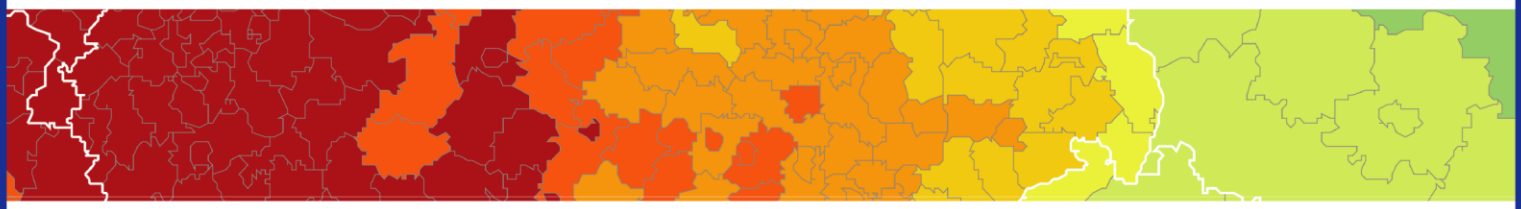

ESPON QoL – Quality of Life Measurements and Methodology

Annex 8 to the Final Report

Case study:
Inner areas - Lazio /Monti Reatini

Applied Research

Final Report

30th October 2020

Final Report

This applied research activity is conducted within the framework of the ESPON 2020 Cooperation Programme.

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This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

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Annex 8 to the Final Report

Case Study 05:

Inner areas - Lazio/Monti Reatini

ESPON QoL – Quality of Life Measurements and Methodology

30th October 2020

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Abbreviations

BES	Benessere Equo e Sostenibile
FUA	Functional Urban Area
ISTAT	Istituto Nazionale di Statistica
OECD	Organisation for Economic Co-operation and Development
SPI	Social Progress Index
TQoL	Territorial Quality of Life
UN	United Nations

Introduction

This is one of the 10 case studies of the ESPON study “Quality of Life Measurements and Methodology”. The purpose and results of the study, including the definition and application of a territorial quality of life measurement methodology, the synthesis of all case study findings, targeted policy recommendations, ideas for fostering cooperation between ESPON, EUROSTAT, OECD and the UN and recommendations for further research, are illustrated in the Final Report, to which this case study report is annexed.

The purpose of the case studies is twofold:

A) to collect good practices that can be adopted in other European regions, and

B) to make use of the methodology developed and allow for adjustments through testing in case studies.

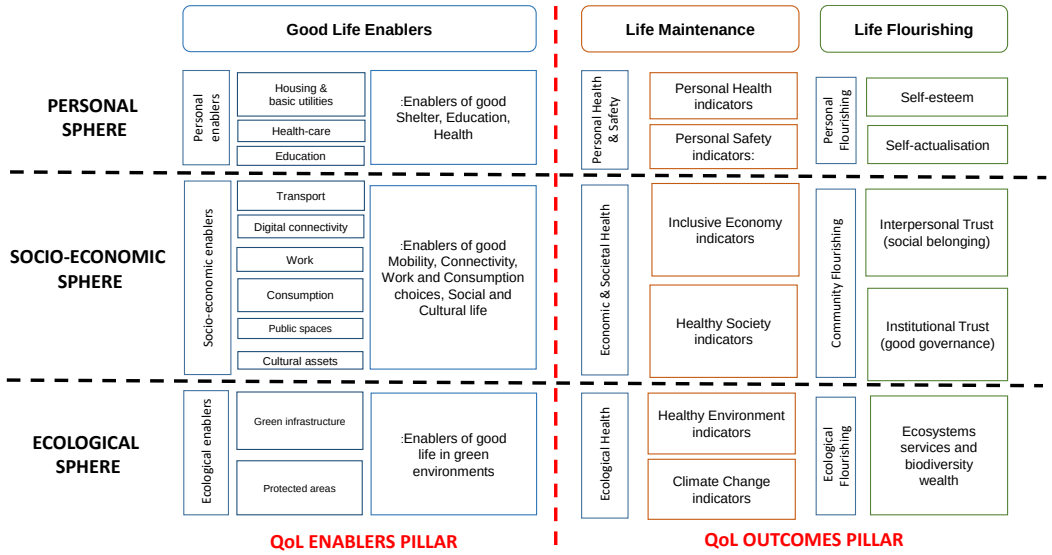
Each case study provides examples of application of the concept of quality of life (QoL) in a specific region. This complements the conceptual model and the research done at European level. The reasons why this region has been chosen forms part of Section 1.

For objective A) the case study report explores the policy context, in which QoL is used and measured in the region (Section 2). It is important to understand for which purpose the concept has been established, in which policy fields it is being used, how different levels of government are involved and which success factors and obstacles can be identified. Section 3 explains the indicators, measurement methods and data that are used for measuring QoL.

Objective B) is covered in Section 4. The study defines and tests a methodology to measure QoL at territorial (sub-national) level and offers guidance to policy makers at different levels – local, regional, national, European – on how to integrate QoL in policy processes and in territorial development strategies. We have applied to the case studies the methodology developed in the main report. This includes the Territorial Quality of Life (TQoL) measurement system and the system for coding indicators.

The TQoL framework defines the system and its main elements (pillars, spheres, sub-domains) to measure QoL facets with reference to territorial entities identified. This is shown in the TQoL framework in figure 1 below.

Figure 1 The TQoL framework



The system for **coding indicators** to represent and monitor adequately the different QoL domains, defined in the TQoL framework, is illustrated in Table 1 below.

Table 1 Coding of the indicator system in the TQoL framework

Dimension	Domain	Sub-domain	Definition
Good Life Enablers	Personal enablers	Housing & basic utilities	
		Health	
		Education	
	Socioeconomic enablers	Transport	
		ICT connectivity	
		Work opportunities	
		Consumption opportunities	
		Public spaces	
		Cultural Assets	
	Ecological enablers	Green infrastructure	
		Protected areas	
Life Maintenance	Personal Health and Safety	Personal health indicators	
		Personal safety indicators	
	Economic and Societal Health	Inclusive economy indicators	
		Healthy Society indicators	
	Ecological Health	Healthy Environment indicators	
		Climate change indicators	
Life Flourishing	Personal Flourishing	Self-esteem	
		Self-actualization	
	Community Flourishing	Interpersonal Trust (Social Belonging)	
		Institutional Trust (good governance)	
	Ecological Flourishing	Ecosystems services and biodiversity wealth	

Both, the TQoL framework and the coding system are applied in all case studies (Sections 4.1 and 4.2).

The methodology developed in this report includes further elements - a dashboard, the latent clustering approach and the citizen-centric approach - that are applied in the case studies, if sufficient data or information have been available. These elements are as follows:

- The indicators coded for local or sub-regional territorial units are presented in a **dashboard** (in an Excel-based tool). In the dashboard different points in time or objective and subjective indicators can be included and compared at territorial unit level. The specific indicators used to monitor the QoL domains are different in each case, as they take into account specific local circumstances that influence the selection of indicators (e.g. availability of data, local priorities and practices).
- In the case studies that cover a large number of territorial units the **Latent Class clustering model** helps to analyse underlying patterns and spatial differences of territorial QoL. However, the number of case studies falling in this category is small.
- A descriptive element of the TQoL approach identified in this applied-research project is the **"citizen-centric" approach**, where citizens are engaged in co-design, implementation and fact-checking activities ("factfulness" tests), to make the measurement of territorial QoL more responsive to the needs and aspirations of citizens to improve their everyday life. This can be promoted, recommended, and applied within the different case study contexts highlighting in particular any existing local practice of citizen engagement that could be adopted as a concrete example of the approach.

These methodological elements are considered in the case studies which were carried out to investigate and compare noteworthy experiences of territorial QoL measurements against the TQoL framework that has been developed with the aim of drawing lessons for further adjusting and fine tuning the methodology, which will eventually allow for its practical and widespread use for measuring QoL across territories in Europe.

1 Description of the region

1.1 Characteristics of the region

Most of the Italian territory is characterised by small towns and villages which often have restricted access to essential services. We define these territories as “inner areas”. These are areas far away from large and medium-sized urban centres and their associated infrastructure.

Since September 2012, Italy has been developing a National Strategy in favour of these Inner areas with the final aim of improving the quality of life and economic well-being of people living in its relatively isolated and sparsely populated areas and – in the long term – reversing the decline of the population.

The methodology to identify the “inner areas” was developed based on two main concepts:

- The Italian territory is characterised by a **dense and varied network of urban centres** which offer a wide range of essential services (like healthcare, education, and transport). These centres represent a 'point of convergence' for people living far apart.
- The distance from these urban networks affects people’s quality of life and their sense of social inclusion.

Based on these concepts, the “service centres” have been defined as those municipalities that offer:

- An exhaustive range of secondary schools;
- At least a first-level hospital (including emergency services);
- At least a “silver-type” railway station (served by regional trains at least).

Starting from the identification of the service centres, all municipalities in Italy have been classified into two macro-classes – “centres” and “inner areas” – with six additional classes mapped according to their distance from the poles[1] as follows:

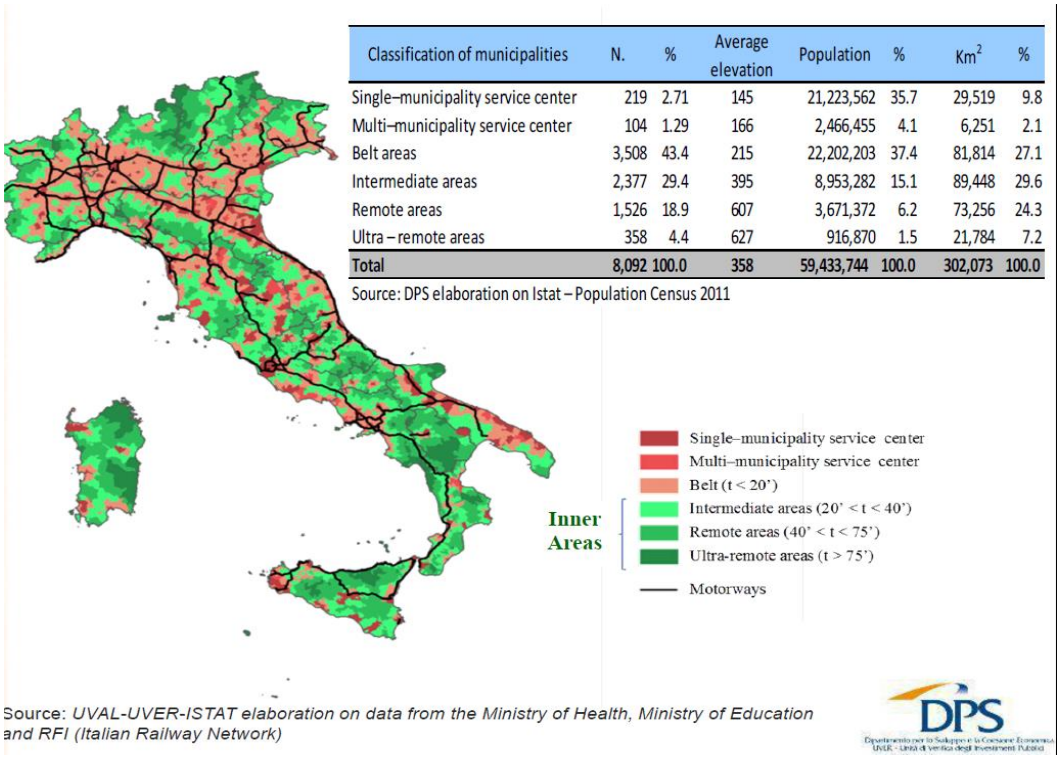
Table 2 - Classification of municipalities

CENTRES	INNER AREAS
• **Poles** • **Local Poles** • **Belt areas**: municipalities up to 20 minutes far from the poles	• **Intermediate areas**: municipalities from 20 to 40 minutes away from the poles • **Peripheral areas**: municipalities from 40 to 75 minutes away from the poles • **Remote areas**: municipalities over 75 minutes away from the poles

“Inner areas” include all the areas 20 minutes or more away from the centres, such as “intermediate”, “remote” and “ultra-remote” areas. The inner areas have been mapped based on ISTAT data for the entire Italian territory, and the following map shows the basic information available about the areas:

[1] The poles host service centres attracting trips from surrounding municipalities. There are two categories: (main) poles with high level urban functions and local poles hosting lower level proximity services.

Figure 2 - Inner areas in Italy



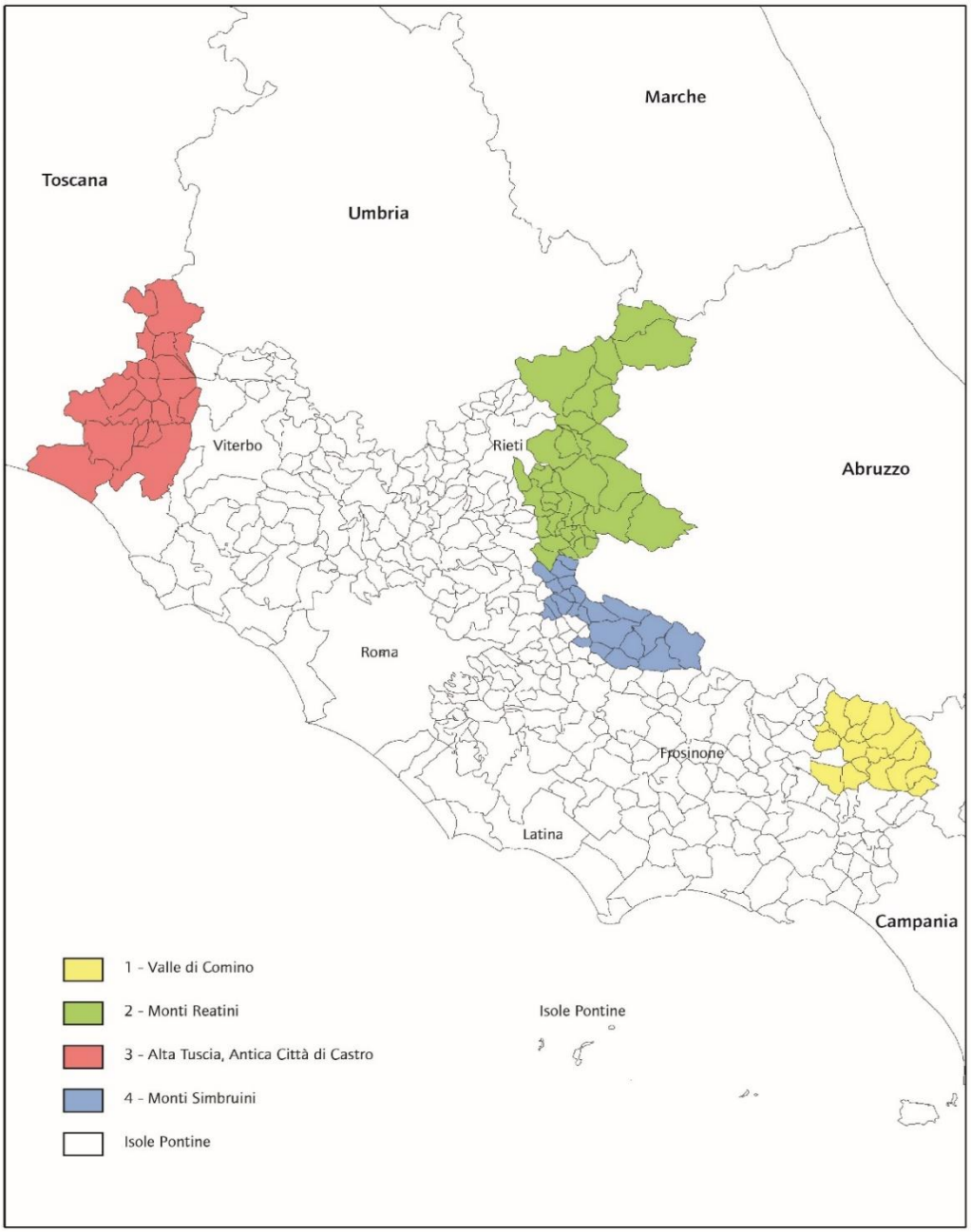
In the case study, we will consider the **whole national strategy** and its application in the **Lazio Region**. In this region, the municipalities are distributed as follows:

Table 3 - Centre-periphery distribution of Lazio Region municipalities

	Municipalities included in "Inner areas Strategies (IAS)" basins				Other municipalities	TOTAL
	IAS 1 Alta Tuscia	IAS 2 Monti Reatini	IAS 3 Monti Simbruini	IAS 4 Valle del Comino		
Pole	0	0	0	0	10	10
Local pole	0	0	0	0	0	0
Belt	0	2	2	2	72	78
Intermediate	7	17	15	11	202	252
Peripheral	12	12	7	5	0	36
Remote	0	0	0	0	2	2
TOTAL	19	31	24	18	286	378

Following the national strategy guidance, four regional "Inner areas Strategies" (IAS) have been initiated in the Lazio Region: Alta Tuscia in the north of the region, Monti Reatini and Monti Simbruini-Valle dell'Aniene near Rome, the capital, and Valle del Comino in the south:

Figure 3 - Inner areas Strategies (IAS) in the Lazio Region

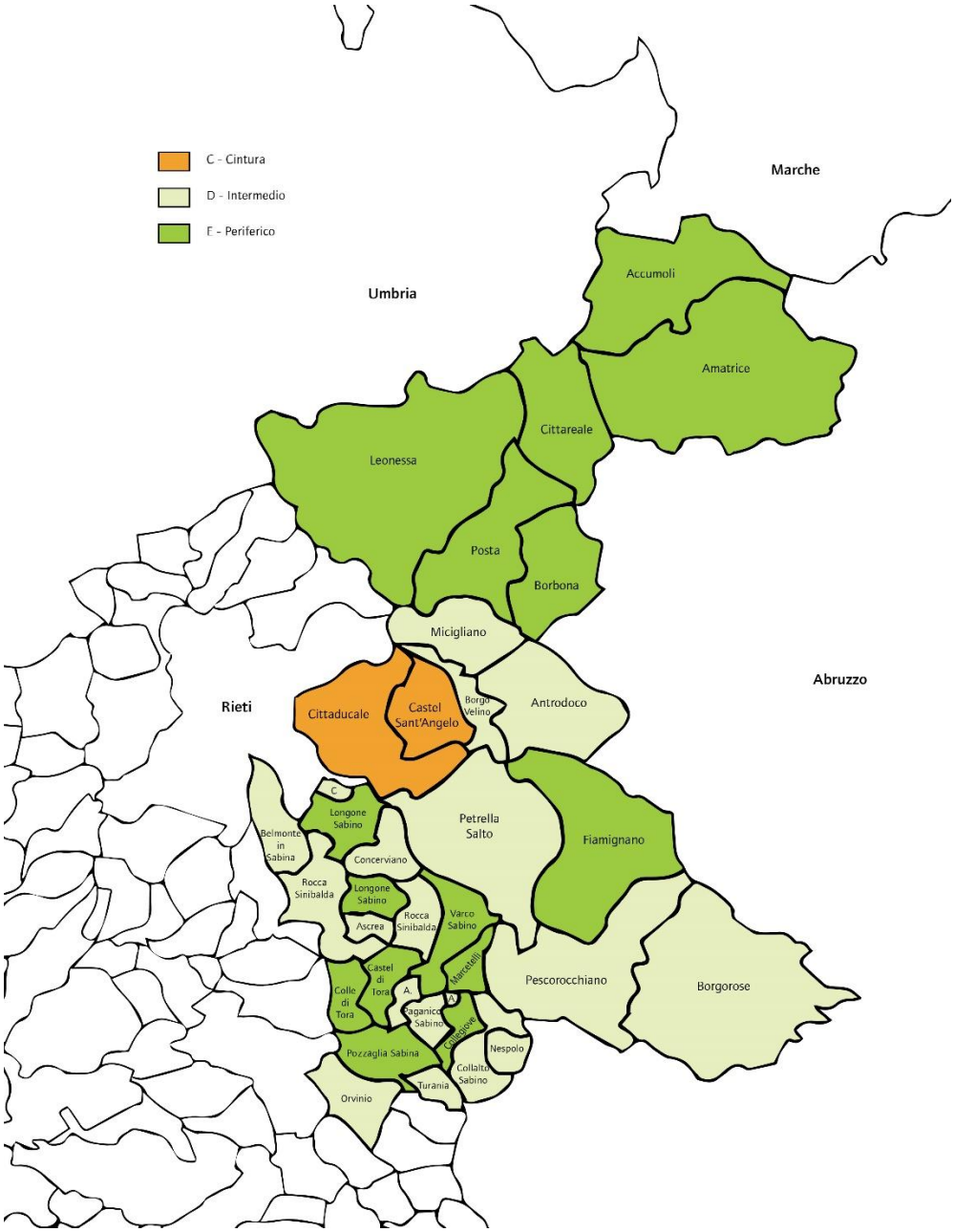


Source: Regione Lazio (2019)

In our case study, we will consider the inner areas dataset available for all of the Lazio region municipalities, to feed an LC-clustering application covering the whole regional area (see section 4.4 below). The qualitative analysis of current strategies and QoL related measurement and monitoring plans and practices will be concentrated instead on the Monti Reatini area (IAS2).

