THE ROLE OF STATISTICS IN SHAPING THE TERRITORY TO ADDRESS DEMOGRAPHIC DECLINE AND SUPPORT DEVELOPMENT. THE CASE STUDY OF SICILY

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Un territorio non è un semplice agglomerato di case, uffici, strade, industrie, semafori, automezzi ecc. È soprattutto un concetto "identitario", uno spazio allo stesso tempo fisico e simbolico, in grado di generare senso di appartenenza nelle persone che ci vivono e attrazione per le altre Antonio Romano

Abstract: This paper highlights the significance of generating territorial statistics as a strategic tool for cohesion-oriented policies. Cohesion policy aims to reduce territorial disparities and requires relevant data. Integrating the territorial dimension in policy models is crucial to address demographic and environmental goals. An operational experiment in Sicily focuses on generating such statistics for better programming. The post-World War II era saw extensive research on local public goods and services, crucial for achieving territorial cohesion. Historical reflections and approaches from the 1970s emphasize optimal levels of government. Recent policies focus on organizational structures for cohesive capacity. Integrating these analyses and utilizing statistical information enhances policy planning for territorial cohesion. Capacity building for Cohesion Policy has evolved since 1988, recognized as crucial for development and sustainability. Some contributions have analyzed limited absorption capacity of financial resources for cohesion investments, proposing organizational schemes for optimal division of labor among actors. The Sicilian 2021-2027 ERDF Regional Programme was inspired by similar models. Statistical data serves as a robust basis for multi-level implementation processes. Sicily identified 29 functional areas based on official indicators, fostering inter-municipal cooperation, population, and economic growth. The "Knowledge and Identity" project empowers strategic decisionmaking and long-term planning to counter depopulation and support territorial development. ISTAT's role as an official statistical producer fulfills social responsibility and supports effective local development strategies. The bottom-up approach empowers local communities for effective growth prospects.

1. Territorial statistics in the era climatic and demographic crisis

Rex Stout, known to the most as the "literary" creator of detective Nero Wolfe, said that "there are two kinds of statistics, the kind you look up and the kind you make up".

The story we want to tell in this essay concerns the importance of statistics "to be maked up" so that they can constitute a strategic tool for the construction of cohesion-oriented policies in multilevel governance contexts.

As reported by the portal of the Department for Cohesion Policies of the Italian Presidency of the Council of Ministers: "cohesion policy has the aim of increasing opportunities for economic and social development to help reduce the gaps and disparities between territories, acting in particular in less developed areas and for the most fragile communities and people. It is based both on the Treaty on the Functioning of the European Union (art. 174) and on the Italian Constitution (art. 3 paragraph 2 and art. 119 paragraph 5), which require special interventions to promote harmonious development and to remove economic and social imbalances.

It is a policy with medium-term objectives which involves various levels of government (central and local) and attributes a formal and fundamental role to economic and social partnership, financing plans, programs and individual projects owned by both central, regional or local authorities"¹. The Italian Constitution specifies that "to promote economic development, cohesion and social solidarity, to remove economic and social imbalances, to encourage the effective exercise of individual rights, or to provide for purposes other than the normal exercise of their functions, the State allocates additional resources and carries out special interventions in favor of specific Municipalities, Provinces, Metropolitan Cities and Regions"².

Planning a medium-term policy aimed at reducing the gaps between different territorial aggregations (the Italian Constitution provides for four levels of government with a territorial dimension, without counting the island dimension introduced in paragraph 6 of art. 119), requires knowing how much necessary to implement interventions capable of acting on the variables that the Constitution itself identifies. An adequate planning exercise therefore requires that the entire kit of necessary cognitive tools, endowed with the adequate degree of significance, be available at each relevant territorial aggregation level. It is evident that the aggregation of the available information and their comparability for each possible territorial aggregation are indispensable tools for qualifying needs and identifying resources necessary to reduce levels of inhomogeneity whose very conceptual dimension is both an object of preliminary recognition and a policy objective, to be set and ongoing monitored.

