

## **TERRITORIAL AGGREGATION OF MEDIUM SIZE CITIES AND THEIR GRAVITATIONAL TERRITORY FOR EFFECTIVE COHESION POLICIES<sup>1</sup>**

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**Abstract:** The Unitary Cohesion Policy in the previous programming cycle (2014-2020) focused on Urban and Inner Areas, but in the current cycle (2021-2027), the approach has expanded to larger territories. This approach targets local development policies, encompassing metropolitan and medium-sized urban areas, inner areas, and other intermediate territorial systems based on internal functional connections. However, the lack of a clear definition for "intermediate" territories makes it challenging for statistics to identify suitable areas for public intervention. Consequently, some territories characterized by economic, cultural, and social centres with significant demographic decline and rapid aging may lack adequate public policies. The Regional Programme ERDF in Sicily for 2021-2027 has been designed to be geographically structured in a way that best addresses the needs and challenges expressed by the entire Sicilian territory. This includes the goal of countering demographic decline and population aging.

To plan and implement effective public policies aligned with the cohesion objectives for 2021-2027, the first step is to define territorial systems based on strict criteria of functionality and internal homogeneity. In this context, a new representation of the Sicilian territory has been developed. It involves dividing the regional territory into "urban" areas (Functional Urban Areas-FUA) and "non-urban" areas (Inner Areas-AI) based on established criteria (OCSE/Eurostat, SNAI). Given the absence of a clear definition for "medium-sized cities" and their associated territories, the authors have identified Urban Rank Inter-Municipal Systems (SIRU) as territories sharing similar characteristics that can contribute to regional-level impacts through place-based strategies. This method involves considering commuting flows of Local Labour Systems (SLL) and local services to identify territories characterized by shared anthropic pressure factors and underutilized resources and attractors. The method yielded the following outcomes, as the selection of a group of medium-sized cities based on demographic and territorial dimensions, functions, and services for a wider area, and past cooperation for local development, the identification of other municipalities with similar specializations and urban criticalities and the framing of inter-municipal systems of urban rank in the "Area Vasta (large)" including a network of poles of attractiveness and relevant functional connections to enhance potentials through infrastructure interventions and

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standards of services provided by the FESR intervention.

### **1. The programmatic and implementation context**

Over the last decade, there has been a noteworthy shift in European and national public policies towards territorial issues. This change reflects a growing interest in non-traditional territorial forms in response to factors such as rapid urbanization, demographic changes, environmental challenges, and the pursuit of sustainable development objectives more effectively. This evolution combines objectives of small municipality reorganization with strategies for local development in the country's most vulnerable areas. The EU played a crucial role in consolidating this shift during the 2014-2020 programming cycle, addressing challenges in both urban and inner regions and promoting connections between urban and rural areas (Partnership Agreement Italia 2014-2020, 2014). With the commencement of the 2021-2027 Cohesion Policy programming cycle, the centrality of the "functionality" criterion (OECD, 2021) was further reinforced in the identification of homogeneous urban areas for the planning and implementation of policies aimed at revitalizing economic development and enhancing urban attractiveness.

In Sicily, the 2021-2027 programming cycle aimed to develop an efficient and responsive strategy to address the diverse needs and challenges of the entire territory. Following European and national guidelines (Regulations UE 1060 and 1058, 2021), Sicily's 391 municipalities were restructured into three homogeneous geographic areas: 9 Functional Urban Areas (FUA), 12 Inner Areas (AI), and 8 Urban Inter-municipal Systems (SIRU) (PO FESR 21-27 Sicily). This aggregation relied on official statistical data for transparency and reliability, adhering to functionality and internal homogeneity criteria to optimize program management and resource allocation.

This holistic approach fosters synergies, optimizes public resource allocation, and addresses socio-economic and environmental challenges beyond individual municipalities, encompassing broader zones of influence. Intermediate territories exist between the FUA and AI, showcasing diverse and distinct areas that lack uniform definitions. Medium-sized cities, crucial for well-being, public services, and cooperation, lack a universally accepted definition. Various authors use demographic size as the primary criterion (ISTAT, 2020), while others emphasize different factors. Medium-sized cities serve as urban centres with a higher quality of life but limited service capacity compared to larger cities. They play a significant role in decompressing challenges faced by larger urban areas. The FESR Sicily 2021-2027 Program identified these territories as Urban Inter-municipal Systems, covering a substantial portion of the region's municipalities, population, and land. The challenge lies in addressing economic issues and enhancing infrastructure and services to align with urban standards.