The territory of the IAS2 Monti Reatini includes 31 out of 73 municipalities of the province of Rieti:

Figure 4 - Monti Reatini map



Source: Regione Lazio (2019)

The 31 municipalities are all classified as mountain territories, with a total surface area of 1,623 km2 and hosting in total 34,853 inhabitants (resident population at the time of the ISTAT census in 2011). This number includes a share of owners of second houses that have established their residence in the area even if they de facto do not live there – so the total population figure is somewhat inflated. Even so, the density of population (21.5 inhabitants/km2) is the lowest of the Lazio Region, and it is small also compared with the average for the four inner areas (138.7 inhabitants/km2).

As for the centre-peripheral classification, only two municipalities – Cittaducale and Castel Sant'Angelo – are belt areas, neighbourhoods of Rieti, the province capital and main urban pole. The remaining 29 municipalities are classified as inner areas, with 15 intermediate and 14 peripheral areas (there are no remote municipalities):

Table 4 - Municipalities included in the Inner Area Strategy "Monti Reatini"

T.1	Comuni Area Interna "Monti Reatini"	Popolazione (ISTAT 2011)	Superficie (Km²)	Densità (abitanti/Km²)
1	Accumoli	653	87	7,5
2	Amatrice	2.646	174	15,2
3	Antrodoco	2.704	64	42,3
4	Ascrea	266	14	19
5	Belmonte in Sabina	649	24	27
6	Borbona	650	48	13,5
7	Borgorose	4.615	146	31,6
8	Borgo Velino	990	18	55
9	Castel di Tora	299	15	19,9
10	Castel Sant'Angelo	1.289	31	41,6
11	Cittaducale	6.900	71	97,2
12	Cittareale	470	60	7,8
13	Collalto Sabino	440	22	20
14	Colle di Tora	384	14	27,4
15	Collegiove	169	11	15,4
16	Concerviano	311	21	14,8
17	Fiamignano	1.455	101	14,4
18	Leonessa	2.480	204	12,2
19	Longone Sabino	583	34	17,1
20	Marcetelli	97	11	8,8
21	Micigliano	131	37	3,5
22	Nespolo	274	9	30,4
23	Orvinio	448	25	17,9
24	Paganico Sabino	172	9	19,1
25	Pescorocchiano	2.211	95	23,3
26	Petrella Salto	1.212	103	11,8
27	Posta	686	66	10,4
28	Pozzaglia Sabina	361	25	14,4
29	Rocca Sinibalda	853	50	17,1
30	Turania	245	9	27,2
31	Varco Sabino	210	25	8,4
	Totale	**34.853**	**1623**	**21,5**

Source: Regione Lazio (2019)

The morphology of the Monti Reatini area extends mainly over three valleys - the Salto Valley, the Turano Valley, and the Velino Valley - all of which are characterized by an extraordinary wealth of environmental resources. The abundance of water resources has always attracted investments aimed at exploiting them. The damming of the Turano and Salto rivers, tributaries of the Velino, in 1939 gave rise to two hydroelectric reservoirs of considerable size that have profoundly changed the geomorphological structure of the territory and which still strongly characterize the landscape. Salto Lake and Turano Lake form a single hydraulic system, thanks to the connection dug into the belly of Mount Navegna. In addition to regulating the flow of water into the Velino, they feed the Cotilia hydroelectric plant located in the Municipality of Cittaducale.

Drinking water of excellent quality is collected by the aqueduct system of Peschiera - Le Capore, developed between 1937 and 1980, which supplies 85% of the drinking water needs of the city of Rome, as well as large portions of the Sabina and Agro Romano areas. This exploitation left the community in Monti Reatini with a widespread feeling of injustice, as the population perceives an imbalance between the advantages that neighbouring urbanized areas (Rome) derive from the exploitation of the territory's resources and the scarce benefits that return to the people, particularly those living in the Salto Cicolano and Velino valleys. The protection of water quality and environmental health has de facto hindered the development of industrial settlements in the area, as compared to other neighbouring areas.

The mountainous environment of the area provides essential eco-system services for the largest regional area and constitutes a heritage of significant naturalistic value essential to biodiversity preservation. In addition, the area hosts numerous sites of the Natura 2000

network. Overall, 12.8% of the area's surface is protected, while the forest covers over 65% of the territory.

The territorial context is affected by several other critical factors such as:

- The inadequacy of the road infrastructure system;
- The absence of an integrated public transport system for connecting the municipalities within the area;
- Poor accessibility from outside the area;
- The need to invest for improving internet broadband infrastructure and services in the area;
- Population shrinking and ageing;
- The inadequacy of health services in the face of growing needs;
- The absence of job opportunities, especially for the young, compounded by the low level of education and training needed to upgrade human capital;
- The need for frequent low-level maintenance to keep up public infrastructures and common goods;
- A highly developed network of hiking pathways, currently being expanded, which however requires significant and expensive maintenance;
- Constant growth in both secular and religious tourism, requiring adequate services.

Long-term demographic dynamics are also problematic. Between 1971 and 2011 the area lost 22.9% of the resident population: the worst figure among all the other inner areas of the Lazio region (which show losses of between 6.6% in Val Comino and 1.6% in Alta Tuscia). A lower share of new foreign residents in 2011 (4.7%), compared to the average of the other regional internal areas (7.7%), contributes to these dynamics.

Partly due to an insufficient influx of new foreign residents, the decrease in the population is mostly concentrated in the lower age groups, with a substantial ageing of the area. In particular, as of January 1, 2017, the population of the area has an extremely high old-age index, equal to 289,722, which means that for every 100 residents under the age of 15 there are 290 residents over 65 years. The weight of the older population groups is also evident compared to the active population (between 15 and 64 years), with an elderly dependency index of 46.3.

The economic fabric of the Monti Reatini inner area also shows troubling trends, exacerbated by the general suffering of the economy of the entire Province of Rieti, which witnessed a dramatic decrease in per capita added value during the 2008-2013 crisis. The unemployment rate then continued to show negative trends between 2013 and 2016 (from 11.6% to 12%), in contrast with an improvement recorded at the regional level.

In accordance with the strongly rural character of the area, agriculture is the main sector of the local economy. However, the share of utilized agricultural area (SAU) in 2010 was 27.6%, much lower than the average value of the inner areas in the Lazio region (36.2%). Furthermore, in Monti Reatini, the SAU dropped by 32.7% from 1982 to 2010 (16.1% of which was between 2001 and 2010), and this trend seems to continue unabated. The decrease in agricultural production is extremely critical, because triggering new rural development would be a decisive element for regenerating an ecological/nature-based local economy in the area, and would reduce the hydrogeological risk at the same time. There is instead a decrease in the number of agricultural tenants under the age of 39, which decreased by 25.7% from 2000 to 2010, and which to date represent only 15.3% of the farmer population.

As for industry, the weak industrial fabric of the area was profoundly affected by the recent economic crisis, to the point that a large part of the Rieti Local Labour System[2] was recognized in 2014 as a crisis area and a target for industrial reconversion and requalification funding as per the regional Law 181/1989. Of the 44 municipalities in this crisis area, 26 are part of the Monti Reatini inner area.

Finally, trade and services represent the weakest sectors of the local economy, affected as they are by the scarcity of domestic demand linked to the decrease and ageing of the population, and being unable to attract external demand, especially tourism. Tourism, while it could take advantage of significant natural resources as well as its notable historical-cultural and eno-gastronomic heritage, has so far not made the desired leap in the quality and integration of services to meet a growing sustainable tourism demand. The accommodation rate is at 56.2 beds per 1000 inhabitants, a value lower than the average for the nation, the region and other inner areas.

1.2 Rationale for selecting the case study

The reason this case study was selected was to study the application of the QoL concept for the "inner areas"[3], both at the national strategy level – for all of Italy – and at the local application level (for the Lazio Region, and more in depth for Inner Area 2, Monti Reatini, within the region).

The case study considers the methodology and the indicators used to identify and measure development features in the inner areas, with the aim of exploring to what extent this could be combined with the methodology and indicators used to measure equitable and sustainable well-being in Italy ("Benessere Equo e Sostenibile" – BES) – currently delivering data aggregated at NUTS3 level – to measure and deliver a picture of quality of life in the inner areas.

Across the entire Italian territory, the inner areas are characterised by:

- Natural resources (forests, protected areas, and agricultural land);
- Cultural resources (archaeological sites, abbeys, small museums and craft centres).
- "Strong heterogeneity" as a result of their specific natural characteristics and peculiar developmental paths;

They are also characterised by a process of marginalization since the 1950s, which affects:

- Demographic trends, with steep ageing of the population everywhere, a continuous decline of the population in the remote and ultra-remote areas since the late 1970s, and increasing immigration flows, especially in the intermediate and remote areas.
- Natural assets and land use, with a reduction in the percentage of land exploited for agriculture in the last 30 years, increasing forest land and increasing exposure to landslide and flooding risks.

[2] Daily commuting area centred on the city of Rieti.

[3] The concept is similar to the concept of "inner peripheralities" investigated at the European scale in the ESPON applied research project PROFECY (ESPON, 2017). In a nutshell, "inner peripherality" is the effect of the combined action of several processes and features on one territory in a way that cause significant limitations in its development potential. PROFECY has identified three theoretical concepts of inner peripherality: 1) Enclaves of low economic potential; 2) Areas with poor access to services of general interest; and 3) areas experiencing aspatial socio-economic peripheralization processes. The inner areas of the Italy case resemble to the second inner peripherality concept.

- Human and territorial capital, which is increasingly under-utilized, and the economy, with the dominant (but declining) role of the agricultural sector, a regional specialization in the manufacturing sectors for some inner areas, especially in the north of Italy, and specialization in rural tourism activities in other areas, especially in the south of Italy.
- The quality and quantity of services supplied, including those considered by the national strategy: transport, health services, and education services.

The common strategic goal for all projects and actors involved in the national strategy "inner areas" (see the next section) is to eventually improve the quality of life and economic well-being of people living in relatively isolated and sparsely populated areas and – as a consequence – reverse the unfavourable demographic trends in these areas (depopulation and rapid ageing). This goal is operationalised by fixing the following within the inner areas:

Local targets:

- Increasing the wealth and improving the well-being of the population. This is strictly related to our QoL measurement project goal.
- Restoring the vitality of local communities. This is related to the goal of localising SDGs projects.

National targets:

- Population growth/stability and increase in employment;
- Definition of new functions for under-utilised human, natural and economic resources;
- Reduction in social costs caused by depopulation trends.

Our case study will investigate more deeply the dimension of well-being, with the ultimate aim of proposing BES indicators to measure the quality of life in the inner areas.

In this context, the selection of the Monte Reatini area in the Lazio Region is particularly suitable. The demographic and economic trends in the area – presented in section 1.1 above – have a clear impact on the quality of life in the area, with a number of problems especially in the mobility, digital connectivity, health and education sectors:

- **Mobility**: Mobility in the Monti Reatini inner area is negatively affected by the orographic characteristics of the territory and by a lack of general infrastructure which, together with the low density of settlements, increases travel times. Much of the provincial and municipal road network is poorly maintained, and often is inadequate in terms of road safety and resistance to seismic and hydrogeological stress. The attractiveness of the only motorway that partially accesses the area, the A24 Rome-L'Aquila-Teramo, is reduced by its high tolls, a discouraging factor both for the movements of residents and for the occasional ones of potential tourists. The weakness of Local Public Transport (LPT) services has led to an almost total dependence on the use of private cars. The LPT services of the Lazio Region (COTRAL) are more aimed at serving regional hubs (Rieti and Rome), to the detriment of internal connections in the area. The connections towards other interregional hubs are served by the Abruzzo Region (TUA) and Marche Region (START) coach operators, with services designed according to the needs of users outside the inner area, and without any integration (e.g. of ticketing).
- **Digital connectivity:** As of 2013, the Monti Reatini inner area presents internet coverage data, both fixed and mobile, that is particularly problematic. In particular, the digital divide amounted to 26.1%, the worst figure among the regional inner areas and very far from both the averages of the national inner areas (8.6%), those of Lazio (1.6%), and those of Italy as a whole (3.5%). Specifically, in the Monti Reatini area, 39.6% of the population is reached by a fixed broadband connection (ADSL) of between 2 and 20 mbps, while only

16.4% has a fixed connection above 20mps, leaving the remaining 44% without a fixed connection. This is an important obstacle to the digital delivery of citizenship services such as info-mobility or telemedicine, as well as to generalized digital access for private enterprises and households.

- **Health and education:** Critical factors in the area include:
  - Low quantity and poor quality of specialized health-care services, with long queues and waiting times for getting health visits and checks;
  - High waiting times for health emergency services;
  - Poor coverage of home – health and social – care services;
  - High number of mixed-age classes in primary schools, due to the small number of pupils living in the villages of the inner areas.

2 Policy context

2.1 Governance levels and the use of QoL in a policy context

The Italian Inner areas strategy is based on a multi-level governance approach that involves different national and regional institutions working together with local territories (i.e. associations of municipalities), and combines several investments, regulatory and planning schemes in one coherent frame, as illustrated in the figure below:

Figure 5 - From Territorial Cohesion policy to Inner areas strategy

Source: Dipartimento per lo Sviluppo e la Coesione Economica (2014)

The strategy receives strong technical support from the Central Government Department for Development Policies (DPS), the Central Bank and the Institute of National Statistics-Committee for Inner areas. It is further supported through a political agreement between the Ministry of Territorial Cohesion and sectoral ministries for Agriculture, Health, Transport, Education, Labour and others. Finally, it is developed in agreement with all Italian Regions and the European Commission.

The implementation of the strategy is ensured by:

- A National Committee – with representatives of the institutions at the central level – in charge of strategic analysis, fostering and monitoring the strategy's application.
- The negotiation with the regions and the establishment of a common operative framework.
- The signature of a Partnership Agreement with the European Commission and high-level commitment from key Ministries and Presidents of the Regions.
- The organization of a platform for networking activities between the different projects.

The success of the strategy is pursued by following a project-based approach, based on the selection, coordinated at the national and regional level, of projects complying with some specific characteristics:

- Create new employment through action on at least two of the selected development factors (land management and forests, local food products, renewable energy, natural and cultural heritage, traditional handicrafts and SMEs[4]);
- Strong participation of the local community;
- Constant monitoring and evaluation process on pre-established results;
- Strong technical assistance;
- Action on both development factors and improvement of basic services (transport, health, education).

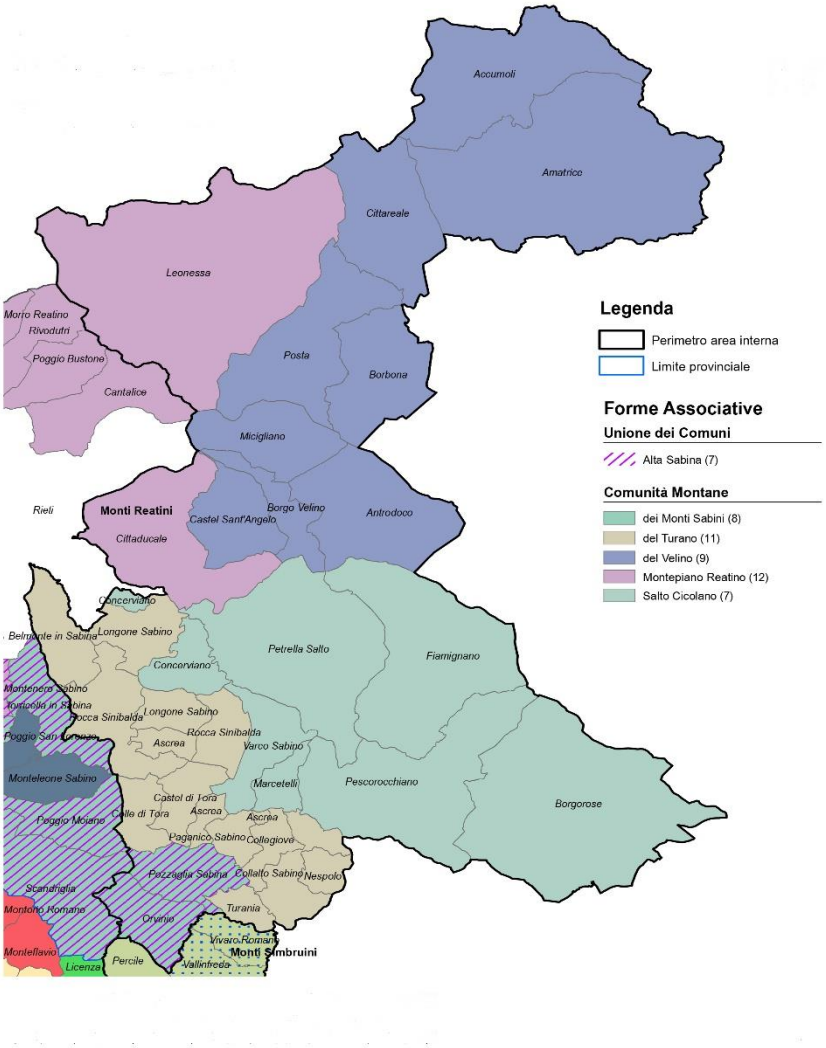
[4] The Inner areas strategy does not mention digitalization among the development factors for rural and remote areas, although this is an increasingly vital element for ensuring the quality of life in rural regions (see the Cork 2.0 Declaration "A better Life in Rural Areas": https://ec.europa.eu/agriculture/sites/agriculture/files/events/2016/rural-development/cork-declaration-2-0_en.pdf)

At the local governance level, in the Lazio Region and in particular in the IAS 2 Monti Reatini, the importance of interinstitutional cooperation to effectively address territorial development challenges is increasingly emphasized.