The need to adopt this "drill-in, drill-out" approach to territorial statistics becomes indispensable where short-medium term development and cohesion policies aim to act in contexts characterized by demographic decline and costs deriving from changes in the climate model. The exogenous nature of the environmental and demographic variables, in the short and medium-term policy models, can be reviewed if, in the

¹ https://politichecoesione.governo.it/it/la-politica-di-coesione/ .

² Constitution of the Italian Republic (art. 119 paragraph 5).

models themselves, the optimal territorial dimension of the policies is conceived as an endogenous transmission variable: population movements, the organization of work and residences, the permeability of water and sewage infrastructures and so on, act on the nature and scale of the climatic and demographic impact, if the territorial dimension of the intervention is adequately identified.

Addressing demographic and environmental targets needs a new way of thinking about policy models, in which the optimal territorial dimension (levels, layers and boundaries) is a dynamic and endogenous dependent variable. The memorandum of understanding³ signed in July 2022 by the Presidents of ISTAT and the Sicilian Region launches an operational experimentation of this endogenous role of the territorial dimension of the policy models and the territorial component of the 2021-2027 ERDF Regional Programme. The methods and results of the experiment "to make-up" territorial statistics in Sicily for a better programming of the next decade are the subject of the following pages.

2. Territorial dimension of policy: from static approach to organizational governance

Since the years following the Second World War, the local nature of the creation of public goods and the management of related services has been the target of a close attention from public policy analysts, economists and statisticians. The analysis tools built to support the Territorial Cohesion Policy cannot ignore the impact of the rationale underlying the economic analysis of local public goods and services. The goal of homogenizing the levels of development and opportunities for access to growth between territories and communities passes through an understanding of the economic, social and political mechanisms underlying the creation and management of local public goods and services systems.

The contribution of public policy analysts starts from the founding reflection of Werner Hirsh, who in 1959 in the Review of Economics and Statistics published was the first to address the issue of how to accompany the growth processes that emerged in metropolitan areas with suitable public policies. The approaches developed in the 1970s (for all, Oates 1972) are oriented towards the optimal dimension of the level of government which must guarantee the production and management of public goods for territories and communities which are starting to present different levels of development. More recently, with the expansion, especially at the supranational level,

³ MoU on the subject of support for social, economic and environmental statistical analyzes for the programming of the unitary cohesion policy 2021-2027 of the Sicilian Region, of the related planning, implementation, monitoring and evaluation tools and for the strengthening of the statistical function in associated form, signed on 11 July 2022, given the appreciation of the Regional Government https://www2.regione.sicilia.it/deliberegiunta/file/giunta/allegati/N.334_28.06.2022.pdf).

of Government Capacity Building-oriented policies that intend to support growth and development processes, the issue of local policies has shifted its focus on the organizational structure (and the related strengthening measures) of policies that act unevenly on development processes in order to guide their cohesive capacity. The two lines of analysis do not have adequate levels of integration and comparison.

The attention to the organizational dimension of the governance structures, defined ex-ante, on which the analyzes of capacity building are concentrated, and the importance attributed to the cost structure at different levels of government in the models of optimal level of government, both lead to not adequately consider the induced effects of spillovers and economies between communities and territories with variable levels of unevenness. The result is analysis with little argument to say about the organizational processes that integrate the levels of government, proposing effective and efficient forms of division of labour. But, at the same time, they use ineffectively the growing presence of statistical information with increasing capillarity at a territorial level, to articulate adequate proposals for implementing the policies targeted to territorial cohesion.

3. The Optimal Level of Government: beyond the Black Box

The issue of the territorial dimension of policies was born to answer the question which is the best level of government to manage public goods that have specific characteristics of a local dimension. Theoretical studies based the arguments on the assumption that the average per capita cost of local public goods decreases as the population served increases. This effect depends on the presence of scope economies (a single input can be used for the provision of several goods) and of increasing returns to scale in production technologies.

