant impact on the final result. Additionally, the distribution of territorial infrastructure in Chile is dominated by non-programmatic logic, in which the politicians in charge of the distribution make use of discretion to improve their electoral results (Orellana Ossandón et al. 2021). Chile's subnational investment in infrastructure is mainly framed in transportation and public works, decided centrally by the sector ministries (OECD 2017).

Faced with this situation, one of the main challenges faced by political systems to advance towards sustainable urban development, lies in defining established technical criteria that direct the thematic and geographical prioritization of public investment in territorial infrastructure on standards of territorial equity or economic efficiency (Orellana Ossandón et al. 2021). This is necessary to counter possible relationships between election results and public investment spending, as has happened in Greece, where ruling parties have tended to reward constituencies that return them to power (Rodríguez-Pose et al. 2016).

In the same way, it is crucial to value private investment. According to the Critical Infrastructure for Development Report (2018), developed by the Chilean Chamber of Construction, more than 60% of the total investment in infrastructure for the next decade requires the participation of the private sector. In fact, 32% could be provided entirely and directly by the private sector if the correct incentives and institutional frameworks are created, and another 29% could be provided under a mixed regime (with public and private financing) (CChC 2018).

Studies in line with the Keynesian vision show a complementarity between public and private investment, arguing that this effect is because public investment is generally limited to goods and services that the private sector will not produce in optimal quantities (Ouédraogo et al. 2020). In this sense, public investment in infrastructure tends to complement private investment because it facilitates the implementation and realization of investment plans by private agents (Martinez-Lopez 2006). Along the same lines, Abiad et al. (2016), using a simulation model, highlighted that increased public investment increases production, both in the short and long term, and increases private investment.

3 Marginal territories

The advanced marginality is concentrated and isolated in delimited territories. It is often associated with territorial stigmatization from the outside and inside (Wacquant 2007). Also, there is a loss or dissolution of the "place" itself because of the physical and socioeconomic conditions, which disadvantage the territory resulting on dependency over other territories (Tort 2003). In this line, the functional relationship between a center and its periphery determines the marginality of the region because they are distant, dependent, and different (Ferrão, Lopes 2004 in Vecchio 2022).

They are distant in a physical and/or in an economic view, where rural and non-productive territories, for example, are left aside from infrastructure development and financial flows. Also, they are dependent because of the lack of labor markets and a sustainable commerce of goods and services in the territory. Finally, they are different because of their own conditions of disadvantage which make them unattractive. Territorial marginality is related to a specific space and location, including the participation, or its lack thereof, in the economic dynamics (Vecchio 2022). There is often an absence

[1] It refers to a project evaluation and prioritization criterion that Chile has used to allocate public resources since 1975, which compares investment at social prices with the number of direct beneficiaries impacted by the project, pointing to purely economic issues and not the beneficiary end (society)

Table 1: Percent of susceptible districts to be lag zones by region in Chile

Region	Total number of district	Number of susceptible districts	Percent of susceptible districts in the region
Arica y Parinacota	4	0	0.00%
Tarapacá	7	3	42.9%
Antofagasta	9	7	77.8%
Atacama	9	3	33.3%
Coquimbo	15	8	53.3%
Valparaíso	38	4	10.5%
Metropolitana de Santiago	52	12	23.1%
Libertador General Bernardo O'Higgins	33	7	21.2%
Maule	30	10	33.3%
Ñuble	21	8	38.1%
Biobío	33	15	45.5%
La Araucanía	32	9	28.1%
Los Ríos	12	6	50.0%
Los Lagos	30	17	56.7%
Aysén Del General Carlos Ibáñez Del Campo	10	6	60.0%
Magallanes Y De La Antártica Chilena	10	5	50.0%
TOTAL	345	120	39.0%

Source: SUBDERE, 2022

of institutions that could benefit the inhabitants or promote new developments through investment in infrastructure. Some of these territories do not have a minimum population which justifies the investment from a cost-benefit perspective. Eventually, this ends in a vicious circle where marginality remains.

Marginal territories are related to the concept of accessibility. This concept has produced a paradigm shift in various research fields, from transportation studies to digital human interactions, as well as in multiple disciplines such as engineering and geography, to name a few (Greco 2018). Accessibility is understood as the potential to access a specific activity. Said potential depends on the ease or difficulty of reaching different points in space and the level of attractiveness or magnitude of the opportunities. In other words, it implies integration over the space of possibilities, weighted by the ease of interaction (Miller 2018). In this sense, due to their peripheral nature, marginal territories lack this potential due to the difficulty of access due to lack of means (infrastructure) and low attractiveness. Investment in infrastructure in these territories tends to be considered inadequate to cover their demand because their population is small and dispersed, making it difficult to justify this investment (Vitale Brovarone, Cotella 2020).

In the case of Chile, an adequate approximation to define this condition of marginal territories is possible from the definition of what, from the field of public policies, is called "lag zones". According to the Subsecretaría de Desarrollo Regional (SUBDERE), it refers to the existence of territories that live in conditions of lag with respect to the country average, for which the program proposes to reduce social and economic gaps prioritized participatively by the public and private actors of each lagging territory. The methodology for defining lag zones considers the district[2] as a unit of territorial analysis. Among the analysis variables that it contemplates are: level of isolation due to geographic or climatic conditions or availability of connectivity infrastructure; travel time to education and health facilities; travel time to services (financial institutions, among others). Table 1 shows the percentage of districts in each region that are susceptible to be classified as lag zones.

4 Approach of the research and methodological application

This work poses as research question: To what extent are the existing gaps in infrastructure for economic-productive development related to the condition of lag zones in the

[2]District is the smallest territorial unit in administrative political terms in Chile.

country? For this purpose, it is maintained as a working hypothesis that, although the lag zones determined by public policy in Chile are limited to aspects related to factors related to the level of isolation of human settlements in terms of connectivity, access to health, education and services, there is a close relationship between endogenous factors (geographical and climatic) with exogenous factors (public and private investment in infrastructure) which together explain the existing gaps between Chilean regions.

4.1 Development of the territorial infrastructure support index (ISIT)

Public and private investment decisions that favor the economic and social development of the country, expanding the geography of opportunities, require indicators that allow establishing the pre-existing conditions of the territory as a source of resources and supporting activities. Thus, based on the report on Critical Infrastructure for Development 2018-2027 prepared by the Chilean Chamber of Construction (CCHC), we carried out a detailed and systematic analysis of investment requirements in fourteen critical sectors for sustainable development in Chile, including water resources, energy, telecommunications, interurban roads, urban roads, airports, ports, railways, logistics, public spaces, hospitals, prisons, education, and resilience.

Subsequently, we organized workshops with Chilean infrastructure and land planning experts to collect recommendations on infrastructure measurement. Also, we reviewed international experiences at a subnational scale (whether regional or interurban) about measuring and comparing aspects related to critical infrastructure for the development of the economic-productive system of a country, such as the Index of Logistics Performance of the World Bank, logistics observatories and indicators of regional integration of Economic Commission for Latin America and the Caribbean, the World Competitiveness Index developed by the International Institute for Management Development Competitiveness Center, among others.

Concerning this, there is a need to exploit, for example, the potential of accessibility indicators as a support tool in infrastructure planning tasks aimed at efficiency and territorial cohesion (Ortega et al. 2014). Likewise, the medium or long-term investment plans, which include indicators of infrastructure gaps and focus on a territorial basis, could play a key role in moving towards a territorially inclusive country (Orellana Ossandón et al. 2021). In addition, a system of indicators highlights territorial inequalities (e.g., greater or lesser coverage of drinking water) and the existing elements that support local communities' social and economic development (Vișan 2019). Other authors, such as Sherval (2009), also point out that constructing a quantitative indicator for specific territorial contexts, (like urban and rural territories), is crucial to guide decision-makers in distributing public subsidies for disadvantaged regions.

Based on the review of various experiences in the development of indicators (Steiniger et al. 2020), such as the System of Indicators and Standards of Urban Development (SIEDU)[3], Rural Life Quality Indicators System (SICVIR)[4], and Urban Quality of Life Index (ICVU)[5], we elaborated the Territorial Infrastructure Support Index (ISIT). The ISIT refers to the territorial aptitude relative to network infrastructures and services for the development and competitiveness of the various activities of the national economic-productive system at the provincial level. Based on the indicators systems mentioned above, we established six dimensions of the ISIT: water, energy, telecommunications, roads, logistics, and resilience. Each one is briefly explained below:

- Water; provision, and coverage of drinking water and sewerage in urban and rural areas, as well as rainwater.
- Energy; related to the provision in the territory of electricity, fossil fuels, and the use of renewable energies.
- Telecommunications; coverage, and quality of fixed and mobile telephone services, and internet in urban and rural areas.

[3] https://www.ine.cl/herramientas/portal-de-mapas/siedu/
[4] https://www.ine.cl/herramientas/portal-de-mapas/sicvir
[5] https://estudiosurbanos.uc.cl/documento/indice-de-calidad-de-vida-urbana-icvu-2021/

- Roads; coverage, and quality of the interurban road infrastructure network on primary and secondary roads.

- Logistics; coverage, and proximity of equipment and services required to support economic-productive development in the territory.

- Resilience; provision of equipment and services to respond to exposure to socio-environmental risks.

For example, on issues of water resources, Ali et al. (2020) developed a regional drought indicator, which provides sufficient evidence for establishing effective drought mitigation policies and early warning strategies. In the case of Chile, the main objective of investments associated with water resources for the next decade is to have infrastructure works that allow the progressive supply of all kinds of demands, both for drinking water service and for environmental, ecological, and productive uses (CChC 2018).

Regarding energy development, Yang et al. (2020) suggest that an effective infrastructure investment strategy could optimize the reallocation of energy resources (e.g., more finance on renewable energies instead of carbon or oil), promote coordinated development between regions, and reduce regional development inequality. Likewise, investment in energy infrastructure can improve social welfare for the poor people's demand for vital energy resources, such as gas and electricity (Li et al. 2018). Also, Gunnarsdóttir et al. (2020) argues that sustainable energy development is a political objective that requires solid indicators. Often, indicators emphasize the economic impacts of energy developments (Allan et al. 2014, Black et al. 2014, Lekavičius et al. 2019) and little or no recognition of environmental or social impacts.

It is essential to highlight the telecommunications infrastructure's role as a driver of GDP and the greater demands for data traffic expected in the future. Although Chile presents high penetration values for residential and mobile internet in the regional context, the country reaches only 70% of the average mobile internet penetration in OECD countries (CChC 2018). Internet access is a challenge in Latin America and the Caribbean, requiring continuous and specific public policies to achieve universal coverage (Serebrisky, Suárez-Alemán 2019).

Concerning these last three dimensions, the input-output matrices[6] illustrate, for example, that water resources, electricity, and telecommunications are used in the production process of almost all sectors, while transport is a transversal input to all of them (Zolfaghari et al. 2020). Indeed, improvements in transport infrastructures positively impact regional development and significant repercussions on the economy and affect many processes (Ortega et al. 2014).

Transport infrastructure is a vital social and economic resource and provides access to current economic and social opportunities (Richardson 2005). Investment in the construction and maintenance of transport infrastructure is enormous, and its repercussions can be seen in all areas of society (Hildén et al. 2004). Regarding this, the road infrastructure supply for better mobility and transportation performance is generally used as an indicator and can be measured from four perspectives: state of the pavement, traffic capacity, safety, and accessibility (Alavi et al. 2016, Dong, Huang 2015, Song et al. 2020). In terms of interurban roads, the importance of roadways in the entire national infrastructure is evident. The geographical configuration of Chile and the scarcity of road alternatives in many parts of the territory means that inland highways and roads take a leading role in the transportation networks of people and goods (CChC 2018).

Logistics is considered the necessary infrastructure to make the freight transport value chain more efficient (CChC 2018). The needs at the national level are associated with improving the efficiency in the treatment of cargo and the transitions between means of transport, following the complete value chain of the merchandise, from its origin to its destination (CChC 2018).

[6] input-output matrices of the central bank of Chile, available at https://si3.bcentral.cl/estadisticas/-Principal1/Excel/CCNN/cdr/excel.html.

4.2 ISIT Selected Variables

The selection of variables to calculate the ISIT involved a procedure that combined two stages. In the first stage, we preselected around 70 indicators distributed in the six dimensions based on national (SIEDU, SICVIR, ICVU) at a territorial scale superior to the city scale or international (OSD, OECD) measurement experiences (Steiniger et al. 2020), published studies, and expert knowledge through interviews and a workshop with members of the infrastructure committee of the Chilean Chamber Construction (CChC). In a second stage, 43 indicators were selected (see Annex 1), based on three critical considerations: availability of official sources to prepare the ISIT periodically and obtain comparable results for the Chilean case, geographical and climatic conditions[7] of each province to make a valid relative comparison, always making sure that each indicator has the 56 provinces.

Further information on the indicators (including all ISIT dimensions with 8 Water dimension indicators, 6 Energy indicators, 5 Telecommunications indicators, 7 for Roads Network indicators, 8 Logistics indicators, and 9 Resilience indicators) is available in the Annex 1. The calculation formula, the institutional source, and the update year are established for each indicator by dimension.

4.3 Indicators by dimensions and synthetic indicator

For the elaboration of the ISIT, from the 43 indicators and their six dimensions, a Principal Component Analysis (PCA) was applied to enable the construction of a synthetic indicator for each dimension evaluated in the ISIT (Shahabi et al. 2012).

Before performing the PCA, all the variables will be normalized between 0 and 100. In addition, the scale of those variables whose original value scale is negatively or inversely proportional to good support of the territorial infrastructure was inverted. Therefore, 0 is considered the minimum or least favorable value for all variables, and 100 is the maximum or best value for supporting the territorial infrastructure.

Each Principal Component (CP) obtained from the analysis is a linear combination of all the indicators, where each one obtains a specific coefficient or weight (eigenvalue). The analysis yields several CPs equal to the number of indicators, and where each CP explains a certain percentage of the total variance.

To generate indicators by dimension, the weights obtained in the PCA are reduced to a single coefficient per indicator. First, the absolute value of each indicator's weight in each dimension, relative to each PC, is multiplied by the percentage of the variance that explains said PC. This process is repeated for each indicator, considering the CP values (see equation 1). After obtaining a single coefficient per variable, a cut-off value (benchmark) is established to select the indicators that make up the final index. The criteria for choosing the cut-off value will be discussed at the work table; however, as an initial criterion, it is suggested to select a benchmark that leaves a minimum of 2 to 3 variables per area. Then, all those indicators with coefficients higher than the benchmark are chosen.

$$Cv_{\,comp1} = PVar1_{\,comp1} * \%S^2_{var1} \tag{1}$$

where

$comp1$ ... Component 1,
Cv ... Final Variable Coefficient,
$PVar1$ ... Variable Weight 1,
S^2 ... Variance.

Subsequently, for the final calculation of each dimension, the coefficients obtained are scaled for the selected indicators to add up to 100 in each area. Then, the provincial values of each indicator (previously normalized) are multiplied by the coefficient and added by dimension. Therefore, the province that has the maximum score in all the indicators of a dimension will have a score of 100 in that dimension.

[7]Some indicators are available only for coastal zones or specific climatic zones (presence of vegetation, among other characteristics).

Table 2: Population and area distribution by region in Chile

Region	Population	% Population	Surface	% Surface
Arica y Parinacota	226,068	1.3%	16,873	2.2%
Tarapacá	330,558	1.9%	42,225	5.6%
Antofagasta	607,534	3.5%	126,049	16.7%
Atacama	286,168	1.6%	75,176	9.9%
Coquimbo	757,586	4.3%	40,579	5.4%
Valparaíso	1,815,902	10.3%	16,396	2.2%
Metropolitana	7,112,808	40.5%	15,403	2.0%
O'Higgins	914,555	5.2%	16,387	2.2%
Maule	1,044,550	5.9%	30,296	4.0%
Ñuble	480,609	2.7%	13,178	1.7%
Biobío	1,556,805	8.9%	23,890	3.2%
Araucanía	957,224	5.4%	31,842	4.2%
Los Ríos	384,837	2.2%	18,429	2.4%
Los Lagos	828,708	4.7%	48,583	6.4%
Aysén	103,158	0.6%	108,494	14.3%
Magallanes	166,533	0.9%	132,297	17.5%
TOTAL	17,573,603	100.0%	756,097	100.0%

Source: Own elaboration, according to INE data, 2022

4.4 Classification for comparative analysis

Given that there is no possibility of comparing the ISIT with any national or international reference that would allow recognizing specific standards in some dimensions, four levels were determined; High, Medium-High, Medium-Low, and Low, based on the results obtained from the statistical processing itself. So then, the territorial aptitude of the ISIT or some dimension would be:

HIGH (dark green) : When the indicator by dimension or synthetic for a province is above the average plus mean standard deviation. $x > \bar{x} + \sigma$

MEDIUM-HIGH (light green) : When the indicator by dimension or synthetic for a province is between the average plus the mean, standard deviation, and the average. $\bar{x} < x < \bar{x} + \sigma$

MEDIUM-LOW (light brown) : When the indicator by dimension or synthetic for a province is between the average and the average minus the mean, standard deviation. $\bar{x} - \sigma < x < \bar{x}$

LOW (dark brown) : When the indicator by dimension or synthetic for a province is below the average minus the mean, standard deviation. $x < \bar{x} - \sigma$

The results for each dimension and the ISIT are represented cartographically, a question that allows observing the differences between regions and within them, showing the contrasts that exist to make the location of some economic-productive activities more feasible depending on what affects them in each dimension.

5 Analysis of results

The regions that conform to the continental territory of Chile present an uneven distribution in terms of their surface and demographic terms, as can be seen in Table 2, organized from north to south.

To better visualize the contrasts existing in the country, in demographic and territorial terms, Table 2 shows that while the Metropolitan region concentrates 40,5% of the population, it only occupies 2,0% of the continental surface. In contrast, the Magallanes

region only concentrates 0,9% of the population and occupies 17,5% of the national territory. Regions such as Antofagasta in the north and Aysén in the south present the same pattern as Magallanes.

The latter reinforces the centralist and unitary character of the Chilean state, as can be seen in Graph 1 were, from north to south, between the regions of Valparaíso and Biobío (5 regions of 16 regions), 73,5% of the population is concentrated, only occupying 15,1% of the national territory. It is crucial to point out that in the OECD report on Chile (OECD 2017), it is stated textually, "Chile has opted for a mixture of two models: on the one hand, a liberal economic model that relies on the ability of the market to distribute resources and tends to limit public intervention. And, on the other hand, a 'centralist model of political administration' is understood as a way to maintain stability, protect national unity, and contribute to economic efficiency and social redistribution. This model places Chile in a unique situation compared to other OECD countries, with low total public spending (as a percentage of GDP) as well as a low level of subnational spending (as a percentage of total public spending)" (p. 8).

The combination of models has made it possible to develop exports focused primarily on the primary sector, with an estimated US$50 billion in exports. This sector is mainly concentrated in mining (50,8%), fruits (9,4%), forestry (7,1%), and aquaculture (6,5%). Mining activity is concentrated in the northern area and the rest are located in the country's southern area, while in the Metropolitan region where the country's capital is located, the commerce and services sector prevail far above the percentage of the population with just over 70,0%.

6 ISIT provincial results

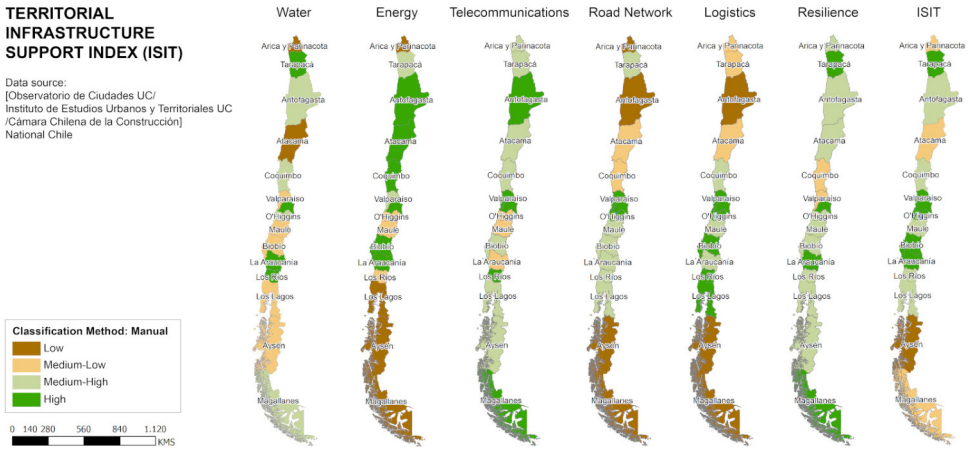
The results of the preparation of the ISIT are presented below, considering two scales of analysis; interregional and intraregional. The interregional analysis allows comparing the ISIT and its dimensions between the different regions of the country. And, the intraregional analysis will enable us to verify the existing contrasts within each region from the results that are represented at the provincial level.

6.1 Interregional Analysis

The interregional analysis is shown in Figure 1, where the results obtained for each region are presented, once applied in PCA and selected the 25 indicators that express the most significant variance, considering a distribution of water with three indicators, energy with four, telecommunications with four, roads with five, logistics with five and resilience with four.

In general, the interregional maps show that the different dimensions of the ISIT in the central macro zone of the country are more favorable compared to the north and south of the country, particularly concerning the southern zone (regions of Aysén and Magallanes), in contrast to a High and Medium-High level of territorial aptitude for the Metropolitan region in almost all dimensions, exceptionally in the telecommunications dimension. Then, the Biobío, Valparaíso, and La Araucanía regions present results with a High and Medium-High level in all their dimensions, although with a greater tendency towards a Medium-High level of territorial aptitude and other Medium-Low. The rest of the regions of the central macrozone, such as the O'Higgins and Maule regions, mainly present a territorial aptitude at a Medium-High level. Both also show a low level in the telecommunications dimension.

Figure 1 also shows a significant level of contrast between dimensions in the extreme north of the country. On the one hand, while the energy dimension is presented with an excellent territorial aptitude, especially in regions with a significant presence of large copper mining such as Tarapacá at the Medium-High level, Antofagasta and Atacama at the High level, which has promoted private investment in terms of development, the supply and diversification of energy sources, mainly through solar and wind energy. And, on the other hand, in the roads and logistics dimensions, territorial aptitude is presented at a Low and Medium-High level, most likely due to the high concentration



Source: Own elaboration, 2022

Figure 1: Interregional comparison by dimension of the ISIT

of the population in its regional capitals and the low level of development of its smaller cities without good alternatives for transportation of workers to mining sites.

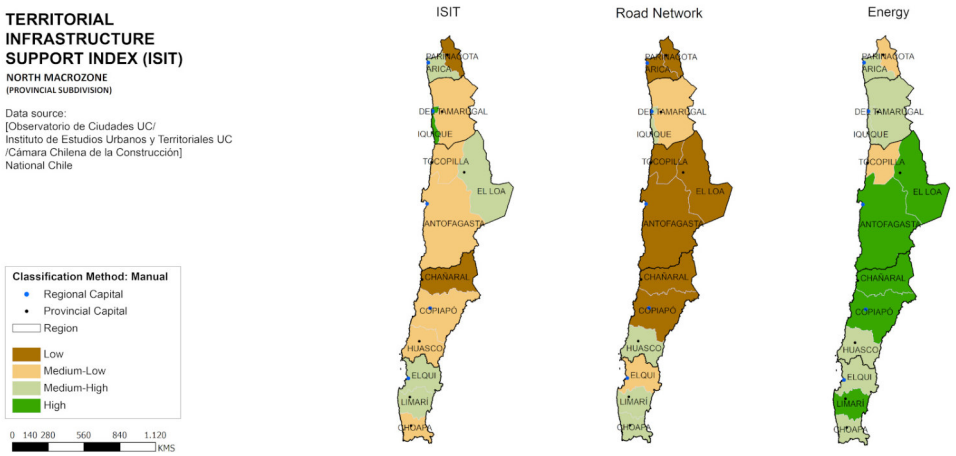
And, in the extreme south, from Los Ríos Region towards the southern zone, the regions show a deterioration in most dimensions, where they mostly reach a Low or Medium-Low territorial aptitude, except for the telecommunications and water dimensions. Figure 1 also shows the characteristics of a territory with rugged geography from the region of Los Lagos to the south, making surface connectivity especially complex in Aysén and Magallanes. In addition, it is an area with historically low population occupation. These two regions cover a third of the country's continental surface but only account for 1,5% of the national population.

Lastly, the ISIT, as a synthetic indicator that results from the average of the six dimensions, shows that only the Metropolitan and Valparaíso regions reach a High territorial aptitude. This situation deteriorates towards the north, reaching a low ISIT level in the Arica and Parinacota Region. In contrast, to the south between the O'Higgins and Los Ríos regions, a Medium-High territorial aptitude predominates, then the Los Lagos, Aysén, and Magallanes regions present an ISIT at Low level. In conclusion, in interregional terms, the country presents critical imbalances in infrastructure and equipment for economic-productive activity that limits its growth and economic development potentials, already warned by the OECD (2017) report and other similar studies.

6.2 Intraregional Analysis by Macrozone

Based on the interregional results, this section reviews the results obtained at the provincial level, considering an analysis based on macro zones. Four macro zones will be considered: The North (regions of Arica and Parinacota, Tarapacá, Antofagasta, Atacama, and Coquimbo); the Central North (Valparaíso, Metropolitana, and O'Higgins), the Central-South (Maule, Biobío, Araucanía, and Los Ríos), and the South (Los Lagos, Aysén, and Magallanes). The intraregional analysis is conducted from north to south for the 55 provinces defined in the continental territory.

The presented analysis shows the contrast between those dimensions where there is greater contrast in the results. That is, where provinces tend to be concentrated in a Low or Medium-Low aptitude versus that of a more favorable dimension, where the provinces are concentrated in the High and Medium-High levels. Likewise, the result of the synthetic index obtained by the provinces of each respective macrozone is presented.



Source: Own elaboration, 2022

Figure 2: ISIT of provinces of the northern macrozone

6.3 Analysis of Provinces of the Northern Macrozone

Figure 2 shows the results by province of the five regions that belong to the northern macrozone. Of all the provinces that conform to this vast territory, only the province of Tamarugal in the Tarapacá Region achieves an ISIT at the High level. However, the province of Iquique, which is in the same region, only reaches the Medium-Low level. For the other regions, the ISIT shows an important contrast between the Arica and Parinacota Region provinces but less prominent between the Regions of Antofagasta, Atacama, and Coquimbo.