## 2. Aims and methods

The territorial reading of the regional context aimed at characterizing and determining the Inter-municipal Systems mentioned in the 2021-2027 Partnership Agreement had to be conducted within a research scenario where two types of territorial systems were previously identified based on specific aggregation criteria: density and gravitational influence (commuting) for Functional Urban Areas (FUAs), and marginality and depopulation for Inner Areas. In light of these premises, the remaining regional territory - and the areas that could potentially be subsequently aggregated - were characterized as generally intermediate due to their residual determination compared to the identification of systems with maximum and minimum urban rank.

An initial analysis of the group of municipalities not included in FUAs and Inner Areas was carried out to define the most conducive analytical hypotheses according to the strategic framework of the Partnership Agreement. According to this framework, the implementation of policies at the territorial level, in addition to having local impacts, must significantly contribute to achieving impacts at the regional level. Within this perspective, the objective of defining strategically relevant Inter-municipal Systems translated into the operational search for urban rank characteristics that appeared present in the territory left from previous aggregations, with greater empirical evidence compared to those more typical of marginal areas.

Subsequent analytical investigations then focused on:

a) The attributes of urbanity, such as demographic and territorial dimensions, the presence of functions and services for a wider inter-municipal area, and the existence of previous experiences in urban development planning and cooperation.

b) The critical combination, typically urban, between factors of concentration related to the vocations/specializations of certain contexts and the pressure factors triggered by them on the environment, services, and overall liveability.

c) The relationships/connections that allowed the aggregation of other municipalities to those that were more characterized according to the two previous criteria, leading to the definition of coalitions/projects that go beyond the perimeter of individual municipalities, starting from the reference to their Local Labor Systems (SLLs), adopted as a comprehensive approach for the territorial analysis of the ERDF Regional Programme.

Through a multi-stage process, an armor of regional Medium-Sized Cities emerged, for which the application of an articulated set of indicators and descriptors, in addition to the typical complexity of the urban dimension, highlighted certain specificities of the regional scenario that, even more than the rest of the South of Italy, is characterized by a clear asymmetry between the aspects of dimensional growth (population and land consumption, primarily) and the actual qualitative

growth of the urban rank (advanced functions and services, opportunities, and quality of life, etc.).

In a preliminary analysis phase, a demographic consistency threshold was set at 30,000 inhabitants, also following the historical regional programming, where, in previous cycles, this class of urban centres was entrusted with the role of promoting and inter-municipal aggregation in local development plans.

The function of being the centroid of their own SLL and the presence of supra-municipal level service centres/facilities (healthcare, social and judicial services) were considered indicative of a medium urban rank of the municipalities in which they were observed. The subsequent Table 1 lists the nine municipalities with a population exceeding the identified threshold value and their corresponding descriptors of urban rank as previously explained.

**Table 1** - *Municipalities with a population exceeding 30,000 inhabitants (in the regional territory outside FUAs and Inner Areas) and indicative descriptors of the "medium" urban rank for supra-municipal service areas.*

Municipality	Population	SLL Centroid	Social-Health District	Hospital Facility	Court	Local Development
Alcamo	45.025	X	X	X	*	
Augusta	34.657	X	X	X	*	
Barcellona	40.499	X	X	X	*	PISU 2007 – 2013*
Canicatti	34.697	X	X	X	*	
Comiso	30.509	X	-	X	-	
Licata	35.496	X	X	X	*	
Partinico	30.917	X	X	X	*	
Paternò	46.202	X	X	X	*	PISU 2007 - 2013
Sciacca	39.246	X	X	X	X	

\*Piano Integrato di Sviluppo Urbano

Below the first dimensional threshold adopted of 30,000 inhabitants, medium-sized urban systems have also emerged, particularly centred on district capitals (administrative area abolished with the reform of the provinces in 1927) and characterized by i) the presence of supra-municipal service functions/centres, similar to the preeminent centres identified in the first phase of analysis based on dimensional thresholds; ii) a significant specialization and/or evident concentration related to a qualifying production asset of the entire regional system, primarily the tourism-hospitality sector, which results in a concomitant concentration of pressure factors on the environment, services, and overall liveability; iii) the growth trends of tourism-hospitality flows at the municipal level, besides highlighting an increasing presence of medium-sized urban systems, have led to issues of over-tourism that, in systems with greater and more enduring hospitality specialization, are rapidly

evolving into phenomena of saturation, with growing challenges related to environmental sustainability and the well-being of residents. The subsequent Table 2 lists the "medium" municipalities identified based on the selection criteria adopted in the second phase of territorial analysis.