The literature has also highlighted the presence of economies of density, linked to the advantage of sharing the cost of providing a given service or public good among a greater number of users: as in the typical case of water, electricity or transport networks. At the same time, the literature has highlighted the presence of grounds for the fact that there are costs increasing with the demographic dimension in the production of public goods: the synthesis of citizens' preferences grows in complexity as their number increases. Accountability also becomes more onerous in larger communities.

From the two pioneering contributions of Oates (1972) and Mirrlees (1972), to that of Dixit (1973), up to the most recent work by Ladd in 1992, followed by Dollery and Fleming in 2005 and by Gómez-Reino and Martinez-Vazquez of 2013 modeling has maintained a constant logical structure. Demand and supply factors interact to determine a non-monotonous trend in the relationship between the size of the territory and the community and the efficiency in the production of public goods. The typical U-

shaped cost curve of the demographic and territorial dimension emerges as the synthetic theoretical basis of the arguments on the optimal size of the level of government most suited to the provision of public goods.

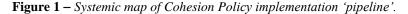
The models are built to answer the question of the optimal level of governance. The analysis is developed to provide an single answer, depending on the cost structure of public good/service and the characteristics of the communities/territories considered, as clearly emerges from the empirical analysis and from the theoretical reflection of Sabrina Iommi (Iommi and others, 2013) for the accurate research of IRPET on Italy and Tuscany.

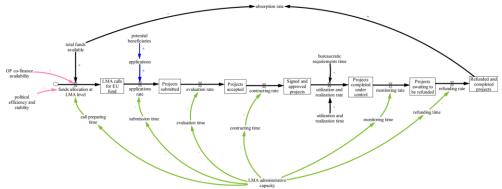
The original theoretical apparatus provides policy making with a *black box* in which the factors determining the effectiveness and efficiency of the selection processes of public goods are homogenized, as well as the organizational dynamics of the administrative machines that implement their creation and management, the determinant role of public finance rule, the absorption capacity of the production systems that actually create public goods and related services, the socio-economic and environmental evolution of the local contexts (communities and territories) in which public goods/services are created and provided.

Demographic and environmental dynamics, directly or indirectly, through their redistributive effects, affect the relative relevance of the variables considered by the literature and the direction of their impacts: an analytical framework suitable for policy making must consider the complex structure of the different effects. In other words, the optimal division of functions between the different levels of government (not the unique optimal level) must be the necessary result of any analysis that addresses the issue of the implementation of public investments between territories and communities. Such an analysis suitable for Cohesion Policy cannot ignore a strongly articulated dimension of the statistical knowledge of territories and communities.

4. Optimal organization for policy implementation capacity: balancing power between government levels

The literature on Capacity Building for Cohesion Policy has been evolving steadily since its introduction in EU planning in 1988. Strengthening the operational capacity of actors involved in implementing Cohesion Policy has been recognized as crucial for addressing development gaps, economic growth, citizens' quality of life, and policy sustainability. The literature on capacity building, developed within the debate on development policies supported by international agencies (OECD and UN, in the first place), focuses on the dysfunctions of administrative machines in countries subject to external financing actions. This aspect has been externally oriented in the European debate on cohesion policies, emphasizing the progressive adjustment to common performance standards, organizational models in line with Union's priorities, and operational alignment with the "Acquis Communautaire," especially regarding directives governing Community Funds for Cohesion Policy. The organizational responsibilities have often been excluded from policy discussions, neglecting the organizational requirements from Community legislation in specific sectors, such as Water Services and Energy.





Cunico G. et al. 2021, fig.3 p. 21.