Indeed, only through associated management of functions and services is it possible to reorganize public spending while improving the quality of services. The aim of such associations is to obtain greater administrative efficiency and simplification, and better address the needs and expectations of the whole system of local actors, through an ever-increasing negotiation and optimization of solutions and the optimization of territorial resources. Following this logic, the Municipalities of the "Monti Reatini" area, while aware of their historical-cultural identity, believe that joining their efforts is a necessary step to realize supra-municipal policies and to implement the roadmap of the National Inner areas Strategy at the local level.

The geographical complexity of the Monti Reatini area is reflected in a number of already existing inter-municipal governance institutions, with a variable geometry of administrative layers coordinating all or part of the 31 Municipalities of the inner area: 5 out of the 6 Mountain Communities of the Province of Rieti and the Union of Municipalities of Alta Sabina.

Figure 6 - Five Territorial governance institutions in the Monti Reatini strategic area



Source: Regione Lazio (2019)

Within each mountain community, the Municipalities involved have shared the management of administrative functions and services to citizens (waste collection, school transport, social services, etc.), by establishing specific agreements (“convenzioni”).

In addition to the shared functions and services above, the "Monti Reatini" Area Conference was established as a permanent coordinating institution. This is the proposing and guiding body for the implementation of the goals and actions of the Monti Reatini inner area strategy. The Conference is made up of:

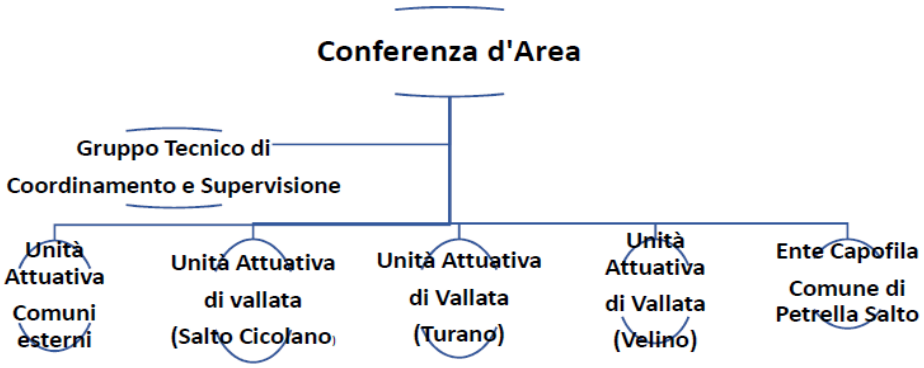
a) The Legal Representative of the Leading Body or his/her delegate. The Leading Body is the Municipality of Petrella Salto.

b) The Legal Representatives of the Mountain Communities of Velino, Turano, Salto Cicolano, or their delegates.

c) A representative chosen from the Legal Representatives of the four Municipalities included in the perimeter of the Monti Reatini inner area but not belonging to the Mountain Communities, or their delegates.

Alongside the area conference, other governance bodies are in charge of the strategy management: The Technical Coordination and Supervision Group; the Leading Body (Municipality of Petrella Salto); and the implementation units (external municipalities, Salto-Cicolano Valley, Turano Valley, Velino Valley).

Figure 7 - Governance bodies of the Monti Reatini strategy management



Source: Regione Lazio (2019)

So far, the area strategy has been developed following a sequence of stages:

a) Identification of the needs of the population,

b) Assessment of available resources and existing practices,

c) Development of a knowledge network in the territory,

d) Engagement of all “change-driven” institutional, entrepreneurial and civil society/citizenship actors;

e) Identification of priorities for planning new area-wide services.

2.2 Obstacles, success factors, achievements and further plans

The main strength in the Monti Reatini area case is the presence of a clear strategy and planning document, fully devising the obstacles and the opportunities to achieve a better quality of life in the area. However, the main weakness now is – not surprisingly – the implementation of the strategy, with several obstacles requiring solutions to better adapt the strategy to the problems emerging during the implementation. In the following we discuss obstacles, success factors and achievements separately for the planning level and the implementation stage.

2.2.1 Planning level

A more recent achievement, and arguably the main one, has been the formal adoption of the Monte Reatini Strategy plan, approved with the Lazio Region Deliberation of 9 July 2019, n. 453.

This strategy has set out several actions, identifying specific implementation objectives, authorities and sources of funding involved. To implement the strategy:

- The Municipalities of the Monti Reatini area will implement shared functions and services suitable for achieving the long-term results envisaged in the strategy, and will coordinate with existing local development projects already financed under other strategies and funding programs;
- The shared functions and services are included under a general agreement umbrella – the "Monti Reatini Inner Area Pact" – to ensure their coherent and continuous development, management and monitoring.

Specifically, the first shared functions and services planned in the "Monti Reatini Pact" include common cadastre and territorial planning services, local public transport services and a common public procurement agency.

The same strategy has also analysed the **obstacles** to achieving a good quality of life in the Monti Reatini area are linked to the following trends, which promise to continue unabated in the coming years if actions – such as those initiated with the Monti Reatini Strategy described in section 2.3 – are not undertaken urgently and deeply enough:

a) Shrinkage of working-age population;

b) A growing number of the elderly whose quality of life is progressively worsening, due to the scarcity of health and other basic services;

c) A strong increase in unemployment fuelled by a growing shortage of job and training opportunities, in particular in the agricultural, ecological and tourism sectors, where the number of opportunities should be much higher;

d) Low supply of services for sustainable tourism;

e) Low supply and diffusion of digital services (telemedicine, info-mobility, etc.);

f) Increase in underemployment and informal work, and precarious jobs generating a higher number of the "working poor";

g) Reduction of new households, as a result of natural or migratory movements, and/or reduction in the number of children per family;

h) Further reduction of the utilized agricultural area (SAU), with the associated increase of hydrogeological risk;

i) Impoverishment of agricultural traditions which represent an asset for the area.

Success factors to exit from the current situation and reverse the trends above have been identified as well, envisioning an alternative scenario.

Indeed, the visionary goal of the strategy is to retain current residents while attracting new households from neighbouring areas, in particular from Rome, and stabilizing some temporary population inflows (e.g. asylum seekers, workers involved in the reconstruction of earthquake areas). The strategy will involve public and private actors and resources in order to:

- Reduce travel times within the area and to/from other areas;
- Improve internal road safety standards;
- Reduce response times for health emergencies;
- Improve the level of quality for social and health services, providing Integrated Home Care;
- Increase the number of students enrolled in primary and secondary schools;
- Improve student learning performance;
- Increase tourist flows;
- Increase the birth rate and vitality of entrepreneurial initiatives, particularly in the food industry and bioeconomic sectors.

The desired long-term impacts (2050) include:

- *Impact on the production system and human capital*: acceleration of generational turnover in the most promising sectors - agro-industrial, livestock, tourism, forestry - also thanks to the introduction of higher and/or specialized training courses aligned with the productive vocations of the territory. Creation of networks between companies and innovators, with the aim of opening up new markets and introducing local products/services in regional, national and global value chains.
- *Impact on tourism supply and demand*: increase in the supply of seasonal tourist services and packages, by upskilling tourism sector operators and their capacity to intercept a greater potential demand of sustainable tourism, slow food, trekking and sport activities. Widespread promotion – especially targeting urban dwellers in the nearby city of Rome - of the environmental and well-being assets typical of these places.
- *Impact on the quality of services for residents*: the Strategy focuses primarily on enhancing the supply of public transport services, integrated with proximity (“last mile”) services managed directly by the Municipalities; on increasing the number of activities (land use mix) and journeys internal to the area; on improving the internal road infrastructure; on providing on-demand mobility services and infomobility services. A further goal is to guarantee each resident the opportunity to cultivate and develop her/his know-how to access the economic and social life opportunities directly on site, by providing safe and well-equipped schools, offering multidisciplinary courses and highly qualified teaching staff. The interventions in health and social services will increase will increase timely access to emergency health facilities, as well as access to digital and home-based health services

The monitoring indicators adopted in the Monti Reatini strategy are focused on five domains of quality of life: mobility, education, healthcare, digital connectivity and environmental protection. The following tables show how these five aspects are currently framed in the strategy, with the definition of expected results, key performance indicators and the actions planned:

Mobility

The drafting of a Mobility Plan (action A1) for the whole inner area will involve the 31 Local Authorities, the Lazio Region and the LPT companies at a multiregional level. To complement/support conventional mobility, an offer of flexible on-call and user-friendly services will be organized for different targets, e.g., daily rides for elderly users of health services, collective taxi and minibus services, a long distance bus-shuttle service interchange of no longer than 15 minutes for tourist journeys (action A2). Road maintenance and safety measures (A3 actions) will help strengthen the connections between the valleys in the inner area, and with other areas outside of them.

Table 5 - Mobility: Expected results, indicators and actions

Expected results	Indicators	Actions
Better mobility within and to/from the inner area, to enhance accessibility to basic services (education, health, etc.) and promote local development	Usage of sustainable mobility services (e.g. collective taxis)	A.1 e A.2 Inner Area Mobility Plan
Better road maintenance and safety within the inner area	Road accidents per 1,000 inhabitants	A.3 Renovation of some road legs in the inner area

Education

The idea of creating workshops (action B1) in disadvantaged and culturally deprived territories, such as those of the inner areas, aims to fill the gap of recreational facilities, needed to encourage socialization among young people; the school, in some cases, continues to be the only educational or cultural spot in the area. The workshops will cover topics such as English and digital literacy, environmental education, music therapy, art and technology and creative writing.

The intervention on training courses (action B.2) will aim to develop of the skills of both the teachers and the pupils, and it will also be aimed at supporting parenthood. Teachers will increase their competence, developing emotional intelligence to manage conflicts within the classroom and to promote personal growth, as well as their digital skills and innovative teaching approaches using ICTs.

Table 6 - Education: Expected results, indicators and actions

Expected results	Indicators	Actions
Increased safety and wider use of school buildings	Safety level of school buildings	B.1 Laboratories
New teaching approaches and knowledge society diffusion	Share of teachers attending training and knowledge updating courses	B.2 Training courses

Healthcare

The new reorganization of the social and health services of the Monti Reatini Inner Area envisages the activation of “valley services”, combining and integrating different services (health, social and solidarity) in the area into one system, with the development of networks of real and digital communities. This new system will include two health houses (Sant'Elpidio and Borgo Velino) and professional networks of health workers aimed at proactive management of chronic conditions and the protection of vulnerable people. In this context, the first planned actions include:

- C.1 - The multidisciplinary itinerant teams, made up of health and social professionals from the various operating agencies, serving different hospital and territorial nodes of the network, and bringing highly specialized services even to decentralized locations, to promote self-care abilities and users' awareness of their personal self-help resources.
- C.2 - The community nurse and midwife: the former is expected to work on primary prevention - reducing risk factors in the population through health education on diet, tobacco and alcohol use, physical activity, prevention of domestic accidents, etc. – as well as secondary prevention - increasing the use of tests and diagnostics for early detection of diseases, and implementing vaccination campaigns as needed; the latter will make it possible to offer services to monitor and support pregnant women.

Table 7 - Healthcare: Expected results, indicators and actions

Expected results	**Indicators**	**Actions**
More and better childcare services and home care services for the elderly	Share of >=65 years residents in home care services (ADI)	C.1 Itinerant health worker teams C.2 Community nurse and midwife profiles

Digital connectivity

The imminent implementation of the Lazio BUL (Large Broadband) Technical Plan, supported by the resources of the POR FESR 2014-2020 (Axis II, Action 2.1.1) and the PSR FEASR 2014-2020 (Sub-measure 7.3), will respond to the needs of the inner area, ensuring stable and continuous connectivity with a speed similar to that of metropolitan areas. These interventions will bring coverage with ultra-broadband at 100 Mbps to 70% of the entire regional territory (including all the offices of the PA), and will cover the remaining 30% with ultra-broadband at 30 Mbps. The availability of BUL will also enable all “digital agenda” actions envisaged to improve the governance of the area (accessibility of data, information, shared services).

Table 8 - Digital connectivity: Expected results, indicators and actions

Expected results	**Indicators**	**Actions**
Reduction of the digital divide with the diffusion of large broadband connections (Digital Agenda)	Area coverage with at least a 30 Mbps connection	D.1 Implementation of the large broadband plan of the Lazio region (BUL)

Environmental protection

The orographic characteristics of the Monti Reatini inner area, together with the abandonment of marginal agricultural plots, leading to the lack of maintenance by agricultural hydraulic arrangements, undermine the hydrogeological stability of the whole area. Actions are necessary to consolidate land slopes affected by landslide phenomena and for hydraulic risk mitigation.

Table 9 - Environmental protection: Expected results, indicators and actions

Expected results	Indicators	Actions
Reduction of the hydrogeological risk in the area	Exposure to landslide risk	E.1 Actions to improve safety and increase the resilience of territories subject to landslide risks

2.2.2 Implementation stage

A specific obstacle emerging for the implementation of the strategy – which was approved by the Lazio Region in July 2019 and now should be realized with a territorial pact (Accordo di Programma) assembling the 31 Municipalities of the area and the Lazio Region department in charge in an unique partnership – was to associate in practice a so large number of small municipalities scattered in three valleys.

While the two valleys of Salto-Cicolano and Turano are geographically and culturally near – the two rivers are even connected with a unique system of dams – the Velino Valley is a different reality with different problems and needs, exacerbated by a recent earthquake with epicentre in the town of Amatrice. A first adaptation would be needed now to recognise that the quality of life and investment needs for the Velino Valley – especially to recover after the earthquake – are too different from those of the other two valleys for them to remain associated in a unique territorial pact (or at least the Monti Reatini pact should include different provisions now for the Velino sub-area and the twin valley of Salto and Turano). A greater territorial homogeneity can only facilitate the implementation of common plans and actions in the different sectors described above – mobility, education, health, digital connectivity and environmental protection.

A second obstacle – less specific to the area, as it can be found more in general in the inner and rural areas – is the cultural attitude of the local policy makers, the mayors of the municipalities, to remain focused on the problems experienced within their municipal jurisdiction, and to compete with each other to gather funding for interventions in their own territories rather than cooperating for realizing strategic interventions at the level of the whole area, with benefits for all. So, the implementation of the Monti Reatini strategy risks in practice to be transformed in a run to get funding on single interventions on which become difficult to eventually find consensus, instead of fostering common strategic investments.

In this respect, the Lazio Region plays a key role, to assist the municipalities in the implementation of the strategy and the identification and approval of investment priorities of strategic value for the whole area.

Another factor that could greatly improve the implementation of quality of life policies and investments, benefiting the whole area, would be to organise systematically the engagement of the users – stakeholders and citizens – in the discussion and monitoring of quality of life targets and indicators of achievement, as suggested in the conclusions of our case study (see section 5.1)

3 Measuring Quality of Life

3.1 Indicators and measurement

The framework of reference to measure quality of life in Italy is the set of equitable and sustainable well-being (BES) indicators and survey administered by ISTAT through its network of regional offices.[5]

The BES indicators are 130 in total, organised in 12 domains of well-being shown in the table below.