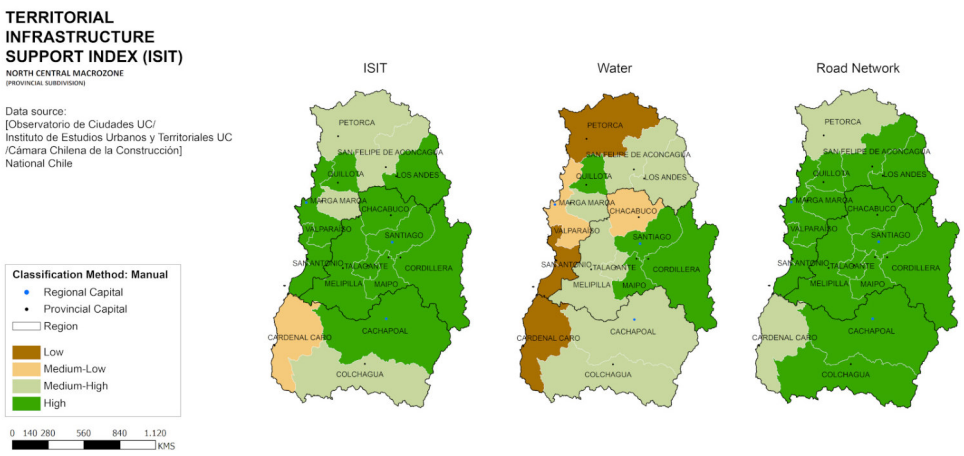
This contrast also shows a significant disequilibrium between dimensions. For example, the Antofagasta region has a good energy performance, derived from mining activity, but poor connectivity, considering the distances. The opposite occurs in the province of Tamarugal, where the indicators are more homogeneous among the different dimensions, allowing the province to stand out with the best overall infrastructure indicator.

6.4 Analysis of Provinces of the Central-North Macrozone

Figure 3 shows how all the provinces of the Metropolitan Region have a High ISIT level, being the only case among all the regions of the country. While in the case of the Valparaíso region, there are contrasts among its seven provinces, where Petorca, Marga-Marga, and San Felipe de Aconcagua reach an ISIT at a Medium-High level, the rest of the provinces have High levels. And, in the case of the O'Higgins region, there is a greater diversity of situations concerning the ISIT, because while the province of Cachapoal reaches a High level, the province of Colchagua obtains Medium-High and the province of Cardenal Caro obtains Medium-Low.

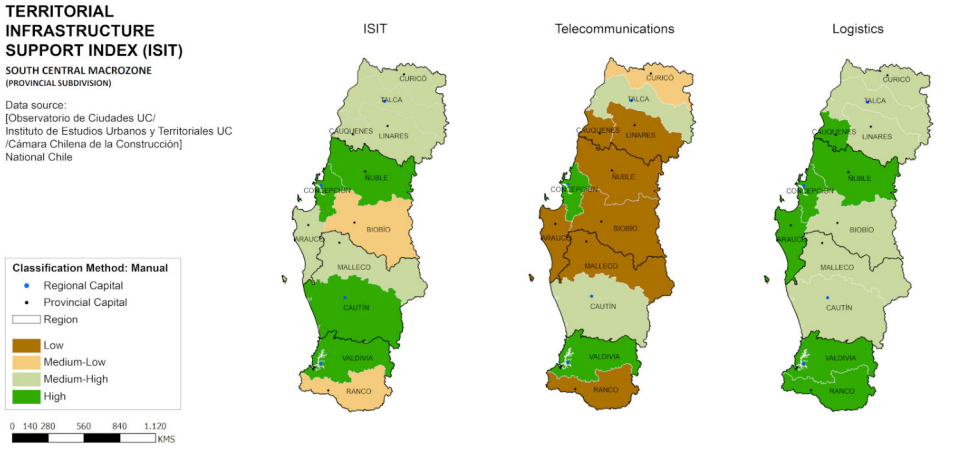
Then, the greatest contrasts between provinces by dimension in the case of the central-north macrozone are in the water dimension where a greater number of provinces obtain Low and Medium-Low levels, particularly in the province of Petorca and San Antonio in the region from Valparaíso and in the Cardenal Caro provinces in the O'Higgins region. Now, although there are provinces with a High and Medium-High level in territorial aptitude in the water dimension, it is crucial considering that the province of Santiago, Maipo, and Cordillera, contain 40,0% of the country's population. There are also provinces in the Medium-Low levels such as Valparaíso and Chacabuco.

In contrast to the previous dimension, in the roads dimension, this macrozone presents its best territorial aptitude, since except for Petorca and Cardenal Caro, which reach a Medium-High level, the rest of the provinces obtain a High level in this dimension. It must be considered that the three regions (of central-north macrozone) that make up



Source: Own elaboration, 2022

Figure 3: ISIT of provinces of the central-north macrozone



Source: Own elaboration, 2022

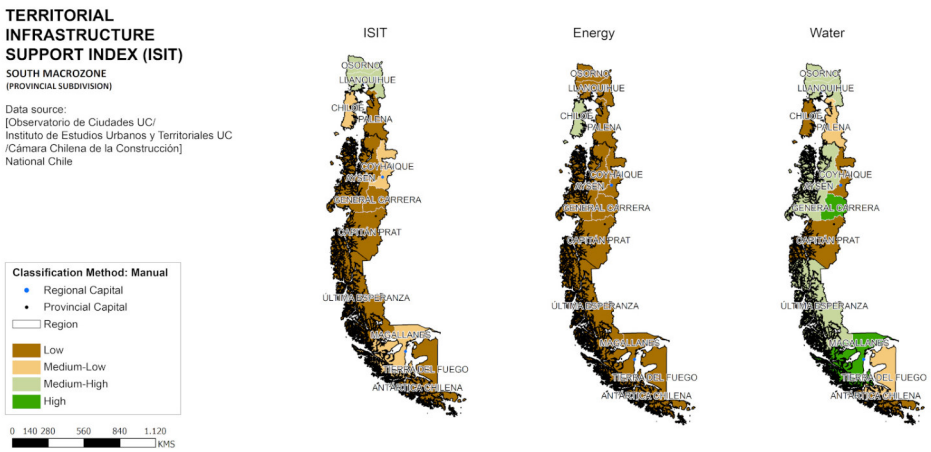
Figure 4: ISIT of provinces of the central-south macrozone

what for this study we have defined as the central-south macrozone, it covers only 6,6% of the country's territory. However, it contains at the same time 56,0% of the country's population, a territory where there are also ports located in the provinces of San Antonio and Valparaíso, that move slightly over 50,0% of the country's cargo, as well as the main international airport in the province of Santiago.

6.5 Analysis of Provinces of the Central-South Macrozone

In Figure 4, the results are positive, given that the ISIT presents most of the provinces in the High and Medium-High level in terms of territorial aptitude, where only the province of Biobío in the Biobío Region and the province of Ranco in the Los Ríos region reach only a Medium-Low level. Maule region's homogeneity in the ISIT is particularly noteworthy, and the greatest contrast is in the Los Ríos Region.

The Telecommunications dimension is where this macrozone presents the fewest advantages, as shown in Figure 4, and more significant contrasts within the regions that comprise it. The most remarkable contrast occurs in the Biobío region given the fact that while the province of Concepción reaches a High level, the other provinces reach a



Source: Own elaboration, 2022

Figure 5: ISIT of provinces of the southern macrozone

Low level. The Los Ríos region holds the same level of contrast. And, in the case of the Maule and Araucanía regions, the contrasts are lower; however, it also accounts for regions where telecommunications do not reach the same coverage and quality standards.

In contrast, the logistics dimension for this central-south macrozone is where the results are most favorable since all the provinces reach a High or Medium-High territorial aptitude, the Los Ríos region is the only region with all provinces at High level.

6.6 Analysis of Provinces of the Southern Macrozone

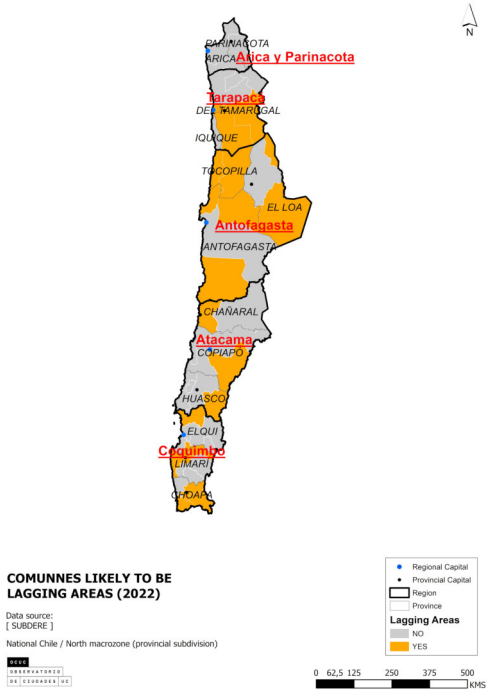
The ISIT for the southern macrozone shows in Figure 5 that the provinces mostly reach a Low level in their territorial aptitude, except for the provinces of Osorno and Llanquihue, which reach a Medium-High level. As noted above, the ISIT shows a greater precariousness in infrastructure and equipment for the Aysén and Magallanes region provinces. It is essential to highlight the interconnected electrical system and the main road reaching the north to the border with Peru, to the south end in Puerto Montt, Llanquihue Province, Los Lagos Region.

When analyzing the most significant contrasts between dimensions, in the southern macrozone, the dimension that presents the worst results is energy, as shown in Figure 5, where all the provinces present a Low level, except for the province of Chiloé (Insular territory of Los Lagos region). The previous shows that in this dimension, there is also a high level of homogeneity between provinces.

Lastly, although there are essential contrasts between provinces in the water dimension for the southern macrozone, it is also the best dimension in terms of results. This question is logical considering it is an area where higher levels of rainfall are recorded, however, there are significant deficiencies in drinking water and sewerage services, and a storage deficit.

7 ISIT analysis regarding lag zones

The lag zones can be considered as marginalized territories, being possible to contrast the results obtained in the maps obtained from the ISIT with the results shown in Table 1. Thus, in the case of the northern macrozone, made up of four regions; Arica and Parinacota, Tarapacá, Atacama, and Coquimbo, which account for 34,4% of the country's surface (see Table 2), where the lag zones are concentrated mainly in the Antofagasta (77,8%) and Coquimbo (53,3%) regions. In the case of the Antofagasta region, where the communes present an ISIT at a low or medium-low level, it coincides with the character of a lag zone of the communes of the province of Tocopilla (see Figure 6), and reaches



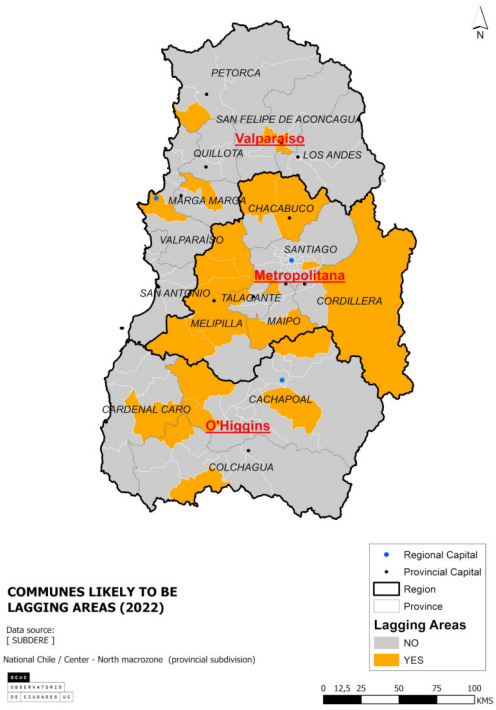
Source: Own elaboration, SUBDERE, 2022

Figure 6: Lag zones by district and province of the northern macrozone of Chile

16,7%. of the surface of the country, only below the Magallanes region (see Table 2). And, in the case of the Coquimbo region, the ISIT result coincides with the communes of the Choapa province. In the case of the Atacama region, where the percentage of lag zones reaches 33,3% of the communes, the coincidence is partial in the case of the province of Chañaral, with only a significant contrast, and in the case of the province of Tamarugal, which shows an ISIT at a High level, while 2 of 5 communes are considered lag zones. In conclusion, the result of the ISIT reaches an important but not total coincidence with respect to the definitions of lag zones.

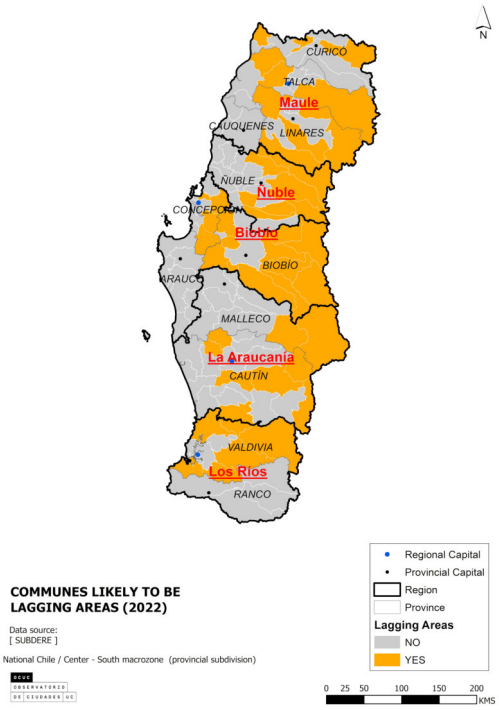
In the case of the central-north macrozone, made up of the Valparaíso, Santiago Metropolitan and Libertador General Bernardo O'Higgins regions, the ISIT results are the same for almost all the provinces (see Figure 3 compared to Figure 7), because the percentages of communes likely to be considered lag zones do not exceed 25,0% for the three regions, being the lowest percentages of all the country's macro-areas. Additionally, it should be considered that this southern macrozone contains 56,0% of the country's population (see Table 2), but the lowest percentage of the country's surface (6,4%). In conclusion, there is a high coincidence between the results obtained from the ISIT with respect to the declared lag zones.

Now, for the case of the regions of the central-southern macrozone, made up of the Maule, Biobío (includes Ñuble), Araucanía, and Los Ríos regions, where 25,1% of the country's population is concentrated (Table 2), the Los Ríos region reaches 50,0% of districts that can be declared as lag zones and then the Biobío region with 45,5%, concentrates the highest percentages (see Table 1). In contrast, the Araucanía region presents the lowest percentage with 28,1%. When comparing these results with those obtained by the ISIT (see Figure 4 compared to Figure 8), it coincides that the provinces of Biobío in the region of the same name and the province of Valdivia in the Los Ríos region, where districts are concentrated as lag zones, present a medium-low level of ISIT. With regard to the rest of the regions, although there are districts that can be declared lag zones, they do not exceed 40,0% of the total number of districts. In conclusion, the result of the ISIT reaches an important but not total coincidence with respect to the definitions of lag zones.



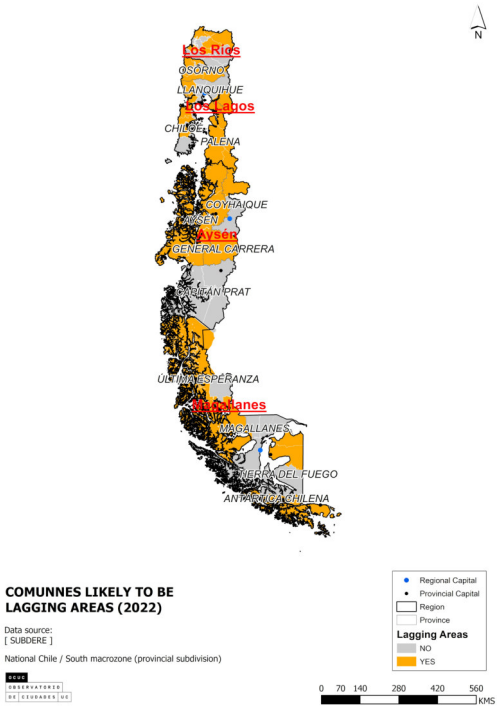
Source: Own elaboration, SUBDERE, 2022

Figure 7: Lag zones by district and province of the central-north macrozone of Chile



Source: Own elaboration, SUBDERE, 2022

Figure 8: Lag zones by district and province of the south central macrozone of Chile



Source: Own elaboration, SUBDERE, 2022

Figure 9: Lag zones by district and province of the southern central macrozone of Chile

And, finally, regarding the results compared to the southern macrozone that integrates the regions of Los Lagos, Aysén, and Magallanes, where only 6,2% of the country's population is concentrated in a total area of 38.2% of the country, a territory characterized by a very low density, particularly in the two extreme regions, where the vast majority of the provinces are likely to be declared as lag zones (see Figure 9). Table 1 shows that among the three provinces, more than 50,0% of communes are in this condition, being particularly high in the Aysén region with 60,0%. This result coincides with that shown by the ISIT (compare with Figure 5), where all the provinces of the Aysén and Magallanes region are at a low or medium-low level. In conclusion, there is a high coincidence between the results obtained from the ISIT with respect to the declared lag zones.

7.1 Conclusions

The ISIT constitutes the first effort in Chile to develop a multidimensional tool to analyze and contrast the state of the infrastructure and equipment needed for the economic and productive development of the country. Chile maintains a political-administrative structure of regions defined in 1974 during the military dictatorship, where later, since the return of democracy in the early 1990s, the reforms in terms of political, administrative, and fiscal decentralization have been insufficient, leaving the country with the lowest level of fiscal decentralization among the OECD countries (OECD 2017) with weak public policy attributions for elected authorities at the regional level (Orellana Ossandón et al. 2020). The latter emphasizes Chile's condition as a unitary and centralist country (OECD 2017), where decisions regarding public investment have concentrated the development of infrastructure and equipment in the central macrozone, mainly where more than two-thirds of the country's population live.

Notwithstanding the previous, Chile's export model, that has enabled participation in international markets, is concentrated in primary and secondary activities located in the north and south of the country, where the ISIT accounts for the existing deficits and high contrasts within the regions themselves. At the same time, this work has made it

possible to demonstrate that the results obtained through the ISIT fit the definitions and identification of lag zones in Chile, where the highest levels of isolation and socio-territorial gaps are concentrated in the extreme north and south of the country. testing the hypotheses.

The ISIT, based on geographical, climatic, and demographic considerations, allows to establish that each region and province has more significant advantages and disadvantages at the national level, to facilitate the location of economic and productive activities. At the same time, it reveals crucial contrasts between regions and within them. From this perspective, this study and its results contribute to visualizing the country's challenges in terms of infrastructure and equipment to reach a development threshold that allows solving the current socio-territorial inequalities in Chile.

The results of this work are consistent with the theoretical and empirical background presented, in relation to the fact that the stock of infrastructure in its different dimensions is decisive in the existing gaps in terms of territorial development in our country, especially in what it says in relation to the connectivity networks associated with some specific dimensions of the ISIT (Roads, Telecommunications, and Logistics, mainly). In particular, the lag zones that are close to the concept of marginal territories for the Chilean case, turn out to be the determining infrastructures in terms of accessibility to public and private goods and services for a significant number of urban and rural localities scattered throughout the national territory.

Regional governors have recently been elected for the first time and the significant demands for greater decentralization on decisions on public investment, planning, and management of their territories, are all aspects that are possibly going to be included in the country's future constitution, a document which will be subject to voter's approval or rejection in September of this year. Therefore, the contribution of this study and its results are transcendent because it seeks to establish an integral – and up-to-date – diagnostic of the infrastructure conditions on the continental territory.

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A Appendix:

Table A.1: List of indicators

DIMENSION INDICATORS	DESCRIPTION
Water	
Drinking water coverage	Percentage of provincial population with drinking water coverage
Sewerage coverage	Percentage of population with sewerage coverage
Total Population by rural drinking water (APR in Spanish)	Relationship of the total provincial population with respect to the number of APR
% Beneficiaries over Rural Population	Percentage of APR beneficiaries with respect to the total population
Annual rainfall deficit	Average annual rainfall of the last four years compared to the historical average
Concessioned urban area	Sanitary concession surface with respect to the provincial urban area
Coverage of operational territories	Area operational territories with respect to the provincial surface
Average water price	Water price per m^3 [No Peak (winter)]
Energy	
Price Benzine 93 Octane	Average price per liter of gasoline 93
Price Benzine 95 Octane	Average price per liter of gasoline 95 octane to the consumer
Price Oil	Average price of oil to the consumer
Total power generation	Sum of energy capacity available by province (Biomass, hydroelectric, wind, thermal and solar)
% Self-Generated Power	Percentage of self-generated power (biomass, wind, solar), with respect to the total power
Electrical Substations	Number of substations SIC/SING/SEM/SEA
Telecommunications	
Successful start calls	Percentage of Successfully Established Calls
Successful term calls	Percentage of Calls Completed Successfully
Fixed networks	Number of Fixed Network connections per thousand inhabitants
inhabitants per telecommunications antenna	Number of inhabitants per telecommunications antenna
Internet connection	Number of Internet connection per 1,000 inhabitants
Road Network	
% Double carriageway paved network	Percentage of dual carriageway paved network
% Paved main network	Percentage of main network paved
% Paved secondary network	percentage of paved secondary network
kms on intercity motorway	Distance to interurban highways, from the centroid or point with the best connectivity in the province
Paving network with respect to surface	Paved network with respect to the provincial surface
mins to intercity highway	Time (mins) to interurban highway, from centroide or point with better connectivity in the province

continued on the next page

Table A.1: List of indicators (continued)

Dimension Indicators	Description
Total network with respect to operational area	Provincial road network with respect to the operational area
Logistic	
Territorial coverage by Post Office (Hás)	Post offices with respect to the provincial area
Coverage of Service Stations (Hás)	Service stations with respect to the provincial surface
Territorial coverage branches of the State bank (Hás)	Banco Estado branches with respect to the provincial area
Distance to airport network (kms)	Distance (kms) to airport network, from centroide or point with better connectivity in the province
Distance to airport network (minutes)	Time (mins) to airport network, from centroide or point with better connectivity in the province
Distance to maritime terminals (kms)	Distance (kms) to maritime terminals, from centroide or point with better connectivity in the province
Distance to maritime terminals (min)	Distance (mins) to maritime terminals, from centroide or point with better connectivity in the province
Distance to service stations (kms)	Distance (kms) to service stations, from centroide or point with better connectivity in the province
Resilience	
% Area risk erosion	Percentage of the territory with Risk of Erosion class Severe or Very Severe
Average isolation hours	Average access (hours) to provincial capital
Kms of average isolation	Average distance (km) to provincial capital, from centroide or point with better connectivity in the province
Primary health distance (kms)	Average distance (km) to Primary Health centers, from centroide or point with better connectivity in the province
Distance to primary health (min)	Average distance (min) to Primary Health centers, from centroide or point with better connectivity in the province
Territorial coverage of Carabineros de Chile (Hás)	Carabineros barracks of Chile with respect to the provincial surface
Disaster Recurrence	Sum of the number of disasters per year (fire, landslides, tsunamis, volcanic activity, storm surges, floods, seismic activity)
Local coverage of the company of firefighters (Hás	Fire companies with respect to the provincial surface
Population per aérodrome	Provincial population with respect to the number of aerodromes

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Ageing, therefore marginal: demographic trends and institutional capacity in marginal Chilean municipalities

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Abstract. In Global South countries, ageing is an incoming phenomenon with socio-spatial implications that are not much explored yet. Global North countries are already facing ageing trends with significant territorial consequences, such as declining populations that contribute to making certain areas marginal. However, different factors may determine the marginality of a municipality or a region in other settings. Drawing on these premises, the paper discusses whether ageing demographic trends contribute to territorial marginality also in a Global South setting. The paper focuses on the case of Chile, a country characterised by significant territorial inequalities and a population that is becoming older. In doing so, it has a twofold purpose: first, examine census data to define what areas are currently experiencing a demographic decline and if these correspond to the areas that national policies define as marginal; second, examine official documents to consider to what extent both national policies and local development plans define ageing as an element of marginality. The decline of population in Chile defines a geography of marginality that complements and expands the one defined in policy strategies, including more areas. In contrast, institutions at different levels are only partially prepared for dealing with the socio-spatial implications of an increasingly older population.

Key words: ageing, territorial marginality, institutional capacity, Chile

1 Introduction

Ageing is a significant phenomenon that increasingly affects also the Global South. Nowadays, older people are 10% of the world population, and ageing affects mainly Global North countries (United Nations 2019): for example, in 2019, older people were 23.1% of the European population, while in Latin America and the Caribbean, they accounted only for 10% of the overall population. Nonetheless, these proportions are expected to change in the next decades dramatically. While Europe is expected to consolidate as an old continent already in the next few decades (older people will be 39.2% of the population by 2050 and 43.7% by 2100), demographic forecasts indicate that Latin America will experience an even faster ageing process: the elderly population (that is, the amount of people aged 65 years and older) will amount to 23.4% already by 2050 and, at the end of the century, 45.6% of the Latin American population will be 65+ (United Nations 2019). These impressive demographic trends confirm thus that ageing will pose a significant challenge outside the Global North in the next few decades.

Ageing has significant socio-spatial implications for the development of cities and regions that nonetheless seem to have received less attention in Global South countries. For example, in Latin America, more attention has been given to issues such as life expectancy, pensions and welfare services (Bilal et al. 2019, Jeong 2013, Rotarou, Sakellariou 2019), in comparison to the spatial dimensions of ageing (Sánchez González 2015). These involve primarily the need to adapt existing settings to a population that is increasingly old and has different needs, in terms of valued opportunities, available resources and degrees of personal autonomy (Boldy et al. 2011, Chui 2008, Costa-Font et al. 2009). However, another crucial dimension is the impact on general demographic trends and their consequences for territorial development. While ageing is often (and mistakenly) associated with population decline (Jarzebski et al. 2021), the growing presence of older people can be observed in places with both a decreasing or an increasing number of inhabitants, be them shrinking regions or areas that attract retired people. In both cases, the effects on the development patterns, the fiscal autonomy and the overall quality of life of a certain place are significant, determining different 'urban futures' and making ageing a possible cause of territorial vulnerability (McCann 2017). Amongst the several consequences that ageing may have for a certain place, the impact on the 'territorial future' appears thus to be especially relevant in relation to what institutions can do in order to deal with increasingly older places. In fact, emerging demographic trends may not only determine new needs and opportunities of a changing population, but also affect the resources that are available to face them.