Recently, some contributions have emerged aimed at analyzing the causes of the persistence of a limited level of absorption capacity of financial resources intended for investments for Cohesion, by territorial areas and specific economic sectors (for all, Cunico et al. 2023). The models used have developed organizational schemes, which, albeit still only implicitly, provide organizational analysis of investments implementation which are a prelude to identifying an optimal division of labor among the various actors of multilevel governance. It's reported the Cohesion Policy implementation map drawn up by Cunico and others in 2021, for example only, which graphically summarizes the dynamic model underlying the analysis developed by the authors in different contributions. Beyond the possible more detailed articulations of the process, it is evident that the structure of the model includes political-institutional, administrative and private actors operating at different levels of government in different phases.

Just limiting to considering the project submission phases and the acceptance and approval phase (i.e. the selection of the operations phase), for the implementation of the programs, it is evident how the model is able to analyze the interaction between actors at different levels of government. Similarly, the considerations relating to the definition of the priorities of the Programs and of the specific financial allocations, even if not adequately modeled, lend themselves to an expansion that develops in a unitary model the interactions involving citizens, interest groups, the actors of the

private sectors and of the private social sector, but above all the political decisionmakers who interact with public opinion and the administrative machines at the various levels of government. An overlapping layer structure of the proposed system dynamics model constitutes a line of research of great perspective to point to results useful for exploring the organization optimal structures for the division of labor between political, administrative and interest representation institutions operating at different levels of governance.

5. The shape of the territory and the function of statistics in the sicilian experience

The Sicilian 2021-2027 ERDF Regional Programme's programming phase is inspired by the analytical scheme mentioned earlier. The use of statistical information with high granularity at a territorial and community scale forms the robust methodological foundation for governing multi-level implementation processes, adhering to regulatory requirements and tools for associationism of Local Authorities and Union of Municipalities. During the 2014-2020 programming period, the EU and Italy focused on addressing challenges in urban areas, emphasizing connections between urban and rural regions through the National Strategy for Inner Areas (SNAI). In the 2021-2027 cycle, Sicily divided its territory into three homogeneous zones: Functional Urban Areas (FUA), Inner Areas (AI), and Urban Inter-Municipal Systems (SIRU). These aggregations, based on regulatory indications and the Pact for Italy, ensure transparency and reliability with official statistical data, enabling effective management of programs and resources. Access to territorial statistical data is crucial for designing, implementing, and evaluating public policies, ensuring they are measurable and rely on precise information over time and space.

The identification, measurement, and analysis of these characteristics require stringent statistical criteria and methods based on official statistics due to their regulatory and guaranteeing nature. Additionally, the chosen aggregation solution disregards previous administrative aggregations constructed for other purposes. Its aim is to foster inter-municipal cooperation and the sharing of common functions and services, creating conditions to promote demographic and economic growth and improve the quality of life for residents.

The National Institute of Statistics is fully committed to expanding the offering of territorial statistics on the main environmental and socio-economic phenomena in the country, providing punctual and accurate information that reflects the dynamics and transformations of Italian society. Analytical and continually updated knowledge of the social, economic, demographic, and environmental conditions of the territory is fundamental for good governance and the development and growth policies of the territory itself. Only through correct and in-depth knowledge of the local reality can informed and conscious decisions be made, directing policies towards concrete and lasting outcomes. In the 2021-2027 cycle, in Sicily, within the framework of territorial policies, the aggregation of territories was based on characteristics aimed at ensuring or at least promoting the achievement of specific objectives. These objectives include internal homogeneity for Inner Areas and functionality for Urban Areas and SIRUs (Single Islands Rural Areas).



Figure 2 – The Sicilian Territorial Aggregations for the 2021-2027 programming cycle

The construction of these new territories has inevitably raised the fundamental issue of lacking knowledge and identity for these 29 Areas, whose consolidation has become the driving force behind strategic decisions for their revitalization. Through the "Knowledge and Identity" project, overseen by ISTAT and the Sicilian Region and formalized through a memorandum of understanding signed in 2022 the statistical function has been identified as the propelling engine for these new areas to acquire indepth and necessary knowledge of their territories. This knowledge is aimed at defining an optimal long-term strategy and promoting countermeasures against demographic decline and territorial development. The ultimate goal was to move beyond mere data "about" territories and progress towards data "for" and "with" the territories themselves.

