An Extended Analysis of the Classification of Italian Inner Areas: Real-Time Monitoring, Methodological Innovations, and Policy Implications

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Abstract

The classification of Italy's inner areas has long served as a cornerstone for territorial policies aimed at addressing spatial disparities and improving service accessibility in peripheral regions. This study revisits and enhances the framework established by the National Strategy for Inner Areas (Strategia Nazionale Aree Interne – SNAI), originally defined in 2014 and updated in 2020. By providing a tool for real-time monitoring and proposing a more nuanced methodology for the classification of inner areas, the present research aims to better inform policymakers on infrastructural and service-related challenges faced by non-urban municipalities. The expanded approach considers not only the traditional metric of travel time by car to the nearest urban center but also differentiates distances to key essential services – hospitals, educational institutions, and railway stations – by using the actual location of the municipal town hall rather than the geometric centroid. These methodological innovations yield a more realistic and detailed picture of service accessibility. Notably, when applying the 2020 thresholds to 2025 data, the proportion of municipalities classified as inner areas increased from 48.5% to 60.4%, signaling that despite the allocation of approximately one billion euros since 2014, peripheral municipalities have grown in number. This counterintuitive finding underlines the necessity for more focused interventions and enhanced resource allocation. The study discusses the implications for territorial cohesion, the equitable distribution of public resources, and the potential for developing predictive models to guide future infrastructure development.

Introduction and Background

In recent decades, Italy has grappled with the complex challenge of bridging the developmental gap between its urban centers and more remote, peripheral areas. The National Strategy for Inner Areas (SNAI) was introduced as a comprehensive policy framework to address these disparities by systematically identifying and targeting municipalities that are distant from essential services. Initially established in 2014 and updated in subsequent years, the SNAI classification hinges on a core assumption: that proximity to urban centers is critical for accessing healthcare, education, and transportation. Urban centers—referred to as "poli"—are defined by a minimum set of infrastructural benchmarks, including the presence of at least one hospital equipped with a first-level Emergency and Acceptance Department, a railway station meeting a silver-level standard, and an educational hub comprising either a classical or scientific high school as well as a technical or industrial institute.

Despite its foundational role in shaping territorial policies, the traditional SNAI classification has its limitations. One critical aspect is the use of a municipality's centroid as a proxy for its geographic center. In many Italian municipalities, however, the centroid may lie outside the actual administrative or inhabited areas, thereby skewing the assessment of service accessibility. Moreover, the original classification aggregates diverse service distances into a single metric of travel time, potentially masking important differences in the accessibility of individual services. These methodological

shortcomings have motivated the current study, which aims to provide a more robust and detailed framework for monitoring and classifying inner areas in Italy.

Objectives

The primary objective of this study is twofold. First, it endeavors to develop a tool that allows for the continuous, real-time monitoring of Italian municipalities that are not classified as urban centers. This dynamic tool is designed to track changes over time and provide policymakers with up-to-date information on the evolving status of peripheral areas. Second, the study proposes an enhanced methodology for the classification of inner areas, addressing the limitations of previous approaches. Key Innovation include:

1. **Improved Geographic Precision:** Instead of using a municipality's geometric centroid, the analysis relies on the location of the town hall. Given that the town hall typically represents the administrative and often the de facto population center, this change offers a more accurate depiction of where residents live and access services.
2. **Differentiated Service Analysis:** Recognizing that access to healthcare, education, and transportation are not homogeneous, the new methodology distinguishes between the distances to hospitals, schools, and train stations. This disaggregated approach provides a granular understanding of infrastructural connectivity and helps identify which sectors may require targeted interventions.

Together, these improvements aim to yield a more realistic portrayal of accessibility issues and to serve as a more reliable basis for designing interventions that promote territorial cohesion.

Methodological Framework

The study's methodological framework unfolds in two distinct phases. The first phase replicates the established approach of the SNAI classification using updated data. Here, the analysis calculates the average travel time by car from the center of each municipality to the nearest urban center—a "polo" that fulfills the requisite infrastructural criteria. This metric has traditionally served as the sole indicator of a municipality's peripheral status.

In the second phase, the study introduces several key innovations. First, the town hall location is adopted as the reference point for each municipality. This decision is based on the observation that in some cases, the geometric centroid does not reflect the actual distribution of population or the location of critical public buildings. By using the town hall's address, the analysis ensures that the measured travel times more accurately reflect the experiences of residents.

Second, the analysis moves beyond a single composite travel time metric by examining the distances to each of the three essential services individually. For instance, the distance to the nearest hospital with an emergency department is measured separately from the distance to the nearest railway station of a given standard, or from the distance to the closest high school or technical institute. This multifaceted approach acknowledges that a municipality might have excellent access to one type of service while remaining isolated in another. The outcome is a "disentangled" set of data that provides clearer insights into which specific areas are underserved.

To validate the enhanced methodology, the study applies the 2020 classification thresholds to a data set from 2025. This application serves to assess the temporal evolution of inner areas under consistent criteria, ensuring that the impact of infrastructural changes and policy interventions over time can be accurately gauged.

Results and Analysis

The reclassification exercise using 2025 data revealed a notable shift in the distribution of Italian municipalities. Specifically, when applying the same thresholds established in the 2020 classification, the proportion of municipalities categorized as inner areas increased from 48.5% to 60.4%. This expansion is particularly significant given that approximately one billion euros have been invested in the strategy since 2014. Such an outcome suggests that, rather than contracting, the number of municipalities facing service accessibility challenges has grown.