**Table 2** - *Medium-sized urban centres (with a population of less than 30,000 inhabitants) with characteristics of specialization/vocation in production and supra-municipal service areas.*

Municipality	SLL Centroid	Social-Health District	Hospital Facility	Court	Local Development
Cefalù	X	X	X	*	
Giarre	X	X	X	*	
Milazzo	X	X	X	-	PISU 2007 - 2013
Noto	X	X	X	-	
Patti	X	X	X	X	
Piazza Armerina	X	X	X	-	
Taormina	X	X	X	*	
Termini Imerese	X	X	X	X	PISU 2007 - 2013

Based on the methodology and results of the territorial analysis of the ERDF ROP 2021-2027, the third phase of the analysis aimed to verify the presence of a "second-level functionality" characterized by:

- Commuting flows and specialization of the Local Labor Systems (SLL).
- The establishment of functions and services complementary to the attractiveness factors of the Medium-Sized Urban Centres/Gateways.
- A noticeable function of integration and diversification (i.e., proximity offering) concerning the more mature Tourist Hubs, which can act to mitigate pressure factors.
- Elements of continuity/spatial aggregation (cluster effect or territorial corridor) attributable to the widespread presence of underutilized territorial resources and attractors.

The analysis revealed an aggregate of municipalities that, due to their geographical location and functional complementarity with respect to the "medium" urban centres, would make a significant contribution to achieving regional-level impacts of implemented policies.

In the aggregate of municipalities presented in Table 3, a correlation was observed in several cases between specialization/attractiveness, economic performance, and

conditions or risks of incipient saturation, similar to what was previously verified in the reference urban centers. Besides the observable influx of people, there is an influx of settlements that cannot be read in terms of official residents: the incidence of built structures and seasonal overpopulation results in these municipalities having a demand for services that is quantitatively and qualitatively urban and generally unmet. Others share underutilized attractiveness factors with the reference urban center, which are not adequately valued in a strictly municipal dimension and perspective, including in communication.

**Table 3** - *Inter-municipal aggregations among municipalities with high accommodation capacity and/or attractiveness of flows and/or settlement pressure and medium-sized urban reference centers.*

<b>Attractive-Settlement Poles</b>	<b>Medium-Sized Urban Centers</b>
Campofelice di Roccella	Cefalù, Termini Imerese
Capo d'Orlando, Furnari, Gioiosa Marea, Terme Vigliatore, Tripi	Barcellona Pozzo di Gotto, Milazzo, Patti
Giardini-Naxos, Letojanni	Taormina
Linguaglossa, Mascali, Milo, Piedimonte Etneo, Sant'Alfio, Nicolosi, Zafferana Etnea	Giarre
Chiaromonte Gulfi, Pachino, Palazzolo Acreide, Ispica	Noto, Comiso
Calatafimi – Segesta, Gibellina, San Vito Lo Capo	Alcamo, Partinico, Sciacca
Aidone, Palma di Montechiaro	Licata, Canicattì, Piazza Armerina

The elements of "intermunicipality" emerging and highlighted in the distribution of Table 3 are not only traceable in the proximity or geographical contiguity of the territories but also in the presence of functional relationships and connections.

From the geographical distribution of the intermunicipal areas illustrated above, the location and role of four urban centres stand out, where physical access infrastructures such as airports and ports with traffic movements, even at the international level, are situated. In addition to the growing traffic flows, their complementarity with those located in FUAs, with which they are associated in terms of management, is also remarkable.

Of these Gateway Cities, three have already been qualified as medium-sized cities based on the preliminary criteria applied (Augusta, Comiso, and Termini Imerese), while the fourth (Pozzallo) can be considered for the presence of transboundary flows, constantly intensifying, to and from Malta.

Among the first intermunicipal aggregations present in Table 3, supported by more immediate geographical and functional connections, two medium-sized cities

stand out for which their dimensional consistency does not correspond to an evident attractive and relational capacity even in terms of contiguity.

The first city (Paternò), despite being the largest in population among those in the first aggregate of regional medium-sized cities and, in general, among those with the greatest territorial extension, shows a kind of functional "self-containment" evident even from its attraction capacity limited to the sole municipality of Ragalna, with a population equal to one-tenth of the centroid.

The second case is represented by a medium-sized city (Augusta), which, due to the capacity and types of port traffic, represents the largest Gateway City among those identified and also expresses the most striking dilemma about the possibility of maintaining its historical productive and functional characterization in the future.