Table 10 - The twelve BES domains

BES domain	Rationale	Nr. of indicators
Health	Health is a central element in life and an essential condition for individual well-being and prosperity of populations. Health outcomes have an impact on all dimensions of the individual life in all its different phases, modifying life conditions, behaviour, social relationships, opportunities and prospects of individuals and, often, of their families.	13
Education and training	Education, training and the level of competences affect the well-being of individuals because they live longer and better because they have healthier lifestyles and more opportunities to find jobs in a less risky position. Furthermore, higher levels of education and training are related to higher levels of access and enjoyment of goods and cultural services, and to active participation in the production process in the cultural and creative sectors.	11
Work and life balance	A job well paid, reasonably secure and corresponding to competences is a universal aspiration of adult people and contributes significantly to the achievement of their wellbeing. However, a bad distribution of work commitments which hamper the balance between working time and social and family life can have a negative impact.	14
Economic wellbeing	Earning capacities and economic resources are not seen as an end but rather as a mean by which an individual is able to obtain and to support a specific standard of living. As for most of the other dimensions of well-being, it is important to go over the mere study of mean or median levels of the chosen indicators, evaluating also the distribution among population.	10
Social relationships	Relational networks to which individuals belong and in which they recognize themselves, represent a fundamental resource that allows pursuing their own ends. A generalized climate of interpersonal trust, high involvement in associative networks and widespread civic culture increase individual wellbeing and social cohesion, allowing a better performance, greater efficiency of public policies and a lower cost of economic transactions.	9
Politics and institutions	The domain is based on the consideration that the trust expressed by the citizens to the institutions facilitate cooperation and social cohesion while allowing greater efficiency of public policies and a lower cost of transactions.	12

[5] See: https://www.istat.it/en/well-being-and-sustainability/the-measurement-of-well-being/indicators

BES domain	Rationale	Nr. of indicators
Safety	The subjective perception and the experience of objective safety in daily life is of paramount importance in the construction of individual and community well-being. The most important effect of criminality on well-being is the sense of vulnerability that it determines on individuals.	11
Landscape and cultural heritage	The geographical landscape is divided into three sub-domains – urban, rural, natural – and the first two, that are shaped by the man's work, are considered as an integral part of the cultural heritage. Heritage can be considered, indeed, either as a sum of items (the "heritage properties": museums, monuments, archaeological areas, etc.), or – in a broader sense – as the organic whole of these elements and their respective territorial contexts. The sensible landscape directly contributes to the quality of life on an existential level, investing a sphere of meaning that is wider than that of the mere visual perception, and of the aesthetic values usually associated with it ("experience"). It also includes, at least, the social attention to the protection of landscape itself as an environmental issue ("awareness").	11
Environment	An environment which is in a vital and healthy state constitutes a prerequisite to ensure authentic well-being for all components of society. If our societies are not able to live within the boundaries of a single Planet (Rockstrom's planetary boundaries), well-being cannot be for all or lasting.	18
Innovation, research and creativity	Innovation and Research are the base of social and economic progress and an indirect determinant of well-being and. An effort was done in estimating a creativity indicator, using as a proxy the percentage of employment working in cultural and creative activities. The ability to attract young people with a high level of education is also included as indicative of propensity in a future progress.	7
Quality of services	High-quality public infrastructures and services improve the general context in which people live and work and their social and economic interactions. The inadequate availability of services particularly affects those who do not have sufficient income conditions to resort to alternatives, while the non-availability of basic services is in itself a factor of poverty and exclusion.	10
Subjective wellbeing	Subjective indicators are useful complement to the most objective indicators, because they allow evaluating the possible differences between the overall life satisfaction or the satisfaction with specific aspects of their life people perceive and what it is captured by statistical observation of economic and social phenomena.	4

The BES report on equitable and sustainable well-being is published by ISTAT every year together with the updated set of indicators. It is not just an editorial product but a line of research, a process that takes the multidimensionality of well-being as a starting point and, through the analysis of a wide set of indicators, describes in a comprehensive way the quality of life in Italy. Every annual report issued so far is accompanied by a statistical annex with all the available indicators and data disaggregated at the NUTS2 (Regions) territorial level.

In 2018 ISTAT issued for the first time a system of BES indicators at local level, related to the 110 Italian provinces and metropolitan cities (NUTS3 level). This is the first result of the project "BES measures at local level", that was started to settle and regularly update a set of indicators that is at the same time useful to meet the statistical information needs at local level and consistent and integrated with the framework applied at national level.

3.2 Data sources for measuring QoL at NUTS3 level

Presently, the BES indicators at local level (NUTS3) include 59 indicators out of the full list of 130 indicators available at national and regional (NUTS2) level. The following table reproduces the list of NUTS3 indicators available for 11 out of 12 BES domains[6]:

Table 11 - BES indicators

Domain	Indicators	Data source	Time series
Health	Life expectancy at birth	ISTAT	2004 - 2016
	Infant mortality rate	ISTAT	2004 -2015
	Road accidents mortality rate (15-34 years old)	ISTAT	2004 - 2016
	Age-standardised cancer mortality rate (20-64 years old)	ISTAT	2004 -2014
	Age-standardised mortality rate for dementia and nervous system diseases (65-w)	ISTAT	2004 - 2014
Education and training	Participation in early childhood education	Ministry of Education, University and Research	2008 - 2016
	People with at least secondary education level (25-64 years old)	ISTAT	2004 -2016
	People having completed tertiary education (25-39 years old)	ISTAT	2004 -2016
	First-time entry rate to university by cohort of upper secondary graduates	Ministry of Education, University and Research	2014 -2016
	People not in education, employment, or training - NEET (15-29 years old)	ISTAT	2004 -2016
	Participation in long-life learning	ISTAT	2004 -2016
	Level of literacy (in secondary students)	Invalsi	2017
	Level of numeracy (in secondary students)	Invalsi	2017
Work and life balance	Employment rate (20-64 years old)	ISTAT	2004 -2016
	Non-participation rate (15-74 years old)	ISTAT	2004 -2016
	Incidence rate of fatal occupational injuries [or injuries leading to permanent disability]	ISTAT	2005 -2015

[6] The subjective assessment of life satisfaction is not undertaken at the more detailed territorial level.

Domain	Indicators	Data source	Time series
	Youth employment rate (15-29 years old)	ISTAT	2004 -2016
	Youth non-participation rate (15-29 years old)	ISTAT	2004 -2016
	Paid days in the year (employees)	ISTAT	2009 -2016
Economic wellbeing	Available income per households	ISTAT	2007 -2012
	Average annual salary of employees	ISTAT	2009 - 2016
	Average annual number of pensions	ISTAT	2011 - 2015
	Pensioners with a low pension	ISTAT	2011 - 2015
	Average amount of family assets	ISTAT	2007 -2012
	Rate of non-performing loans per households	Bank of Italy	2004 -2016
Social relationship	Non-profit organizations	ISTAT	2001; 2011
	Volunteers in non-profit organisations	ISTAT	2001; 2011
	Schools with obstacle-free routes	ISTAT	2015
Politics and institutions	EU election participation	Ministry of Interior	2004; 2009; 2014
	Regional election participation	Ministry of Interior	2004 - 2015
	Women municipal administrators	ISTAT	2004 -2016
	Municipal administrators under 40 years	ISTAT	2004 -2016
	Prison density	ISTAT	2004 -2016
	Municipality degree of internal financing	ISTAT	2007 - 2015
	Municipality revenue collection capacity	ISTAT	2007 - 2015
Safety	Homicide rate	Ministry of Interior	2004 -2016
	Other reported violent crimes	ISTAT	2004 -2016
	Reported widespread crimes	ISTAT	2008 -2016
	Road mortality in suburban areas	ISTAT	2004 -2016
Landscape and cultural heritage	Density and importance of museum heritage	ISTAT	2015
	Spreading of agritourism farms	ISTAT	2010 -2016
	Density of historical green	ISTAT	2011 - 2016
	Consistency of the historical urban buildings	ISTAT	2001; 2011
Environment	Water losses in urban supply system	ISTAT	2015
	Waste in landfill	ISTAT	2004 - 2016
	Quality of urban air - PM10	ISTAT	2013 - 2016
	Quality of urban air - nitrogen dioxide	ISTAT	2013 - 2016
	Urban green	ISTAT	2011 - 2016
	Energy from renewable sources	Terna	2013 - 2016

Domain	Indicators	Data source	Time series
	Separate collection of municipal waste	ISTAT	2004 - 2016
Innovation, research and creativity	Patent propensity	ISTAT	2004 - 2012
	Incidence of patents in the high-tech sector	Eurostat	2004 - 2011
	Incidence of patents in the ICT sector	Eurostat	2004 - 2011
	Incidence of patents in the biotech sector	Eurostat	2004 - 2011
	Brain circulation (25-39 years old) Net migration rate of holders of a tertiary degree	ISTAT	2004 - 2016
Quality of service	Children who benefited of early childhood services	ISTAT	2004 - 2014
	Irregularities in electric power distribution	ISTAT	2004 - 2016
	Seats-km offered by local public transport	ISTAT	2004 - 2015
	Hospital emigration to other regions	ISTAT	2004 - 2015

However, the current BES survey sampling base is not sufficient for developing reliable indicators at the municipal level across all of Italy, and in particular for the municipalities included in the inner areas. As for the latter, only a limited number of indicators – and only for some QoL domains – will be collected in the strategic documents issued for the individual areas.

3.3 Data sources for QoL at municipal level

The most relevant source that could provide data for computing several QoL-related indicators at the municipal level – for all municipalities in Italy, including those in the inner areas – is the Statistical Atlas of Municipalities issued by ISTAT. This provides a wide variety of information on economic, social, environmental, cultural and demographic aspects. The statistical information can be consulted from a web platform where data are organised in 16 areas and more than 40 thematic sub-areas. A unique feature of this data warehouse is that the information, starting at the municipal level, can be aggregated, filtered and consulted for multiple territorial layers (from NUTS5 to NUTS1 – the country level).

Table 12 - Statistical Atlas of Municipalities indicators

Domains		Indicators	Time-series	Data sources
Agriculture		Producers and processors of agri-food products (DOP-IGP and TSG)	2014 -2016	ISTAT, Ministry for Agricultural, Food and Forestry Policies
Drinking water		Water input and output of the municipal network for drinking water distribution (m3)	2012; 2015	ISTAT
Social Services		Expenditure of social services by types of users, types of interventions and service managers	2013; 2014	ISTAT, Ministry of Economy and Finances
		Expenditure and number of users of early childhood socio-educational services by type of intervention and management	2013; 2014	
Credit, savings and income		Number of bank branches	2015-2018	Bank of Italy
		Amount of deposits and loans (€)	2015-2018	Bank of Italy
		Taxpayers Taxpayers with income from real estate Income from real estate (€) Taxpayers with income from employment and similar Income from employment and similar (€) Taxpayers with pension income Pension income (€) Taxpayers with income from self-employment Self-employment income (€) Taxpayers with business income Business income Taxpayers with income from capital gains Income from capital gains (€) Taxpayers with taxable income Taxable income (€)	2012-2017	Ministry of Economy and Finances
Environmental quality	**Water**	Water consumption for domestic use per capita (m3)	2010; 2011	ISTAT
		Population served by urban wastewater treatment plants (%)	2008-2011	
	Air	Fixed monitoring units of air quality (n/100.000 inhabitants and n/100km2)	2008-2012	
		Number of times that PM10 limit has been exceeded	2008-2012	
	Energy	Household electricity consumption per capita (kWh)	2008-2012	
		Consumption of methane gas for domestic use and heating per capita (m3)	2008-2012	
		Power of photovoltaic panels of communal buildings on 100,000 inhabitants (kW)	2008-2012	
		Extension of thermal panels of communal buildings on 100,000 inhabitants (m2)	2008-2012	

Domains		Indicators	Time-series	Data sources
	Waste	Municipal waste collection compared to inhabitants (Kg)	2008-2012	
		Waste sorting (Kg, %)	2008-2012	
		Population served by waste sorting (%)	2008-2012	
	Noise	Noise monitoring campaigns per 100,000 inhabitants	2008-2012	
		Number of times that noise limit has been exceeded	2008-2012	
		Extension of noise-reducing asphalt on km3	2007-2009	
		Extension of noise barriers on km3	2007-2009	
	Mobility	Motorcycles and cars per 1,000 inhabitants	2008-2012	
		Public transport demand per capita	2008-2012	
	Environmental data	Experiences of participatory design Environmental report Social Report Collection of toners, batteries, batteries and WEEE ISO 14001 certifications and EMAS registration for municipal buildings and participating entities Green purchases (electronics, furniture, furnishing, cleaning, energy services, building materials) School supplies (fair trade and organic products) Energy efficiency of public lighting Light pollution prevention and reduction Cars (total, methane, LPG, electric and petrol) Paper (recycled and environmentally friendly) Types of public lighting Green management Urban green (typology including historical, density, m2, %) Density protected areas Ecological network Total density of green areas	2013	
Culture		Number of museums or similar institutions Number of visitors	2017; 2018	ISTAT; Ministry of Cultural Assets and Activities
Demography		Resident population by gender and age	1991-2019	ISTAT
		Nuptiality by type of marriage and property regime	2004-2016	
		Birth rate including age, nationality and residence of the parents	1999-2016	
		Resident foreigners by gender and age	2012-2017	
Business		Number of active enterprises by ATECO number and companies' size	2012 -2017	ASIA register
		Number of workers in active enterprises (annual average values) by ATECO number and enterprise size	2012 -2017	

Domains	Indicators	Time-series	Data sources
Education	University students by degree course, gender and nationality	2015-2017	Ministry of Universities and Research
Health	Healthcare institutions & beds in hospitals for areas of clinical specialization and type of institutions	2014-2017	Ministry of Health
Hydrogeological characteristics	Low, medium and high hydraulic hazard zones (km3) Planning (PAI) Attention Area (km3) Moderate-, medium-high and very high landslide hazard area (km3)	2017	ISPRA report on hydrogeological instability
Tourism	Farmhouses by type of services (accommodation, restaurants, etc.)	2014 - 2017	
	Tourism carrying capacity in terms of number of accommodation facilities, rooms, beds and bathrooms by ATECO code and type of establishment, degree of urbanization and geographical location, as well as country of residence of visitors	2002 - 2016	
Safety	Road accidents considering deaths, injuries	2001- 2008	ISTAT

In addition, the **Italian Agency for Territorial Cohesion** maintains a database of diagnostic indicators with data for all the municipalities included in the inner areas. Most of the data are also included in the Statistical Atlas, but the information is more complete and structured for the purpose of doing diagnostic analysis on the inner areas, with the following data categories:

- **Main features**: number of municipalities in the inner area, population, surface, density.
- **Demography**: population by main age classes, resident foreign population, population dynamics.
- **Agriculture and forests**: agricultural land surface (share and variation), farmers (in total and below 40 years old, part time), share of protected areas, forest surface, jobs and working days in the agricultural sector per 1,000 inhabitants.
- **Industry and services**: specialization index (for manufacturing, energy, construction, retail and other services sectors), number and dynamic of firms per 1,000 inhabitants, share of foreign owned firms.
- **Digital divide**: access to broadband connection.
- **Cultural heritage and tourism**: number of heritage sites, number of visitors (in total and per 1,000 inhabitants), number of beds in hotels, etc., per 1,000 inhabitants.
- **Health**: territorial health care facilities (“ambulatori”), average number of inhabitants per physician, hospitals (number of beds and patients per 1,000 inhabitants) and patients over 75 years old, home health services, prenatal care, health emergency services.
- **Accessibility**: time distance from the inner area pole, daily frequency of local public transport services, population living within 15-30 minutes travel time (by car) from the nearest railway station, frequency of rail services, population living within 15-30 minutes of the nearest highway entrance, population living within 30 minutes by car from the nearest airport, population living within 30 minutes by car from the nearest maritime port, synthetic accessibility index computed for daily commuting areas (“sistemi locali del lavoro”).

- **Education**: number of schools, share of municipalities with a primary school, number of pupils per school building, share of foreign pupils, number of special care pupils per teacher, share of pupils resident in the same municipality of the school, teacher mobility, share of full-time classes, share of classes with less than 15 pupils, share of permanently employed teachers, outcome indicators (average and standard deviation of Invalsi scores), share of municipalities with a secondary school, share of municipalities with a high school.
- **Municipal associations** (for sharing territorial functions and services): number and share of associated municipalities, number of municipalities in service consortia.

The indicators are aggregated per inner area and available for two points in time: years 2010-2012 and year 2017.

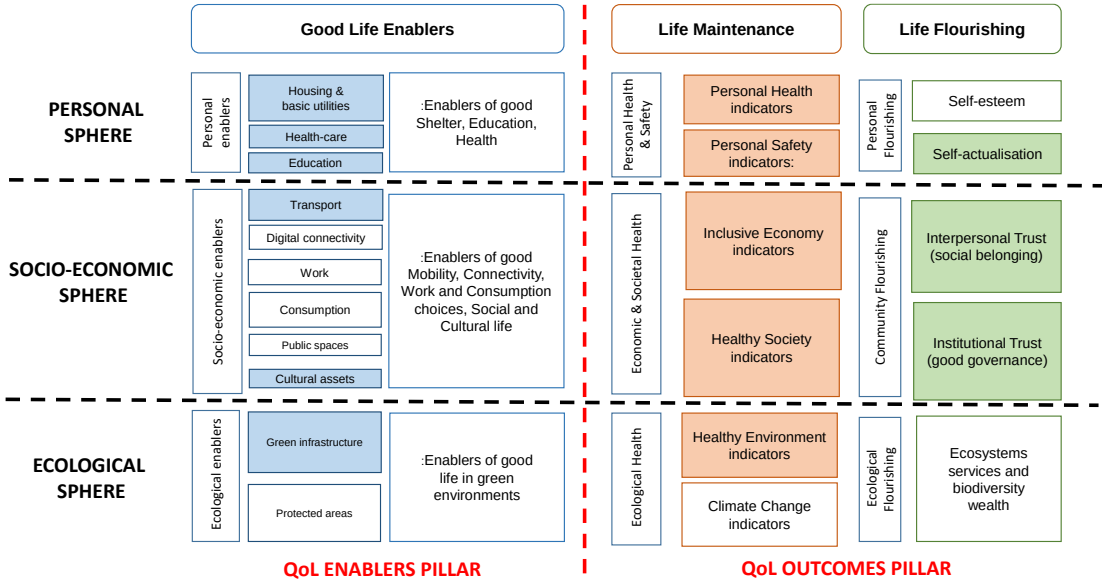
4 Analysing and testing the methodology used in the case study as compared to our approaches

4.1 Comparing the QoL approach in the case study with our conceptual model

In the following, the three data sets that can be considered to develop QoL-related indicators for the inner areas in Italy are mapped onto our TQoL framework.

Figure 8 below highlights the (sub-)dimensions of the TQoL framework that are covered by the **BES indicators at NUTS3 level**.

Figure 8 - The TQoL framework of BES indicators at NUTS3 level



The system of indicators adequately covers the quality of life outcome dimensions – life maintenance and life flourishing – with a number of objective and subjective indicators. However, the latter is based on national and regional surveys that are based on samples that are not granular enough to deliver reliable results at the municipality level (LAU)[7], but rather only at the national, regional (NUTS2) and – for a subset of BES indicators – county (NUTS3) level. There are also indicators that are useful for monitoring some of the "good life enabler" domains: housing & basic utilities, healthcare, education, transport, cultural assets, and green infrastructure.