The socio-spatial effects of ageing could be thus stronger in areas that are already stagnating and losing inhabitants, appearing marginal. In Latin America, urban areas concentrate not only most of the population but also wealth, especially in the case of extractivist economies. While peripheral areas provide resources, the value they generate is captured by a few cities that act as gateways to the global economy (Atienza et al. 2021). Therefore, the combined concentration of inhabitants and resources determines significant forms of territorial inequality and may easily configure non-urban areas as "places that don't matter" (Rodríguez-Pose 2018), lacking opportunities and quality of life for their inhabitants (Collantes 2019, Vendemmia et al. 2021). Considering the future impact that ageing will also have on Latin American populations, it would be relevant to consider if, together with the concentration of wealth and inhabitants, also ageing acts as an additional factor that marginalises a specific territory.

Drawing on these premises, the paper intends to investigate if ageing demographic trends also contribute to determining a condition of territorial marginality in a Global South setting. The analysis focuses on Chile, a Latin American country that well represents some of the issues related to ageing, marginality and territorial inequality: it is a rapidly ageing country, with the highest presence of elderly inhabitants in the region – currently 10.6% of the population, while by 2050 one third of the Chilean inhabitants are expected to be aged 65+; (United Nations 2017); it is a highly unequal country, where economic activities and wealth show high levels of spatial concentration (Aroca et al. 2018, Badia-Miró 2020); and it is a country prone to marginality, due not only to its peculiar geography but also to the strong institutional centralisation (Orellana et al. 2016). Other Latin American countries have high shares of urban population and also show similar ageing trends, as in the case of Uruguay (14.9% of the population is aged 65+) and Brazil (9.3%) (United Nations 2019); nonetheless, these countries are less centralised than Chile or, as in the case of Uruguay, have undergone decentralisation processes (Ruiz Díaz 2018).

The paper focuses on municipalities where ageing processes have a higher incidence and considers how institutions at different levels currently deal with ageing. In particular, the analysis is based on three steps: (1) determine what municipalities are currently more exposed to ageing and to what extent these correspond to areas that national policies define as marginal; (2) consider if local institutions can deal with the needs of ageing local communities, providing basic services and developing plans that frame public action; (3) examine if their current development plans consider ageing as an issue. We hypothesise that ageing defines a different geography of marginality compared to official definitions, and that local institutions only partially address the ongoing demographic transformation despite its relevance for the development of these places.

2 Ageing: a phenomenon affecting territorial marginality and institutional capacity?

Even if territorial marginality is a fuzzy concept that has received quite different definitions (Moscarelli 2021), most definitions do not seem to consider ageing dynamics when defining a territory as marginal. In general, the relationship between a centre and its periphery defines what areas are marginal: those places that are far from a geographical centre, both in spatial and functional terms, are considered marginal since they are distant, dependent and different from the centre (Ferrão, Lopes 2004). Even from a regional perspective, such distance does not simply refer to a spatial dimension but also involves participation in a particular space's social and economic dynamics. If a territory is far from a centre and does not share its social, economic, and institutional features, it can be considered marginal (Copus 2001). A similar approach can also be found in the European Cohesion Policy, which defines as inner peripheries those areas with scarce access and poor socioeconomic conditions (Moscarelli 2021). The current definitions of territorial marginality tend thus to focus on the location of a specific place and its participation in ongoing socioeconomic dynamics but do not seem to address directly any demographic dimension.

Instead, adverse demographic trends may be observed in areas that were already defined as marginal based on other criteria, such as spatial proximity and access to basic opportunities. This is, for example the case of Italy, a country where national strategies define marginal areas according to their (lack of) access to health, education and mobility: the elements that identify such "institutional periphery" are thus mainly spatial features, even if the resulting marginal areas have in common trends such as population degrowth and increasing ageing (Vendemmia et al. 2021). Similarly, several regions of Spain experience the loss of population and a growing presence of older inhabitants, due to historical trend of migration towards urban, developed areas. These ageing trends are the result of a loss of population that occurred already in the central decades of the twentieth century, affecting especially those rural regions closer to developing urban areas (Pinilla, Sáez 2017).

Nonetheless, ageing is not simply a feature found in areas that are already marginal per se, but rather is a phenomenon that may differently impact the development of a specific place. As McCann (2017) discusses in relation to different urban futures, an ageing population may have different consequences on the development of a specific place. An ageing place may have a growing population, as in the case of coastal or rural areas that become destinations for specific forms of amenity-led migration (Gosnell, Abrams 2011): in this case, the impact of ageing can be positive for the local economic development. Instead, in those places that are losing inhabitants and where the remaining population is increasingly older, differences may be observed between urban, former industrial places and remote areas. In these two cases, different can be the implications on local development and the strategies to contrast the adverse effects of such demographic trends – as the different strategies deployed for shrinking areas (Haase et al. 2016) and inner peripheries (De Toni et al. 2021) demonstrate. The different impact that ageing can have on a territorial setting suggests that an increasingly older population is not necessarily observed in contexts that are marginal by definition. On the contrary, ageing can make a certain territory marginal or, under certain circumstances, avoid such conditions.

Ageing also has significant consequences for the institutions in charge of governing a specific territory and responding to its challenges. Institutional capacity is another slippery concept, generically considered as the ability to perform some of the varied tasks that government bodies are in charge of: for example, providing essential services and dealing with existing assets, such as infrastructures (Alm et al. 2021); manage scarce resources, as in the case of water (De Loë et al. 2002, Pirie et al. 2004), or plan and anticipate future threats, for example implementing policy to reduce disasters (McGregor et al. 2021). At least three levels define the capacity of an institution (Rosas Huerta 2008). At a micro level, crucial is the availability of resources, including financial and human ones. At a meso level, the management ability emerges as the element that determines the possibility to use existing resources to perform specific required tasks. Finally, at a

macro level, the capacity of an institution depends on its ability to interact with other significant actors, institutional or not, effectively. Ageing, mainly when observed in a context that is losing population, potentially negatively affects local institutions' capacity. Having a smaller local working population, the fiscal and financial resources available to local institutions in ageing places diminish, affecting the institutional capacity at a micro level. As a consequence, also their capacity to deal with the challenges of ageing (referring thus to the meso level), for example providing the services necessary for an increasingly older population, decreases.

Finally, ageing could further reduce the institutional capacity to deal with territories whose marginal condition poses specific challenges for the government bodies in charge of them. An example in this sense are the so-called 'places that don't matter', declining areas where local discontent has converged into populist electoral results (Rodríguez-Pose 2018). In these places, experiencing economic crises and population losses, only some inhabitants remain: and in many cases, these are the older, retired citizens whose age and emotional attachment to these places make their relocation unlikely (Rodríguez-Pose 2018, p. 201). The marginal nature of these places can affect the action of institutions in at least two senses. First, when the perceived marginality leads to antagonistic electoral results, the political divide between marginal, populist territories and central, "privileged" places can affect institutional capacity at a macro level, reducing one institution's ability to cooperate with other institutional bodies both horizontally and vertically. Second, these revengeful and antagonistic attitudes can affect the administration of marginal places even when electoral results do not reflect a populist shift. For example, marginal places can adopt an antagonistic attitude also in relation to the definition of their local identity and its consequences for planning decisions and processes (Mattila et al. 2020).

3 The case of Chile: ageing in an unequal, centralised country

Territorial marginality is only partially a policy priority in Chile, although several features of the country – geographically, economically and socio-politically – contribute to determining a marginal condition for several areas of the country. First of all, the geography of Chile is unfavourable, or even "crazy", according to a Chilean essayist (Subercaseaux 2005). The country's northern regions are characterised by deserts, while the southern parts of it have a cold climate and are fragmented into several islands, increasing their isolation. As a result, in a country which is 4.270 km long, 90% of its population lives in cities and especially in the Metropolitan Region, which includes the capital city of Santiago: even if the area covers only 2% of the Chilean territory, 40% of the national population lives there (INE 2018). Moreover, Chile's government has traditionally been centralist, struggling with decentralisation and resisting the transfer of attributions to regional and local governments (Orellana et al. 2016). Also economic activities reflect such centralist attitude, showing extractive mechanisms that favour the capital city and do not benefit the territories where these different activities – such as mining, forestry, intensive cultivations and farming – are realised (Atienza et al. 2021). As a consequence, the relevant socioeconomic inequalities of the country (Agostini, Brown 2007) become even stronger in non-metropolitan territories, leading to several socio-territorial conflicts (Delamaza et al. 2017). The geographical, economic, and political features of Chile contributed thus to marginalise vast parts of the country, determining significant forms of territorial inequality that public investments have not been able to address effectively (Orellana-Ossandon et al. 2020).

In a country where territorial disparities are an important public issue, ageing could become an additional determinant of marginality. The proportion of older people in Latin American countries is increasing (Gietel-Basten et al. 2020). This trend is even more intense in Chile, where older people have been 11.4% of the population in 2017, and will be 33% of the total population by 2050 (United Nations 2017). Here, the neoliberal policies that have characterized the country in the last decades determine that the provision of public welfare services is scarce in terms of quality and availability (Jeong 2013, Kurtz 2002, Wigell 2017), affecting mainly the quality of life of older people and configuring ageing as an additional element of fragility. As a result, pensions became one of the most

mentioned elements during the 2019 protests of Chile's estallido social and one of the most debated social welfare issues during the COVID-19 pandemic (Heiss 2020). The presence of a fragile group such as older people may affect mainly rural areas, where they prevail (INE 2018). However, their presence seems to have a different effect according to the places taken into account (McCann 2017): seaside or lake locations experiencing forms of internal amenity-led migration may benefit from a growing ageing population (Vecchio et al. 2022), while other places may have an increasingly older population due to the internal migration of younger inhabitants (Rodríguez Vignoli 2019). Ageing appears thus to be a potentially significant and partially overlooked phenomenon that could further affect the development of territories that in Chile are already experiencing significant forms of marginality.

Nonetheless, the existing policy on territorial marginality does not consider ageing as a possible issue. In particular, the convergence policy of Chile defines "left behind regions" (zonas rezagadas) according to two criteria: isolation and social gaps. Isolation refers to localities "that have difficulties of accessibility and physical connectivity, have very low population density, present dispersion in the territorial distribution of their inhabitants, and show low presence and coverage of basic and public services, according to the existing relationship between the components of structural isolation and degree of integration" (Ministerio del Interior y de Seguridad Pública 2018). Social gaps instead represent "the distance between communal poverty and regional poverty, which is understood as the difference between the average income poverty rate and the multidimensional poverty rate of each commune, and the regional average of both rates" (Ministerio del Interior y de Seguridad Pública 2018). Other national policies, more generically referred to rural areas (Subsecretaria de Desarrollo Regional 2020), rapidly mention older people as a group that deserves "priority attention" – together with women, youth, indigenous people, disabled people and migrants (Subsecretaria de Desarrollo Regional 2020). Even at a local scale, rural municipalities' local development plans (PlaDeCo) do not mention ageing as a challenge to be addressed, focusing instead on other relevant issues such as vulnerability, social equity and housing (Orellana-Ossandon et al. 2020). In synthesis, Chile presents significant issues of territorial marginality, and ageing is a potentially more fragile condition than in other countries; nonetheless, these two issues – part of the national policy debate – do not seem to dialogue between each other yet.

4 Methodology

To examine whether ageing demographic trends contribute to determine a condition of territorial marginality also in Chile, the paper draws on a three-steps analysis. These are intended to detect the municipalities that are currently facing intense ageing processes, to synthetically assess their institutional capacity, and to examine to what extent they perceive ageing as a policy issue.

4.1 Definition of ageing municipalities

First, census data from the Chilean censuses of 2002 and 2017 (INE 2003, 2018) are examined to detect which municipalities are currently facing relevant ageing processes. The 2012 census was not considered since it has serious issues of representativeness that affects its validity (Neupert 2017). Although data are available also for previous censuses, the analysis focuses on the first two decades of the twenty-first century since this is the moment in which the Chilean demographic pyramid starts to change and the share of older population increases, showing changes in established demographic trends. The analysis considers 345 Chilean municipalities (excluding the municipality of Antártica, which is not recognised internationally) and first selects those municipalities where in the last census the elderly population was above the national average (11.4%), calculating the ratio between older inhabitants (aged 65+) and the overall municipal population. Then, in the selected municipalities the evolution of the population is considered, examining what municipalities have been losing inhabitants in the last years (comparing the 2002 and the 2017 census). In doing so, those municipalities facing a situation of potential demographic decline are selected. Finally, the set of selected municipalities is compared

Table 1: Variables and indicators used for the synthetic index of institutional capacity

Variable	SINIM indicator	Type of item
Fiscal autonomy	Dependency from the Common municipal Fund	Continuous (%)
Socioeconomic conditions of the population	Percentage of inhabitants under the line of poverty	Continuous (%)
Provision of health services	Number of municipal clinics	Continuous (nr)
	Number of municipal rural clinics	Continuous (nr)
Capacity to plan	Existence of a land use plan	Discrete (yes/no)
	Existence of a community development plan	Discrete (yes/no)
	Antiquity of the community development plan	Continuous (nr years)

Source: own elaboration

to the group of municipalities that are officially defined as isolated zones or as zonas rezagadas – that is, lagging areas for which development strategies are a priority. This last step examines how many municipalities previously selected are also officialy defined as lagging or isolated zones.

4.2 Assessment of the municipal institutional capacity

To consider the capacity of local institutions to deal with the needs of their communities – especially in relation to ageing populations – the analysis focuses on the selected municipalities to assess the financial resources available to them and their ability to provide certain essential services. It is important to notice that in Chile, due to profound administrative reforms promoted under Pinochet's military dictatorship, the provision of public services such as health and education is in charge of municipalities. At the same time, the financial resources available to them mainly come from the taxes they can collect. A national fund – Fondo Común Municipal (common municipal fund) – redistributes resources among municipalities so that the dependence from this source is a proxy of the resources (or scarcity of) available to a municipality.

Therefore, a synthetic index of institutional capacity is proposed, considering two dimensions (see Table 1 for a detailed presentation of variables and indicators). On the one hand, the index consideres the resources available to the municipality and its population, considering the dependency on the common municipal fund and the percentage of inhabitants in a condition of poverty. On the other hand, the index considers the services that a municipality can provide, focusing on basic health services that can be important for older people (clinics and rural clinics) as well as the planning tools available to the municipality. These include both normative land use planning tools (Plan Regulador Comunal) and strategic planning tools (Plan de Desarrollo Comunitario, community development plan), and reflect the ability of a municipality to project its action on a longer temporal horizon. Data referred to these items are based on data from the Chilean National System of Municipal Information (SINIM – Sistema Nacional de Información Municipal). Depending on the type of item (Table 1), discrete variables can receive 1 or 0 points (if a plan is available or not), while a 0-1 normalisation is applied to continuous variables. The average score of each municipality in relation to these items determines their final institutional capacity score.

4.3 Analysis of community development plans

To consider if the municipalities consider their ageing condition as a policy priority, a content analysis of their community development plans is performed. Being a strategic tool, these plans are usually easier to update compared to land use planning tools, and they can usefully express to what extent a municipality perceives specific issues as a priority. The analysis is performed on 39 plans, examining the plans that municipalities made publicly available on their websites. First, the analysis examines if plans mention ageing as a phenomenon that is affecting the municipality, estimating if and how the plans conceptualise this demographic trend. Second, the analysis focuses on more specific references to older people and demographic issues, determining what the strategies and actions deployed to deal with the needs of this growing population group are.

5 Results

5.1 Marginal and ageing municipalities in Chile: a partially overlapping geography

In Chile, the current definitions of isolated or lagging areas do not cover most municipalities where ageing can determine a condition of marginality. Examining census data for the 345 Chilean municipalities, the majority of them (243) currently shows a number of older people higher than the national average. These involve very different places, from isolated villages to boroughs of Santiago's metropolitan area. However, only 70 of these municipalities are currently experiencing also population loss, and, among them, 48 are small, rural municipalities (with less than 25.000 inhabitants; here we exclude municipalities with more inhabitants and places that are not rural, as per Berdegué et al. 2010). These places show some differences in relation to the intensity of their demographic decline (Table 2). Some municipalities show a condition of relative stability (-0.6%, Hualañe) of its population over 15 years, while others show a more intense loss of inhabitants (-15.8%, in Lumaco). As for ageing, the incidence of older people ranges from values slightly higher than the national average (12.3%, in Futrono) to a stronger presence (20.5 %, in Curepto). Interestingly, the municipalities where older people are more present are not the places that have lost more inhabitants and vice versa. The preliminary selection of municipalities highlights thus that 14% of Chilean municipalities are currently experiencing demographic trends that may define a potential condition of territorial marginality.

Table 2: Population of the selected ageing municipalities; regions are shown from North to South

Region	Municipality	Inhabitants in 2002	Inhabitants in 2017	Population loss (2002-17)	Older inhabitants (2017)	% of older inhabitants (2017)
Atacama	Canela	9.420	9.093	-3.5%	1.821	20.0%
Atacama	Combarbalá	13.531	13.322	-1.5%	2.521	18.9%
Atacama	Río Hurtado	4.770	4.278	-10.3%	843	19.7%
O'Higgins	Paredones	6.656	6.188	-7.0%	1.179	19.1%
O'Higgins	Pumanque	3.477	3.421	-1.6%	649	19.0%
Maule	Curepto	10.712	9.448	-11.8%	1.934	20.5%
Maule	Empedrado	4.203	4.142	-1.5%	525	12.7%
Maule	Chanco	9.423	8.928	-5.3%	1.394	15.6%
Maule	Hualañe	9.720	9.657	-0.6%	1.602	16.6%
Maule	Licantén	6.732	6.653	-1.2%	984	14.8%
Maule	Vichuquén	4.786	4.322	-9.7%	735	17.0%
Biobío	Florida	10.889	10.624	-2.4%	1.796	16.9%
Biobío	Quilleco	10.327	9.587	-7.2%	1.662	17.3%
Biobío	San Rosendo	3.971	3.412	-14.1%	563	16.5%
Ñuble	Cobquecura	5.579	5.012	-10.2%	1.015	20.3%
Ñuble	El Carmen	12.780	12.044	-5.8%	1.910	15.9%
Ñuble	Ninhue	5.737	5.213	-9.1%	987	18.9%
Ñuble	Ñiquén	11.417	11.152	-2.3%	2.005	18.0%
Ñuble	Pemuco	8.788	8.448	-3.9%	1.175	13.9%

Continued on next page

Table 2 – continued from previous page

Region	Municipality	Inhabitants in 2002	Inhabitants in 2017	Population loss (2002-17)	Older inhabitants (2017)	% of older inhabitants (2017)
Ñuble	Portezuelo	5.362	4.862	-9.3%	845	17.4%
La Araucanía	Carahue	25.575	24.533	-4.1%	3.601	14.7%
La Araucanía	Cunco	18.800	17.526	-6.8%	3.055	17.4%
La Araucanía	Freire	25.163	24.606	-2.2%	3.472	14.1%
La Araucanía	Galvarino	12.635	11.996	-5.1%	1.739	14.5%
La Araucanía	Gorbea	15.215	14.414	-5.3%	2.417	16.8%
La Araucanía	Saavedra	13.995	12.450	-11.0%	2.041	16.4%
La Araucanía	Teodoro Schmidt	15.323	15.045	-1.8%	2.513	16.7%
La Araucanía	Toltén	11.201	9.722	-13.2%	1.533	15.8%
La Araucanía	Ercilla	9.131	7.733	-15.3%	1.072	13.9%
La Araucanía	Los Sauces	7.603	7.265	-4.4%	1.114	15.3%
La Araucanía	Lumaco	11.335	9.548	-15.8%	1.405	14.7%
La Araucanía	Purén	12.965	11.779	-9.1%	1.742	14.8%
La Araucanía	Traiguén	19.179	18.843	-1.8%	2.921	15.5%
Los Ríos	Los Lagos	20.117	19.634	-2.4%	2.525	12.9%
Los Ríos	Máfil	7.147	7.095	-0.7%	995	14.0%
Los Ríos	Futrono	14.899	14.665	-1.6%	1.807	12.3%
Los Ríos	Lago Ranco	10.034	9.896	-1.4%	1.473	14.9%
Los Lagos	Cochamó	4.323	4.023	-6.9%	647	16.1%
Los Lagos	Fresia	12.620	12.261	-2.8%	1.832	14.9%
Los Lagos	Maullín	15.621	14.216	-9.0%	2.339	16.5%
Los Lagos	Puqueldón	4.124	3.921	-4.9%	647	16.5%
Los Lagos	Quemchi	8.553	8.352	-2.4%	1.293	15.5%
Los Lagos	Quinchao	8.932	8.088	-9.4%	1.218	15.1%
Los Lagos	Puerto Octay	10.171	8.999	-11.5%	1.132	12.6%
Los Lagos	Purranque	20.814	20.369	-2.1%	3.038	14.9%
Los Lagos	Río Negro	14.732	14.085	-4.4%	2.159	15.3%
Los Lagos	San Juan De La Costa	8.782	7.512	-14.5%	1.371	18.3%
Los Lagos	San Pablo	10.137	10.030	-1.1%	1.650	16.5%

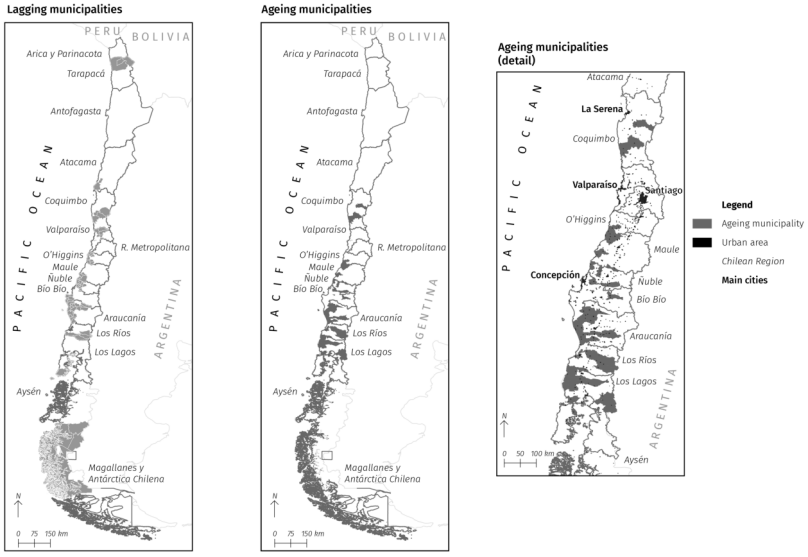
Source: own elaboration on INE, 2003, 2018

These municipalities are concentrated in a relatively limited extension of the Chilean territory, excluding the most extreme regions of the country (Figure 1). These include places ranging from the Region of Coquimbo, in the North, to the Region of Los Lagos, in the South, but some clusters emerge in the central-southern part of Chile: one between the regions of O' Higgins and Maule, another one in La Araucanía (the most deprived region of Chile), and two in the regions of Los Ríos and Los Lagos. While different are the locations of these municipalities, several of them are located between coastal and rural zones. The distribution of these municipalities seems thus to confirm that internal migration does not affect the most extreme regions of the country (Rodríguez Vignoli 2019).

The resulting geography shows some differences with the municipalities that Chilean national policies identify as lagging areas (Figure 1). The Chilean Subsecretariat for Regional Development currently identifies 66 municipalities as lagging areas, based on their isolation and social deprivation. However, only 23 of the ageing municipalities currently belong to lagging areas. The main overlaps can be observed in the rural regions of Maule and La Araucanía, while in other zones there is a partial correspondence: ageing municipalities are part of wider lagging zones, or instead define autonomous clusters. Moreover, lagging areas also include municipalities in extreme regions of Northern and Southern Chile. Therefore, ageing municipalities in Chile define a geography of marginality that is potentially different from that of lagging areas: in some cases, demographic decline adds to an already recognised condition of socio-spatial marginality; in others, the increasingly older remaining population can determine a situation of fragility despite the good physical connectivity and favourable socioeconomic conditions.

5.2 Municipal institutional capacity: different capacities in deprived settings

The examined municipalities show pretty different levels of institutional capacity (Table 3 and Figure 2). The index of institutional capacity shows the existence of different degrees



Source: own elaboration

Figure 1: Lagging and ageing municipalities in Chile

of capacity when comparing ageing municipalities. Some places show low results (such as the municipalities of Galvarino and Teodoro Schmidt, whose score is 0.27), while others score better (for example, the municipality of Gorbea, with a score of 0.70); interestingly, these municipalities are part of the same deprived region, La Araucanía. Comparing the municipalities that are defined as lagging zones or not, the municipalities with lower and higher capacity shows similar results; instead, the average capacity of the two groups is slightly different, being higher in the case of non-lagging areas. As for the spatial distribution of the municipalities with different scores, apparently, no clear patterns emerge (although an analysis of spatial autocorrelation would be relevant if the index of institutional capacity were available for each municipality of the country). While in some cases neighbouring municipalities show similar levels of institutional capacity (as in the regions of Los Ríos and, partially, Los Lagos), even the main clusters of ageing municipalities show different results: the most evident case is that of La Araucanía, where towns with higher and lower scores are close to each other. As represented in the synthetic index proposed, institutional capacity reflects a territorial multiplicity that does not correspond exactly to existing definitions of marginality (based on geographical distance and socioeconomic deprivation), nor new definitions based on demographic variables.

Considering the elements that constitute the institutional capacity, a more nuanced picture emerges. In relation to the financial resources available to a municipality, the levels of autonomy of each town are quite different: the majority of them – except one – depend on the common municipal fund, and more than half of their resources depend on transfers from the national government; however, on average only 20% of the financial resources is raised locally and, in some cases, there is almost a total dependence from the common fund (as in Saavedra, where 95% of the resources derive from national transfers). In relation to the population above the poverty threshold, more than half of the inhabitants belong to this group in each examined municipality, ranging from 63% in Galvarino to 89% in Gorbea, Pumanque and Purranque. As for the health services provided by municipalities, only in 9 out of 48 a clinic is available. While the availability of this service should depend on the number of inhabitants, no direct correspondence is observed between a higher number of inhabitants and the presence of such service. Different is the situation for rural clinics, basic services in charge of responding to the first health needs of the inhabitants and not able to deal with medical emergencies. In the examined municipalities, the number of rural clinics ranges from 0 to 14, which probably depends on the more or less dispersed spatial distribution of the population, rather than on the simple overall number of inhabitants.