### **3. Results**

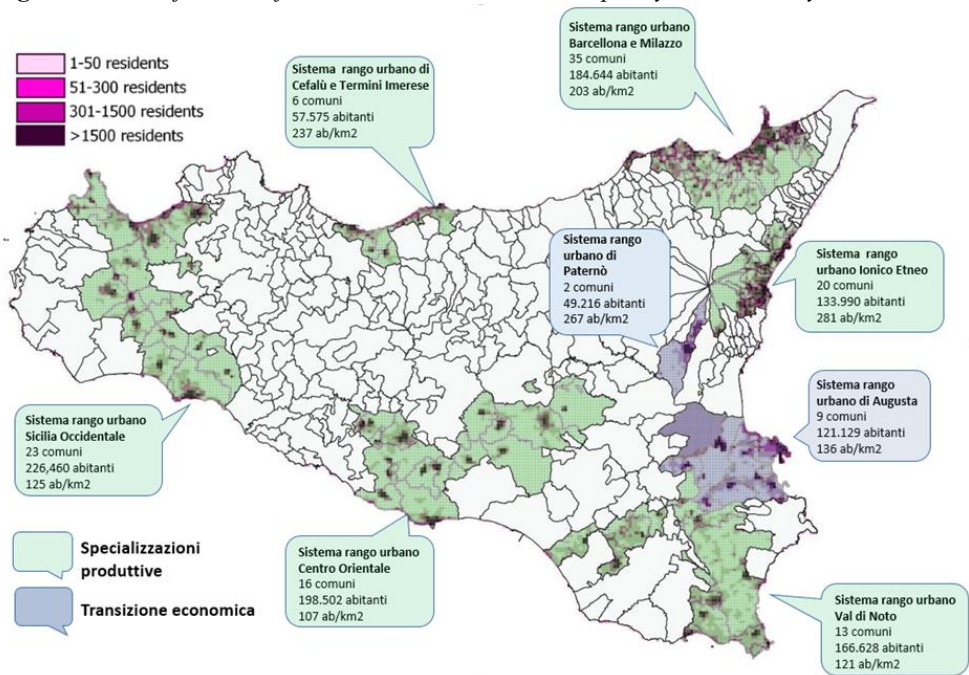
The outcomes of the analysis have led to the identification of a total of 123 municipalities, with a population of 1,130,532 residents, and the establishment of eight Inter-municipal Systems defined as "Urban Rank" since they are aggregated and clearly characterized by Medium-Sized Cities, Gateway Cities, and the main accommodation and attraction Hubs in the portion of the regional territory that was not originally classified as Functional Urban Area or Inner Area.

The eight Urban Rank Inter-municipal Systems (SIRUs) were constructed, as specified above, through various analysis steps supported by the implementation and analysis of over fifty indicators at the municipal level. These indicators allowed us to trace the main socioeconomic, demographic, environmental, and some essential service characteristics of the territorial systems. Particular attention was also given to the construction of second-level urban functionality indicators (commuting, services complementary to the attractiveness of Medium-Sized Cities, and densification from tourist attractiveness - ADP 21-27).

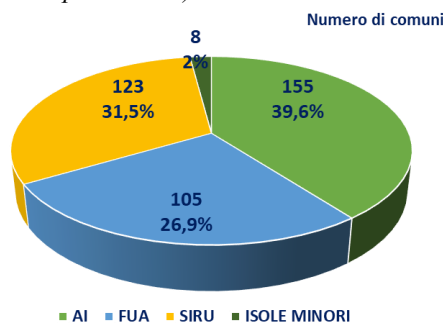
Through the analysis of the unifying characteristics of the Urban Rank Inter-municipal Systems (SIRUs) (common strengths and weaknesses), it was possible to identify the specific potential and needs of each territory in terms of infrastructure, services, and support for economic activities, and therefore, the most suitable public policies for their development. In doing so, the presence of Inter-municipal Systems that play a specific role, which we can define as intermediate, between the Urban and Inner territories of Sicily, has been highlighted.

More specifically, these Urban Rank Inter-municipal Systems, due to their identified peculiarities and needs, represent a specificity of urban areas that are not represented by metropolitan Functional Urban Areas (FUAs), medium-sized urban areas, or even coalitions of inner areas in the Sicilian territory.