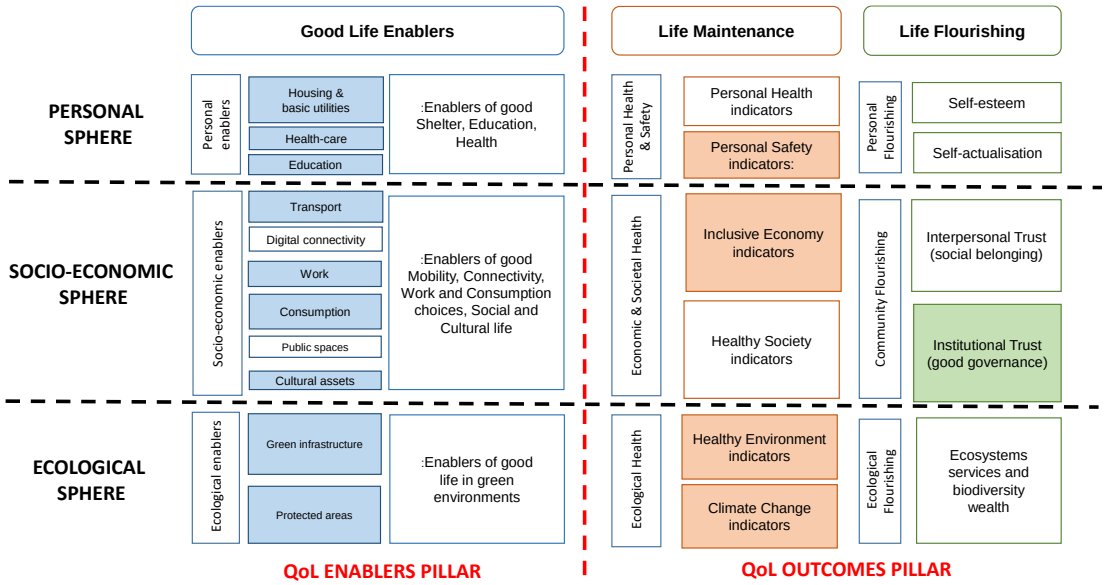
The BES domain of "Innovation, research and creativity" – with indicators measuring patents propensity and brain circulation – is not explicitly included in our Territorial QoL framework. These indicators could be an important driver of quality of life, especially for the flourishing of the personal lives of the innovators or other shareholders benefiting from possible innovation spill-overs – in particular when they emerge at the local level - and for the possibility that widespread dissemination of new projects and services could improve the future living conditions of customers and citizens. Innovation, research and creativity indicators could be included then in a modified "Inclusive Economy and Innovation" category – especially for cases

[7] This with the exception of some (14) metropolitan cities where a specific BES survey and analysis has been undertaken.

of inclusive innovation with widespread benefits for the local population – and/or in the self-actualization category of life flourishing – e.g. for the indicators concerning brain circulation.

Figure 9 below highlights the (sub-)dimensions of the TQoL framework that are covered by the **Statistical Atlas of Municipal indicators**.

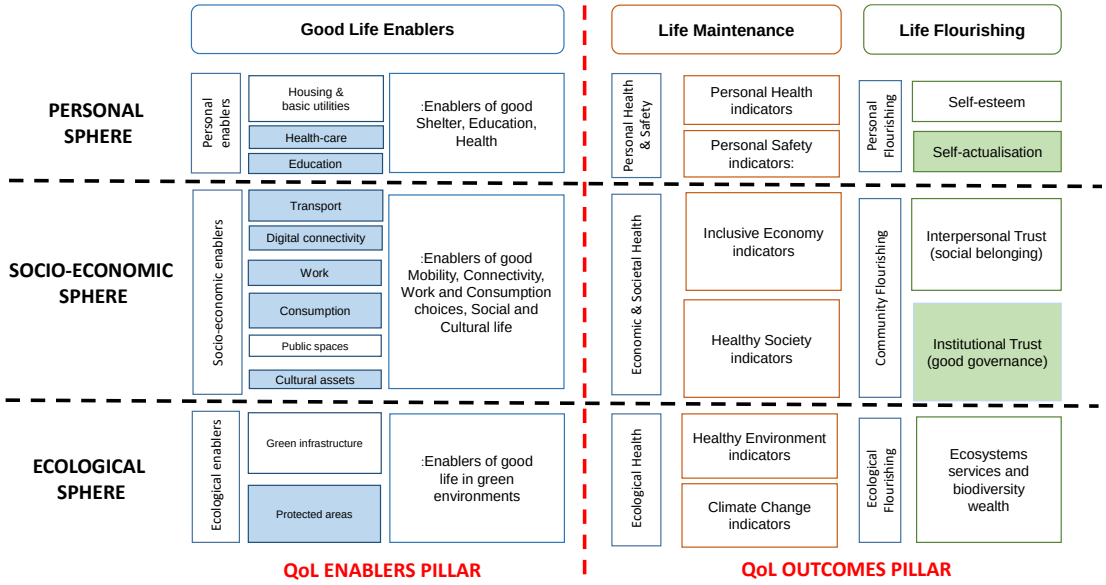
Figure 9 - The TQoL framework of the Statistical Atlas of municipal indicators



This source is partially complementary to the BES indicators, as it covers almost all the subdomains of the "good life enabler" dimension – only digital connectivity and public space are not covered – and most of the life maintenance sub-domains, with the exception of personal health and healthy society indicators. The life flourishing sub-domains, however, are under-represented, with only some indicators in the category of institutional trust/good governance. In any event, the main merit of the Statistical Atlas is the municipal level of territorial detail (LAU), while the BES indicators are only available at the NUTS3 level and for a few large cities.

Lastly, figure 10 below illustrates the overlap between the **Inner areas set of diagnostic indicators** and our TQoL framework.

Figure 10 - The TQoL framework of the Inner areas set of diagnostic indicators



The inner areas diagnostic database includes data at the municipal level that is aggregated per inner areas, covering mostly the good life enabler dimension of the TQoL framework, with the exception of public spaces and green infrastructure. The dimension of life maintenance is not represented, while in the dimension of life flourishing the self-actualization category includes objective outcome indicators of education (Invalsi scores) and the association of municipalities to provide services in the inner areas, which is an element of good governance.

Considering the problems of depopulation affecting the inner areas, the diagnostic database includes demographic data to monitor the composition by age and the natural and migratory dynamics of the population in the territories, which are not included in the TQoL framework. Obviously, quality of life is strongly related to demographic drivers, but this relationship is ambiguous: on the one hand, quality of life is a factor causing the population to "vote with their feet", moving to or leaving a place based on the presence or lack of good life enablers (compounded by the affordability of housing and commuting costs); on the other hand, population shrinkage or overcrowding affects several aspects of quality of life, with a potentially negative feedback loop. For this reason, demographic trends are not included as one component of the TQoL framework, although an analysis will be always necessary to investigate the cross-influences between territorial quality of life and population movements,

To conclude, the combination of the three sources above – which is possible if the BES survey is extended to cover the layer of municipalities (in practice transforming the sample survey in a census) – would provide almost complete coverage of the territorial quality of life framework.

4.2 Coding the indicators

Tables 13, 14 and 15, respectively, code the indicators of the BES dataset at the NUTS3 level, the Statistical Atlas of Municipalities and the Inner areas diagnostic dataset, for the dimensions of the TQoL framework.

As mentioned, the **BES data** are the most complete, but their level of territorial detail is poor. Efforts to collect BES data beyond the NUTS3 level would be highly beneficial, and could be facilitated in some cases by using permanently new big data sources, for example, the pollution control data that could be provided by new smart public lighting lamps currently being installed in Italy. Concerning the nature of the indicators, it is important to note that the BES source

provides objective outcome indicators for education – classified in the self-actualization category (while there are only two indicators of education service quality included in the education enabler category) – social belonging (non-profit organizations and volunteers) and good governance.

The **Statistical Atlas of Municipalities** provides a richer collection of indicators – as compared to the BES source – for the good life enabler dimension, and for the heathy environment and climate change indicators in the life maintenance dimension. The latter include the mapping of low, medium and high hydraulic and landslide hazard zones, an aspect connected to the need to reduce the risks and impacts of disasters caused by increasingly frequent extreme weather events. For the inclusive economy category, this source provides the full collection of taxpayer data (number and income) for different typologies of earnings (real estate, employment, pension, self-employment, business profit, capital gains), which could be very useful to measure inequality trends, although the same data are affected by several problems related to reliability (due to the informal economy, tax evasion, etc.). Finally, the only data available in the life flourishing dimension are related to good governance (community flourishing), with indicators of environmental governance (experiences of participatory design, environmental and social reports, ISO14001 and EMAS certification for municipal buildings).

The **inner areas diagnostic indicators** are the richer collection of data available at the municipal level and for aggregated areas to compute indicators of good life enablers, and in particular indicators of the availability and scope of healthcare services, the availability, accessibility and scope of education services, accessibility to long-distance transport infrastructure (rail, highways, airports, maritime ports), and the presence of work opportunities in the agriculture, industry, service and tourism sectors.

Table 13 - Coding of the BES indicators at the NUTS3 level in the TQoL framework

Dimension	Domain	Sub-domain	Definition
Good Life Enablers	Personal enablers	Housing & basic utilities	Water losses in urban supply system Irregularities in electric power distribution
		Health	Hospital emigration to other regions
		Education	Schools with obstacle-free routes Children who benefited of early childhood services
	Socioeconomic enablers	Transport	Seat-km offered by local public transport
		ICT connectivity	
		Work opportunities	Spreading of agritourism farms
		Consumption opportunities	
		Public spaces	
		Cultural Assets	Density and importance of museum heritage Consistency of the historical urban buildings
	Ecological enablers	Green infraestructure	Urban green Density of historical green
		Protected areas	
Life Maintenance	Personal Health and Safety	Personal health indicators	Life expectancy at birth Infant mortality rate Age standardised cancer mortality rate (20-64 years old) Age standardised mortality rate for dementia and nervous system diseases (>65)
		Personal safety indicators	Road accidents mortality rate (15-34 years old) Road mortality in suburban areas Incidence rate of fatal occupational injuries (or injuries leading to permanent disability) Homicide rate Other reported violent crimes Reported widespread crimes ("microcriminalità")
	Economic and Societal Health	Inclusive economy indicators	Employment rate (20-64 years old) Non-participation rate (15 - 74 years) Youth employment rate (15-29 years old) Youth non-participation rate (15-29 years old) Paid days in the year (employees) Available income per households Average annual salary of employees Average annual amount of pensions Pensioners with a low pension Average amount of family assets
		Healthy Society indicators	People Not in Education, Employment or Training - NEET (15-29 years old) Rate of non-performing loans per households
	Ecological Health	Healthy Environment indicators	Waste in landfill Separate collection of municipal waste Quality of urban air - PM10 Quality of urban air - nitrogen dioxide Energy from renewable resources
		Climate change indicators	
Life Flourishing	Personal Flourishing	Self-esteem	
		Self-actualization	Participation in early childhood education People with at least secondary education level (25-64 years old) People having completed tertiary education (25-39 years old) First time entry rate to university by cohort of upper secondary graduates Participation in long life learning Level of literacy (in secondary students) Level of numeracy (in secondary students)
	Community Flourishing	Interpersonal Trust (Social Belonging)	Non-profit organizations Volunteeers in non-profit organization
		Institutional Trust (good governance)	EU election participation Regional election participation Women municipal administrators Municipal administrators under 40 years Municipal degree of internal financing Municipal revenue collection capacity Prison density
	Ecological Flourishing	Ecosystems services and biodiversity wealth	

Table 14 - Coding of the Statistical Atlas of Municipalities indicators in the TQoL framework

Dimension	Domain	Sub-domain	Definition
Good Life Enablers	Personal enablers	Housing & basic utilities	Water input and output of the municipal network for drinking water distribution (m3) Water consumption for domestic use per capita (m3) Household electricity consumption per capita (kWh) Consumption of methane gas for domestic use and heating per capita (m3)
		Health	Healthcare institutions & beds in ordinary decency and day hospital for areas of clinical specialization and type of institutions
		Education	Expenditures and number of users of early childhood socio-educational services by type of intervention and management University students by degree of course, gender and nationality
	Socioeconomic enablers	Transport	Motorcycles and cars per 1.000 inhabitants Cars by type of engine (total, methane, LPG, electric, petrol) Public transport demand per capita
		ICT connectivity	
		Work opportunities	Producers and processors of agri-food products (DOP-IGP-TSG) Number of active enterprises by ATECO number and companies' size Number of workers in active enterprises (annual average values) by ATECO number and enterpise size
		Consumption opportunities	Expenditure of social services by type of users, types of interventions and service managers Farmhouses by type of services (accomodation, restaurants, etc.) Tourism carrying capacity in terms of number of accomodation facilities, rooms, beds and bathrooms by ATECO code and type of establishment, degree of urbanization and geographical location, as well as country of residence of the visitors
		Public spaces	
		Cultural Assets	Number of museums or similar institutions Number of visitors
	Ecological enablers	Green infrastructure	Urban green (typology including historical, density, m2, %)
		Protected areas	Density protected areas
Life Maintenance	Personal Health and Safety	Personal health indicators	
		Personal safety indicators	Road accidents considering deaths, injuries
	Economic and Societal Health	Inclusive economy indicators	Taxpayers with income from real estate Income from real estate (€) Taxpayers with income from employment and similar Income from employment and similar (€) Taxpayers with pension income Pension income (€) Taxpayers with income from self-employment Self-employment income (€) Taxpayers with business income Business income (€) Taxpayers with income from capital gains Income from capital gais (€) Taxpayers with taxable income Taxable income (€)
		Healthy Society indicators	
	Ecological Health	Healthy Environment indicators	Population served by urban wastewater treatment plans (%) Fixed monitoring units of air quality (n/100.000 inhabirtants and n/100 km2) Number of times that PM10 limit has been exceeded Municipal waste collection compared to inhabitants (Kg) Waste sorting (Kg, %) Population served by waste sorting Collection of toners, batteries and WEEE Paper (recycled and envirnmentally friendly) Noise monitoring campaigns per 100.000 inhabitants Number of times that noise limit has been exceeded Extension of noise reducing asphalt Extention of noise barriers Light pollution prevention and reduction
		Climate change indicators	Power of photovoltaic panels of communal buildings per 100.000 inhabitants (kW) Extension of thermal panels of communal buildings per 100.000 inhabitants (m2) Energy efficiency of public lighting Green purchases (electronics, furniture, furnishing, cleaneing, energy services, building materials) Low, medium and high hydraulic hazerd zones (km3) Moderate, medium, high and very high landslide hazard area (km3)
Life Flourishing	Personal Flourishing	Self-esteem	
		Self-actualization	
	Community Flourishing	Interpersonal Trust (Social Belonging)	
		Institutional Trust (good governance)	Experiences of (environmental) participatory design Environmental Report Social Report ISO14001 certifications and EMAS registration for municipal buildings and participating entitities
	Ecological Flourishing	Ecosystems services and biodiversity wealth	

Table 15 - Coding of the Inner areas diagnostic indicators in the TQoL framework

Dimension	Domain	Sub-domain	Definition
Good Life Enablers	Personal enablers	Housing & basic utilities	
		Health	Territorial health care facilities ("ambulatori") Average number of inhabitants per physician Hospitals (nr. of beds and patients per 1.000 inhabitants) Number of hospital patients over 75 years old Home health services Pregnant women care Health emergency services
		Education	Number of schools Share of municipalities with a primary school Number of pupils per school building Share of foreign pupils Pupils requiring special care per supporting teacher Share of pupils residents in the same municipality of the school Share of full-time classes Share of classes with less than 15 pupils Share of permanently employed teachers Teachers' mobility Share of municipalities with a secondary school Share of municipalities with a high school
	Socioeconomic enablers	Transport	Time distance from the inner area pole Daily frequency of local public transport services Population living within time thresholds by car (15, 30 minutes) from the nearby railway station Frequency of rail services Population living within time thresholds (15, 30 minutes) from a nearby entrance to the highway Population living within 30 minutes by car from a nearby airport Population living within 30 minutes by car from a nearby maritime port Synthetic accessibility index computed for daily communting areas ("sitemi locali del lavoro")
		ICT connectivity	Access to broadband connection
		Work opportunities	Farmers (in total and below 40 years; part-time) Jobs and workind days in the agricultural sector for 1.000 inhabitants Industries and services' specialization index (for manufacturing, energy, construction, retail and other service sectors) Number and dynamic of firms per 1.000 inhabitants Share of foreign owned firms
		Consumption opportunities	Number of beds in hotels etc. per 1.000 inhabitants
		Public spaces	
		Cultural Assets	Number of heritage sites Number of visitors (in total and per 1.000 inhabitants)
	Ecological enablers	Green infrastructure	
		Protected areas	Share of protected areas Forest surface
Life Maintenance	Personal Health and Safety	Personal health indicators	
		Personal safety indicators	
	Economic and Societal Health	Inclusive economy indicators	
		Healthy Society indicators	
	Ecological Health	Healthy Environment indicators	
		Climate change indicators	
Life Flourishing	Personal Flourishing	Self-esteem	
		Self-actualization	Average and standard deviation of Invalsi scores (education outcome)
	Community Flourishing	Interpersonal Trust (Social Belonging)	
		Institutional Trust (good governance)	Number and share of associated municipalities Number of municipalities in service consortia
	Ecological Flourishing	Ecosystems services and biodiversity wealth	

4.3 Other relevant features of the approach

4.3.1 QoL in a territorial context

The inner areas are mostly rural. Rural areas are diverse and have distinct needs, and this must be considered in any effort to measure quality of life in these areas.

A general framework to consider the specific features and needs of the rural areas, and its recent evolution in the context of global mega-trends and challenges driving change also in the rural areas (namely population ageing and migration, climate change and environmental pressures, but also the impacts of urbanisation, global shifts in production, technological breakthrough), has been recently introduced by the OECD, with its Rural 3.0 people-centred rural policy approach (OECD, 2019).

Rural Policy 3.0 is a policy framework to help national governments support rural development, following the New Rural Paradigm, endorsed in 2006 by OECD member countries, which described for the first time rural policy as an investment strategy to foster competitiveness in rural territories. This approach represented a radical departure from the typical subsidy programmes of the past aimed at specific sectors. Rural Policy 3.0 is an extension and a refinement of this Paradigm. The "3.0" refers to the three-dimensional view of rural policies adopted in this approach:

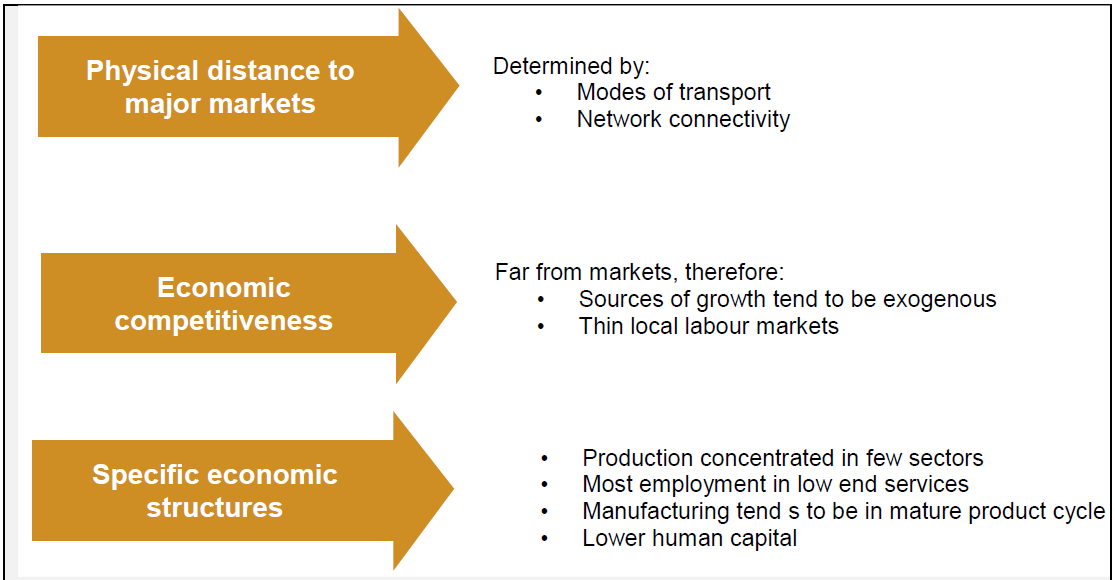
- *Three objectives*: The shift beyond just economic objectives to encompass social and environmental issues.
- *Three type of rural* – from a simple rural dichotomy to rural areas inside FUA, close to cities, and remote (and interactions between them and cities).
- *Three different stakeholders* – from government acting alone to working with the private sector and civil society.