Table 3: Institutional capacity of the selected ageing municipalities: synthetic index and indicators (normalized scores)

Region	Comuna	Part of a lagging area	Institutional capacity – synthetic index	Fiscal autonomy	Socioeconomic conditions of the population	Number of municipal clinics	Number of municipal rural clinics	Existence of a land use plan	Existence of a community development plan	Antiquity of the community development plan
Atacama	Canela	yes	0.50	0.56	0.46	0.00	0.64	0.00	1.00	0.80
Atacama	Combarbalá	yes	0.48	0.20	0.79	0.00	0.86	0.00	1.00	0.50
Atacama	Río Hurtado	no	0.37	0.30	0.75	0.00	0.43	0.00	1.00	0.10
O'Higgins	Paredones	yes	0.49	0.07	0.84	0.00	0.21	1.00	1.00	0.30
O'Higgins	Pumanque	yes	0.40	0.35	1.00	0.00	0.21	0.00	1.00	0.20
Maule	Curepto	no	0.57	0.29	0.82	0.00	0.57	1.00	1.00	0.30
Maule	Empedrado	yes	0.38	0.10	0.78	0.00	0.07	0.00	1.00	0.70
Maule	Chanco	yes	0.35	0.18	0.64	0.00	0.50	0.00	1.00	0.10
Maule	Hualañe	no	0.38	0.53	0.60	0.00	0.21	0.00	1.00	0.30
Maule	Licantén	no	0.33	0.28	0.53	0.00	0.29	0.00	1.00	0.20
Maule	Vichuquén	no	0.51	1.00	0.76	0.00	0.29	0.00	1.00	0.50
Biobío	Florida	no	0.46	0.14	0.80	0.00	0.29	1.00	1.00	0.00
Biobío	Quilleco	no	0.36	0.29	0.80	0.00	0.21	0.00	1.00	0.20
Biobío	San Rosendo	no	0.31	0.01	0.62	0.00	0.07	0.00	1.00	0.50
Ñuble	Cobquecura	yes	0.45	0.11	0.12	0.00	0.14	1.00	1.00	0.80
Ñuble	El Carmen	no	0.54	0.23	0.32	0.00	0.71	1.00	1.00	0.50
Ñuble	Ninhue	yes	0.47	0.09	0.45	0.00	0.14	1.00	1.00	0.60
Ñuble	Ñiquén	no	0.50	0.23	0.65	0.00	0.00	1.00	1.00	0.60
Ñuble	Pemuco	no	0.62	0.71	0.51	0.00	0.14	1.00	1.00	1.00
Ñuble	Portezuelo	yes	0.48	0.04	0.70	0.00	0.14	1.00	1.00	0.50
La Araucanía	Carahue	yes	0.55	0.07	0.48	0.00	1.00	1.00	1.00	0.30
La Araucanía	Cunco	no	0.53	0.39	0.66	1.00	0.43	0.00	1.00	0.20
La Araucanía	Freire	no	0.53	0.27	0.50	0.00	0.57	1.00	1.00	0.40
La Araucanía	Galvarino	no	0.27	0.09	0.00	0.00	0.71	0.00	1.00	0.10
La Araucanía	Gorbea	no	0.70	0.24	0.98	1.00	0.36	1.00	1.00	0.30
La Araucanía	Saavedra	yes	0.40	0.00	0.07	0.00	1.00	1.00	0.00	0.70
La Araucanía	Teodoro Schmidt	yes	0.27	0.04	0.37	0.00	0.29	0.00	1.00	0.20
La Araucanía	Toltén	yes	0.44	0.11	0.08	0.00	0.50	1.00	1.00	0.40
La Araucanía	Ercilla	yes	0.51	0.21	0.40	1.00	0.29	0.00	1.00	0.70
La Araucanía	Los Sauces	yes	0.51	0.21	0.50	1.00	0.29	0.00	1.00	0.60

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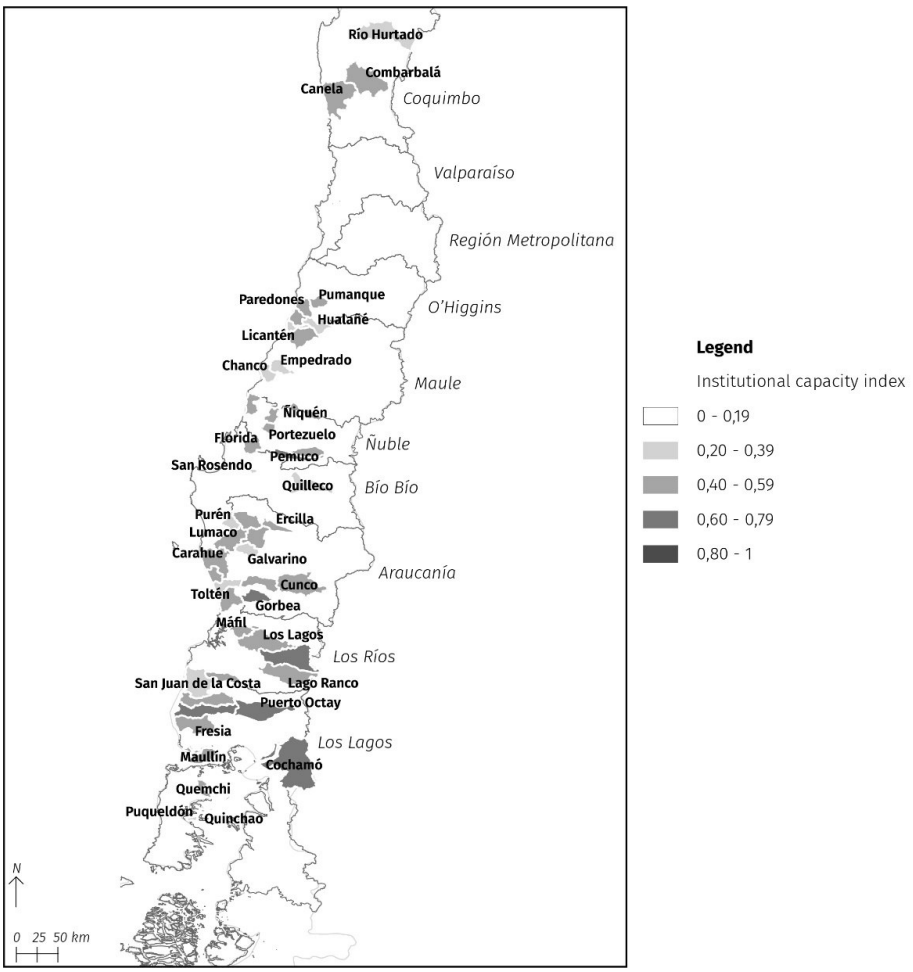
Table 3 – continued from previous page

Region	Comuna	Part of a lagging area	Institutional capacity – synthetic index	Fiscal autonomy	Socioeconomic conditions of the population	Number of municipal clinics	Number of municipal rural clinics	Existence of a land use plan	Existence of a community development plan	Antiquity of the community development plan
La Araucanía	Lumaco	yes	0.40	0.10	0.15	1.00	0.36	0.00	1.00	0.20
La Araucanía	Purén	yes	0.35	0.05	0.74	0.00	0.36	0.00	1.00	0.30
La Araucanía	Traiguén	yes	0.50	0.26	0.60	0.00	0.43	1.00	1.00	0.20
Los Ríos	Los Lagos	no	0.60	0.54	0.82	0.00	0.43	1.00	1.00	0.40
Los Ríos	Máfil	no	0.52	0.32	0.93	0.00	0.07	1.00	1.00	0.30
Los Ríos	Futrono	yes	0.69	0.51	0.87	1.00	0.36	1.00	1.00	0.10
Los Ríos	Lago Ranco	yes	0.57	0.56	0.85	0.00	0.36	1.00	1.00	0.20
Los Lagos	Cochamó	no	0.67	0.33	0.89	1.00	0.57	0.00	1.00	0.90
Los Lagos	Fresia	no	0.56	0.35	0.72	0.00	0.64	1.00	1.00	0.20
Los Lagos	Maullín	no	0.51	0.20	0.79	1.00	0.36	0.00	1.00	0.20
Los Lagos	Puqueldón	yes	0.39	0.25	0.88	0.00	0.29	0.00	1.00	0.30
Los Lagos	Quemchi	yes	0.60	0.38	0.64	1.00	0.57	0.00	1.00	0.60
Los Lagos	Quinchao	yes	0.50	0.35	0.39	0.00	0.57	1.00	1.00	0.20
Los Lagos	Puerto Octay	no	0.66	0.72	0.87	0.00	0.43	1.00	1.00	0.60
Los Lagos	Purranque	no	0.66	0.59	0.98	0.00	0.57	1.00	1.00	0.50
Los Lagos	Río Negro	no	0.57	0.52	0.83	0.00	0.14	1.00	1.00	0.50
Los Lagos	San Juan De La Costa	no	0.36	0.06	0.19	0.00	0.36	0.00	1.00	0.90
Los Lagos	San Pablo	no	0.47	0.52	0.78	0.00	0.00	1.00	1.00	0.00

Source: own elaboration on SINIM, 2021



Source: own elaboration

Figure 2: Institutional capacity of ageing municipalities in Chile

Finally, as for the availability of planning tools, only 25 out of 48 municipalities have a land use plan. Considering that in Chile these tools include urban areas but not rural ones, municipalities with a mainly rural territory may not consider planning as a priority. Different is the case for community development plans, which are available in all municipalities but one. These are quite recent documents, considering that the newest one was adopted in 2021 and the oldest one in 2011. On average, these plans have an antiquity of four years, something coherent with both the duration of a mayor's term (four years) and with the fact that municipal elections took place in the whole Chilean territory in 2021 and, before, in 2017.

5.3 Community development plans: recognising ageing without tackling it

In the examined community development plans, ageing is mainly recognized as affecting these marginal territories. 29 out of 39 examined plans – that is, three out of four – explicitly mention ageing as a significant phenomenon that municipal institutions need to deal with (Table 4). Among them, ageing is considered in two ways. On the one hand, several municipalities consider it simply as an ongoing phenomenon, mentioning that the number of older inhabitants has grown and highlighting similarities with regional or national demographic trends. On the other hand, other municipalities mention ageing as a threat, for example in SWOT analyses: when considered a negative phenomenon, ageing is mentioned together with issues such as loss of population, diminution of youth, and adverse demographic trends that affect mainly rural areas.

Table 4: Contents referred to ageing in the examined local development plans

Region	Comuna	Part of a lagging area	Has a community development plan	Antiquity of the plan	Acknowledges ageing as an issue	Proposes strategies for ageing	Proposes leisure activities	Proposes active ageing	Proposes care services
Atacama	Canela	yes	yes	8	yes	yes	yes	no	yes
Atacama	Combarbalá	yes	yes	5	no	yes	no	no	no
Atacama	Río Hurtado	no	yes	1	plan not available	-	-	-	-
O'Higgins	Paredones	yes	yes	3	yes	no	no	no	yes
O'Higgins	Pumanque	yes	yes	2	plan not available	-	-	-	-
Maule	Curepto	no	yes	3	yes	no	no	no	yes
Maule	Empedrado	yes	yes	7	yes	yes	no	yes	yes
Maule	Chanco	yes	yes	1	yes	no	no	no	yes
Maule	Hualañe	no	yes	3	yes	no	no	no	no
Maule	Licantén	no	yes	2	no	no	yes	no	no
Maule	Vichuquén	no	yes	5	yes	yes	yes	yes	no
Biobío	Florida	no	yes	0	yes	yes	yes	yes	yes
Biobío	Quilleco	no	yes	2	yes	yes	no	no	yes
Biobío	San Rosendo	no	yes	5	yes	yes	yes	yes	yes
Ñuble	Cobquecura	yes	yes	8	plan not available	-	-	-	-
Ñuble	El Carmen	no	yes	5	plan not available	-	-	-	-
Ñuble	Ninhue	yes	yes	6	yes	no	no	no	yes
Ñuble	Ñiquén	no	yes	6	yes	yes	no	no	no
Ñuble	Pemuco	no	yes	10	no	no	no	no	yes
Ñuble	Portezuelo	yes	yes	5	yes	no	no	no	no
La Araucanía	Carahue	yes	yes	3	no	yes	no	yes	yes
La Araucanía	Cunco	no	yes	2	yes	yes	no	yes	no
La Araucanía	Freire	no	yes	4	plan not available	-	-	-	-
La Araucanía	Galvarino	no	yes	1	yes	no	yes	no	yes

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Table 4 – continued from previous page

Region	Comuna	Part of a lagging area	Has a community development plan	Antiquity of the plan	Acknowledges ageing as an issue	Proposes strategies for ageing	Proposes leisure activities	Proposes active ageing	Proposes care services
La Araucanía	Gorbea	no	yes	3	yes	no	no	no	yes
La Araucanía	Saavedra	yes	no	7	plan not available	-	-	-	-
La Araucanía	Teodoro Schmidt	yes	yes	2	yes	yes	no	no	yes
La Araucanía	Toltén	yes	yes	4	yes	no	no	no	yes
La Araucanía	Ercilla	yes	yes	7	yes	yes	no	yes	no
La Araucanía	Los Sauces	yes	yes	6	plan not available	-	-	-	-
La Araucanía	Lumaco	yes	yes	2	yes	yes	no	yes	no
La Araucanía	Purén	yes	yes	3	yes	yes	yes	yes	yes
La Araucanía	Traiguén	yes	yes	2	yes	yes	yes	yes	no
Los Ríos	Los Lagos	no	yes	4	plan not available	-	-	-	-
Los Ríos	Máfil	no	yes	3	no	yes	yes	no	no
Los Ríos	Futrono	yes	yes	1	yes	yes	no	no	yes
Los Ríos	Lago Ranco	yes	yes	2	plan not available	-	-	-	-
Los Lagos	Cochamó	no	yes	9	yes	no	no	yes	no
Los Lagos	Fresia	no	yes	2	yes	yes	yes	yes	yes
Los Lagos	Maullín	no	yes	2	yes	yes	no	no	yes
Los Lagos	Puqueldón	yes	yes	3	no	no	no	no	no
Los Lagos	Quemchi	yes	yes	6	yes	no	no	yes	no
Los Lagos	Quinchao	yes	yes	2	no	no	no	no	no
Los Lagos	Puerto Octay	no	yes	6	yes	no	no	yes	no
Los Lagos	Purranque	no	yes	5	yes	no	no	no	no
Los Lagos	Río Negro	no	yes	5	no	yes	no	no	no
Los Lagos	San Juan De La Costa	no	yes	9	no	no	no	no	yes
Los Lagos	San Pablo	no	yes	-	no	no	no	no	no

Source: own elaboration

Nonetheless, the references to the increasing presence of older people do not necessarily lead to addressing the ongoing demographic decline or the welfare of the elderly population: in fact, 20 municipalities propose measures for their older inhabitants. In doing so, the actions fall into three categories. First, the most common refers to the provision of health care services, including home care, transfer to clinics and medical assistance more in general (found in 20 municipalities). Second, 14 municipalities promote active ageing, proposing measures to prevent or accompany the effects of ageing – for example, programs that focus on older people's physical and mental health. Interestingly, some of the measures for active ageing in rural municipalities also focus on training, so that older inhabitants can continue working in their farms, and in promoting literacy, to facilitate the application of the ageing population to public funds that can support their working activities. Finally, a smaller number of municipalities (10) focuses on leisure activities, promoting trips and other social events to entertain their older inhabitants. However, only four out of 29 examined plans propose actions that refer to these three categories, showing thus partial approaches to the needs of an increasingly older population.

6 Discussion

Considering the current demographic trends of Chile, ageing appears as a condition of potential territorial marginality. In a slowly but increasingly ageing country, the increase in the number of ageing inhabitants and the loss of population affect mainly rural areas. These include places that could be potentially defined as marginal based on spatial proximity and socioeconomic conditions. The selected places are located mainly in the central and southern regions of Chile, excluding the most extreme areas of the country. These places appear to be marginal primarily from a spatial perspective, considering that often they are far from metropolitan areas and from the main longitudinal corridor that connects Chile from North to South. Moreover, these are also excluded from the main socioeconomic processes of the country, that outside the main metropolitan areas are mainly referred to the presence of extractivist industries; as a result, significant flows of internal immigration originate from these regions. It must be noticed that none of the examined municipalities shows more than 30% of older inhabitants, a value that – based on other declining settings (Golini et al. 2000) – can be considered as the threshold determining the possible extinction of a community. Based on these elements, in the case of Chile, ageing seems to reinforce trends of territorial marginalisation that are already ongoing rather than determining new trajectories of development. Moreover, the current demographic trends define ageing as an emerging issue rather than as a structural condition of marginal areas.

Ageing defines a geography of territorial marginality that is different from the institutional one. The institutional definitions, in fact, rely on traditional criteria, focusing on spatial proximity and social deprivation (Ferrão, Lopes 2004, Moscarelli 2021). Moreover, more recent definitions seem to privilege the latter dimension: a 2021 document defines municipalities that could be defined as lagging areas focusing mainly on their socioeconomic condition, leading to the contradictory results of having both rural villages and big cities of the country (such as Valparaíso) within the same category (Subsecretaria de Desarrollo Regional 2021). As a result, the municipalities where ageing is a further determinant of marginality only partially correspond with institutional definitions of lagging areas. More interestingly, ageing municipalities in some cases would expand existing clusters of lagging municipalities. Considering the potential impact of demographic trends on places already left behind (McCann 2017), it would be relevant to include ageing and other demographic dynamics when defining marginal territories, instead of considering ageing simply as an element that characterises areas that are marginal per se.

While the features of demographic decline allow defining an alternative geography of marginality, the institutional capacity does not allow to do so. The institutional capacity of the examined municipalities in fact does not seem to suffer from the ongoing ageing processes, or at least not yet. Despite the lack of a comparison with other, non-ageing places, the selected municipalities show certain differences among them when examining

the resources available to them and the services they can provide (referring thus to the micro and meso level of institutional capacity, according to Rosas Huerta 2008). The scarcity of financial resources is a common issue among the examined areas, even if the level of poverty of their population is different. The provision of health services demonstrates more significant differences that probably are related to the spatial distribution of a population (i.e., more clinics are necessary to spatially cover a sparser population, living in several rural settlements) rather than to the resources available to a municipality or to the number of inhabitants to be served. These differences suggest the importance of considering the accessibility to certain essential services when defining marginal areas. In other settings, the accessibility to basic services – the possibility to access places such as schools, hospitals or stations within a certain spatial or temporal distance – is a criterion used to define what areas are marginal (see for example Vendemmia et al. 2021). Instead, in the case of Chile, this issue is considered only in relation to isolated areas, rather than including also lagging areas.

The examined areas show thus the same fragility that is common to other Chilean municipalities, although ageing can potentially expand the definition of institutional capacity in marginal areas. In Chile, both individuals and institutions can be considered as vulnerable: the former are exposed to the structural inequality of the country and the different opportunities available to them, while for the latter, the resources available to provide several essential services are scarce (Vecchio et al. 2021). Currently, the Chilean Organic Law of Municipalities – a norm that complements the existing Constitution – identifies several fields in which local institutions can or must be active. On the one hand, urban planning (at the local scale) and community development are two functions exclusively in charge of municipalities. On the other hand, municipalities can also develop activities related to several other fields, in which the intervention of other institutions is optional: among them, social welfare, public health, education, social housing, and risk prevention. In settings such as ageing municipalities, the capacity of local institutions can be affected by both the decrease of the available resources and the increase in the needs of the local population, especially in terms of welfare provision. Even if the strengthening of local institutions has been the object of academic and political debate for a long time, local institutions will possibly remain central also in the next decades. For example, the draft for a new Constitution for Chile, elaborated between 2021 and 2022, states that "the basic principle for the municipal government should be the search for harmonious and equitable territorial development, aiming for all people to have equal access to the same level and quality of municipal public services, regardless of where they live" (proposed Chile Const. art. 212, §2).

Right now, ageing does not seem to affect the institutional capacity of the examined municipalities, although an increasingly older population could have a more relevant impact in the following years (McCann 2017). Moreover, the limited possibility of providing certain services at the municipal level probably requires considering what opportunities are available at a higher scale – for example, groups of neighbouring municipalities located within a certain distance. This focus on the spatial availability of certain opportunities would be relevant not only for those services addressing the needs of an increasingly older population (for example, health services), but also for the services that can prevent younger inhabitants from leaving marginal areas: this could be the case for education, considering that the availability of schools can determine the need to migrate to urban areas where these are more easily available.

The approaches of marginal Chilean municipalities to ageing aim to tackle the specific needs of the elderly population but do not seem to include them within broader strategies to address their demographic decline. The examined plans tend to recognise ageing as an existing condition and, in some cases, as a threat to be considered when planning for a municipality's development. However, most measures tend to address ageing as a "static" phenomenon that requires granting health and leisure to older people, but without considering the impacts of an increasingly older population on local communities. Interestingly, the municipalities that propose innovative forms of active ageing are mainly rural ones, where the population is potentially more isolated and requires higher levels of autonomy. Nonetheless, while the local plans address the needs of local older people

– among the subjects that are less likely to relocate elsewhere (Rodríguez-Pose 2018) – less attention is provided to measures that could attract new inhabitants and activities. Therefore, considering that national strategies for ageing areas are being developed but that local institutions are struggling in this sense, the existing gap between lagging, ageing areas and other parts of the country could increase when the share of older inhabitants grows in the next years.

The present study is a first exploration of the relationship between ageing and territorial marginality in Chile with a focus on institutional capacity and, therefore, it suffers from some limitations. First, the analysis focuses simply on municipalities that are currently losing inhabitants and showing an increasingly older population. The assessment of their institutional capacity provides a relative evaluation that does not consider places that are currently experiencing other dynamics – such as an increase of the population thanks to the arrival of older inhabitants, or even the loss of population that occurs in places with younger inhabitants. Expanding the sample of examined municipalities would thus allow providing a more solid comparison between municipalities. Moreover, the same index of institutional capacity is a first, limited assessment that could benefit from the inclusion of other variables available in public databases: these could refer to the resources available to municipalities (in terms of available staff, for example) as well as to the services provided by local institutions (including education and social welfare). Expanding the sample of examined municipalities and the set of indicators would probably allow for more robust data analyses, allowing, for example, correlations and regressions. Moreover, the quantitative results could go together with qualitative analyses focusing on specific, representative cases, and complementing thus the content analysis of community development plans. For example, a possible avenue for future research could consider interviewing local decision makers to understand more in depth their perception of the relationship between ageing, marginality, and the resources available to institutions to face them.

7 Conclusions

This exploratory analysis focused on Chile's ongoing ageing demographic trends to consider if these contribute to determining a condition of territorial marginality also in a Global South setting. The results show that forms of population decline can be observed both in contexts already defined as marginal in national policies and areas that are not yet defined as such. Therefore, ageing seems to define an alternative geography of marginality, thus complementing and expanding official definitions of marginal areas. Moreover, the capacity of local institutions to recognise and address the issues of ageing appears to be limited due to the lack of resources required to provide essential services to an increasingly ageing population, and because of the limited set of strategies proposed to face the ongoing demographic decline.

The proposed analysis shows thus that, in line with peripheral settings in Global North contexts (for example, in Europe), areas that are declining in terms of population are also marginal from a spatial and socioeconomic perspective, at least in the case of Chile. The finding can be a first step towards a more systematic approach to the definition of marginal areas in Global South contexts, where territorial peripheries have been widely examined in relation to centralised institutional schemes, intense urbanisation processes and extractivist economies: ageing, an emerging issue that in the next decades will affect most Latin American countries, can emerge as an additional element determining territorial marginality. Further analyses are required to define more precisely what these marginal territories are and the abilities of their institutions to deal with such conditions. Even if ageing does not appear as a phenomenon that determines marginality per se, it is crucial to consider the additional impact it could generate on places already being left behind.

Acknowledgement

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Defining marginality in the periurban areas of Quito: A descriptive approach based on empirical and spatial data

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Abstract. In Latin America, marginality is a complex phenomenon involving various geographically significant factors, including the critical, physical, social, and human aspects. Bouldering areas of cities are often excluded from infrastructural interventions and social policies. In the case of Andean countries such as Ecuador, marginality affects not only rural lands but also in-transition areas between different geographical regions, as in the case of mountainous and coastal zones. These regions are characterized by a wide range of natural resources and climate conditions, and because of their diversity and relative proximity to the major cities, they offer potential for sustainable development. Nonetheless, the lack of infrastructure affects the accessibility of these periurban areas and critically limits their interaction. Drawing on these elements, the paper seeks to investigate whether periurban areas can be considered marginal and what tools can depict an encompassing image of local marginality, stressing its advantages for the local community. Following this idea, the paper focuses on the case of Lloa, a large rural parish in the Metropolitan District of Quito (DMQ), to determine which criteria can better capture its marginality, considering it as a periurban in-transition area. The paper suggests a cross-discipline methodology to push the limits of the field through the review of a significant body of literature and a thorough qualitative and quantitative analysis of the case study. Finally, the paper emphasizes the inadequacy of the current forms of planning to effectively define the marginality of periurban areas as a whole in the region by reflecting on the case study and through an analysis of the existing land use plans.

Key words: marginality, Metropolitan District of Quito, landscape, periurban

1 Marginality: Not a simple issue in Quito

1.1 The multidimensional urban problems in Quito

The dynamics of migration among countries, as well as between rural areas and cities, are particularly pronounced in Latin America. For instance, Ecuador experienced significant internal migration movements in the last decades and took in a sizable population from

Venezuela, which was experiencing a political and socioeconomic crisis at the time (Malo 2021). This circumstance is influencing how the city will look, which has undergone rapid and contested urban growth in recent decades (Carrión, Erazo Espinosa 2012). According to numerous studies (Carrión, Erazo Espinosa 2012, Cruz Cabrera et al. 2016, Durán Saavedra et al. 2016, Martí-Costa et al. 2016), the growth of the city led to the emergence of a sizable number of marginal sectors that frequently developed through invasion processes and impromptu constructions. The Moncayo administration, in force from 2000 to 2009, attempted to implement a series of reactive and extraordinary actions to deal with the problem. The city authority put into effect an urban plan designed to regulate these informal settlements. However, Quito still has a lot of inequality because of numerous ongoing, historic urban issues and current sociospatial challenges.

There are numerous ways to comprehend urban inequality in Quito. The city, for instance, includes dangerous clusters whose vulnerability leads to social isolation and natural hazards, among other issues (Bracchi et al. 2020, Durán Saavedra et al. 2016, Martí-Costa et al. 2016, Torrijo et al. 2020). These clusters are made up of periurban villages that are currently socioeconomically underdeveloped and lack access to goods and services. Lloa, a periurban parish in Quito, seems to fit the aforementioned description. Indeed, it has exceptional natural resources and a distinctive landscape, which includes different ecosystems in a few kilometers of extension; it is also very close to a crowded and dense portion of the city. However, despite being located in a very touristy area due to the presence of the Pichincha Volcano, it is a critically undeveloped parish with a severe shortage of infrastructure and transportation. The mild regulatory framework governing the development of periurban areas exacerbates this dual nature and reinforces the marginality of this sector.