**Figure 1 - Classification of the Urban Rank Inter-municipal Systems in Sicily.**

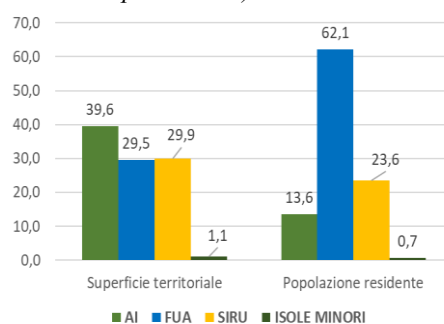


**Figure 2 - Comuni per macro aree - Anno 2022 (valori assoluti e percentuali).**



Fonte: elaborazioni su dati Istat

**Figure 3 - Superficie e popolazione per macro aree - Anno 2022 (valori percentuali).**



Fonte: elaborazioni su dati Istat

The table below shows a selection of indicators that have been used in the methodology both to identify the Urban Rank Inter-municipal Systems (Medium-Sized Cities) with particular attention to the main intervention sectors of the



Cohesion Policy 21-27, and to determine the positioning of individual SIRUs relative to Functional Urban Areas and Inner Areas. The results of the selected indicators demonstrate a perfectly intermediate dimension in the continuum between urban areas (FUAs) characterized by high density and demographic concentration, as well as functional relationships between the various aggregated administrative units, and the Inner Areas (AIs) characterized by demographic and economic decline and poor accessibility.

**Table 4 – Indicators for Inter-municipal Systems and Macro Areas - Various years<sup>2</sup>.**

SIRU	Ind.1	Ind.2	Ind.3	Ind.4	Ind.5	Ind.6	Ind.7	Ind.8	Ind.9	Ind.10
Centro orientale	-9,4	170	10,6	47,8	10.302	4,7	23,8	1,3	2,2	1,2
Sicilia occidentale	-4,8	190	14,6	54,9	9.637	6,3	25,6	1,3	10,2	1,8
Tirreno sud orientale	-5,8	194	17,7	56,0	2.288	8,2	36,7	1,8	17,1	1,4
Val di Noto	-0,6	151	13,2	51,1	1.814	7,8	26,1	1,3	6,1	0,5
Tirreno sud occidentale	-2,7	188	19,4	66,3	2.754	10,2	30,2	1,3	44,6	5,3
Paternò	-4,5	131	12,7	48,7	-	7,2	30,6	1,4	0,9	0,8
Ionico etneo	-3,4	176	17,1	63,8	49.171	9,1	50,8	1,7	51,3	1,4
Augusta	-6,2	189	19,9	43,5	148	9,1	37,5	1,1	3,0	2,9
<b>MACRO AREE</b>										
FUA	-2,4	159	18,2	57,3	13.476	10,4	24,1	1,1	13,0	3,7
<b>SIRU</b>	<b>-5,1</b>	<b>176</b>	<b>15,4</b>	<b>54,5</b>	<b>8.377</b>	<b>6,9</b>	<b>31,8</b>	<b>1,4</b>	<b>10,7</b>	<b>1,6</b>
AI	-9,5	198	12,1	49,5	949	3,2	32,8	1,8	1,4	1,8
ISOLE	+3,3	183	21,1	81,7	6.103	6,8	5,3	2,1	56,2	0,9
<b>MINORI</b>										
<b>SICILIA</b>	<b>-4,0</b>	<b>168</b>	<b>16,7</b>	<b>55,7</b>	<b>9.322</b>	<b>6,5</b>	<b>26,9</b>	<b>1,3</b>	<b>8,2</b>	<b>2,9</b>

Fonte: elaborazioni su dati Istat, Ispra, Miur; Mibact, Ministero della salute

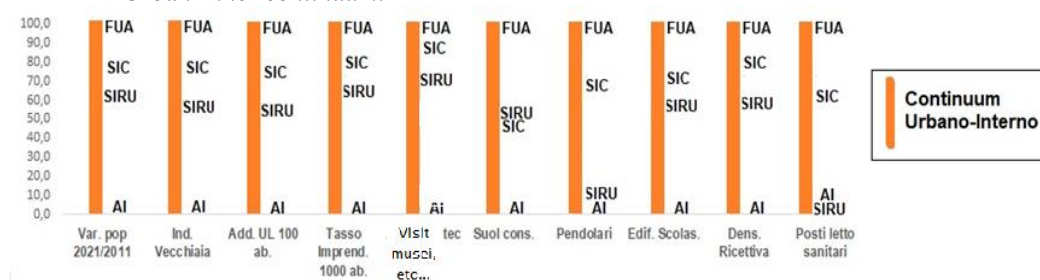
The results in the table show, for almost all the examined indicators, the intermediate positioning of the SIRUs with respect to both macro urban and non-urban areas. The exception is the indicator of hospital beds per thousand inhabitants, where the value of the SIRUs is lower than both FUAs and AIs. This positioning is likely to be explained by the territorial logics and organizational models of the regional healthcare system.