In a nutshell, the Rural Policy 3.0 is a people-centred approach that moves beyond focusing on industry sectors. It focuses on delivering a level of well-being to rural dwellers that is comparable to what is attainable in urban areas, even though different aspects may be emphasised. In general, quality of life has: i) economic dimensions, where household income hinges on employment in firms that are productive and competitive; ii) social dimensions whereby households have access to a broad set of services and local society is cohesive and supportive; and iii) a local environment that provides a pleasant place to live. The balance among these elements may vary considerably across rural areas. This broader well-being agenda does not abandon the objective to improve rural competitiveness; rather it recognises that competitiveness is a necessary, but not a sufficient, condition for well-being.

What the inner areas concept in Italy and the new understanding of rural areas in the OECD Rural Policy 3.0 approach have in common is the functional relation of the areas with surrounding territories (see box below).

A new understanding of rural areas (extracted from OECD, 2019)

The first step in analysing rural areas is to have the appropriate territorial scale and definition. Rural or lower density economies are different from urban economies, across three main dimensions, as it is shown in the figure below:



Source: OECD (2016) Regional Outlook https://doi.org/10.1787/9789264260245-en

The first dimension is physical distance from markets and the costs it imposes in terms of transport and connectivity. The second dimension is the importance of competitiveness in regions where the home market is small, the economy is highly specialised in the production of commodities, and transport costs particularly within countries, are absorbed by local firms. The third dimension is the "first-nature geography", or how natural endowments and geographical conditions shape local economic opportunities.

Proximity and linkages to cities exert a strong influence on rural areas. Urban and rural areas are interconnected through demographic, labour market, public service and environmental linkages that often cross traditional administrative boundaries. They are not limited to city-centred local labour market flows and include bi-directional relationships. Each type of interaction encompasses a different geography, forming a "functional region". Based on functional geography, the OECD identifies three ways to define rural areas with different characteristics, challenges and policy needs:

1. *Rural areas within a Functional Urban Area (FUA)* – these rural areas are an integral part of the FUA, which consists on an urban centre surrounded by a commuting zone. As part of commuting zones, the development of these rural areas is integrated to that of the FUA.
2. *Rural areas with access to a FUA* – these areas have strong linkages to a nearby FUA, but may not be part of its labour market. There are flows of goods, ecosystem services and other economic transactions between them. While the urban and regional economies are not integrated, much of the development of rural areas is linked to the FUA. Close to 80% of the rural population in OECD countries lives in this type of rural region.
3. *Remote rural areas* – these areas are distant from a FUA. Connections to FUAs largely come through market exchange of goods and services. Personal interactions outside the rural area are limited and infrequent, but there are good connections within the region. The local economy depends to a great extent on exporting the output of primary activities. Growth comes from building upon areas of absolute and comparative advantage, improving connectivity to export markets, matching skills to areas of comparative advantage and improving the provision of essential services.

Each of these places tends to have different policy challenges and opportunities, as shown in the table below:

Type	Challenges	Opportunities
Rural inside metropolitan areas	• urban encroachment and competition over land use • activities concentrate in the urban core • loss of rural identity	• access to a large and complex market • potential to capture benefits of urban areas while avoiding the negatives
Rural outside, but in close proximity to metropolitan	• conflicts between new residents and locals • may be too far away for some firms, but too close for others	• potential to attract high-income households seeking a high quality of life • relatively easy access to advanced services and urban culture • good access to transport
Rural remote	• highly specialised economies subject to booms and busts • limited connectivity and large distances between settlements • high per capita costs of services	• absolute advantage in production of natural resource-based outputs • attractive for firms that need access to an urban area, but not on a daily basis • can offer unique environments that can be attractive to firms and individuals

Source: OECD (2016), OECD Regional Outlook 2016: Productive Regions for Inclusive Societies, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264260245-en.

Besides the new understanding of rural areas, Rural Policy 3.0 suggests three priority areas of action for OECD countries:

- **The first is how to increase productivity and foster competitiveness in the context of global value chains and digitalisation.** This includes implementing incentives and mechanisms that support rural areas to identify unique assets, reduce bottlenecks and invest in enabling factors. Economic growth and shared benefits of increased productivity advances living standards through better jobs and higher incomes, and is a necessary precondition for rural well-being. Increasing productivity can directly affect also the resources available to improve well-being, such as investments in healthcare or adapting to climate change. Some rural areas are performing strongly in productivity but inequalities remain, and many rural economies are lagging behind. Facilitating new economic opportunities and overcoming these divides will depend upon commitment to improving broadband quality in rural areas**.** High-speed internet connection is instrumental for rural economies to benefit from emerging technologies and improve competitiveness in global market. Increases in rural productivity can be achieved through better linkages with cities and tradeable activities, because 1) better links with urban areas lead to higher rates of GDP and population growth, and 2) tradable activities offers the opportunity for rural areas to overcome small market size. Finally, increasing productivity in tradable activities depends upon leveraging unique assets and resources, and adding value to primary sectors. Rural economies must take advantage of context specific assets that are immobile which can represent areas of absolute advantage.
- **The second is how to adapt to an ageing population and address demographic pressures**. Focus areas include making rural areas more attractive through the provision of high-quality services, and leveraging economic opportunities associated with an ageing population. Creating an attractive living environment and adapting to demographic changes are essential to rural well-being. Although large cities offer benefits in terms of employment, wages and social opportunities – they also generate costs such as air and noise pollution, and higher house prices. Rural areas offer lower cost of living, and natural and cultural amenities, which can be a source of competitive advantage, particularly for regions with good access to cities. Pressures of ageing in rural economies are much stronger, but

population ageing and the “silver economy” is also an economic opportunity for rural areas. An ageing population indicates that people are living healthier for longer. Today, elderly people are better educated and wealthier, and will consume and invest in their local communities. As rural areas are at the forefront of the ageing phenomenon, they can become laboratories for testing flexible work arrangements, new housing designs, community infrastructure, and innovations in leisure, health and social care services. Regions with good access to cities and those with high amenities can attract elderly people who are looking for a better lifestyle. This will generate opportunities for new businesses and investment in rural communities. The attractiveness of rural areas can be improved through the availability of high-quality public services. Investments in public services can require economies of scale that are difficult to achieve in low density areas, so communities must identify other arrangements to ensure adequate service provision. With growing pressures on public spending due to an aging population, regions are beginning to adopt new approaches to continue providing for rural dwellers. This includes investment in broadband to facilitate digital solutions such as telemedicine and remote education.

- **The third is supporting rural economies in the shift to a carbon neutral economy**. Priorities will include facilitating shifts to more sustainable forms of land use, investment in renewable energy, and proactive support for regions affected by economic restructuring. Rural areas are pivotal in the transition to a carbon neutral economy because of their natural endowments and specialisation in resource-based industries. Land present in rural areas is fundamental to absorbing carbon from the atmosphere. Forest and wetlands function as natural carbon sinks - trees and other vegetation absorb large amounts of carbon dioxide from the atmosphere. Shifts to sustainable land use can be facilitated by reforestation, soil carbon sequencing as well as bioenergy with carbon capture and storage. Rural areas can also employ a number of proactive strategies to support a just transition to a carbon neutral economy, e.g. facilitating renewable energy investment, identifying ways to valorise ecosystems services, promoting the circular and bio-economy.

As it is shown by the results of the clustering analysis presented in section 4.4.2 below, the Monti Reatini areas hosts mostly rural remote municipalities, few rural poles and three small urban poles. This composition is typical of inner areas, and the priorities of the Rural 3.0 approach are therefore a central tenet also for the national Inner Area Strategy in Italy.

To highlight their relevance for the Quality of Life measurement in the rural territorial context, we match in the following table the Rural 3.0 priorities and the criteria (variables) adopted to select and feature the inner areas in Italy with the TQoL sub-domains:

Table 16 - Matching of OECD Rural Policy 3.0 priorities and the Italian Inner Areas Strategy criteria with the TQoL framework

Rural Policy 3.0 priorities	**ESPON TQoL Framework sub-domains**	**Italian Inner Areas Strategy variables**
DEMOGRAPHY: Adapting to demographic change and delivering high-quality services	Housing & basic utilities Healthcare Education services Transport Digital connectivity Consumption Cultural assets Personal health indicators Personal safety indicators Healthy society indicators Self-esteem	Level, composition and dynamics of the population (shrinking, ageing, share of foreigners) Healthcare Education services Cultural heritage Local transport Accessibility to rail/highway/airport infrastructure Digital divide

Rural Policy 3.0 priorities	ESPON TQoL Framework sub-domains	Italian Inner Areas Strategy variables
	Self-actualization Interpersonal trust (social belonging) Institutional trust (good governance)	Territorial governance (association of municipalities to manage common resources and services)
ECONOMY: Increasing productivity and making the most out of innovation	Digital connectivity Work opportunities Inclusive economy	Economic sectors composition and dynamics (number of firms and workers in manufacturing and services; specialization indexes) Agriculture: utilization of land and number of farmers Tourism Distance from urban markets Accessibility to rail/highway/airport infrastructure Digital divide
ENVIRONMENT: Facilitating the transition to a carbon neutral economy	Protected areas Healthy environment indicators Climate change indicators Ecosystems services and biodiversity wealth	Forests and other natural assets Protected areas

The Italian Inner Area Strategy criteria focus on some key "good life enablers" of the TQoL framework, as they include the level of mobility, education, healthcare services provided to the population, the availability and quality of Internet (broadband) connections, and the extension of environmentally protected areas. The education sector includes also some indicators that can be taken as a proxy for "life flourishing", as the diagnostic indicators include the quality of the education and training received by the students in the area (measured by means of the Invalsi tests in Italian and Mathematics for different school levels: primary, secondary, high school).

In addition, in the Monti Reatini area, there is an explicit focus on ecological resilience (a "life maintenance" aspect in the TQoL framework) insofar as the strategy aims to reduce hydrological risks in the area, while socio-economic resilience is addressed by measuring unemployment levels, and in particular the share of young farmers in the agricultural sector, which remains the most important sector in this rural area.

4.3.2 Involvement of citizens – Citizen-centred approach to Quality of Life

The Monti Reatini Area Strategy is the result of a participatory process. This was framed as a series of listening, participation and dialogue events that have involved and still involve the area's stakeholders. This participation is divided into eight thematic fields, reflecting the division into axes and sectors of intervention of the Inner Area Strategy, which bring together actors from different centres of competence, central and local administrative levels, innovators and civil society actors in a common venture.

Table 17 - Thematic fields of the participatory process

Topic	Actors
Mobility	Isfort; Comitato pendolari dell'area; Cotral
Education	USR Lazio- Ambito territoriale di Rieti; I.O.C. di Amatrice; I.C. Luigi Mannetti; I.O.C. di Borgorose; I.O.C. Galileo Galilei; I.C. di Leonessa; I.C. Luigi Marco Polo (rappresentanze dirigenti scolastici, docenti, genitori e studenti)
Healthcare	Regione Lazio (DG Sanità), ASL Rieti, Sabina Universitas (Corso di Laurea in Infermieristica), Associazione Clubmedici di Cittaducale, Caritas Diocesana, Ass. Coop Valtur, Federfarm
Digital connectivity	Regione Lazio (Ufficio Di Gabinetto Del Presidente - Agenda Digitale), MISE, Infratel Italia Spa
Environmental protection	Regione Lazio (Lavori Pubblici, Stazione Unica Appalti, Risorse Idriche e Difesa del Suolo), Comuni di Pescorocchiano, Varco Sabino, Nespolo, Turania, Collalto Sabino, Collegiove, Micigliano, Posta, Leonessa e Cittaducale

Focus groups have been organized to analyse needs, perform sectoral Strengths-Weaknesses-Opportunities-Threats (SWOT) analyses, identify action priorities, and conduct feasibility analyses for the selected interventions.

This participatory process triggered numerous meetings attended by representatives of all the municipalities in the area; some meetings with representatives of the Technical Committee were open to the public in the territories; other technical meetings were organized in the Lazio Region with the lead Mayor of Petrella Salto and regional technical assistance experts in order to give a decisive boost to the definition of the various measures.

However, in order for the strategy to be effective, the participatory process should not be limited to simply drafting strategic documents, but also should concretely support the implementation and monitoring of the planned actions and solutions included in the strategy. The function of involving citizens must be entrusted primarily to the mayors of the inner area, and coordinated in a unitary manner, with communication standards that are as shared and homogeneous as possible. This will ensure transparent and constant information on what is being done in the area, what tools are used, what results are achieved, what new problems come up and how new requests that may arise are incorporated in the process. This should help to develop a sense of belonging to a wider territorial community, one that goes beyond individual municipal boundaries.

4.4 Application of the methodology in the case study context

The main instrument used to measure and monitor quality of life in Italy is the BES survey and the related datasets. However, as shown in the previous sections, BES data are not of the level of granularity needed to measure QoL in the inner areas, as they allow to compute indicators not deeper than at NUTS3 level (and this not for all BES variables, many of them being produced at NUTS2 level).

For this reason, it is not possible to measure the life maintenance and flourishing domains of the TQoL framework in a meaningful way, as there are no data at the municipal level to compute objective and subjective quality of life outcome indicators (with the exception of a few large cities in Italy, where BES analyses and data are availableinner areas).

However, even if it is not possible to apply the TQoL dashboard tool in this case study, there are interesting data at the municipal level (LAU) for all municipalities, which allow for the computation of indicators for most of the aspects of the good life enablers domain of the TQoL framework, and in particular for personal enablers, such as health and education; socio-economic enablers, such as the presence of work opportunities in agriculture, manufacturing, services, and tourism; digital divide indicators; and some ecological enablers, such as the surface area of forests, protected areas, the level of seismic risk, and landslide exposure. These aspects allow for the consideration of some of the basic conditions for the population to decide whether to move from or stay in a place.

These data can be used for a LC-clustering analysis applied to all of the Lazio region municipalities, as described in the next section.

4.4.1 LC-clustering design

In the case of the inner areas, the quality of life outcome can be measured in a very basic and simple way, by measuring the movement, composition by age and immigration of foreigners.

What can these proxies tell us? If the population is shrinking and the remaining population is aging – as it is often the case in the inner areas – this can be interpreted as a macroscopic signal of poor quality of life for the historical residents. In addition, if the share of foreigners is increasing, this could be a signal that the life circumstances – e.g. low cost of housing, availability to commute longer distances, local employment in agriculture or small-scale services – are good enough to attract new generations of immigrants.

In this respect, the available quality of life outcome proxy variables, to be used as co-variates in a pilot LC-clustering application for all 378 Lazio Region municipalities, classified according to the inner areas territorial typology, include:

- The variation of resident population in the period 1971-2011;
- The percentage of those over 65 at the start and end years;
- The share of foreigners at 2001 and 2011.

The available clustering variables are presented in the scheme below, divided by ecological, socio-economic and personal (healthcare and education) enablers:

Table 18 – Clustering variables by ecological, socio-economic and personal enablers

ECOLOGICAL	**SOCIO-ECONOMIC**	**PERSONAL**
• % of forest • % of protected areas • Standard deviation of altitudes within the municipality area • Seismic risk index • Landslide exposure index	• Total workers (not in agriculture) 2009 • Manufacturing workers 2009 • Tourism workers 2009 • Variation of manufacturing workers 1971-2001 • Variation of service workers 1971-2001 • Employed in agriculture 2001 • Variation of employed in agriculture 1971-2001	Healthcare: • Hospital beds per 100,000 inhabitants • Beds in hospices for the elderly per 1000 aged Education: • Number of infant schools • Number of primary schools students per 1000 inhabitants

ECOLOGICAL	SOCIO-ECONOMIC	PERSONAL
	• Variation of Agricultural Surface Used (SAU) 1982 – 2010 • ICT connectivity: % of population without fixed access 2012 • ICT connectivity: % of population without fixed or mobile access 2012	• Number of secondary school students per 1000 inhabitants • Number of high school students per 1000 inhabitants

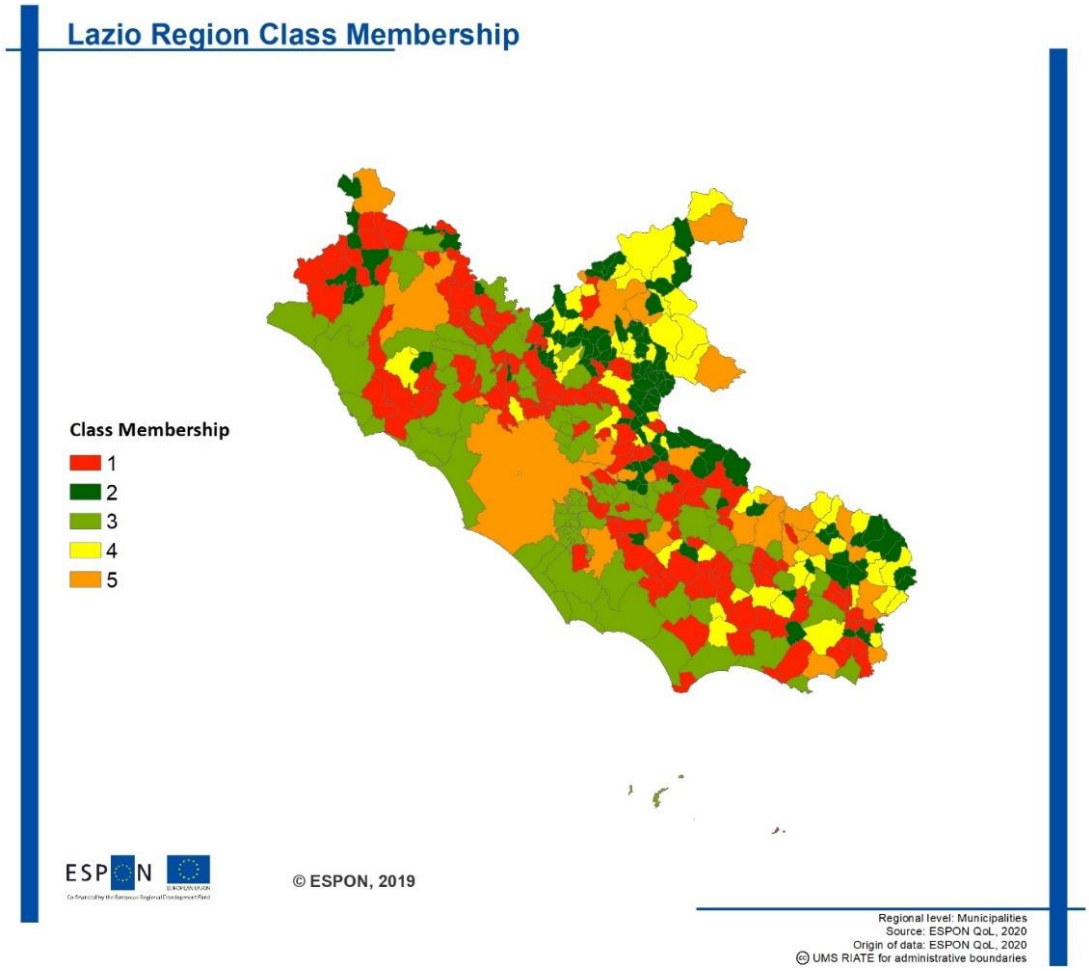
4.4.2 LC-clustering results

The latent class analysis was based on 14 indicators capturing QoL enablers, including four ecological, five socio-economic and five personal enablers, for the whole sample of 378 municipalities of the Lazio Region. In addition, 6 covariates related to the demographic composition of the municipalities and changes therein after the past decade(s) were included in the class membership function.