Several factors could explain this counterintuitive trend. First, demographic changes such as urban migration and population aging may have contributed to the decline in population density in peripheral areas, exacerbating their isolation. Second, infrastructural improvements in urban centers might have widened the gap between these centers and their surrounding territories, thereby increasing average travel times for rural populations. Third, the refined methodology itself—by virtue of using the town hall location and distinguishing between different service distances—may be more sensitive to subtle variations in accessibility that were previously undetected.

These findings highlight a critical policy implication: significant financial investments in the past decade have not necessarily translated into a reduction of peripheral areas or an improvement in service access for these regions. Instead, the enhanced classification tool underscores that many municipalities remain on the margins, calling for a reexamination of current resource allocation strategies and the design of future interventions.

Implications for Policy and Practice

The implications of this study extend beyond a mere academic exercise in geographic classification. The new tool for continuous monitoring of inner areas holds several practical benefits for policymakers and stakeholders:

1. **Enhanced Resource Allocation:** By offering a more accurate map of service accessibility, the classification tool can guide public authorities in distributing funds more equitably. Municipalities that are identified as particularly underserved in specific sectors—be it healthcare, education, or transportation—can be prioritized for targeted investments. This targeted approach is likely to foster more efficient use of resources, ensuring that public spending addresses the most critical gaps.
2. **Timely Identification of Critical Situations:** The real-time monitoring capability embedded in the new tool enables authorities to promptly detect and respond to infrastructural deficiencies. In a rapidly changing landscape, the ability to identify municipalities that are on the brink of isolation can lead to early interventions, thereby preventing the deepening of social and economic disparities.
3. **Predictive Modeling for Future Infrastructure:** The granular data provided by the differentiated analysis of service distances offers a strong foundation for developing predictive models. These models could forecast the locations where new infrastructure would yield the greatest benefit, helping to strategically plan the construction of hospitals, schools, and transport hubs. By proactively addressing potential bottlenecks, policymakers can foster a more balanced territorial development.
4. **Support for Territorial Cohesion Policies:** A more precise mapping of inner areas directly contributes to the broader goal of territorial cohesion. The findings of the study underline that current measures may be insufficient in curbing the expansion of peripheral areas. In response, the study advocates for a reassessment of policy tools and strategies that go beyond financial investment alone, suggesting that a more integrated approach—one that combines

infrastructural development with socio-economic interventions—is needed to reverse the trend.

5. **Informing National and Regional Strategies:** Finally, the study's methodology and results can serve as a benchmark for future research and policy planning. By documenting the evolution of inner areas over time and demonstrating the impact of infrastructural investments, the research provides valuable feedback to both national and regional policymakers. This evidence-based approach can help refine the criteria for classifying inner areas, ensuring that the strategy remains dynamic and responsive to emerging challenges.

Discussion and Future Directions

The marked increase in municipalities classified as inner areas—from 48.5% to 60.4%—raises important questions regarding the effectiveness of past investments and the adequacy of current strategies. While the infusion of approximately one billion euros into the SNAI initiative was intended to reduce spatial disparities, the findings suggest that these investments have not yet translated into a measurable improvement in service accessibility for many peripheral areas. This observation may point to several underlying issues: the spatial diffusion of investments, the possibility of infrastructural inertia in remote areas, or even evolving patterns of population distribution that outpace policy interventions.

Moreover, the methodological improvements proposed in this study have broader implications for research on rural and peripheral development. By shifting from a centroid-based to a town hall-based approach and by disentangling the various components of service accessibility, the study offers a more refined tool for capturing the lived experiences of residents in peripheral areas. Future research might build on these innovations by incorporating additional layers of data—such as public transportation availability, digital connectivity, and socio-economic indicators—to further enhance the comprehensiveness of the classification.

Another promising avenue for future inquiry lies in the integration of geographic information systems (GIS) and remote sensing technologies. Such integration could facilitate the real-time collection of spatial data, allowing the monitoring tool to continuously update and refine its assessments. This dynamic data-driven approach would not only bolster the responsiveness of the policy framework but also empower local stakeholders with actionable insights.

Finally, the creation of predictive models based on the differentiated service distances offers exciting prospects for anticipatory planning. By simulating various scenarios—such as population shifts, infrastructural upgrades, or changes in transportation networks—policymakers could better understand the potential future trajectories of inner areas. These models could inform strategic decisions that preemptively address areas of vulnerability, thereby fostering a more resilient and cohesive territorial system.

Conclusion
In summary, the extended analysis presented in this study represents a significant step forward in the classification of Italy's inner areas. By adopting a refined methodological approach that leverages the town hall location and distinguishes between distances to hospitals, schools, and train stations, the research provides a more accurate and actionable framework for assessing service accessibility. The application of this tool to 2025 data reveals a concerning trend: the expansion of peripheral municipalities despite substantial financial investments over the past decade. This counterintuitive finding calls for a critical reappraisal of current policies and underscores the need for more targeted, evidence-based interventions.

The implications of the study are far reaching. Enhanced resource allocation, timely identification of critical infrastructure gaps, the development of predictive models, and stronger support for territorial cohesion policies are just a few of the benefits that can arise from a more precise mapping of inner areas. As Italy continues to grapple with regional disparities and the challenges of rural development, this research offers both a diagnostic tool and a roadmap for future policy innovation.

Ultimately, by providing policymakers with a dynamic, granular, and realistic picture of service accessibility across Italy's municipalities, the study aims to contribute to a more balanced and inclusive development strategy—one that ensures that even the most remote areas are not left behind in the quest for national prosperity.

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