After the descriptive analysis of the indicators and the identification of their

<sup>2</sup> Ind.1: % Population Variation (2011-2021) ; Ind.2: Dependency Ratio (2021) ; Ind.3: Employees in Local Units per 100 Inhabitants (2019) ; Ind.4: Entrepreneurship Rate (Enterprises per Population) per 1,000 Inhabitants (2019) ; Ind.5: Average Visitors to Museums, Galleries, Archaeological Sites, and Monuments ; Ind.6: Land Consumption Rate per 100 Hectares (2020) ; Ind.7: Incidence of Commuters Outside the Municipality (2020) ; Ind.8: School Buildings per 1,000 Inhabitants (2021) ; Ind.9: Accommodation Density Index - Bed Places per Square Kilometer (2020) ; Ind.10: Bed Places in Healthcare Facilities per 1,000 Inhabitants (2019) ;

intermediate positioning with respect to the two-macro areas, in order to confirm this specificity, it was decided to apply a methodology to synthesize the indicators and verify the results obtained. To this end, after standardizing the selected indicators for the 3 territorial macro areas (SIRUs, FUAs, and AIs), the method of difference between the mean and mean squared deviation of individual indicators multiplied by their coefficient of variation was applied. This method was chosen for both its ease of calculation and its ability to identify the statistical behaviour of the individual indicators contributing to the intermediate positioning of the SIRUs in the landscape of Urban and Non-urban coalitions in Sicily. The results of the methodology are synthetically represented in Fig. 4.

**Figure 4 - Positioning and distance of the Urban Rank Inter-municipal Systems on the Urban-Inner continuum.**



#### 4. Some concluding remarks

The identification of homogeneous territories, achieved through appropriate criteria such as aggregations of municipalities with specific characteristics, serves as a fundamental step in fostering their active involvement in both Italian and international political agendas. While it may appear relatively straightforward to direct public policies and allocate resources towards either densely populated urban areas or economically disadvantaged rural regions, which represent the two extremes of the territorial continuum, it is indeed more intricate to address the needs of territories falling outside these well-defined categories.

In this context, medium-sized cities and their surrounding areas emerge as pivotal components of the Italian and Sicilian territorial landscape. Despite their importance, these territories present challenges when it comes to their precise identification and understanding of their role within the overall planning and political context. However, for the 2021-2027 programming cycle, Sicily has successfully developed a meticulous and well-structured approach to define and recognize these intermediate territories. The primary goal is to establish relevant criteria for the allocation of economic resources, while simultaneously acquiring in-depth

knowledge essential for planning and executing development policies, particularly in territories of vast significance and complexity, characterized by distinct challenges and unique issues.

The process of identifying these intermediate territories is grounded on several key criteria: the characterization of Local Labor Systems (SLL), which carefully examines the dimensions and degree of specialization of the centroid municipality and the surrounding municipalities within their scope. This approach facilitates a comprehensive understanding of the territories' economic dynamics and employment patterns; the identification of complementary functions and services that are intricately linked to the territories' specialization and attractiveness factors. These may include Medium-Sized Cities, Gateway Cities, mature or saturated Tourist Hubs, and regions with high attractivity. Recognizing and enhancing these features contribute significantly to the overall development strategy; the emphasis on fostering a growing and discernible function of integration and diversification of offerings, often referred to as "proximity offerings." This strategic approach aims to alleviate settlement pressures and mitigate the demands for services caused by excessive concentration, both in terms of location and seasonality. Lastly, the consideration of the function of complementarity and/or continuity of territorial offerings within and between the territorial strategies of the Inter-municipal Systems. This approach ensures effective coordination of territorial resources and activates previously underutilized attractors through targeted regional-level actions.

By applying these rigorous criteria, Sicily has achieved considerable success in identifying homogeneous territories that share common characteristics. This comprehensive approach has not only provided them with access to vital resources for territorial development but also empowered them to address the ever-increasing and multifaceted challenges they encounter in their quest for sustainable progress. The coherent and strategic pursuit of these objectives has ushered in a new era of territorial governance that is more responsive, inclusive, and forward-thinking.

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