1.2 The current theoretical scenarios in the region

Vulnerability and occasionally poverty are common characteristics of Latin American cities. As evidenced by the literature (Hardoy, Pandiella 2009, Tavares, Betti 2021), this circumstance could lead to a complicated dynamic of marginality (Hardoy, Pandiella 2009, Tavares, Betti 2021).

The researchers contend that, despite a debate on spatial and economic focuses (Sabatini 1981), this concept has multiple starting points (Alonso 2019), including poverty and spatial (Nun 1999, 2010, Quijano 1972), socioeconomic, political, and cultural factors (Gutiérrez, Sáez 2018, Oliven, Salazar 1981), as well as environmental ones (Perlman 2019). In Latin America, marginality frequently carries a negative connotation for contested areas or territories, which instead struggle to highlight the positive aspects of their settings and cultures (Horn et al. 2021). However, a recent work published by Horn et al. (2021) describes a multidimensional and multi-scalar scenario of disputed territories in Latin America. In essence, the culture-based co-production of territories offers an antithetical idea of habitat to the hegemonic culture of the neoliberal urban development model. It redefines the parameters of equity, marginality, and (under)development. This approach from Horn et al. may encourage other domains of spatial analysis and valuation to consider marginality as a multidimensional concept and complicated issue (Horn et al. 2021). Therefore, the paper explores the scenario of marginality in Quito since it validates several variables from the literature while also introducing new spatial elements stemming from the local landscape value. As a result, this work employed the landscape units idea, as defined by geographer Emma Pérez-Chacón Espino as "a conceptual and methodological tool that has its origin in the intersection of two different disciplinary requirements: one that derives from the consideration of the landscape as a complex territorial system, and therefore linked to the need to establish a scientific reading of the territory; and another that arises from the requirement to respond to the operational challenges of territorial planning, since, at least in appearance, the natural environment is no longer considered exclusively as a mere support for economic activities" (Pérez-Chacón Espino 2005, p. 124). Moreover, Anne Winston Spirn argues that "successful resolution to urban problems must integrate all these dimensions: social, economic, environmental, and aesthetic. Given limited resources, cities can no longer afford to address these issues separately. [...] We must seek common solutions to social, economic, cul-

tural, and environmental problems" (Spirn 1994, p. 165-166). Thus, this paper aims to analyse a specific case study utilizing a multidimensional method that involves the physical component as well as the socioeconomic and demographic elements. Likewise, the Autonomous Community of Catalonia in Spain produced a first prototype of a landscape catalogue in 2006 (Generalitat de Catalunya 2006, Nogué i Font et al. 2016, Sala i Martí 2010), focusing on the definition of landscape atlases based on previous international experiences. Furthermore, this tool requires the authorities in charge of approving partial territorial plans to incorporate the catalogue's indications. Moreover, since this approach is simple enough to apply in a variety of situations, this strategy has been employed throughout Europe and, more recently, Latin America, where governments have begun to take important landscape qualities and aspects into account in urban planning.

1.3 The landscape-based approach

Marginality in Quito could be described through a landscape-based approach, that considers the value of the context as a sum of processes "both natural and cultural: the patterns they produce are juxtaposed, interwoven and overlain" (Spirn 1994, p. 17). Its physical geography confirms relationships of influence between the natural and artificial elements, as well as links to urbanisation and the socioeconomic process of inequality (Carrión, Erazo Espinosa 2012, Martí-Costa et al. 2016). Given the case study, it is worth mentioning that in ecology, the ecotone – the boundary between two different ecosystems – is considered a transition area where two communities collide and integrate (Solomon et al. 2010), as well as a location with high biodiversity and richness. This idea reveals a perspective on marginality that is more positive and at odds with socioeconomic thinking. Urban policies and socioeconomic concerns are largely ignored in this ecological concept, which focuses primarily on the natural environment. However, its contribution is crucial to comprehending what marginality currently means in Latin America. Therefore, the landscape approach encourages a balanced study of this complex system, as it offers specific methods, such as landscape units, that combine natural elements with anthropogenic and planning issues, thus indirectly taking sociological criteria into consideration. Landscape means a complex whole, a spatial, temporal, and ethical reality at the same time (Venturi 2004). The European Landscape Convention defines landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (Council of Europe 2004, p. 2). This definition has also been adopted by the Latin American Landscape Initiative (LALI), which is currently in charge of promoting the appreciation, management, protection, and sustainable planning of the Latin American landscape. Due to its complexity, the landscape is made up of numerous dimensions, including material, perceptual, and symbolic ones. These dimensions interact with one another to define the characteristics of a particular landscape.

1.4 The focus of the paper

The case of Lloa discloses potential strengths in marginal locations, owing to its border position, underpopulated urban tissue, and non-highly growing demography. These planning issues enhance the relevance of landscape units as they reveal the intrinsic values of the marginal landscape, make an assessment of its current condition, and develop a set of landscape quality criteria and actions to support it. As a result, the perception of marginality raises the question of how to characterize local conditions and provide a framework for researching marginality as a multidimensional urban state. The research hypothesizes that, despite the negative values given by literature, marginality might be understood and conceived as a beneficial circumstance when landscape values insist on studied places.

2 Marginality: What does Latin America have to say?

2.1 Introduction

In Latin America, the concept of marginality is an important academic topic (Perlman 2019). Many scholars from various disciplines have emphasized the term's relationship with the urban context for decades (Doré 2008, Jaume 1989, Quijano 1972, Sabatini 1981), as this concept involves several cultural, political, and economic elements (Oliven, Salazar 1981) as well as spatial meanings (Gutiérrez, Sáez 2018, Perlman 2019). The theoretical framework of this study was developed on the basis of Latin American literature in order to have a thorough understanding of local knowledge and culture (de Sousa Santos 2015).

2.2 The Latin American theories of marginality

A vast body of researchers (Alonso 2019, Doré 2008, Jaume 1989, Nun 1971, Quijano 1972, Sabatini 1981) investigate the evolution of the topic based on the urban dynamics of this region. These elements are quite distinct yet complementary to one another, and they have a direct impact on the growth of a city.

Nun (1971) and Quijano (1972), for instance, addressed the connection between marginality and the issue of poverty and inequality in a city. Quijano described marginality as a socioeconomic phenomenon, highlighting the role of the neoliberal system in the establishment of two polar opposites, the "hegemonic nucleus" and the "marginal pole". He refers to individuals or small groups who are excluded from the main system as well as from the economic and productive fringe of society because the neoliberal system in Latin America excludes a society with limited economic resources and a low level of education. Another approach to marginality is to measure access to commodities and services, which, in the case of centralised governance, limits the empowerment of peri-urban people and does not provide alternatives to the marginalized condition (Quijano 1972). Quijano (1972) and Nun (1971, 1999, 2010) construct the centre-periphery dualism based on a cluster's location within or outside the city, implying that individuals located further away from the city are more vulnerable to marginalization. Instead, some academics go on to Sabatini's (1981) concept, which has recently been supported by Perlman (2019) and others, that defines the marginal population as part of the city's economic system. Moreover, Sabatini argues that "there does not seem to be a situation of absolute and global exclusion or social marginality, as posited by the theories of marginality. What there is, is a dialectic between rejection and integration" (Sabatini 1981, p. 65). For that, the evolution from a socioeconomic, political and cultural marginality (Oliven, Salazar 1981) to a more enhanced concept of marginal environment (Gutiérrez, Sáez 2018, Perlman 2019, Sabatini 1981) overcomes the "ecologist" limit, establishing a non-linear relationship between economically marginal areas and deteriorated urban sectors (Sabatini 1981). Sabatini's suggestion to include the concept of context in the debate of marginality marks a significant shift in the Latin American theoretical framework. Although the key focus of his speech is habitat or housing, he expresses a fundamental idea: the marginal environment is defined by a lack of goods and services, a lack of neighbourhood facilities and network services, and little or no access to urban employment and service centres, all of which describe the urban context of the area.

Perlman ratified in 2019 the concept of context, stressing how marginality in Latin America is deeply linked to urban poverty as well as to an unfavourable environment described by three aspects: insecurity in the occupation of the territory, the quality of the construction, and therefore its instability, which can disappear suddenly; the third element of precariousness is the mobility of the population, which reflects the first intuition of marginality as an effect of migration (Park 1928). The precariousness that Perlmann describes then configures a panorama of fast sociospatial evolutionary cycles.

2.3 Marginality as multidimensional topic

Several studies describe the overlap of different kinds of risks and hazards, from climate change (Romero Lankao, Qin 2011) to poverty and exclusion (Hardoy, Pandiella 2009), and the impact of the COVID-19 pandemic on this fragile situation (Kesar et al. 2021, Tavares, Betti 2021) in the Andean cities. Hence, it is not possible to define marginality as a purely socioeconomic and policy issue, as some studies show how the study of marginality has generated other crucial themes, such as social exclusion (Enriquez 2007), informality (Doré 2008), peripheries and precariousness, poorness, contested territories (Chu et al. 2016, Horn et al. 2021), and urban vulnerability (Alguacil Gómez et al. 2014, Rebotier 2012). The contested territories in Latin America reflect a patchwork of conflicts (Clare et al. 2018, Horn et al. 2021, Perlman 2019, Sisson 2021) and point to a more comprehensive understanding of marginality in this area.

Multidisciplinary approaches spanning both regional and local scales can better address an encompassing definition of marginality (Alguacil Gómez et al. 2014, Hardoy, Pandiella 2009, Romero Lankao, Qin 2011). They describe the complexity of marginality through a multidimensional framework that brings up a theoretical point of view that highlights numerous variables, including the socioeconomic topic, public policy, and housing. The socioeconomic perspectives and spatial elements of the landscape (as an "environmental" macro-system) will be scrutinized in the case study to support or contradict the theoretical question.

3 Quito: A metropolitan district with a huge and multifaceted marginality

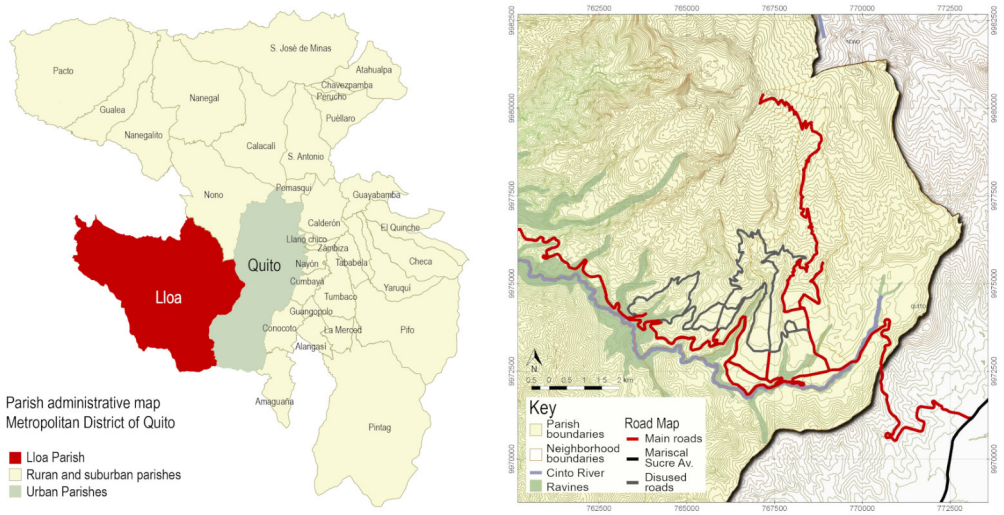
3.1 An overview

Ecuador is a very biodiverse country with 24 provinces that consist of four different climatic zones. Three of them, Sierra, Costa, Amazonía, describe the continental territory, while the fourth one is about the Galapagos archipelago. Nevertheless, due to the volcanic origin of current landscapes and geography, many in-between territories are not specifically defined, and for urban planners, they are perceived as marginal. In other words, these regions' understanding is extremely underdeveloped, likely as a result of their slow urbanisation and consequently low speculative interest. Furthermore, the definition and regulation of marginal areas are plagued by a number of serious problems, as shown by the current regulatory framework. The Metropolitan District of Quito (DMQ) is made up of 33 rural and 32 urban parishes, along with sizable in-transition areas; thus, its situation reinforces the critical issue. This highlights how important it is to comprehend marginality from a variety of perspectives, including those related to geography, planning, and policy, among others.

3.2 The case of Lloa

A very explanatory example of diversity is the rural parish of Lloa in the Metropolitan District of Quito (DMQ) (Figure 1). Lloa is the largest rural parish in the DMQ, and it occupies an altitude range from 1.800 to 4.786 m.s.n.m. (GADP de Lloa 2019) with a diversity of landscapes and ecosystems. In fact, it has a wide variety of natural resources (Figures 3 and 7), climate futures (Figure 7, Table 1), and therefore landscape units that represent economic and tourism potentialities that are not exploited since the existing infrastructure allows limited access to the sites of interest. It covers 545 km^2 and makes up 20% of DMQ. Lloa combines geography, biodiversity, and population to create a tourist destination where they can choose from a variety of activities, from sports and recreation to those more in-line with their surrounding natural and gastronomic environment. As a result, Lloa has enormous potential for natural and tourist attractions that could modernize the idea of marginality.

The parish can only be accessed via two routes, both of which are vulnerable to landslides and weather hazards (Figures 1, 2, and 7), while inter-parish transport is scarce and limited. Moreover, only private vehicles are able to reach the internal areas. Because of these circumstances, many of the nearby natural attractions are probably unknown to both tourists and Quito residents.



Source: Google Earth and OpenStreetMap
Notes: Elaborated by N. Rodríguez

Figure 1: Lloa in the Quito Metropolitan District. Source: Lloa Development Plan and Land Use Planning (GADP de Lloa 2019); main and abandoned roads

The lack of public transportation in human settlements like farms, villages, and other productive and tourist destinations forces people to organize their transportation through an ad hoc network without the benefit of any formal agreements. There are only three carriageways that pass through the parish. The Virgen del Cinto monastery, a recognized religious landmark, is located along the two routes that connect Chillogallo and Magdalena, two neighborhoods in Quito's south. The connection with Chillogallo is considered a first-order street, while the connection with Magdalena is a second-order street. Because both streets are not directly connected to the main Quito street network, access to Lloa is made more difficult. A third-order street runs through Chiriboga village and connects Lloa to Santo Domingo de los Tsachilas province. Hence, Lloa could be classified as a parish with poor connectivity, mobility, and accessibility because the quality of the three infrastructures in terms of dimension, maintenance, and use is subpar.

As in the recent story of Quito (Carrión, Erazo Espinosa 2012), the periurban location should imply a rural area in transition to an urban tissue; however, despite its proximity to the city, Lloa is rural in both landscape identity and social aspects. In fact, it is economically and socially excluded from mainstream processes. Moreover, by ignoring their sociospatial complexity, urban policies and planning strategies exacerbate this widening divide. According to the Development Plan and Land Use Planning (PDOT) of Lloa (GADP de Lloa 2019), the area under study is delimited in the north by the parish of Nono and the canton of San Miguel de los Bancos; in the south by the canton of Meja; in the east by the DMQ and in the west by the cantons of San Miguel de los Bancos and San José de Minas (Province of Santo Domingo de los Tsáchilas). Its territory has a clear vocation as an urban green nucleus, i.e., a "space with a high degree of naturalness and a good state of conservation adjacent to the city" (CEA 2014, p. 17). Similarly, in the land use of Lloa (Figure 3), according to the PDOT, the ecological protection zones correspond to 42.7% of the total area, while the natural resource areas correspond to 52.4% of the total area (GADP de Lloa 2019). Further, its boundaries even touch the province of Santo Domingo, a district between Sierra and Costa, that is located at an altitude of only 500 meters above sea level (Figure 7), which emphasizes the geographical and landscape variety of the area. The northeastern part of the parish, which has the most varied landscape, is where urbanised areas are located, accounting for less than 1% of the total area, according to the Agriculture and Livestock Ministry (MAG). The urban consolidated tissue of DMQ is also closest to this area of Lloa. Therefore, Lloa

Source: PDOT of Lloa (GADP de Lloa 2019)

Figure 2: Main road network

could be referred to as an "in-transition" parish, which describes the shifting from one region's landscape and culture to another.

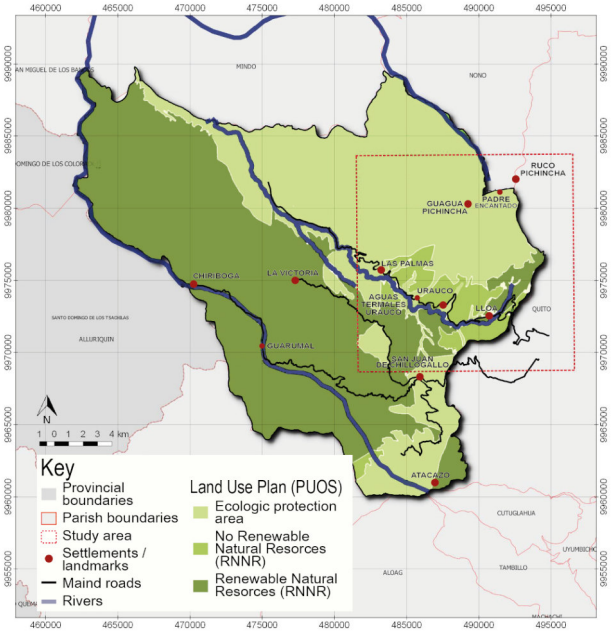
Lack of goods and services in Lloa is another way to describe the condition of marginality. For instance, only 36% of urbanised areas have access to potable water, despite being one of the district's primary water suppliers (GADP de Lloa 2019). The rest of the populace risks their health by using water from ditches or rivers. Only 34% of the parish, mostly in the centre, has sewage infrastructure, which creates another health risk because most waste is dumped into septic tanks or, in the worst-case scenario, directly into ditches or streams. The garbage collection service has 40% coverage, so there should be critical issues with dumping and contamination. Contrarily, the parish is rated as having a moderate level of public lighting (70%) and electricity (77%); however, this could indicate that the dispersed neighbourhoods are underserved (GADP de Lloa 2019).

The entrance to Lloa from Quito is marked by the Metropolitan Park "Chilibulo-Huayrapungo", a popular destination for recreation among Quito residents. Nevertheless, a few courtyards and neighbourhood parks reveal a critical issue about public space in the urbanised areas of Lloa. The parish also has a low level of connectivity: only the parish head and the surrounding neighbourhoods are moderately served and connected to the city, and the roads get worse the further the passenger travels from the city. The only paved infrastructure is the Lloa-Palmira collector, despite its imperfect state. The other two collectors that lead to the Chiriboga and La Victoria sectors have a longer earthen roadbed. This critical circumstance is increased by the annual rainfall values that range between 835.10 mm and 1500 mm and an estimated annual average of 177 rainy days (GADP de Lloa 2019), as well as temperature that can reach 0°C. Therefore, the sector is highly affected by the risks of landslides, with severe consequences for accessibility. Further, volcanic threats (very common throughout the country) significantly increase the latter problem in the event of an evacuation.

4 Methodology: Discovering landscape values in marginalized areas

4.1 General framework

This research has an empirical approach with a narrative focus; it does not provide a general definition of marginality but instead makes an effort to weave a multidisciplinary



Source: Land use and occupation plan (2015)
Notes: elaborated by Nadia Rodriguez

Figure 3: Land use map

statement around a specific local notion of marginality. This empirical dialogue between disciplines contributes to enhancing the range of parameters on marginality and further leads to a new definition of the topic and a cutting-edge local planning approach. The authors offer a three-stage analysis to accomplish this. First, this work presents an archival and desktop critical analysis and focuses on Latin American scientific publications since the local academic interpretation of the topic shapes a specific concept of regional marginality.

4.2 Sociospatial methods and tools

This first step is accomplished by conducting a thorough review of the literature on Latin American theories of marginality and contrasting it with observations of the actual situation on the ground, which results in the paper's opening insight and the Latin American academic definition of marginality. The second step is to dive into a specific case study and use descriptive spatial analysis to show how marginality is defined there and what the potentialities of the location are. This step is developed through two analytical tasks: the first one focuses on an official statistical survey delivered by the National Institute of Statistics and Census (INEC 2010), and the second one is based on proving that statistics are supported by citizens. To gather first-hand qualitative data from residents or local stakeholders, a specific ad hoc questionnaire was distributed to the community. The fieldwork analysis also includes 50 interviews conducted over the course of one fieldwork week with local residents. The questionnaire is divided into four sections, the first of which aims to confirm and verify the statistical information gathered by INEC. The next set of items pertains to the working and educational environments, and the third phase is concerned with determining whether a person is a permanent or transient resident, as well as with local businesses and income levels. The final inquiries centre on the assessment of tourist potential and the degree of commitment of the locals. For instance, a series of inquiries have been made to determine which local opportunities could be developed and which priorities have been identified. In order to achieve this, questions are inserted to help measure the ranking of landscape and tourist resources as perceived by each interviewee.

The paper proposes (third step) the use of the landscape approach (Pérez-Chacón Espino 2005) as a tool to review the actual, local situation matched with the socioeconomic findings of the area in order to fully comprehend the values of the space and its conceptual implications. Using ArcGIS software, the final task entails conducting a geographical analysis with the goal of identifying marginal landscape features in the given area. In this instance, the categorization and evaluation of Lloa's landscape have been defined using the methodology outlined in the Catalan landscape catalogues (Nogué i Font et al. 2016).

According to Nogué i Font et al. (2016), the catalogues were designed as a tool to support the implementation of landscape policies in territorial and urban planning, and especially as an instrument to protect, manage, and order the landscape in Catalonia. The catalogues are based on the concept of landscape as a complex and integrated reality of natural, artificial, and cultural aspects. They assume the definition of the Council of Europe Landscape Convention, according to which "landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors (Council of Europe 2004). Four phases have been defined for the definition of the landscape catalogues: (i) identification and characterization of the landscape; (ii) landscape assessment; (iii) definition of landscape quality objectives; and (iv) establishment of proposals for criteria and actions. The definition of landscape units is part of the first phase and is aimed at identifying the distinctive features of a portion of territory, that is, recognizing those natural elements, cultural (tangible and intangible), and visual elements that distinguish a given landscape from another (Nogué i Font et al. 2016). The variables used to define landscape units must take into account the territory's dynamics, historical context, points of view, perceptions, and land use rather than just the physical and structuring aspects of the area. The definition of landscape units in the Lloa territory has taken each of these variables into account.

The process carried out in this study does not define an integrated system of criteria and actions; rather, it aims to show that Lloa's negative condition of marginality due to its socioeconomic shortcomings could be "balanced" by the high value landscape that the study shows. Clearly, this could be ascertained or specified at the moment in which the value of the landscape begins to be considered a necessary variable in territorial and urban planning. The landscape study has been applied by identifying general geographical features of Lloa and, based on them, employing two analytical criteria: biophysical and anthropogenic. The former involves the analysis of elements that visually highlight two natural components of the landscape: the biotic, which means flora and fauna, and the abiotic, which describes non-living elements such as climate aspects, hydric resources, and geologic data. The produced maps were created using shapefiles from the Quito municipality's open data (datos abiertos de Quito) and INEC shapefiles, which are accessible from a public website. In order to wrap up the analysis, a visual-basin plug-in has been used to map the visual values of particular landscape clusters in the area under study. The three phases offer a fresh perspective on the concept of marginality in Latin America and present a novel paradigm of it in Quito.

5 Social approach: Are people from Lloa marginalized?

5.1 Desktop analysis

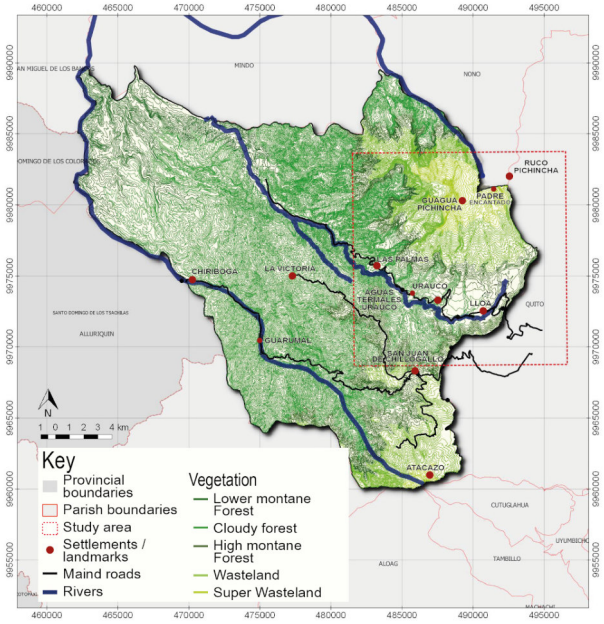
An archival analysis of the socioeconomic situation in Lloa brings the following results. The parish consists of a low-income community with huge precariousness. For instance, official data from INEC (2010) show that 80% of people belong to the population of working age (PET), so this has decreased since 2001 (82%), confirming that the young population is leaving the parish. Indeed, although there is a population growth rate of 0.5%, 58% of the inhabitants are adults (19 to 64 years old), and the age group between 35 and 64 years old is the majority, which indicates that young people are leaving Lloa. Regarding the presence of local economic activities, the economically active population (PEA) compared to the economically inactive population (PEI), denotes a 7% growth of the PEA and a decrease in the PEI, which shows that, despite the conditions, the villagers take advantage mainly in the primary sector, as 52% of the inhabitants are

dedicated to activities such as agriculture, livestock, forestry, and fishing, compared to 11% of industries and 37% of services (GADP de Lloa 2019). Therefore, in Lloa, the average family is supported by jobs in the primary sector. However, due to the health and economic crisis in Ecuador stemming from COVID-19, the census scheduled for 2020 will be published in 2023. Hence, because of this census and the resulting lack of real-time information, empirical field work has been done through conducting interviews with local villagers who voluntarily agreed to be part of the research.

5.2 Interview analysis

Gender equality is confirmed, with 54% of respondents being men and 46% being women, according to the 50 interviews conducted in Lloa. Additionally, the predominant age group continues to be between 35 and 64 years old, which supports the issue of young people migrating. Further, 66% are employed in agricultural activities, 24% in the commercial sector, and barely 10% in the construction industry. Data on the types of work that parishioners do were gathered in order to better understand their way of life: 70% of those polled admitted to having a part-time, independent job related to farming, such as cultivating or selling crops in Quito or at the parish head's weekend fair. Furthermore, a significant portion of people sell their own goods; 60% of those surveyed are business owners, with 83% of them based in Lloa and 17% outside the parish. There is a direct correlation between these variables and the level of income per household, with an income per household ranging from one (50%) to two (30%) basic wages. As a result, most of them are uninsured (63%), i.e., they are not affiliated with the Ecuadorian Institute of Social Security (IESS). Furthermore, the type of work people do affects whether they live in Lloa frequently or permanently, with 27% of people visiting the parish only for work and 50% making it their primary residence. It was also found that most of the people (63%) have lived for more than five years in the current residence (private accommodation), and 58% of the polled form households with more than five people.