To find the optimal number of latent classes different models were estimated with two to eight latent classes. The 5-class solution provided the optimal balance in terms of data fit, model complexity (the number of parameters) and the interpretability of the solution.

Table 19 at the end of the section provides the profiles of the 5 latent classes in descending order based on their relative size. In addition, Figure 11 below provides a map of the class membership:

Figure 11 - Clustering of municipalities in the Lazio region based on QoL enablers indicators



The five “QoL enabling” cluster can be interpreted in the following way:

The first cluster, 33.1% of the sample, reflects an “average” profile in the sense that its values are more or less aligned with the sample means. Especially the distributions of the ecological and economic indicators reflect those of the sample as a whole. The same goes for the considered covariates. Differences are revealed, however, with respect to access to health services and the number of tertiary school student per 1000 inhabitants. These values are considerably lower than the sample means, indicating that these indicators are strongly skewed in the sample. The municipalities in this cluster are located throughout the Lazio region, generally in the territorial strip between the coastal municipalities and those further inland. Based on the revealed pattern, we can identify the first cluster as **“rural areas outside, but in close proximity of functional urban areas (FUA)”**

The second cluster may be considered the most problematic from a QoL perspective. Over a quarter of the municipalities (26.6%) is assigned to this class. While the share of forest area is highest in this class (57.9%), which may be considered a positive outcome, it performs worse on all other indicators compared to the other four classes. The population density, 46.6 inhabitant per square kilometre, is very low. The share of agricultural jobs is highest in this class. In addition, access to digital, transport, health and education services is very low. For example, 37.4% does not have a fixed or mobile ICT connection. In addition, student numbers in secondary and tertiary schools are zero. The covariates indicate that only 700 people on average live in these municipalities. Moreover, this is the only class which has experienced a decline in the population in the period 1971-2011 (of about 10 %). Also, in terms of the aging of the population this cluster is most extreme; 27.5% of the population is aged 65 or above and

this class also experienced the largest increase in the aging of the population. Finally, the regions in this class have a relatively small share of foreigners and have not been able to attract foreigners in the period 2001-2011. The municipalities in this cluster are located further inland than those of the first cluster, in the mountain areas of the Lazio region. Based on the revealed pattern, we can identify the second cluster as **"rural remote areas"**.

The third cluster (19.4% of the sample) paints an opposite picture to class 2. While the share of forest area is lowest (nearly 20%), the scores with respect to the other indicators are generally favourable; it has the highest share of people working in service jobs (62.2%), highest ICT connectivity, and highest access to a railway station. The covariates indicate that these municipalities have middle-sized populations of around 23,000 inhabitants. The populations in these municipalities have grown most over the period 1971-2001 (over 70% on average), while the aging levels are lowest, only 18.7% is aged 65 or above. Interestingly, these municipalities have the highest share of foreigners and in line with this figure also have been able to attract most foreigners over the period 2001-2011. Figure 11 shows that the municipalities belonging to this class are generally located near the coast or along the main long-distance corridors from Rome to Naples in the South and to Florence in the North. Based on the revealed pattern, we can identify the third cluster as **"small cities"**.

The fourth cluster (14.2% of the sample) resembles the second class, although the figures are consistently better. An important difference with the second class is that the municipalities in this cluster do have students in secondary education. Looking at the covariates the municipalities in this class have 2400 inhabitants on average, substantially higher than those in the second cluster. This may explain the fact that these municipalities are better able to maintain higher levels of the QoL enablers. In addition, the municipalities in this class did not experience a decline in the population. They do have relative high shares of aged inhabitants and low shares of foreigners. The municipalities belonging to this class are generally located further inland compared to the other municipalities. Based on the revealed pattern, we can identify the fourth cluster as **"rural poles"**.

Finally, the fifth cluster (6.8% of the sample) reflects the larger municipalities (including Rome). Their profiles more or less correspond to that of the third class – both clusters include urban centres. An important difference here is that access to health services is higher. In addition, looking at the covariates, the population increase has not been so dramatic as in the third class (only 12.6%). The main difference, looking in detail to the municipalities belonging to the third and fifth cluster emerges in the relative power of attraction: lower in the third class, which includes two county capital cities – Frosinone and Latina – and other small cities relatively self-contained, while it is higher in the fifth class, which includes Rome, other two county capital cities – Viterbo and Rieti – and other urban poles that mostly for their geographical position and the presence of central services attract population from the surroundings. Based on the revealed pattern, we can identify therefore the fifth cluster as **"urban poles"**.

Overall, the analysis shows that the demographic variables are significantly correlated with the QoL enablers. In addition, the demographic variables are themselves strongly intercorrelated. The population level is inversely correlated with the level of aging, while being positively correlated with the share of foreigners. Not surprisingly, more striving regions are generally larger, younger and also the ones that attract more foreigners. The analysis also reveals that participation in secondary education is a key indicator as to the question whether a municipality falls into the lowest "QoL enabling" class (the second cluster) or one of the others.

Table 19 - Profiles of the 5 clusters

		Cluster					
	N=378	1: Rural areas outside FUA	2: Rural remote areas	3: Small cities	4: Rural poles	5: Urban poles	Sample mean
Cluster Size (Number)		125	100	73	54	26	
Cluster Size (%)		33.1	26.6	19.4	14.2	6.8	
Indicators	**Variable**						
Ecological enablers	Population density (2011) per km^2	150.6	46.6	512.6	83.6	315.1	194.8
	Share of forest on total surface %	36.3	57.9	19.8	51.6	42.7	41.4
	Standard Deviation of altitudes within the municipality area (2013)	119.4	155.9	74.4	227.8	243.9	144.2
	Seismic Risk Index (2012)	0.9	1.3	1.7	2.3	9.7	1.9
Socio-economic enablers	Share of workers in manufacturing jobs (2001) %	23.9	12.6	22.4	24.2	25.3	20.7
	Share of workers in service jobs (2001) %	53.1	56.1	62.2	51.4	61.4	56.0
	Share of workers in agricultural jobs (2001) %	23.0	31.3	15.5	24.4	13.4	23.3
	ICT connectivity: population without fixed or mobile access 2012 %	0.5	37.4	2.1	26.8	6.0	14.7
	Centre with at least a Silver railway station %	7.5	0.0	58.5	4.9	31.2	0.2
Personal enablers (healthcare and education)	Centre with hospital emergency service %	0.0	0.0	5.4	0.0	19.5	2.4
	Hospital beds per 100.000 inhabitants (2011)	0.0	0.0	230.2	0.0	927.8	107.5
	Number of primary school students per 1000 inhabitants	41.9	20.5	45.3	38.0	41.4	36.3

		Cluster					
	N=378	1: Rural areas outside FUA	2: Rural remote areas	3: Small cities	4: Rural poles	5: Urban poles	Sample mean
	Number of secondary school students per 1000 inhabitants	27.3	0.0	29.6	29.4	28.6	20.9
	Number of tertiary school students per 1000 inhabitants	0.1	0.0	46.4	0.0	54.2	12.7
Covariates							
(Change in) demographic composition	Total resident population (2011)	4,312	703	23,123	2,398	119,917	14,558
	Change in population between (1971-2011) %	45.1	-11.7	71.2	9.9	12.6	27.9
	Share of population aged 65 or above (2011) %	20.2	27.5	18.7	23.6	21.5	22.4
	Change in population aged 65 or above between (1971-2011) %	7.7	10.0	9.3	8.1	9.7	8.8
	Share of foreigners (2011) %	6.9	5.6	7.6	5.8	5.2	6.4
	Change in number of foreigners (2001-2011) %	5.0	3.9	5.4	4.2	3.5	4.5
Territorial typology	Share of peripheral and ultra-peripheral (E+F) %	21.0	36.8	11.0	20.3	11.6	
	Share of intermediate (D) %	51.9	57.3	51.2	60.8	48.6	
	Share of belt (C) %	27.2	5.9	32.3	19.0	16.6	
	Share of poles (A+B) %	0.0	0.0	5.5	0.0	23.2	

Finally, it is interesting to see the territorial QoL related clustering results for the 31 municipalities of the Monti Reatini area. The table below shows to which clusters the municipalities belong:

Table 20 - Classification of Monti Reatini municipalities by clustering profile

Monti Reatini: Territorial QoL related clusters		
Cluster 2 – Rural remote areas	**Cluster 4 – Rural poles**	**Cluster 5 – Urban poles**
Ascrea, Belmonte in Sabina, Borbona, Castel di Tora, Castel Sant'Angelo, Cittareale, Collalto Sabino, Colle di Tora, Collegiove, Concerviano, Longone Sabino, Marcetelli, Micigliano, Nespolo, Orvinio, Paganico Sabino, Pozzaglia Sabina, Turania, Varco Sabino	Accumoli, Antrodoco, Borgo Velino, Fiamignano, Leonessa, Pescorocchiano, Petrella Salto, Posta, Rocca Sinibalda	Amatrice, Cittaducale, Borgorose

Coherently with its geographical configuration and position in the Lazio region, the inner area Monti Reatini does not include urban poles nor rural areas outside but in close proximity to the metropolitan FUA of Rome. The classification of the municipalities in 19 rural remote areas, 9 rural poles and 3 urban poles seems coherent with the real characteristics of the municipalities.

The data of the outcome variables – the demographic variables chosen as a proxy of the quality of life needed to settle in place – and clustering variables (proxies of ecological, socio-economic and personal enablers) are shown in the following tables.

Table 21 - Monti Reatini municipalities – Demographic variables

MUNICIPALITY	cluster	Total resident population 2011	% over 65 2011	Total Population % Var. 1971-2011	% foreigners 2001	% foreigners 2011
Accumoli	4	653	33,69	-47,47	3,73	7,2
Amatrice	5	2646	31,03	-28,41	1,82	4,65
Antrodoco	4	2704	23,34	-16,28	2,32	7,1
Ascrea	2	266	36,84	-37,12	0	7,52
Belmonte in Sabina	2	649	20,34	5,7	0,32	3,54
Borbona	2	650	30,62	-29,65	0,83	4,92
Borgorose	5	4615	21,86	-9,42	1,24	5,7
Borgo Velino	4	990	21,41	47,76	2,06	4,14
Castel di Tora	2	299	30,43	-38,85	0,7	6,35
Castel Sant'Angelo	2	1289	26,22	-0,46	1,72	3,65
Cittaducale	5	6900	20,91	43,24	0,92	3,39
Cittareale	2	470	38,51	-44,05	0,83	4,26
Collalto Sabino	2	440	32,05	-45,68	2,82	5
Colle di Tora	2	384	28,65	-20,17	1,83	5,21
Collegiove	2	169	41,42	-50,44	0	2,96
Concerviano	2	311	33,12	-46,93	0	2,25
Fiamignano	4	1455	31,62	-40,93	0,81	4,33
Leonessa	4	2480	28,31	-29,59	0,91	4,6
Longone Sabino	2	583	30,19	-43,07	2,05	5,83
Marcetelli	2	97	54,64	-76,17	0	1,03
Micigliano	2	131	34,35	-55,59	2,14	0
Nespolo	2	274	25,55	-34,92	0,89	6,2
Orvinio	2	448	31,47	-29,23	0,94	10,49
Paganico Sabino	2	172	38,37	-51	0,56	8,14
Pescorocchiano	4	2211	30,89	-44,08	0,35	3,62
Petrella Salto	4	1212	30,12	-48,07	0,3	4,62
Posta	4	686	29,88	-42,93	2,06	5,1
Pozzaglia Sabina	2	361	50,14	-63,13	0,49	4,71
Rocca Sinibalda	4	853	28,14	-19,91	0,73	3,52
Turania	2	245	26,53	-46,27	2,94	4,9
Varco Sabino	2	210	37,62	-62,63	3,04	7,62

Table 22 - Monti Reatini municipalities – Ecological variables

MUNICIPALITY	cluster	Population density (per Km2) 2011	Total surface (Km2) 2011	Total Forest Surface (ha) 2010	Share of forest on total surface (%)	Standard Deviation of altitudes within the municipality area 2013	Sismic Risk Index 2012	Landslide exposure (classes of population) 2012	% protected areas 2010
Accumoli	4	7,47	87,373	5819,89	66,61%	304,45	5,65	1 - 10 Ab.	35,3
Amatrice	5	15,17	174,3998	9848,32	56,47%	361,773	6,63	11 - 75 Ab.	57,21
Antrodoco	4	42,31	63,9046	4200,96	65,74%	315,691	7,68	76 - 250 Ab.	
Ascrea	2	19,03	13,9764	1123,26	80,37%	162,518	1,28	1 - 10 Ab.	12,92
Belmonte in Sabina	2	27,45	23,645	1784,21	75,46%	93,3896	1,47	1 - 10 Ab.	
Borbona	2	13,55	47,9562	2707,18	56,45%	243,186	3,66	1 - 10 Ab.	
Borgorose	5	31,65	145,815	8097,32	55,53%	371,33	5,39	1 - 10 Ab.	22,61
Borgo Velino	4	54,12	18,2932	1400,26	76,55%	361,77	2,38	11 - 75 Ab.	
Castel di Tora	2	19,3	15,4915	953,54	61,55%	198,703	1,29	1 - 10 Ab.	24,57
Castel Sant'Angelo	2	41,22	31,2702	2365,47	75,65%	305,508	2,24	11 - 75 Ab.	
Cittaducale	5	96,84	71,2544	4787	67,18%	272,546	3,13	1 - 10 Ab.	
Cittareale	2	7,88	59,6713	3657,91	61,30%	256,992	3,47	1 - 10 Ab.	
Collalto Sabino	2	19,67	22,3734	1771,74	79,19%	135,502	1,48	11 - 75 Ab.	10,52
Colle di Tora	2	26,72	14,372	745,52	51,87%	155,811	1,13	1 - 10 Ab.	0,02
Collegiove	2	15,92	10,6128	855,31	80,59%	202,397	1,54	1 - 10 Ab.	40,13
Concerviano	2	14,54	21,3899	1693,98	79,20%	148,097	1,49	11 - 75 Ab.	
Fiamignano	4	14,46	100,6209	5685,52	56,50%	260,101	3,36	76 - 250 Ab.	
Leonessa	4	12,15	204,0358	12823,61	62,85%	269,237	7,47	1 - 10 Ab.	
Longone Sabino	2	16,98	34,3344	2419,93	70,48%	144,713	2,21	1 - 10 Ab.	
Marcetelli	2	8,75	11,084	980,89	88,50%	128,232	2,2	11 - 75 Ab.	44,5
Micigliano	2	3,55	36,8523	2794,15	75,82%	394,883	1,82	11 - 75 Ab.	
Nespolo	2	31,69	8,6469	747,36	86,43%	95,2472	1,26	1 - 10 Ab.	52,55
Orvinio	2	18,15	24,6891	1639,69	66,41%	104,222	1,3	1 - 10 Ab.	36,66
Paganico Sabino	2	18,47	9,314	701,32	75,30%	240,876	1,35	1 - 10 Ab.	55,3
Pescorocchiano	4	23,33	94,7773	7137,95	75,31%	201,237	4,06	11 - 75 Ab.	0
Petrella Salto	4	11,77	102,9322	7203,3	69,98%	363,885	3,46	76 - 250 Ab.	
Posta	4	10,39	66,0143	4199,07	63,61%	334,802	4,99	11 - 75 Ab.	
Pozzaglia Sabina	2	14,45	24,9792	1489,49	59,63%	147,207	1,44	11 - 75 Ab.	0,15
Rocca Sinibalda	4	17,21	49,5559	3261,06	65,81%	251,516	1,64	1 - 10 Ab.	5,64
Turania	2	28,79	8,5104	685,59	80,56%	94,19	1,17	1 - 10 Ab.	
Varco Sabino	2	8,48	24,7531	1907,14	77,05%	192,232	1,93	11 - 75 Ab.	24,72