At the core of the project, from the construction of the Areas to the planning and implementation of policies and resources, lies statistical information, which plays a fundamental role in supporting decisions in the social and economic realms. It aids in defining priorities and shaping the trajectories of territorial and public administration development. Statistical information is crucial for capturing transformations in the production and environmental systems, while also providing a comprehensive understanding of citizens' life paths and the services dedicated to them. For the new territorial aggregations, a sound understanding of statistical information is crucial. It aids in developing strategic and operational guidelines for the Regional Programme and ensuring an optimal process of programming, implementation, and monitoring. This facilitates coherent identification of needs and related objective formulation and offers valuable support in selecting the most effective implementation tools, including monitoring and evaluation systems.

The project aimed to empower competent regional offices and territorial coalitions by facilitating their acquisition of significant knowledge and fostering a strong identity perception. This enabled a more informed and effective approach in defining strategies, programs, plans, and agreements to optimize resource utilization. A comprehensive analysis was conducted on the characteristics and needs of the regional territory and specific areas within the territorial coalitions, comprising various Local Authorities. This process involved utilizing a set of relevant indicators to determine priorities, action plans at the local level, and to monitor and evaluate the impacts of the implemented policies. As a result of this indicator framework, an editorial series of "Territorial Area Dossiers" was created to enable new territories to gain knowledge and identity for conscious and effective resource planning, programs/agreements, and the development of various Territorial Strategies (ERDF Sicily 2021-2027).

Another vital objective of the Sicilian experience was to strengthen the independent capabilities of competent regional offices and territorial structures engaged in conducting surveys, data collection, processing, dissemination, and storage of statistical data related to various aspects of territorial cohesion policy. This objective led to the development and sharing of models for producing and utilizing integrated databases. These databases were derived from the integration of statistical and administrative sources and provided valuable insights. The collaboration with institutions such as the National Institute of Statistics (ISTAT), the Sicilian Region, Local Authorities, and other public and private entities facilitated the availability of these data.

6. Some concluding remarks

The identification of homogeneous territories, based on appropriate criteria such as aggregations of municipalities with specific characteristics, facilitates and supports their involvement in both Italian and international political agendas. While it may seem straightforward to direct public policies and resources towards either densely populated or more disadvantaged areas, which represent the two extremes of the territorial continuum ranging from purely urban to strongly rural, it is more complex to identify other territories that do not belong to either of these categories.

Within the ISTAT-Regione Siciliana experience, ISTAT fully fulfills its implicit mandate or social responsibility as the official producer of statistical information. It responds to the increasing need for information in a complex and articulated society and provides informative support to public decision-makers and, thus, the entire community in a democratic system (Notarstefano, 2020). On the other hand, the Regione Siciliana fulfills its duty to support the co-design of Territorial Strategies as required by European regulations, overcoming local shortcomings in statistical expertise and local planning, resulting in a reduction of drafting times from several years in the 14-20 cycle to a few months in the current cycle.

Through this experience, accordingly with the bottom-up construction of strategies and the local vision, the shared identification of specific needs and opportunities for each community has become possible, as well as their development and growth potential, aiming at building effective local development strategies in the short and long term. The main results of this experience include a significant increase in the connection between cohesion policies and local development objectives, greater local governance and knowledge capacity of cohesion policies, strengthening of functions shared by Territorial Authorities, structural reinforcement of Sicilian Unions (with a higher average number of municipalities and population), identification of a set of municipal indicators useful for the tasks of planning, programming, and management of Local Authorities, consistent with Cohesion Policies.

It also has provided analytical support for the construction of the Territorial Strategy for each Area, identifying needs and criticalities to address through public spending, offers transparent and objective information on their territory and needs to all residents, allows for correct and shared evaluation of the impacts of public action, and disseminates methods and objective criteria for information sharing and the construction of territorial strategic visions.

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