Natural elements (40%) and gastronomic offerings (21%) are thought to be the most significant aspects of Lloa's potential and priorities. Recreational activities (horseback riding, trekking, fishing, and mountain biking) follow with 18%, rural travel routes with 13%, and finally cultural and religious issues with 8%. A question was also raised about the parish of Lloa's potential as a tourist and landscape destination. People categorically state that the area has potential for tourism, which demonstrates that Lloa also has a high level of resident relevance and appropriation. Furthermore, 13% of those polled gave priority to the creation of new jobs (13%) or businesses (16%), which has raised concerns about the industry's unstable employment conditions. On the other hand, only 10% stated public spaces as their primary need. However, the request to improve other services, like public transportation and travel agencies, received the most pertinent response (21%). This reflects the subordination of business and tourism issues to Quito. The earlier responses support the interest in landscape potential. A question has therefore been posed about community-based tourism, and 33% of users claim to know what it entails while 62% are unaware of it. To ensure that everyone understood the idea completely, it was explained to them all, and 90% of respondents said they would be willing to participate in or benefit from such a project. This corroborates earlier assertions about the importance of the landscape and supports the notion of community-based landscape development. This information, along with statistical data, demonstrates that Lloa is regarded as a location with significant natural resources and tourist attractions that are connected to the major urban centres. The people who live there are aware of this potential and eager to use it. However, they believe that receiving technical support is essential to gaining empowerment and creating a long-term strategy that enables them to achieve their goals.



Source: DMQ open data 2016
Notes: Elaborated by Nadia Rodriguez

Figure 4: Plant cover

6 A spatial analysis: Is marginality a negative concept in the local context?

6.1 The basic spatial information

The parish of Lloa has been studied as a territorial area of interest from a spatial perspective, with the goal of describing the landscape. The spatial analysis started collecting the basic spatial information of Lloa. The open-access repositories return relevant parish information. First, spatial data on land use, natural resources (plant cover), hydrographic maps, and relief maps were obtained. Furthermore, the road map and Lloa's urban settlement are geo-referenced. The data were then processed using ArcGIS to produce relevant information such as territorial profiles, landscape units, and a visual basin map. Moreover, the basic spatial information was used to develop the Landscape Value Evaluation Matrix, an empirical tool that complements the Landscape Unit catalogue.

6.2 Landscape Units of Lloa

After the spatial analysis of Lloa, the study focused on detecting the specific features of the case study in order to delineate different landscape units. Nogué i Font's methodology was used to conduct the landscape analysis, with a particular emphasis on the biophysical and anthropogenic criteria. This study supports the existence of five ecosystems that are influenced by altitude, flora, and fauna (Table 1, Figure 4). This variety of ecosystems results from the parish's varying slope, which leads from a dry climate typical of the mountains to a humid climate typical of the coastal zone. The water system, which shapes the Blanco River sub-basin (a portion of the Esmeralda River basin), is yet another abiotic component. According to the Lloa PDOT, the Mindo River, Cinto River, and Soloya River are the three major rivers that join to form the Blanco River. These rivers receive water from other rivers as well as from several ravines that are created by the Guagua Pichincha's slope. The PDOT acknowledges a total of 22 micro-watersheds (Figure 5).

According to Nogué i Font et al. (2016), anthropogenic criteria are used to describe the presence of humans in a given area of the landscape and include factors like population, land use, dynamics, history, and aesthetics. Urban settlements in Lloa have no relevant

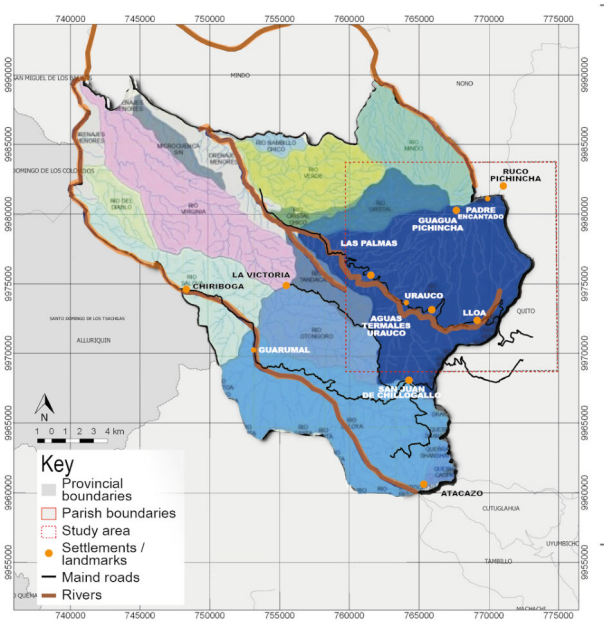
Table 1: Ecosystems of Lloa

	Lower Montane Forest	**Cloudy forest**	**High Montane Forest**	**Wasteland** (Páramo)	**Super wasteland** (Superpáramo)
Altitude (m.a.s.l.)	1240-1800	1800-3100	3100-3400	3400-4100	4100-4760
Tree characteristic	Treetops from 20 to 25 m, evergreen forest	Tree tops from 20 to 25 m, abundant moss/ low to medium dense forests	Tree tops from 15 to 20 m, sloping stems and abundant moss on the floor	Herbs in tuft and small shrubs	Low-cover rocky soil of very resistant plants
Vegetation	Mosses, ferns, orchids, bromeliads and heliconias	Mosses, ferns, orchids, bromeliads	Mosses and epiphytes	Grassland	Disappearance and gradual replacement at height
Species	Ceibo, guarumo, Zapote and Platanillo	Anthurium of Mindo,, Brunellia acostae and Piper sodiri	Reziera verrucous, Freziera canescens and Croton elegan	Chuquiragua, valerian, Grassland, Aloadilla and Saracha	Cushions, Rosetas acaulescentes, Short-stemmed shrubs and Grasses
Fauna	Dung beetles, eagles, lizards, tangaras, humming-birds, South American chameleon, dwarf iguana	Spectacled bear, whitelisted bats, High Andean mice, land frogs and carnival beetle	Nectarivorous bats, lizards, beetles and prickle	GaviláVariable, the Marsupial Frog of San Lucas and the Moorish Wolf	Condor, curiquingue, bandurria, spectacled bear, moor wolf, rabbit
Aquatic fauna	Macroinverte-brates - Astroblepus ubidiai	Macroinverte-brates - Astroblepus ubidiai	High diversity macroinverte-brates - Trout	Insects and Trout	
Notes	Maximum dry season: one month	Perfect habitat for bamboos	Transitional vegetation / Threat: excessive extraction of wood	Threat: Grassland and crop burning	Threat: Grassland burning

Notes: Elaborated by N. Rodriguez

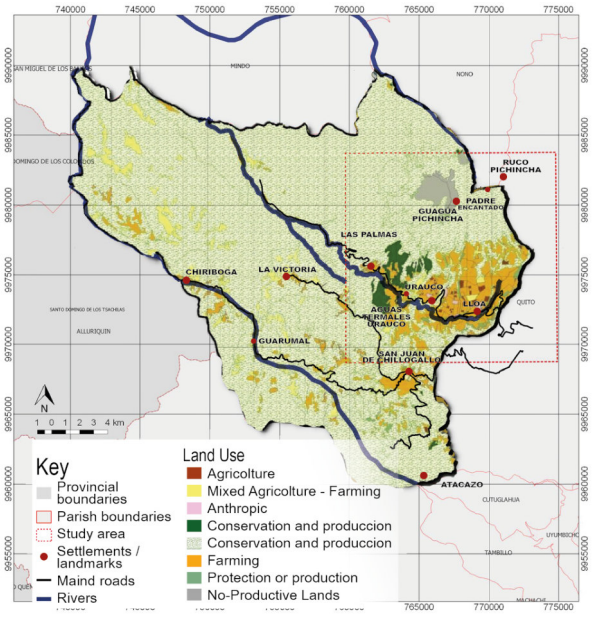
surface area (1%). However, land use shows a significant surface of ecological protection (43%), 52% is destined to renewable natural resources (RNR), and the remaining 5% is interested in non-renewable natural resources (mining), populated settlements, and dispersed agricultural residences (Figure 6). Furthermore, the majority of activities take place in the proximity of the human settlements that border Quito, while the area to the southwest is primarily protected, despite some changes to the forests brought on by agricultural activity.

The historical aspect also imparts interesting information, beginning with the parish's name, which, according to linguist Jacinto Jijón y Caamao, means "high plateau" and originates from the area's original populations, the Cara and the Colorados (PDOT). The Inca also left their mark on Lloa; it is interesting to note that the Ruta del Sol, which is a part of the network of Inca roads leading to Peru, passes through the parish. This route is enriched by other routes from more recent times, such as the Ruta de las Haciendas from the colonial era and the Ruta del Pichincha, which ascends the top of the Guagua Pichincha, circles the volcano, and leads the town of Mindo. These trails, given the topography of the place (Figure 7), provide a number of exclusive observation points that



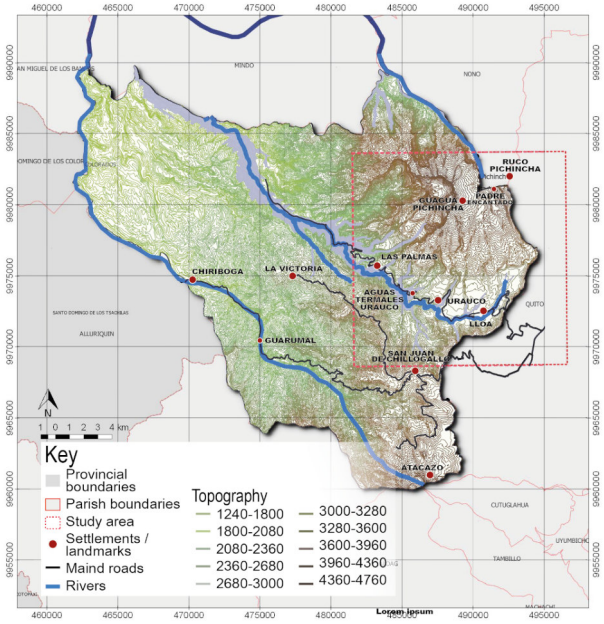
Source: PDOT of Lloa (GADP de Lloa 2019)

Figure 5: Hydrographic map



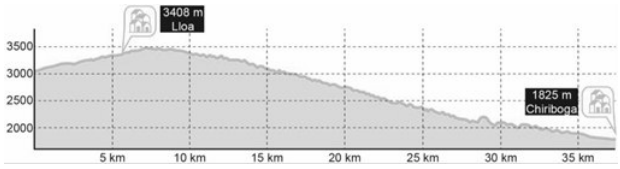
Source: PDOT of Lloa, Instituto Geográfico Militar – DMQ
Notes: Elaborated by Consultora Morales, 2015

Figure 6: Land Use



Source: DMQ open data 2016
Notes: Elaborated by Nadia Rodriguez

Figure 7: Reliefs maps



Source: GoogleEarth
Notes: Elaborated by N. Rodriguez

Figure 8: Street profile to Chiriboga W-E

are crucial to this study (Figures 8, 9, and 11). As the landscape catalogues of Catalonia indicate, "the determination of the most important observation points – by virtue of their visual scope or human frequentation – and the cartography of visual basins are essential requirements in the delimitation of landscape units, since they allow determining the extent to which each sector contributes to the perception of the landscape" (Nogué i Font et al. 2016, p. 52).

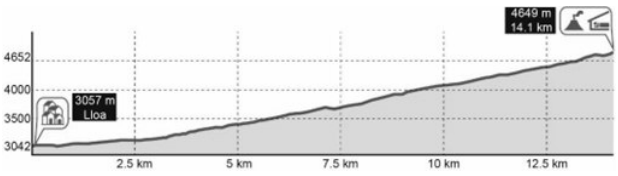
Previous elements have been processed to define landscape units; hence, the biophysical analysis data overlapped the anthropic ones. Therefore, the result stresses the importance of relief and geographical features in identifying a total of seven landscape units, described as follows:

Cordillera: it is characterized by the corresponding climate and vegetation to the moor, its vegetation is scarce and the soil rocky.

Ceja Andina: it is a strip that borders the moor and is the transition between the cloud forest and the mountain range, developing in the which corresponds to the high montane forest.

Transforming landscape: is the territory that corresponds to the areas with more inhabitants and whose land is used for crops, livestock, fishing, quarries. It presents a change from a natural landscape to an anthropic one.

Cloudy Forest: it occurs on the slopes and represents the largest portion of the parish



Source: GoogleEarth
Notes: Elaborated by N. Rodriguez

Figure 9: Street profile to Pichincha volcano S-N

Notes: Elaborated by N. Rodriguez

Figure 10: The Lloa landscape unit and the smaller area with the richest landscape

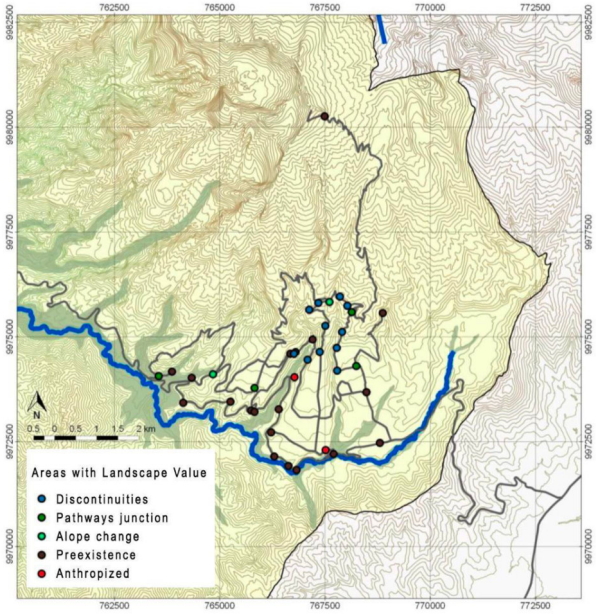
as it is the transition between the mountains and the coast, with the particularity of humidity and low clouds.

Low Montane Forest: it belongs to the sub-Andean highlands and develops under high rainfall and high humidity, causing what is known as "evergreen forests".

Rivera: it covers the extension of the two main rivers (Cinto and Saloya) and presents a strong risk of contamination of different types.

Ravines: given the topography of the parish, there are numerous ravines, but this unit describes especially the steepest one, the Río Cinto, which in fact is a limit to agricultural growth.

The analysis of the landscape units has followed several phases. The first concerns the collection of biophysical and anthropogenic information. To this end, land use analysis as well as a natural resources survey have been realized using ArcGIS software to process data and information from the open-data of Quito and Decentralized Autonomous Government databases. The macro criteria that are used in this phase are categorized as follows: urban topography, vegetation, hydrology, urban morphology, accessibility, and the dynamic of the area in relation to its historical dimensions and visual basins. The result is the landscape unit map (Figure 10), showing a smaller area really rich for the high number of different landscapes, one close to the other and nearby the urban consolidated tissue of Quito.



Notes: Elaborated by N. Rodriguez

Figure 11: Landscape Value Zone

A thorough analysis has been developed in order to learn more about the perceived value of the landscape and the visual advantages of this outlying area, building on the findings of the landscape unit definition. In order to achieve this, a focused analysis of the chosen quadrant was conducted (Figure 10). Two distinct surveys were conducted: one focused on the topography and tourist attractions (Figure 11), including ancestors', past paths, and modern paths; the other involved a topographical comparison with the surveyed locations. As landscape landmarks, it is possible to identify the Guagua Pichincha volcano peak, the Chuquiragua hill, the thermal waterfalls of Uruaco and Palmira, the waterfalls of San Juan and Chirinchos, among others, and the footpaths and cycling routes that interconnect all these natural landmarks. Along these paths, one can find interesting human endeavours that support tourism, such as the Santuario de Nuestra Señora del Cinto and a number of haciendas (farms), like Hacienda las Palmas and Hacienda Concepción Monjas, which, in addition to housing visitors, also serve to increase awareness of the area's biodiversity. In these locations, it is possible to carry out cultural activities involving learning about the local environment and traditional methods for farming, keeping animals, and fishing in trout alleyways. The Virgen del Cinto monastery, properly situated on the western edge of the Chilibulo Metropolitan Park of Quito, is another Lloa attraction. Devotees travel to the monastery as a pilgrimage destination; in particular, in September, when the Virgen del Cinto is honoured, groups of pilgrims travel by foot from Quito to the shrine.

Based on this, five types of landscape value zones are recognized:

Pre-Existence: places that have value because of tourist attractions, agricultural and built-up historical presences, and services

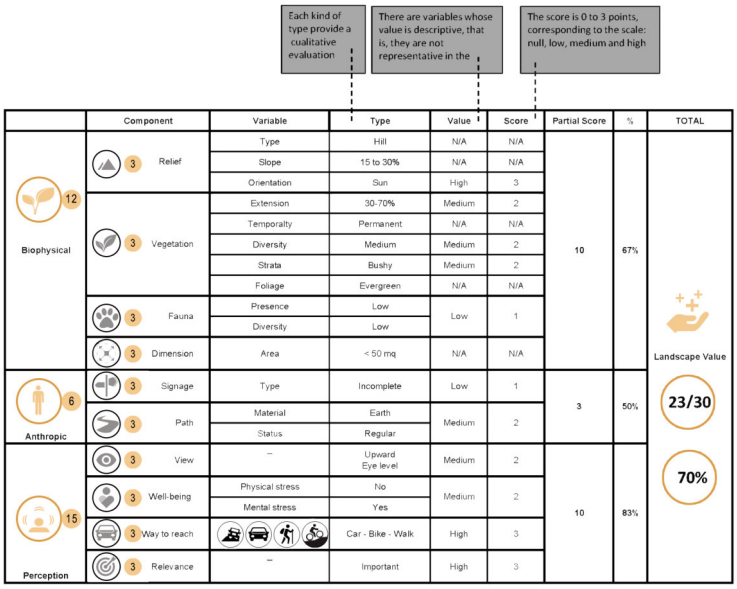
Anthropic landscape: places valuable because of the human presence

Discontinuity: open spaces along the paths with a high biophysical and perceptive component

Path cross: nodes between principal paths and route towards other attractions

Slope change: nodes between principal paths and underused trail with slope change. The trails are considered as possible potential for future activities

Table 2: Landscape Value Evaluation Matrix



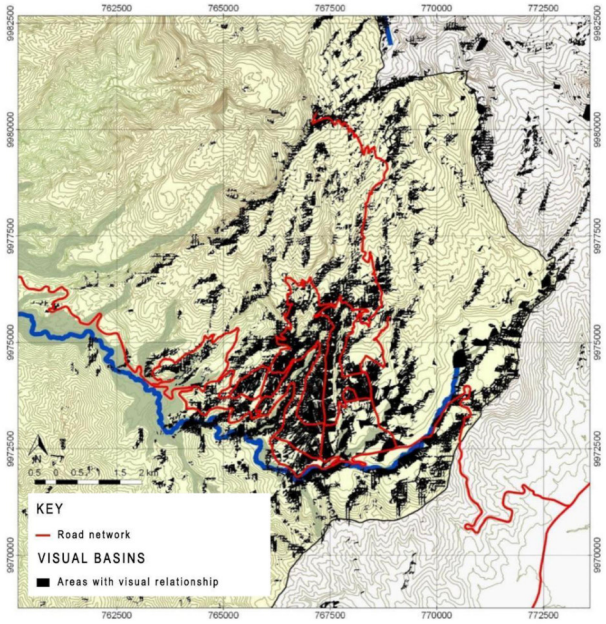
Notes: Elaborated by N. Rodriguez

An empirical analysis of the landscape value of these five categories has been conducted using a novel matrix in order to verify the data. A landscape assessment matrix is created using a survey and analysis of three attributes: biophysical, anthropological, and perceptual, which are further divided into other variables to be scored. The matrix is designed to assess the current state of the landscape, and each attribute is given a score between 0 and 3, representing a scale from "null", "low", "medium", and "high". According to this rating, the biophysical attribute is made up of four evaluable components and is worth 12 points; the anthropic attribute is made up of two components and is worth 6 points; and the perceptive attribute is made up of four components and is worth 12 points. The maximum score is 30, so this tool enables users to identify which features are weak and those that could be exploited (Table 2).

The topographical analysis shows that the relief has an important impact on the landscape value of the path system. A visual capability study of the path system was conducted in order to define the visual value of the various paths. This kind of study determines a system of visual basins that describe what is possible to see and how far it is possible to see from different selected points of interest.

For the purpose of defining the visual basins, the chosen points were processed with ArcGIS using the Visual Basins plug-in, which enables the surfaces to be in a direct visual relationship while excluding morphologically depressed areas. This step enables the identification of the most pertinent and potentially valuable points of view within the analysed area. The visual basin definition enhances perception of local differences (Figure 12).

Therefore, the concept of marginality could be complemented by the study of the landscape as a combination of spatial and empirical analysis using a multi-scalar and multidisciplinary approach. The focus area is regarded as marginal in relation to Quito based on socioeconomic studies, but thanks to the landscape approach, it reveals a high level of interest due to its divergent values and viewpoints. This is clear when examining the outcomes of the previous landscape value detail. Aspects from Quito and the Lloa protected ecosystems are gathered in this area. In terms of natural and human biodiversity, it can be compared to an ecotone using ecological parallelism.



Notes: Elaborated by N. Rodriguez

Figure 12: Visual basins

7 Concluding remarks

Marginality is a crucial topic in Latin America since this region is still embedded with multidimensional issues of vulnerability, inequality, poverty, and exclusion. According to Latin American theories, marginality is a problem caused by socioeconomic inequality, and in underprivileged areas, the chances for integral human development are severely constrained. Moreover, the impact of environmental risks, climate change, and – more recently – COVID threats calls for a novel approach that involves ecology suggestions and landscape tools in order to enhance the Latin American theory of marginality toward an integral framework of the problem. As the paper shows, there are several points of view for defining marginality, such as socioeconomic, spatial (landscape), and perceptive (citizen perception). These glances display aspects that provide a cutting-edge conceptualization of the topic: the citizen's perception confirms the socioeconomic situation, while the landscape approach gives a complementary position that opens up the possibility for potential future research.

Conceptually, marginality represents a complicated situation of socioterritorial conflict involving both outsiders and residents close to the area. Similar to the case study, such marginal areas might be small settlements a short distance from the city limits that act as a transitional area to rural lands. Furthermore, marginality is an expression of the local communities' overall underdevelopment, particularly in terms of socioeconomic issues, access to goods and services, and the precariousness of housing and the urban environment. When the landscape features are taken into account, however, marginality assumes a different meaning: in actuality, the marginal areas with high landscape values play a crucial role in articulating and governing the territory, offering the possibility for sustainable urban and tourist development.

The case study offered a number of important insights that can be divided into three main categories: (i) involving local communities in the concept's definition, (ii) setting up a testing ground, and (iii) assessing the viability of accepted theories of regeneration. Particularly, the precariousness of their urban environments and economies, as well as the scarcity of goods and services, worsen the ghettoization of Lloa's communities and the perception of marginality. For instance, the lack of adequate infrastructure severely limited communications with Quito, despite its proximity. The overall data

confirm that Lloa is a marginalized territory in both socioeconomic and infrastructural aspects; however, the interviewees showed pride and a sense of belonging, which could be a new positive aspect of marginality if related to landscape values. As a matter of fact, the awareness of landscape features is an element that opens up a new theoretical and practical horizon regarding the definition of marginality.

The landscape assessment matrix developed for the case of Lloa incorporates elements of the methodology described in the Catalan landscape catalogues while also developing an ad hoc approach for the particular situation under investigation. The features considered in the Catalonia catalogues are very broad since it is a tool developed for larger-scale studies, while in the case study a specific portion of the territory was analysed. Therefore, the evaluation framework has been specifically designed to take into account the variables helpful for addressing the issue of marginality, particularly those connected to anthropocentric actions and perception.

The catalogues are a useful tool for valuing the landscape, protecting it, and considering it an essential tool for territorial and urban planning. The landscape, when understood as a complex system, provides a novel interpretation of territories since it offers a cutting-edge definition of those areas labelled as marginal, as in the case of Lloa. It is obvious that using the catalogue's instructions as a universal guideline is not possible. Although its methodology can be used elsewhere, each distinct territory should create its own catalogues and recommendations for the local regulatory system. This research shows that there are aspects of the methodology that can be fully applied, but others require adaptation to the local situation.

Moreover, the landscape units of Lloa disclose a high value of green elements in both their biotic and abiotic components. The huge climate and landscape components demonstrate that the marginality in Quito could work as an ecosystemic balance against pollution and other urban problems. Moreover, the biodiversity and the landscape landmarks display an encouraging scenario for sustainable tourism, creating a new opportunity for developing the parish. The smart use of technology, such as the application of a visual basin plug-in, opens up new ways of interpreting and analysing the spatial features of marginal lands.

The use of landscape to study marginality could produce a potentially novel method if current theories are taken into consideration. For instance, it suggests considering the landscape when planning activities and taking marginality into account. As a result, it creates a comprehensive system of relationships between various disciplinary and analytical dimensions focused on marginality reduction as it is understood today. The research findings, however, do not alter the definition of marginality for marginal urban areas with scant or non-existent landscape values. Instead, it proposes to enhance the variables behind the topic. Further, a new study should be developed using alternative methodologies, including at least the concepts of urban landscape and values that operate on a different scale (Cullen 1976, Gehl 2014, Hillier et al. 1993, Lynch 1960).

These overarching considerations offer a possible response to the query about what specific insights on marginality are displayed by the case of Lloa. The main insight is led by the balance between socioeconomic marginality and the huge variations of landscape in the peripheral condition:

- the enhancement of the landscape view from the most interesting miradores, enables a positive condition of marginality and a perception of the environmental variations as in-transition areas between landscapes;
- a path tourist's system structure, focused on the understanding of the biodiversity of the Lloa, opened the area to new potential connections (leisure and educational) with the city of Quito;
- Sustainable development focused on responsible tourism could generate employment and local business; therefore, it could reduce the critical socioeconomic condition, increase the sense of belonging and, finally, update the perception of marginality.