Table 23 - Monti Reatini municipalities – Socio-economic variables

MUNICIPALITY	cluster	Manufacturing workers 2001	Manufacturing workers % Var. 1971-2001	Service workers 2001	Service workers % Var. 1971-2001	Employed in agriculture 2001	Employed in agriculture % Var. 1971-2001	Agricultural Surface Used (SAU) 2010	Agriculture Surface Used (SAU) %Var. 1982-2010	ICT connectivity: % of population without fixed or mobile access 2012
Accumoli	4	39	225	29	-56,06	55	-68,39	2904,38	-33,15	34%
Amatrice	5	35	-33,96	225	-3,43	195	-55,98	5168,57	-49,57	15%
Antrodoco	4	100	19,05	178	-30,2	19	-89,84	1978,6	-49,41	2%
Ascrea	2	1	-75	17	13,33	13	-85,71	150,15	-73,77	74%
Belmonte in Sabina	2	8	-20	43	290,91	17	-78,75	348,79	-52,99	38%
Borbona	2	15	-21,05	34	-17,07	25	-82,52	1366,96	-2,36	9%
Borgorose	5	99	450	240	43,71	58	-90,91	5245,61	-26,04	21%
Borgo Velino	4	110	900	38	-5	10	-74,36	692,04	45,15	0%
Castel di Tora	2	5	150	19	-34,48	9	-79,07	430,02	-13,26	0%
Castel Sant'Angelo	2	11	175	63	12,5	14	-92	646,02	-27,64	73%
Cittaducale	5	1895	51	977	241,61	72	-55,83	2018,05	-23,1	4%
Cittareale	2	2	-71,43	10	-79,17	35	-73,88	1360,18	-31,49	37%
Collalto Sabino	2	3	-25	16	-65,96	13	-88,18	157,57	-72,42	14%
Colle di Tora	2	0	-100	14	-33,33	11	-87,36	347,23	-53,87	97%
Collegiove	2	1	-50	46	100	3	-91,43	108,79	-62	95%
Concerviano	2	1	-75	21	-38,24	5	-94,57	128,94	-74,97	72%
Fiamignano	4	6	-66,67	54	-28	48	-79,92	3089,34	-36,02	71%
Leonessa	4	54	-78,74	288	30,32	157	-58,24	7038,13	7,03	35%
Longone Sabino	2	6	-53,85	13	-76,79	7	-96,05	465,48	-59,41	64%
Marcetelli	2	1	-50	4	-85,19	0	-100	2,02	-98,97	100%
Micigliano	2	0		7	-66,67	2	-96,08	789,7	-32,99	97%
Nespolo	2	0		9	-18,18	2	-96,08	44,35	-70,7	0%
Orvinio	2	3	-62,5	14	-41,67	10	-79,17	833,08	-28,98	0%
Paganico Sabino	2	2	100	4	-88,24	1	-97,62	83,88	-73,47	79%
Pescorocchiano	4	26	-10,34	101	-32,67	68	-88,69	2425,09	12,94	88%
Petrella Salto	4	1	-90,91	64	-45,76	29	-84,74	3404,24	-35,55	44%
Posta	4	8	-63,64	60	-14,29	44	-66,15	2132,43	-5,86	0%
Pozzaglia Sabina	2	2	-33,33	20	-44,44	11	-91,06	571,71	-57,97	0%
Rocca Sinibalda	4	7	600	24	-44,19	40	-78,61	602,96	-69,84	28%
Turania	2	0	-100	7	-61,11	3	-91,67	98,94	-62,38	91%
Varco Sabino	2	3	0	11	-50	7	-94,96	161,91	-78,78	65%

Table 24 - Monti Reatini municipalities – Personal (health & education) service variables

MUNICIPALITY	cluster	Total resident population 2011	Number of beds in hospices for the elderly 2011	Beds in hospices for the elderly per 1.000 aged 2011	Number of infant schools 2011-2012	Students primary schools 2011-2012	Number of primary school students per 1000 inhabitants	Students Secondary schools 2011-2012	Number of secondary school students per 1000 inhabitants	Students High School Institutes	Number of High School students per 1000 inhabitants
Accumoli	4	653	0	0	1	17	26,03		0,00	0	0,00
Amatrice	5	2646	0	0	2	88	33,26	78	29,48	73	27,59
Antrodoco	4	2704	0	0	3	107	39,57	128	47,34	0	0,00
Ascrea	2	266	0	0			0,00		0,00	0	0,00
Belmonte in Sabina	2	649	0	0	1	17	26,19		0,00	0	0,00
Borbona	2	650	0	0			0,00		0,00	0	0,00
Borgorose	5	4615	0	0	4	178	38,57	107	23,19	42	9,10
Borgo Velino	4	990	0	0	1	47	47,47		0,00	0	0,00
Castel di Tora	2	299	0	0	1		0,00		0,00	0	0,00
Castel Sant'Angelo	2	1289	0	0	1	32	24,83		0,00	0	0,00
Cittaducale	5	6900	70	50,18	5	342	49,57	173	25,07	116	16,81
Cittareale	2	470	0	0	1	7	14,89		0,00	0	0,00
Collalto Sabino	2	440	0	0		21	47,73		0,00	0	0,00
Colle di Tora	2	384	0	0		25	65,10		0,00	0	0,00
Collegiove	2	169	0	0			0,00		0,00	0	0,00
Concerviano	2	311	0	0			0,00		0,00	0	0,00
Fiamignano	4	1455	0	0	1	28	19,24	21	14,43	0	0,00
Leonessa	4	2480	0	0	2	84	33,87	55	22,18	0	0,00
Longone Sabino	2	583	0	0	1	12	20,58		0,00	0	0,00
Marcetelli	2	97	0	0			0,00		0,00	0	0,00
Micigliano	2	131	0	0			0,00		0,00	0	0,00
Nespolo	2	274	0	0			0,00		0,00	0	0,00
Orvinio	2	448	0	0	1		0,00		0,00	0	0,00
Paganico Sabino	2	172	0	0			0,00		0,00	0	0,00
Pescorocchiano	4	2211	0	0	2	61	27,59	41	18,54	0	0,00
Petrella Salto	4	1212	0	0	3	29	23,93	21	17,33	0	0,00
Posta	4	686	0	0	1	12	17,49	16	23,32	0	0,00
Pozzaglia Sabina	2	361	0	0			0,00		0,00	0	0,00
Rocca Sinibalda	4	853	0	0	2	28	32,83	40	46,89	0	0,00
Turania	2	245	0	0			0,00		0,00	0	0,00
Varco Sabino	2	210	0	0			0,00		0,00	0	0,00

To conclude, the aim of the pilot LC-clustering application presented above was to test the methodology on the dataset of municipalities classified by centre-peripheral territorial typology in the Lazio region. The dataset for the pilot application was downloaded directly from the Open Data website of the Italian Agency for Territorial Cohesion (IATC) in Italy.

The results of the cluster analysis are encouraging, especially considering that this has been elaborated on a basis of a subset including only some of the indicators available in the sources of data at municipal level – the Statistical Atlas of Municipalities and the database of the Inner Areas Diagnostic Indicators. Indeed, we could elaborate only the data freely available from the IATC web-site for the municipal level, which are only a part of the full set of inner areas aggregate indicators accessible on the same web-site.

5 Synthesis and conclusions

5.1 How the QoL concept and indicators could be further developed in the region

We suggest three directions for applying the ESPON Territorial Quality of Life framework and tools, with the aim to improve the measurement of quality of life in the inner areas and support the continuous update, implementation and monitoring of the Inner Area Strategies, in the Monti Reatini pilot context and elsewhere, in other inner areas of Lazio and in Italy.

First direction: Detect different quality of life patterns and needs within the inner areas, using the LC-clustering approach to identify clusters of rural remote areas, rural and urban poles, analyse the quality of life levels and fine tune policies and strategies to fill the quality of life gaps for different typologies of municipalities within the inner area.

This direction would require strengthening the cooperation between the central and the regional authorities involved in the national Inner Areas Strategy. At the central level, IATC and ISTAT should cooperate to harmonise the access to their sources of municipal indicators, respectively the database of inner areas diagnostic indicators and the Statistical Atlas of municipal indicators.

More in detail, tailored access (on demand) could be provided by the IATC to a wider set of more updated diagnostic indicators at the municipal level. The Open Data website already provides a dataset of 116 variables aggregated at the IAS level[8], which are constructed using municipal data that cannot be accessed on the website. These updated indicators include more elements on the different good life enablers: e.g. specialization indexes for agriculture, the food industry, manufacturing, energy, gas and water, the building sector, trade, other services; the number of companies per 1000 inhabitants and their rate of growth; the number of cultural heritage sites (open and closed) and visitors per 1000 inhabitants; tourist accommodation (beds per 1000 inhabitants); new healthcare indicators (outpatient services provided per 1000 inhabitants, hospital admission per 1000 inhabitants, hospitalization rate > 75 years old, avoidable hospitalization rate, share of elderly receiving home-care services, share of monitored pregnant women, waiting time targets for emergency services, average number of patients per doctor, average number of patients per paediatrician), new education indicators (for primary schools: share of foreign students, share of students residing in the same municipality as the school, disabled students per support teacher, mobility rate of teachers, share of classes with less than 15 students, share of mixed-age classes, share of full-time classes, share of teachers with temporary contracts, average results of Invalsi Tests for Italian and for Mathematics – the same variables are available for the secondary school and high school levels); and finally a full set of accessibility indicators (accessibility by car to the nearest pole; access to local public transport; access to long-distance railways, highways, airports, and ports).

As discussed in section 4.1 above, the IATC diagnostic data allow to compute indicators for most of the “Good Life enablers” domains of the TQoL framework, while the ISTAT Statistical Atlas includes several objective indicators for the “life maintenance” dimension. So, a greater synergy between these two sources to harmonise the access to the data would already help to cover two out of three dimension of the TQoL framework, leaving however still uncovered most of the “life flourishing” domains (the latter would require also an investment to extend subjective well-being survey to cover the municipal level, as suggested below for the second direction).

[8] The IATC diagnostic indicators dataset has been described at the end of section 3.1 above.

This effort of harmonization should be extended to include also important administrative sources of data not mentioned in section 4.1, namely the data of population registers of the municipalities from the Ministry of Interior and the enterprises register from the Chambers of Commerce.

To conclude on this direction, an harmonised central access and delivery of municipal level data on territorial quality of life aspects, combined with the LC-clustering tools to investigate QoL patterns, could help especially the regional authorities in charge of inner areas strategy planning and monitoring at regional level to calibrate their analyses of the situation. The pilot clustering exercise presented for the Lazio region in section 4.4. above is an anticipation of what could be done in the future, using better and more readily accessible municipal data, to analyse quality of life patterns in the inner areas.

Second direction: Provide the ESPON Territorial Quality of Life dashboard as a toolkit to support the measurement and monitoring of quality of life in the inner areas, based on BES indicators elaborated at municipal level and tailored to the needs of the local municipalities and population.

The second direction would require strengthening the cooperation between the central and the regional level by one side and the municipalities at the local level on the other side, combining a top-down and bottom-up processes to monitor quality of life and sustainable development achievements in the inner areas.

The top-down approach should offer to the municipalities data and tools to monitor QoL, developing a tool-kit for the municipalities within the inner area that could include:

- The ESPON TQoL dashboard tool and the guidelines for its application.
- Municipal datasets to feed the dashboard with the statistical information available and apt to measure the different aspects of quality of life, comparing the indicators across the municipalities of the area.

The information from ISTAT, IATC and other central data sources should be enriched by designing a new BES survey oriented to the needs of the inner areas, with greater granularity at the LAU level and stratification of the sample to adequately cover these rural areas. BES surveys tailored to the inner areas could be administered in cooperation by ISTAT, IATC, the regional government and associations of the inner areas municipalities at local level, delivering indicators suitable to measure and compare objective and subjective QoL dimensions at municipal level.

The bottom-up approach should involve local stakeholders and the population of the inner areas in “quality of life conferences” to discuss basic quality of life facts – what is needed to improve quality of life for the people living in the area, to support economic and social activities and to maintain the quality of the environment – identifying the needs and translating them in priorities for measuring and monitoring quality of life indicators.

Third direction: Launch a Territorial QoL Living Lab in the Monti Reatini area to trigger and support a citizens-based approach to measuring and monitoring quality of life indicators and targets achievement in the area, working as a pilot experience under the ESPON umbrella to promote an European network of TQoL living labs.

This pilot bottom-up process of consultation and participation should be managed by a local covenant of mayors, associating the municipalities of the area. Periodic (annual) conferences should be organised where citizens and stakeholders are invited to discuss the quality of life achievements, deliberate new priorities etc. – based on the information provided by the TQoL

dashboard and analyses performed periodically to monitor the implementation of the Inner Area Strategy.

This bottom-up factual-based monitoring of the quality of life indicators would allow the citizens and stakeholders to verify concretely the achievements of the strategy, and advocate for corrective actions when progress towards the goals is lagging behind. The process itself will contribute to raise a greater awareness of the Inner Area Strategy itself in the local population. This could also help to enlarge people perception and understanding of common challenges and problems, as well as to augment the knowledge about possible shared solutions.

The "quality of life living lab" would enable citizens living in the different municipalities to compare the quality of the services they receive, and advocate for improvements when gaps are evident. The whole process will strengthen the people feeling of belonging to a same wider territorial community, beyond the boundaries of the single municipalities.

5.2 How the QoL concept of this ESPON project can be improved and enriched

Although not included explicitly in the TQoL framework of indicators, the cost of local services is clearly a complementary aspect to consider.

This aspect is also the subject of an ongoing OECD project for understanding present and future public service delivery costs, based on grid-data that allow to estimate costs of provision by clusters of grid cells that can be aggregated at different geographic scales.[9]

It is generally held that the cost of public service provision increases with the degree of remoteness and sparsity due to transportation costs, loss of economies of scope and economies of scale, and greater difficulty in attracting and retaining professionals (e.g., health care professionals).

We do not suggest however to include the cost of services directly in the TQoL framework and dashboard tool, but only to accompany the measurement and analysis of the quality of life at territorial level with the analysis of the costs of public services that are essential to maintain equitable living standards across different typologies of territories.[10]

Another element - particularly evident in the Monti Reatini context – is the influence of local cultural factors, that should be made more explicit at least in the application of the TQoL framework, if not with a separate domain in the framework itself. An important cultural factor is the traditional mentality acting against innovation and modernization of the lifestyle, impacting especially on the desire of younger people to remain or move to the inner areas. As highlighted in one interview, the "girls in the Monti Reatini don't want their female children to born and live there, not to struggle with the gender stereotypes they had to combat in their life".

Gender issues – including also the attitude towards the LGBT rights and quality of life – are indeed transversal to several aspects of the TQoL framework. This can include indicators of

[9] Delivering health, education and other services of general interest to inhabitants of rural and urban areas is a mandate for governments around the world. Many OECD countries have an explicit constitutional commitment to maintain equitable living standards across their territories, thus making this issue a priority.

[10] An open database on territorial public accounts ("conti pubblici territoriali) is provided by the Italian Agency for Territorial Cohesion, the same agency providing the inner areas diagnostic indicators discussed in previous sections. The database includes – amongst other – data of municipal expenses, which are however available in aggregate form, at regional level (NUTS2). See: https://www.agenziacoesione.gov.it/tag/conti-pubblici-territoriali/

LGBT rights in the “self-esteem” sub-domain, males/females work-life balance in the “heathy society” sub-domain, and gender pay gap in the “inclusive economy” sub-domain, to name a few. Being so transversal, the suggestion is not to include a separate domain for the gender QoL, but to highlight genders gaps wherever they emerge in measuring the QoL across the dimensions of Good Life enablers (e.g. gender gaps in the access to some services), life maintenance and life flourishing.

5.3 COVID-19 and its impact on QoL

The inner areas case study focus is particularly important if we consider some macro trends accentuated by the COVID-19 pandemic outbreak. The latter could lead to permanent changes in lifestyles, which are desirable not only to protect the population from the risks of this and possible future pandemics, but also to reduce the risks associated with climate change. Three interrelated points can be highlighted here, with important implications for quality of life in the inner areas:

- Agile and digital work (smart working) has become for a prolonged period - practically all of 2020 - the dominant way of working in many sectors and services. More generally, many facets of social life, such as working, studying, buying, and interacting, have started to take place more frequently online than offline during lockdown, and it is still uncertain to what extent and for how long it will remain necessary to maintain social distancing, by avoiding physical gatherings in many circumstances. Changing habits also has positive aspects, for example, avoiding commuting at rush hours, congestion, crowding on public transport, etc., and avoiding unnecessary meetings and journeys. However, to become permanent, these potential benefits of smart working would require concomitant changes, first of all in the ability of public administrations and companies to (re-)organize their management by objectives. Moreover, smart working will create new sources of inequality, with significant differences between those who are able to work online and those who carry out activities where their presence and physical contact with other people remain essential.
- At a deeper level, the shift to smart working was for many not only a forced change of daily habits, but led to a mindset change, decoupling “being at work” – at home or everywhere you are - from “going to the office” in the mind of people. This has profound personal, psychological and social implications - primarily regarding the quantity and quality of time devoted to work and that devoted to one's personal and family life. The realization that it is not necessary to "go to work" in the traditional sense, and that work can be done just as easily, if not more so, from home or another location (where existing internet infrastructure and organizational arrangements allow it), represents a new freedom that widens the range of possible choices for living, settling, producing, and consuming. The office itself remains a place to go to interact with others, and for planning, management, co-creation, and evaluation activities where physical presence remains key for the quality of interaction and outcomes, but it is not more necessarily the place where to go every day to perform individual tasks that can be executed more efficiently at home.
- The spatial implications of all this seem evident: there are opportunities for polycentric development and, in particular, for reversing the trend of a shrinking population in the inner areas, thanks to the resettlement of new types of inhabitants, for instance, young families attracted to move there by cheaper housing prices and rents or - on a seasonal basis - the owners of second homes who might find it convenient to use them for longer periods. However, the necessary requirements for reversing this trend include not only ensuring access to basic public services (the current goal of the inner areas strategies focusing on delivering sufficient infrastructure and services for mobility, health and education) and supporting the productive development of the areas, but also providing the quality of life

levels necessary to attract new population flows. In addition, it is important to facilitate the integration between the needs and expectations of old and potential new inhabitants/users of the inner areas, whose number - in a scenario of digitization and widespread agile work - could increase significantly.

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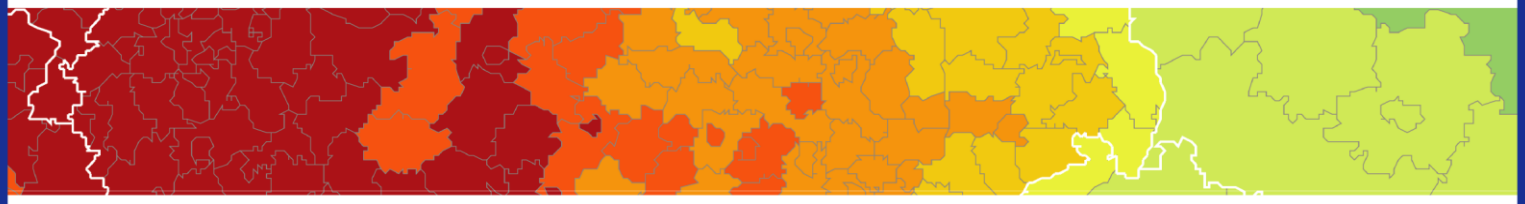
Flavia Terribile – Agenzia per la Coesione Territoriale

Angela Ferruzza – ISTAT

Sabrina Lucatelli – Strategia Nazionale Aree Interne

Marco Leonetti – Strategia Monti Reatini



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