The results encourage the disciplines that deal with marginality to work no longer as separate areas but as an interconnected network that must necessarily form a system to

obtain innovative results with high impact on the territories. The landscape, particularly in Latin America, is a true heritage that ought to be valued and preserved for the future because it can give marginality a positive meaning and reshape the discouraging narrative that the socioeconomic theories provide. Although descriptive, the findings from the initial phase of this research pave the way for a later stage of work that will systematize a multiscale analysis and define a set of indicators aimed at integrated action on the territory.

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Remote and connected. Negotiating marginality in rural coworking spaces and "tiers-lieux" in France

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Abstract. Originally associated to big cities' centres, coworking spaces and "tiers-lieux" ("third-places") have been blooming in rural regions and small towns over the past five years. The development of those places has been critically supported by local and national authorities, with a growing interest from rural localities. Indeed, those places are supposed to provide answers to numerous contemporary territorial challenges, and to tackle several dimensions or rural vulnerability. They are supposed to enhance sustainability by reducing the need to commute and car-dependence, by bringing both workplaces and services closer from home. They are also mobilised to tackle the issue of the digital gap between centres and peripheries, providing digital infrastructures and hardware. Finally, they are supposed to reduce territorial inequalities by strengthening rural entrepreneurship, safeguarding local jobs, facilitating professional retraining and attract new residents by providing an easier access to telework.

Conducted between 2017 and 2019 in the Auvergne-Rhône-Alpes region, our study provides some elements to evaluate the effects of those places on territorial vulnerability and marginality. Based on the study of 17 coworking spaces situated in rural areas, their funders' trajectories and their users' profiles, we discuss the motives and the expected returns of those places, and their actual potentialities and limits.

In this article, we intend to shed light on the actual practices, uses and users of rural coworking spaces and third places, in order to question the territorial change they bring about from a demographical, sociological and territorial point of view. Interrogating the notion of marginality at the light of those places and their users, our study highlights the diversity of lifestyles in the rural areas. Coworkers display particular spatial anchorages, with local resources being valued, though combined with forms of plural and multilocalized belongings. Their relationship with the margin is chosen, controlled and reversible, sometimes even yearned for. Their connectedness is not so much defined by where they live rather than by who they know and where they move, embodying the social dimensions of marginality.

1 Introduction

Coworking spaces have emerged at the beginning of the years 2000 in the San Francisco Bay. They have originally been created by digital workers themselves, in search of a place to work when their status allowed them to work anywhere (Liefooghe 2018). Shared spaces of work also responded to the need of the growing freelance workforce to have access to an affordable workplace, in the context of booming prices on the Californian real estate market (Lallement 2015). Soon attracting the curiosity of the media, they are

now seen as one of the symbols of new ways of living and working, typical of the so-called "collaborative" economy and of digital nomadism (Scaillerez, Tremblay 2017).

During the years 2010, coworking spaces have spread throughout Europe and the world, first in the major cities and more recently in medium-sized towns and even some villages (Besson 2018, Leducq et al. 2019). In France, many non-profit coworking spaces adopt the label of "tiers-lieux" (third-place). In the French context, the "Third place" movement, reuniting diverse collaborative workplaces such as coworking places, fablabs and makerspaces, has emerged at the same time, a proof of both dissemination and differentiation of those shared places of work in different urban environments (Leducq et al. 2019).

Indeed, recent data shows that the biggest increase of such places in the past 5 years was recorded outside the metropolitan areas (Lévy-Waitz 2018, 2021). In 2018, they represented 42 % of all spaces in France and up to 70 % in some regions where special public policies and funding have been implemented (Nouvelle-Aquitaine, Occitanie). Indeed, there is a growing interest from municipal communities for those projects. Following the first report of the Mission on Coworking Places and Third Places commissioned by the Ministry of Economy (Lévy-Waitz 2018), the State has also launched its own funding scheme, with a wide 5-year subsidy programme aiming at creating 300 new third places in particularly vulnerable rural and suburban territories ("Fabriques de territoire"[1]). This territorial dimension aims, on one hand, at operating a "re-balancing" between inner cities and their peripheries (both urban and rural), and on the other hand, at fostering local development. The consistent budget dedicated to this programme (175 million €) highlights the importance of expectations towards those places.

In France, according to the latest classification of the National institute of statistics based on population density, a third of the population lives in rural areas (D'Alessandro et al. 2021). The population living in rural areas faces the increasing scarcity and remoteness of everyday services (Doré 2019), while employment areas are concentrating in the metropolis thus expanding daily commutes (Reynard, Vallès 2019). This reliance on mobility to access diverse resources (work, services, healthcare) has been particularly exposed during the "Yellow Vests" movement, highlighting the acute risk of social exclusion due to the lack of accessibility in rural areas (Farrington, Farrington 2005).

Third-places are supposed to answer some of those challenges. First, they are supposed to allow employees to work closer from home, and to bring back services in remote areas through the functional mixity of those spaces (Lejoux et al. 2019). Third-places are also assumed to build on the digitalisation of the economy to reduce territorial inequalities: the opportunity to provide more and more products and services at distance through the internet is supposed to boost rural entrepreneurship, create new jobs and allow rural entrepreneurs to access distant markets. In addition, third-places could avoid emigration and help attract new residents through telework. Finally, third-places are also expected to counterbalance the territorial effects of the welfare State retrenchement (Courcelle et al. 2017), by offering multiservices hubs while rationalising public spending through the use of digitalisation (Courcelle et al. 2012).

The idea, however, is not new: as early as in the 1990s, the State already saw in telework a potential tool of local development (Salgueiro et al. 2017). The DATAR (Interministerial direction of planning and regional attractivity, suppressed in 2014 and replaced with the General commission of territorial equality) launched in 1990 a programme to set up "telecottages" in order to promote telework in the countryside and address territorial inequalities through the support of remote work in rural areas. But the experience fell short of expectations and never really reached an audience (Crouzet 2002, Moriset 2011, Pouly 2020). In 2005, another call for tender by the Interministerial Direction of Planning and Territorial Competitiveness aimed at implementing 100 telecottages on the national territory. But by the year 2008, there were about 35 of such places in rural areas (Salgueiro et al. 2017), versus about 20 times more coworking spaces and third-places ten years later (Lévy-Waitz 2018).

[1] "Fabriques de territoires" is a national program launched in 2019 by the Ministry of Territorial Cohesion and renewed in 2021, aiming at labelling "Territorial hubs" . It comes with an operating grant of 75 000 to 150 000 € over 3 years (50 000 € per year maximum). See https://www.cohesion-territoires.gouv.fr/labellisation-de-300-fabriques-de-territoire-en-france

The recent success of coworking spaces in the countryside thus comes with a little surprise. We argue that it can be explained by changes in the demography of some rural areas, that have become more and more attractive to "creative classes" that are increasingly sensitive to environmental amenities and to the values and narratives of contemporary "neo-rurality". The multiplication of social innovations in the countryside across the past ten years testifies from a renewed dynamism in those residential flows from the city to the countryside, that was already tangible before the Covid-19 pandemic, but gained new attention since 2020. Indeed, a new research agenda has emerged after the pandemic on the opportunities of coworking spaces to respond to the challenges of the rapid increase of telework, including in rural areas (see, for example, Manzini Ceinar, Mariotti 2021b). In the same time, there has been an increasing interest for the possibility for generalisation of telework to allow for a large-scale relocation of jobs from the urban to more peripheral areas, thus reviving the interest to use telework as a tool for local development (Hölzel, de Vries 2021, Sen 2021, Reuschke et al. 2021), but also to tackle the issue of spatial inequalities (Reuschke 2021). However, not all countrysides benefit from such dynamism, nor all parts of those countrysides.

In this article, we intend to shed light on the actual practices, uses and users of rural coworking spaces and third places, in order to bring out the social and spatial patterns of those places prior to the pandemic. We don't seek to evaluate their effects from an economic point of view (for this, see for example Besson 2018), but rather to highlight the territorial change they bring about from a demographical and sociological point of view, while questioning to what extent marginality can be defined as the property of places, or of people. We will first present the methodology and scope of this study, before revisiting definitions of coworking and third-places and the origin of their recent spread in the rural areas (Section 3). Then, we will present the empirical results of our study. First, we will present the characteristics of those places and their users, by focussing on the users of shared offices (Section 4). Then finally, we will examine the motives and expected benefits of the social and spatial networks derived from those places (Section 5). Third-places, we argue, are not at the origin of the contemporary rural dynamism in the places they establish themselves, but may accelerate it by creating networks of entrepreneurs. In this respect, we will point out some potentialities and limits of this model, including the risk of rural gentrification and deepening of inequalities between territories in the context of State retrenchment.

2 Methodology

In this article, we rely on data gathered between 2017 and 2019 in the Auvergne-Rhône-Alpes region in the framework of a publicly funded research programme called Coworkworlds[2].

The fieldwork, completed before the 2020 lockdown, comprised 4 different phases. We first conducted an inventory of all coworking spaces open at the time of the survey. This census that we expected to be as exhaustive as possible indicated that although 47% of those spaces are located in the centres of big cities, there were also many coworking spaces in the suburbs, medium-sized towns and rural areas, attesting to the geographical spread of coworking (Leducq et al. 2019). Indeed, almost a quarter of those spaces were situated in rural areas of the region (see Table 1). The second phase of the research aimed at characterising the coworker population and a panel of coworking spaces. A quantitative survey was administered to 377 individuals (including 79 in rural areas) in a panel of 54 places, including 12 in small cities and rural areas (mostly in Drôme and Ardèche). Table 1 summarises the geographical scope of the research.

We originally did not include third places in our study, which was focused on coworking spaces exclusively. But the progressive dissemination of this word, especially among rural non-profit shared places of work, coupled with its progressive institutionalisation with the creation of France Tiers Lieux, forced us to re-evaluate this choice and to broaden our sample to all collaborative shared offices.

[2]French National Agency for Research, contract nr. ANR-17-CE22-0004

Table 1: Data collection process according to urban environments

Urban type	Number of registered spaces		Number of investigated places		Number of persons interviewed for the quantitative survey		Semi-structured interviews
	N	%	N	%	N	%	N
Metropolis – centres	72	57.60%	27	50.00%	237	59.70%	12
Metropolis – suburban	24	19.20%	15	27.78%	101	25.44%	1
Rural	29	23.20%	12	22.22%	59	14.86%	19
Total	125	100.00%	54	100.00%	397	100.00%	32

Table 2: Interviewees

Name	Gender	Age	Status	Occupation	Founder or user
Agata	F	36-55	Self-employed	Photographer	Both
Alice	F	36-55	Self-employed	Photographer	User
Baptiste	M	26-35	Salaried employee	Engineer	User
Benoît	M	36-55	Business owner	Informatician	Both
Clément	M	26-35	Salaried employee	Project developer	User
Damien	M	36-55	Self-employed	Ergonomist	User
Gaëlle	F	36-55	Self-employed	Stylist	User
Jeanne	F	36-55	Business owner	Founder and manager	Both
Julien	M	36-55	Self-employed	Web developer	User
Maëlle	F	26-35	Self-employed	Photographer	User
Matthieu	M	26-35	Self-employed	Forest manager	User
Mickaël	M	36-55	Both	Web developer	User
Patrick	M	36-55	Salaried employee	Founder and manager	Both
Paul	M	36-55	Self-employed	Photographer	Both
Quentin	M	36-55	Self-employed	Engineer	User
Rosa	F	36-55	Self-employed	Translator	User
Stéphane	M	36-55	Self-employed	IT consultant	Both
Théo	M	26-35	Self-employed	Music producer	User
Yannick	M	36-55	Both	Multiple businesses	User
Cécile	F	26-35	Self-employed	Naturopath	Founder
Eric	M	36-55	Self-employed	Photographer	Both
Sebastien	M	36-55	Salaried employee	Web developer	Both
Alizée	F	26-35	Salaried employee	Communication	Founder

A third phase of the research has consisted in semi-structured interviews conducted with 32 coworkers who agreed to be contacted after the questionnaire (including 19 in rural areas), and with 20 founders of such places (including 5 in rural areas). For this qualitative part of the project, the researchers sought out a diversity of professional and family situations, as well as a diversity of spaces frequented: interviewees have been recruited in 12 different rural coworking spaces. Table 2 summarises the sample of interviewees. As many founders of those places are also users, some interviewees have been interviewed both as founder and user.

Finally, ethnographic research has been conducted during 2 years in a "third-place" situated in a small city (8,000 inhabitants). A last phase of the research was supposed to be based on collection of GPS tracks of a subsample of voluntary coworkers, but had to be cancelled because of the lockdown.

3 Coworking spaces and third-places in the French context

3.1 From diffusion to differentiation

Coworking is a new form of spatial organization of work that is closely linked with the knowledge and creation economy (Spinuzzi 2012). It is a fee-based service defined by the share of a place with office equipment (typically a high-speed internet connexion, a copy machine and coffee) and a network of individuals (Blein 2016, Gandini 2015). But more importantly, coworking is a practice based on specific references and values that stem from digital culture and the knowledge economy (Berrebi-Hoffmann et al. 2018).

The "third place" movement originates from a wider set of actors. Referring themselves to Ray's Oldenburg concept, they put the local community at the centre of their definition. Ray Oldenburg originally defined third-places as neutral places, opened to the public and ordinary in their appearance, like cafés, cinema, libraries and so forth, and that ensure daily sociality in a given community (Oldenburg, Brissett 1982, Oldenburg 1999). Those places are "third" because they are different from the first place (home) and the second place which is the place of work. In Oldenburg's initial work, the focus was put on ordinary sociality places in the city and on social mixing opportunities they brought about, with the opportunities to bond with individuals that were neither co-workers nor family. A few decades later, the concept of third-place has first been excavated in the French context by public libraries in their strategy of user diversification (Burret 2017).

Indeed, the development of digital nomadism has increased the possibility of working "anywhere, anytime" (Alexander et al. 2011), allowing for a "multilocality" of workplaces (Di Marino, Lapintie 2020). This allowed a growing number of places to become "third places", including coffee shops, librairies, universities, etc. The concept has also expanded to a wide range of activities in the cultural and social sector, which now frequently refer themselves to this notion, including community cafés, cinemas, restaurants, artistic wastelands, etc. The dimension of collaboration and co-operation is frequently at the centre of their "raison d'être" (Akhavan 2021). The development of a broad national grant programme for "third places" in 2019 in France has also contributed to the spread of this label among a diversity of actors. Indeed, the programme aimed at creating a nationwide network with the creation of a national agency "France Tiers Lieux." However, their actual definition remains very lax and focuses more on intentions than actual content: they are defined as "places that reunite diverse activities, participate in the local economic development and animate a community"[3] or "places for doing together (...) that have spread thanks to the digital development on the territory"[4]. More generally, we can define third-places as hybrid non-profit community-based places that provide various services. Their very originality is that they refer to a place (and not to a specific activity or organisation), and they imply some dimension of functional mixing: being both a coworking place and a workshop or a studio, both a community garden and a place of work, both a café and a coworking place, etc.

Third-places now designate a wide range of places and practices, accounting for a progressive differentiation, adaptation and hybridation of the original concept (Liefooghe 2018), in particular in rural areas where multifunctionality is needed because of the low-density context and of the specificities of the local labour force. Since the focus of our study is on the effects of telework, we have included in our study only those "third places" which designates or includes shared office spaces. Indeed, many non-profit coworking spaces prefer to label themselves "third-places", to distinguish themselves from a more business-oriented vision of coworking.

3.2 Third-places and local development policies: Promises and pitfalls

Popular in the social innovation and creative economy sphere, third-places have also attracted the interest of public policy, whether it be at the local or at the national levels. Indeed, those places are in line with the newest forms and precepts of territorial development, since "the search for synergy between actors has been the new alpha and

[3]France Tiers Lieux
[4]Ministry for Territorial Cohesion (Ministère pour la Cohésion des Territoires)

omega of local public action", says André Torre (Torre 2018). By bringing together various local actors in a same physical place, they thus represent the spatial transposition of this ideal of social networking. In addition, they embody a certain vision of the "creative city" or the "smart city" that has been appropriated and promoted way beyond the city, with the idea of a "smart countryside" being more and more trending.

As a result, in many cases those places have been supported, directly or indirectly, by actors of territorial development. In some cases, the support to coworking spaces (CS) has been a continuation of previous policies of telework and telecottage implementation and promotion (Salgueiro 2015), in the framework of digital development policies. In some others, it has come as a complementary tool for policies aiming at attracting migrant entrepreneurs (Sajous 2015). In the Ardèche county, the network of CSs has been partly funded by a scheme of rural youth support, while it has been developed by a scheme of digital economy development support in the Drome county.

Although coworking is mainly an urban phenomenon, the last few years have seen a flouring of CSs in peripheral areas (Capdevila 2021). Different factors can explain this widespread of CSs in rural areas (Mariotti et al. 2021). On the one hand, CSs may operate in rural areas as well as in urban areas because the geography of creative industries is more complex than the simple concentric circle (Felton et al. 2010). On the other hand, more and more knowledge workers tend to work from rural locations because of their benefits: higher general wellbeing, lower congestion, less polluted air, lower cost location, exploiting institutional leeway, etc. These elements show that CSs are expected to become drivers of economic change while retaining the creative class and knowledge workers in the periphery, thereby increasing the competitiveness and performance of rural areas.

But the literature exploring the "indirect" effects of CSs on the local environment is still scant (Leducq, Ananian 2019), especially in rural areas (Knapp, Sawy 2021, Mariotti et al. 2021). The main studies have shown that CSs can have positive effects on rural areas, in different countries and regions. For example, Fuzi has shown that CSs can support entrepreneurship in sparse regions like South Wales (Fuzi 2015) and Capdevila that CSs can be considered as drivers for economic development in rural areas in Catalonia (Capdevila 2018). Heikkilä studied the Finnish case and argued that rural coworking supports local economy by enabling collaboration, subcontracting, joint ventures, and all other forms of shared activities (Heikkilä 2012). In Italy, Mariotti, Akhavan and Di Matteo showed that, on average, CSs in rural areas, compared to those in urban areas: (i) perceived a higher positive impact of the in the urban context; (ii) declared to be more satisfied; (iii) experienced higher social and organizational proximity, and lower institutional proximity; (iv) have created new professional relationships, and had the chance to access new information channels and new training opportunities inside the CS (Mariotti et al. 2021). Recently, Mariotti et al. have also shown that being located in a rural area may represent an economic benefit for coworkers' organizations (Mariotti, Di Matteo 2022). According to their results, if an organization collocates its employees in a CS settled in a rural area, the organizations' incomes would probably be more performative as against the case in which the employees had been placed in a CS located in an urban area. Nevertheless, further research is needed to better understand the diffusion of CSs in rural areas and its effects on socio-economic spatial development. According to Mariotti et al., "Although CSs seem a very attractive instrument for small towns and rural communities, we know very little about their functions, user profiles, their links with socio-economic spatial development, etc" (Mariotti et al. 2021, p. 189)[5].

The COVID-19 crisis has been an accelerator of the knowledge workers' increasing lure for more remote destinations. For example, the share of teleworkers outside metropolitan areas has massively increased in Italy (Mariotti et al. 2021) but also in remote parts of the UK like South West England and Wales (Bosworth et al. 2021). Different factors could foster the implementation of coworking spaces in rural areas: (i) the willingness of companies to downsize their offices by relocating employees in other locations and promoting remote working; (ii) the tendency by freelancers and digital nomads to move to rural areas to experience a higher quality of life (Manzini Ceinar, Mariotti 2021b).

[5]A European research project, funded by the COST Action, and untitled "New working spaces and the impact on the periphery" aims to fill this gap in the literature.

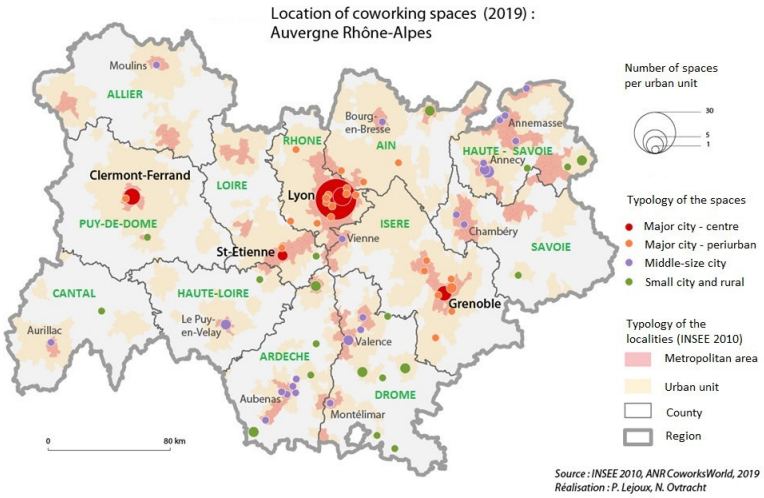

Figure 1: Location of coworking spaces in Auvergne-Rhône-Alpes (2019)

CSs in rural areas could thus provide new opportunities for new network connections and relationships to emerge within rural spaces, by connecting rural people into wider knowledge networks (Thomas 2019) but also by creating new interdependencies between urban and rural areas (Bosworth et al. 2021, Bürgin et al. 2021). In that case, attracting CSs located in urban poles that have been greatly affected by the COVID-19 might be a good strategy for local authorities located in rural areas. But this implies to develop tailored policies and to enlarge the (CS) toolkit for local development in smaller towns and rural areas (Manzini Ceinar, Mariotti 2021b). Local authorities have a key role to play in enabling coworking in such areas in its function as operator and financial supporter (Knapp, Sawy 2021), but, at the same time, they should also respect the spontaneous and flexible aspects of these new working spaces (Fuzi 2015).

3.3 The geographies and demographies of remote working in the Auvergne-Rhone-Alpes region

After having set the general framework of the dissemination of shared places of work in French rural areas, we now turn to the empirical results of our study in the Auvergne-Rhône-Alpes region. The Auvergne-Rhône-Alpes region is known for its economic and cultural dynamism as much as for its numerous environmental amenities. It is amongst the most dynamic French regions and one of its particularities is the high rate of professionals and managers in the population (INSEE 2019). Indeed, it is a region that comprises several big cities and recognised universities and campuses, thus attractive to a highly qualified population.

A first significant fact (Figure 1) that arises from the quantitative data we gathered is that metropolitan areas put aside, shared places of work are not to be found in the countrysides that are closest to the main cities and in the counties that are more polarised by them and most metropolised (Loire, Ain, Rhône and Isère). They are more numerous in Drôme and Ardèche which are further away from the main urban areas and have lower overall density[6] (respectively 78 and 59 inh./km2), and no important city (Valence, the main city, has 62,500 inhabitants and no university of its own, while Aubenas is a very small urban area of 12,000 inhabitants). However, other peripheral rural counties such as Cantal or Allier, that are more remote and less populated, were not affected in the same way.

An interesting parallel emerges when the geographical repartition of coworking spaces throughout the region is confronted with demographic trends at the county-level. Table 3

[6]As a comparison, Rhône has a density of 572 inh./km2, Isère 170, Ain 112, and Cantal which is the less dense county of the region has a density of 25 inh./km2.

Table 3: Evolution of the population between 2008, 2013 and 2018 per county, AURA region

	Population			Annual variation rate of the population (%)					
				total		natural change		migration	
	2008	2013	2018	P1	P2	P1	P2	P1	P2
Ain	581,355	619,497	647,634	1.3	0.9	0.5	0.4	0.8	0.5
Allier	342,807	343,431	337,171	0.0	-0.4	-0.3	-0.4	0.3	0.0
Ardèche	311,452	320,379	326,606	0.6	0.4	0.0	-0.1	0.5	0.5
Cantal	148,737	147,035	144,765	-0.2	-0.3	-0.4	-0.6	0.2	0.3
Drôme	478,069	494,712	514,732	0.7	0.8	0.4	0.2	0.3	0.6
Isère	1,188,660	1,235,387	1,263,563	0.8	0.5	0.6	0.5	0.1	0.0
Loire	742,076	756,715	763,441	0.4	0.2	0.3	0.2	0.1	0.0
Haute-Loire	221,834	226,203	227,552	0.4	0.1	0.0	-0.2	0.4	0.3
Puy-de-Dôme	628,485	640,999	659,048	0.4	0.6	0.1	0.1	0.3	0.5
Rhône	1,690,498	1,779,845	1,859,524	1.0	0.9	0.8	0.8	0.2	0.1
Lyon agglo-meration	1,272,188	1,336,994	1,398,892	1.0	0.9	0.9	0.9	0.1	0.0
Savoie	408,842	423,715	433,724	0.7	0.5	0.4	0.2	0.3	0.2
Haute-Savoie	716,277	769,677	816,699	1.4	1.2	0.6	0.6	0.8	0.6
Auvergne-Rhône-Alpes	7,459,092	7,757,595	7,994,459	0.8	0.6	0.4	0.4	0.3	0.3
France (mainland)	62,134,866	63,697,865	64,844,037	0.5	0.4	0.4	0.3	0.1	0.1

Source: INSEE, population censuses
Notes: **P1**: 2008-2013, **P2**: 2013-2018

highlights the very diverse situations that is to be found in the 5 most rural counties of the AURA region (highlighted in grey)[7].

Indeed, part of the explanation for the uneven spread of coworking is to be found in the changing demography of some French countrysides, especially in the "presential countrysides with residential and touristic attractivity" (Pistre 2012). This typology refers to the theory of presential economy, coined by Davezies (2008), Terrier et al. (2005) and Terrier (2006) to describe the economy of a territory based on consumption, rather than production. In Pistre's typology, presential countrysides where locally consumed services and tourism are dominant are opposed to productive countrysides, where industrial and/or agricultural activities prevail. Based on demographic trends, Pistre's typology shows that presential countrysides with residential and touristic attractivity are affected both by temporary flows of visitors (tourism) and internal residential migration from both active and retired populations. Those categories of countrysides are to be found in the South-Western oceanside and in Southern France, including the Drome and Ardèche counties.

Indeed, those new "lifestyle migrations" (Benson, O'Reilly 2009) or "amenity migrations" (Cadieux, Hurley 2011, Martin et al. 2012, Moss 1987, 1994) are historically particularly important in the south of France. Among them, the proportion of more qualified populations such as professionals, artists, cultural workers and managers is on the rise (Bilella 2019, Charmes 2019) as shows the Table 4.

Independently from those wide demographic trends, the practice of remote working has also been developing in the last ten years, mainly because of the wide precarisation and subcontractualisation of many professions of the knowledge and creation economies, with a bloom of free-lance (Gill, Pratt 2008, Gill et al. 2019). An indication of this increase of the "gig economy" can be found in the number of self-employed persons through micro-enterprises. Unfortunately, statistical data can't be disaggregated both by sectors and by counties. However, data per county shows that Drome and Ardeche have a rate of micro-entreprises that is more than 3 times the national average (respectively 27, 25 and 7 per 1000 inhabitants).

Though still a marginal practice, remote working for salaried workers has also been expanding in the last five years, prior to the pandemic which has obviously been a game

[7]This table is extracted from Bianco E. and Geymond J., "Près de 8 millions d'habitants", INSEE Flash Auvergne-Rhône-Alpes, 2020, https://www.insee.fr/fr/statistiques/5006465#documentation

Table 4: Net internal migration rate per socio-professional status, 2016, per 1000 habitants

	Ardèche	Drôme	AURA Region
Farmers	3,70	7,70	0,70
Entrepreneurs, tradesman and craftsmen	12,80	4,70	-0,10
Professionals and managers	10,90	8,60	2,70
Technicians and associate professionals	5,00	6,60	3,00
Clerks and administrative staff	5,70	4,40	2,80
Blue-collar workers	10,50	4,70	2,30
Retirees	9,90	5,80	0,50
Other inactive	0,50	-2,70	2,50
Total	6,40	3,20	2,10

Source: INSEE RP

changer. In 2017, 3% of the employed workforce reported teleworking regularly, but the number rose to 9% for those who lived more than 50 km away from their workplace. Moving further away from the city centres and teleworking had already been described as a solution for young families to circumvent the housing crisis in the cities and increasing commuting times and costs, though a solution that was (and is still) restricted to highly qualified jobs (Ortar 2009).

Indeed, for the overwhelming majority of our respondents, coworking is linked with residential migration and a project of lifestyle change and establishment in a place of choice – rural in some cases, urban in other (Flipo, Ortar 2020). Being able to pick a lifestyle and an attractive – yet remote – place of living can thus be considered as a privilege for high-demand profiles. As the example of Quentin, a highly qualified engineer with a PhD in environmental biology shows, for some rare and demanded qualifications, remote working can be negotiated even before hiring:

> *At the time, I was in Lyon and I was looking for a job, anywhere really. And a few months before my contract ended, I had not found anything that suited me (...) So I decided to take control of things. I thought: "Let's settle in a place that we like". And so, we decided to settle here, and to find a job after. And that meant there was a 99.9% probability that it would be a job in telework, since my job is pretty specific. (...) My current supervisor, he knew I was looking for a job. We discussed, and he thought about it. He didn't have much time to recruit, and he knew me already. So he trusted me, and I think I was the only candidate. So I asked what I wanted [telework with an office in a coworking space subsidised by the employer] and he accepted everything.*

4 Daily practices of coworking: Living a rural life while being connected

4.1 Motivations for choosing remote working in the countryside

As several works on amenity migration have described, newly arrived populations in the countryside ("neorurals") are frequently attracted by environmental amenities and recreational activities many of them have discovered during holidays (Pistre 2012, Talandier 2007, Tommasi 2014). Indeed, it is not by chance that those territories are affected by both touristic and lifestyle migration flows, since both are frequently interconnected in individuals' biographies. When asked about their motivations to move, many interviewees refer to environmental amenities as the following excerpts from respectively Maëlle, a photographer and Matthieu, a forest manager, show:

> *I came for the holidays. I knew a little already. But it was mostly my intuition, from when I came. The landscapes, really, it was mostly about the landscapes. And I also had the intuition that there was a social life that would fit me.*

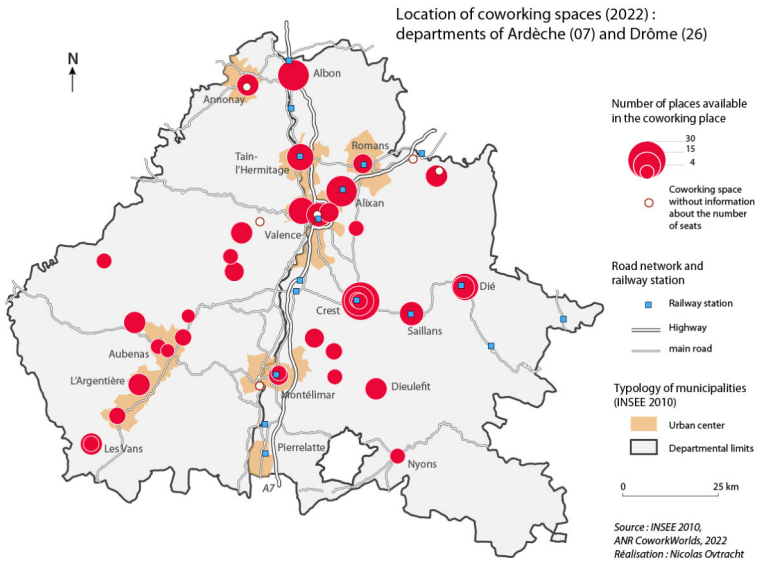

Figure 2: Map of CSs in Drôme and Ardèche

> *It was a bit by chance, a bit from the feeling, a bit ... because it's well placed, between the Chartreuse, the Vercors, Ardèche*[8]*. ... With my wife, we have the same attraction for mountains. (...) We could have lived elsewhere. That's really by taste that we chose here.*

The cultural dynamism of those rural areas, inherited from a long history of waves of demographic renewal (Cognard 2006, Sencébé, Lepicier 2007), also plays a major role in the positive image they reflect, as we can see in the first interview excerpt. For many of our interviewees, those countrysides are remote enough to "look like a real countryside" (versus more artificialised peri-urban landscapes) but still attractive enough to remain "alive" (with activities and an important service-oriented local economy that, as we saw, is partly driven by the touristic flows).

On a living area scale, we notice that connectivity remains an important feature of coworking spaces. Most of them are located along the main local roads and in the local centralities. Few of them depart from those structuring axes, as we see in Figure 2 focused on the counties of Drôme and Ardèche.

Though those territories lack mobility infrastructures and transport services for daily commutes, the temporalities of teleworking, with rares episodes of long-distance mobility intersected with longer periods of sedentarity, projects accessibility on a different scale, as those two coworkers, Mikaël, a web developer, and Alice, a photographer, explain:

> *With this job, it's about once a month in Paris, so generally I drive to the fast train station*[9] *and after, I take the train. I was doing more or less the same thing when I was working for M. [in California]: taking the fast train to Paris and then a flight. And I think it will be the same with this project in Germany I'm going to start soon: a fast train and then...*
>
> *[I go to Paris at least twice a year]. When I was still a member of an agency, I used to go more often. I was on the board so I had to go every two months in Paris, and I was going through my meetings with clients at the same time.*

Again, the transportation needs of the coworkers are more similar to those of the tourists than to those of the average population who commutes mainly within the county, from residential to industrial areas. In the case of coworkers, the proximity of the Rhône valley, that is particularly well connected to big cities and especially Paris with the presence of

[8] Those are different chains of mountains and/or regional natural parks.
[9] In his case, a one-hour drive.

the high-speed train from Paris to Marseille, is frequently referred to as an important factor for having chosen Drôme and Ardèche as a place of work.

Another striking fact when looking at the localisation of CSs at the county-level is the fact that they are situated in local centralities and small cities that correspond with the most urbanized areas of the countryside. Not being "out of nowhere", they are frequently situated in the inner areas of those small towns, close to shops and services (schools, retail trade, services and equipments). As Agata, the co-founder of a coworking space in Isère explains what motivated the choice of the centre of a 1,450 inhabitants village:

> *This is why we chose here, it's ideal because it's really a central location, the farmers' market is just here. (...) We chose here because it's the central town in the area, it's the village where you have some shops, maybe a dozen. And there's also school, kindergarden and middle school. There is everything, in fact.*

In this respect, the case of coworkers highlight the importance of those local equipments in the creation of a dynamic of attractivity (Talandier, Jousseaume 2013). Characterized both by centrality and the presence of equipments, they reflect a desire to conjugate both the benefits of the city and the countryside in "human-sized" microcities (Charmes 2019). This dimension of access to services and equipments has also been found by Hölzel, de Vries (2021) in the context of German rural CSs.

4.2 From the shared office to the collective utopia: Varieties of third-places in the countryside

The spread of CSs and third-places outside the city results from a progressive differentiation from the original californian concept. They thus share a certain number of characteristics that one can find in any of such places around the world and reflect their common culture: paperboards, sticky notes and colourful decoration, mix of home and office furniture (couches, balls, cushions, but also printers, screens, and a lot of wires), DIY experiments are amongst the most common features of such places wherever they be, giving a sense of common identity all around the world (Fabbri 2016, Flipo, Lejoux 2020, Gourlay et al. 2021).

However, despite a common "look", those places differ in their organisation and purposes, including within small cities and rural areas. The data we have gathered allow us to distinguish between 3 main categories of places.

The first and most common is the small shared self-administered office (5 to 10 persons). It is created at the initiative of a group of independents and remote workers who used to work from home and that gather around the will of having a common place of work in order to help them differentiate their private and professional lives (Flipo, Ortar 2020), ensure a daily sociality and share the costs. As Stéphane, co-funder of a CS in Drôme, tells:

> *We were a group of 5 persons ... our motives were to break down social isolation and having a friendly place to discuss, share and pool resources.*

Added to those motives is the need for gaining visibility, thus ensuring potential outputs to their members. Indeed, it is not rare that coworking space initiatives derive from business and employment co-operatives as Paul, co-funder of a coworking space in Ardèche, explains:

> *We have created sort of a brand, I mean a network of skills that are highlighted and allows us to showcase different provisions of services (...) and despite all the benefits of teleworking and modern telecommunications, it is way more natural and motivating to share a common space.*

Those places are organised through independent and self-managed non-profit associations, are self-administered in most of the cases, and are frequently supported by local authorities through the provision of premises belonging to the municipality at low rent. In exchange, municipalities find a way to renew and value vacant premises with the help of public

subsidies, and to promote their digital dynamism. In our study, the wide majority of places belong to this category, many of them being very small.

The second model is the hybrid non-profit third-place, created at the initiative of a person or a group of persons that do not necessarily have a use of such a place for themselves, but wish to bring a new type of service on the territory. Those places are generally bigger (10 to 50 persons), offers a range of activities (café, workshops, cultural events, community gardens, etc). In some cases, it even comprises a project of shared housing. Those projects are developed in buildings bearing a particular identity or image, often a wide and more or less abandoned premise that is part of the local architectural heritage such as an ancient factory, mill or convent. Part of the project is directed towards restoration, similarly to what has been described in city centres (see, for example Mariotti et al. 2017). As Cécile, the founder of a third-place in Drôme explains:

> *When we saw the [abandoned] factory, we sort of fell in love with the place. We thought: Wow, there is so much to do here. We instantly thought about workshops, about a wide diversity of activities, a café, a place that would be ... alive, opened, melting a maximum of public and of different people.*

Those ambitious projects are thus very different in terms of budget from the small shared offices, and are very more likely to be managed by skilled cultural entrepreneurs, for which they represent a both professional and personal project. In those cases, the coworking activity is designed to complement other activities, provide funding and use the space. Those places mix more diverse actors and lie on a larger base of volunteers and supporters. They are based on the will of providing a "hub" for social, cultural and territorial innovation, which allow them to have access to bigger and more diverse sources of funding (such as the "Fabriques de territoire" funding scheme, which implied explicitely the necessity of having a strategy towards local development). In our study, 3 places belong to this category.

The third model is the heir of telecottages: places that have been entirely created by local development actors, or telecottages that have been transformed in coworking spaces by a change of scenography or visual identity. Those places usually lack a solid base of coworkers and are rather used for punctual needs, by mobile professionals or tourists in need of an internet connection. Indeed, when they are not led and actively animated by users themselves, those places lack a real community and fail to attract users. In our sample this category is fairly rare (1 case only) but could be expanding with the increase appeal for municipalities and intermunicipalities to "have their own third place".

4.3 The creative class in the countryside: portraits of users

The data from our quantitative study based on a sample of 377 users in the Auvergne-Rhône-Alpes region shows that while places vary, their users remain very homogeneous and more importantly, their profiles are not very different from the ones attending the coworking spaces located in the big metropolitan areas. As a matter of fact, our study shows that family status aside, city centres' coworkers and rural coworkers are very similar. Within founders' narratives, we also find a lot of previous experiences of coworking in urban areas, like Benoît, a 43 years-old entrepreneur, explains:

> *I knew about coworking already, because I used to live in Paris where I tried a few ones, and also because I'm interested in the managerial literature, innovation etc.*

On average, rural users are indeed slightly older and more frequently live in couple with children, while urban coworkers are younger and more often single. They are, however, both characterized by a very high skill level. In our quantitative sample, 91 % of them have a university degree, 66 % a graduate degree (74 % in the city centres). The type of occupations is also similar in the wide majority of cases: our study confirms the importance of what has been labelled by Florida (Florida 2004) the "creative classes" (photographers, graphic designers, architects, writers and translators) and of occupations connected with the digital economy (web developers, web designers, community managers, computer programmers...), that has been underlined in the literature on coworking spaces (Gandini

Table 5: Sociodemographics of coworkers

	Rural environment (N=79)	Total sample (N=377)
Gender		
Men	51%	54%
Women	49%	46%
Age		
18-25 years-old	3%	7%
26-35 years-old	49%	44%
36-55 years-old	47%	47%
56 and over	1%	2%
Professional status		
Wage-earner	53%	48%
Independent	47%	52%
Level of qualification		
Primary and secondary school	8%	5%
Undergraduates	25%	29%
Graduates and postgraduates	66%	65%

Source: based on authors' own study (N=377)

2015, Gill, Pratt 2008, among others). It also confirms the importance among those highly qualified office-users of a wide "consulting" sector, from life coaches to engineering consultants, including newest occupations such as "facilitator in collective intelligence". Some occupations, however, are specific to the rural areas: forest managers, botanists and nature guides can have a use of a coworking space for the administrative part of their jobs, as well as diverse small companies connected with nature and tourism. Finally, rural coworking spaces and third places are also frequently hosts for local associations' employees, who use those places as their registered office.

Status-wise, our data (Table 5) shows that rural coworking spaces distinguish themselves from urban ones by a slight majority of wage-earners (53%) versus independent workers, while the ratio is reverse in the city (52% of independent workers). Among those, more than half (29%) is made of local small businesses and associations employees, while the rest (20%) is made of long-distance teleworkers whose employers are in the main cities of France, Europe and even the world as we discussed earlier.

We can notice that the rural coworkers profile is fairly different from the "traditional" rural home teleworker, who has been described as mostly in the second half of their career and in a "nest-emptying phase" (Sajous 2015). Coworkers are younger and frequently have young children at home, which is one of the reasons why they need a separate space to work (Flipo, Ortar 2020).

5 Expected benefits and limits of third-places for rural renewals

5.1 Managing residential mobility and professional transitions

Our study reveals that the public of rural coworking space and third-places is overwhelmingly made of new residents that arrived recently from the big cities of the region (Lyon, Marseille, Grenoble), but also from Paris and even from expatriation abroad. Although in some cases it is motivated by a desire to return to the region where they grew up, more frequently it is a result of a multidimensional life project including professional, residential and even educational strategies. Indeed, the presence of numerous alternative schools around the coworking spaces is no coincidence. Those families are frequently looking for a place to "land" and to reinvent their lives, and coworking spaces give them the opportunity to secure their access to a professional network. In this respect, the presence of a coworking space can be decisive in the choice of a place to live, as Maëlle, 35 years old, a photographer who was back from 10 years in the Middle-East, explains:

> *I had sort of a life-changing event in my life last year, and I decided to stop living out a suitcase, to stop this nomadism that was burdensome. (...) I decided I had to look where to settle down and [this area] was already in my top 3. I came for whoofing, for holidays, with the perspective of snooping around already. So I just looked up the internet for shared places of work, coworking spaces. I had already visited one before coming here. I had the plan to visit another one too, but when I visited here I though "OK, this is what I need". I felt like it was very much like me, in the spirit, the values... I didn't know [City] and I had never stepped a foot in there before. (...) So I took an appointment in the coworking space (...) and I travelled here especially for the visit. (...) There was one free spot and I said right away "OK, I want it. It's here". Then I visited [City] and two hours later it was decided: "This is it. This is where I am going to settle".*

Indeed, coworking space managers we have met have reported being called regularly by prospecting new residents looking for a place to land in a more or less wide area. Jeanne has arrived from the North of France and left a "very urban life" to reconnect with nature. She and her husband were prospecting in a wide southern France to enjoy the dry and sunny weather. Although their choice of localisation has been primarily determined by the presence of a renowned alternative school, the presence of a coworking space in a neighbouring village has also been determinant. As Jeanne explains,

> *When I first came here I thought: "Oh my god, what am I going to do here?" So this coworking space, it gave me a project.*

While the coworking space can be a place of familiarity and an easy way to make new friends in a new environment like Maëlle underlined, it can also support professional transitions, in particular the change from wage-earner to independent worker that many new residents make. For those "lifestyle entrepreneurs" (Gomez-Breysse 2016, Saleilles 2010), coworking spaces bring crucial resources: a network that is professional, but even more importantly spatial and local. Indeed, the projects of "lifestyle entrepreneurs" are frequently based on some valorisation of the concept of "being local". Having access to local social resources is thus particularly important, and coworking space make those resources available way more easily and quickly than it used to be. For teleworkers, the main benefits of CSs are the possibility to maintain a daily sociality and avoid isolation, while promoting a better balance between personal and professional lives by creating a spatial differentiation between home and work (Flipo, Ortar 2020).

5.2 Cosmopolitan and anchored: the tertiarization of neorural migrations

Being crossing points, sometimes included in international networks, coworking spaces and third places also provide an answer to the desire of many new residents to "reconcile a local identity with a global citizenship" (Tommasi 2014, p. 62). This desire is visible in the persisting interest that is put into travelling, testified by the affluence of travel guides in the common bookshelves. Being urban and highly educated, coworkers often share a cosmopolitan socialisation. They have travelled a lot, sometimes since childhood, and frequently have maintained cross-national ties. As Jeanne puts it, "what we offer is a more gentle life, while remaining connected to the world".

This remaining connexion with big cities and foreign countries participates in the redefinition of the frontiers between urbanity and rurality. On one hand, they embody the "landscape idyll and desire to live in "human-size" units with associated social practices, meaning the friendliness attributed to small communities because of generalised mutual acquaintance" that Poulot (2015) labelled "urban ruralisation". But on the other hand, they also participate to a soft rural urbanisation by importing urban lifestyles, practices and references in the countryside. Their interest and participation in city centres' renewals is typical of this will of finding (or bringing back) some urbanity in their daily lives.

Although pertaining to very different sectors than the traditional "neopeasantry" that is traditionally associated with neorurality (Sallustio 2018), rural coworking space and third-places adopt a number of concepts in common. Being grass-roots, sometimes associated with a local symbolic architectural premise, they correspond with the idea of a

"concrete local utopia" that is typical of the "fifth wave of neorurality" (Rouvière 2016). They also embody the ideal of "relocation" of activity (Sencébé, Lepicier 2007) – though it is by means of telework. Indeed, coworking space managers and users often use the concept of "short circuit" as both a model and a metaphor, with the idea that coworking spaces contribute to the fact that "things are being made locally".

5.3 Are third-places levers for rural renewals or gentrification forefronts?

While it seems clear that coworking space participates in creating a rural renewal dynamic, several limits have to be pointed out.

First, it appears that coworking space and third-places have met an existing demand that is the first reason of their success. Unlike telecottages that have been implemented top-down, the public support to those places has been mainly indirect and based on grass-roots initiatives. From our study in the Auvergne-Rhône-Alpes region, we have found that when local authorities have decided to "set up their own coworking space" without leaving the initiative to local entrepreneurs and remote workers, those places did not succeed, either because they have been ignored by the local demand that has preferred other places, or because there was no demand to meet. This tends to prove that although coworking spaces reinforce local dynamism, it cannot create one from scratch. Therefore, our study has shown that coworking spaces have spread in areas that were already benefiting from a favourable demography, not the other way round. Their development, however, also confirms that the existence of varied equipment and services foster the attractivity of rural areas (Talandier, Jousseaume 2013) and create positive dynamics of attractivity. Founders of CSs chose a village over another because of the presence of such equipment and services such as: general stores, bakeries, cafés, schools, post offices etc. Third-places often come with new services (such as cafés and restaurants, exhibition spaces and concert halls…) to add to those already existing, while coworkers are keen on consuming the local services and goods. As a result, coworking spaces and third-places participate in the presential economy and the revitalisation of small cities centres, that have been almost totally deprived of economic activity since the expansion of hyperstores and peripheral commercial areas in the 1970s. This positive effect is likely to benefit the whole local population.

The second main limit is the lack of social diversity that can be found in those places (Krauss, Tremblay 2019). Indeed, the identity of those places is to be found in their values, scenography, cultural references and lifestyles that are both urban, educated and millenial. Because they are predominantly places of work, designed by and for certain occupations and for certain generations, they share cultural and social references that are far from being widespread. The lack of diversity is also explained by their functioning, based on acquaintances and co-optation, leading to social homogamy (Berrebi-Hoffmann et al. 2018). In this respect, CSs do not provide social diversity but rather strengthens the networks of like-minded individuals, bearing the risk of estranging themselves from the rest of the population. In this context, spatial marginality may be doubled with social marginality, with those newly arrived social groups not sharing the same places of work, of shopping or even of education than the rest of the population (the bloom of alternative private schooling also being a distinctive feature in those areas). Indeed, as described elsewhere, spatial marginality is often seen as a resource for new communities (Léger, Hervieu 1983). However, this aspect should not be overstated nor the opposition between "neos" and "locals" caricatured. Indeed, among the places we have researched during fieldwork, we have also noticed that some of those that we have labelled "multifunctional third-places" have developed active strategies to encourage their appropriation by a wider range of inhabitants, like the provision of services (printing and photocopy, distribution site for local newspapers and informations…) or the provision of workshops, that attract a wider diversity of users. However, this often relies on the energy and willingness of voluntaries and many places reckon they lack such energy and time for unpaid work. The main limit here is thus the lack of social and cultural mediation that is needed to ensure the appropriation by a wider range of inhabitants.

Finally, attractiveness also creates tensions on the housing market, that appear affordable for those coming from the city and teleworkers who keep their urban salary

while moving to the countryside. Until the pandemic, those migrations have remained too anecdotical to have an impact on local housing markets. Indeed, coworkers remain very few compared to the wide range of other places of work that make most of the rural economies. But the expansion of telework during the Covid-19 has increased the tensions not so much because of actual massive flows (Milet et al. 2022), than because of the creation of a housing bubble caused by the novel interest of investors for those places (Delage, Rousseau 2021). In places where the housing market was already tense because of the abundance of secondary homes, telework has worsen the situation. Would it be generalized, telework would probably create new forms of spatial segregation, less determined by the distance to city centres than by quality of life and amenities.

6 Conclusion and discussion

Our study has shown that while CSs seem to have undoubtable positive impacts for their users, their impact on the territory is not so clear and easy to evaluate. Their location patterns tend to show that CSs and third-places reveal the wider evolutions of contemporary rural areas, both socially, demographically, and also culturally in the way rurality is defined, inhabited and imagined. While a massive "urban exodus" has not happened, the pandemic has revealed – and maybe accelerated – a quiet and mild alteration that was already ongoing, with the spread of remote labour allowing an increased number of workers to access lifestyle migration – whether it be in the countryside, or elsewhere. The power of those narratives of "life change" has been unveiled at the occasion of the COVID-19 lockdown, during which those romanticized and idealized visions of the countryside have been described as "the new Eldorado".

The fact that places that are remote and were previously described as mostly marginal are now pictured as the new "places to be" interrogates. Indeed, there is an obvious contradiction between the numerous empirical evidence of a growing marginalisation of rural areas in France (see for example the report by Dufrégne, Mattei 2019), and their increased desirability (including in public policy narratives). In this article, we have argued that not only the diversity of rural areas and their uneven dynamism is frequently underestimated, but also that the same territories can be dwelled on differently by various social groups, with very different experiences of marginality. The example of coworking shows that marginality can be accommodated, and even yearned for, when high connectivity, multilocality and reversibility of anchorages provides resources for individuals to cope with or even circumvent the constraints of marginality, and keep only the positive aspects of it. We thus argue that there is a need to better take into consideration the social dimensions of marginality in public policy making. Favouring local development through business and social innovation-oriented strategies may not benefit the most precarious local populations nor the most marginalised territories. Instead of reducing inequalities between rural and urban areas, it may increase the inequalities between desirable and less desirable areas – whether they be urban and rural. Indeed, we have seen from our study that those places were unevenly distributed – even at the scale of the region – and way more developed in the most attractive areas of the region. Reversely, the attempts at implementing such places in locations where there was no local demand have been failing. In addition, within the considered areas those places are likely to benefit first and foremost to populations that are not generally lacking social networks nor professional opportunities. As a result, there is a need of thinking about such places as not only responding to the needs of the most qualified and mobile workforce territories often wish to attract, but also responding to the needs of the local population (for example, with coupling it with employment and training services, or providing more general public services that are lacking in many rural areas).

The geography of coworking spaces also confirms the factors of attractivity for residential migration, in particular local services and landscape amenities, but also cultural dynamism. This attractivity for lifestyle migrations has fostered the development of CSs and allowed for their success. The touristic dimension appears particularly important, both as a factor of discovery for potential new residents, but also as a way of offering a high number of local businesses despite the relatively low size of the local

markets. They also echo the processes of gentrification described in the literature about city centres, with the presence of CSs following the quest for a certain local "identity" (Mariotti et al. 2017), that we have here referred to as a mix of rural and urban features. And similarly to the urban context, the rise of housing prices are not so much driven by the behaviour of individual households relocating, than by investors looking for a good opportunity (Delage, Rousseau 2021). Finally, we have shown that the habits and uses of mobility made by coworkers, being closer to those of tourists than of the more "classical" rural workforce, is likely to distort the definition of accessibility and marginality in their narratives. Because they don't commute every day and because when they use remote activities to avoid unwanted mobilities, many coworkers are likely to consider a 2-hour drive to the train station as "close enough" and not interpret marginality as a problem, but rather as an "appropriate distance" to the city.

However, those places also participate in the rural renewals by facilitating the spatial and professional transitions of newcomers. CSs provide crucial resources to lifestyle entrepreneurs, by offering networks that are both professional-like and peer group-like. They also undoubtedly enhance the quality of work life of teleworkers and help prevent some of the main psychosocial risks associated with telework. Nevertheless, despite their project of social mixing, the anchorage of those places in creative labour creates mechanically a lack of social diversity and a difficulty to reach a wider audience in the absence of dedicated human resources to manage them. Then, the question of their social impact remains an open question: should places of work be subsidised by public funding? This question is even more important after the pandemic, when many firms have decided to reduce their office surface and save on their buildings' expenses.

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