The Knowledge Phase of the Strategic Programming: The Case Study of the Jonian Valleys of Peloritani (Sicily, Italy)

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Abstract. This paper presents the follow-up phase of a broader work that illustrates a multidisciplinary research activity carried out as part of an institutional collaboration between the Mediterranea University of Reggio Calabria and 18 Sicilian municipalities, located in an area called "Jonian Valleys of Peloritani", Italy. The collaboration is finalized in order to outline perspectives and strategies for the material and immaterial progress of the area. The research activities are at initial stages, this paper illustrates the first results of the cognitive phase relating to the case study.

Keywords: Strategic programming · Stakeholder involvement · Citizenship education · Youth entrepreneurship · Project evaluation

1 Introduction

As explained more fully in the first part of the work, the cognitive activity, preparatory to programmatic choices, it is aimed at acquiring information related to the territorial system. More specifically, there are four phases to be developed to design a strategic program of interventions:

1. Knowledge Phase
2. Proposal Phase
3. Evaluation Phase

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4. Planning Phase

Phase 1, of a cognitive nature, is in turn divided into two parts:

- 1.a Analysis of the territorial system
- 1.b Listening and territorial animation

In detail, phase "1.a Analysis of the territorial system" has as its object:

- Geomorphology and hydrogeology
- Settlement system
- Infrastructure, accessibility and mobility
- Demographic structure
- Economic-productive system (also historically characterizing activities) and employment dynamics
- Natural and cultural resources - tangible and intangible
- Socio-cultural structure: associations and cultural activities
- Services for the quality of life and social equity
- Planning, governance and express planning tools - funded and unfunded
- Historical Background.

While phase 1.b "Listening and territorial animation" includes:

- Recognition of public and private actors
- Individual meetings with stakeholders and public forum for the needs' analysis and assessment
- Identification of strategic areas.

2 The Territorial System

The Geographical District, the object of the present study, is located in the north-eastern part of the metropolitan area of Messina, Sicily. Bounded upstream by the Peloritani mountains, it is crossed by four rivers: the D'Agrò, Savoca, Dinarini and Nisi streams, within whose valleys fall the 18 municipalities involved in this study. In general, the Geographical District is marked by the presence of the potentialities and criticalities that can be found in the entire South of Italy. On the one hand, the resources offered by the rich historical, cultural and natural heritage in its tangible and intangible features. On the other hand, the worrying employment issue, about the youngest segments of the population. Also, can be outlined issues related to the hydrogeological structure of the territory and its widespread accessibility by the primary and secondary road network. From a morphological and infrastructural point of view, the area tends to be homogeneous, although some socio-economic and historical-cultural emergencies are still evident. The analysis aims at identifying these peculiarities, intending to enhance their value as a system, with particular reference to the valleys. Finally, the single thematic in-depth studies, necessary to produce a rich and exhaustive territorial framework, will always refer to the enhancement of the whole area.

2.1 Overview of the Area

The area's overview starts from a territorial, morphological and infrastructural description. These considerations are relevant to understand the complexity of the territorial system before going into its peculiarities.

The Geographical District has a mild, Mediterranean climate, with average annual temperatures between 18–20 °C and relatively low rainfall (ISPRA 2020) which has favoured the tourist and agricultural-forestry vocation over time. On the other hand, global warming and the decrease in rainfall put the area at risk of desertification (IRSSAT 2020). The high hydrogeological risk of landslides and coastal erosion can be detected due to damming works and inert material withdrawals along the riverbeds, reducing the contribution of solid material to the beaches and causing their retreat (PAI).

The main transport infrastructures are the A18 motorway Messina-Catania, the State Highway 114 Orientale Sicula, the Catania-Messina railway line and the waterfront promenade which extends along the entire coastline interrupted only by the estuaries of the rivers. The railway infrastructure is also the main obstacle between the urban settlements, partially developed close to the coastline and the shoreline. The transversal accessibility, parallel to the development of the watercourses and perpendicular to the valleys, connects the inland municipalities through provincial roads. In this sense, the mobility pattern (Fig. 1) is common to all the territorial units constituted by the valleys.

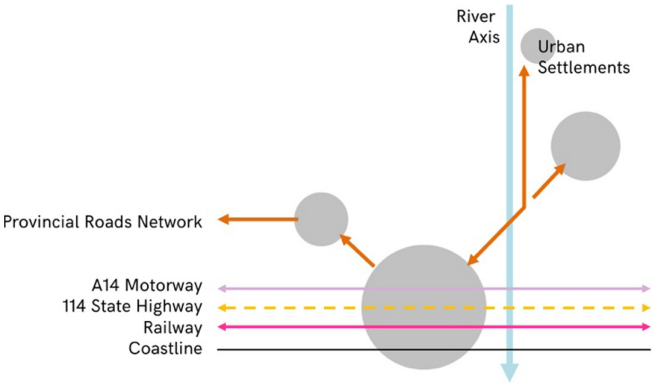

Fig. 1. The mobility pattern of the valley units.

The city settlements are closely related to the morphology and the infrastructure of the Geographical District, which have determined the urban development. The coastal cities are developed between the coastline and the railway line and are the most populated. The inland municipalities are, on the other hand, for the most part closely related to the valley system, with a less compact and more distributed urban development. This aspect is to be considered to the agro-forestry vocation of these towns, often articulated in satellite districts and villages related to the main urban centre.

2.2 Socio-Economic Profiling

The study area covers a total extension of 264.186 km^2, about a tenth of the province of Messina. The municipality with the largest territorial area is Antillo, 43.6 km^2, the innermost municipality in the area; whereas the municipality with the smallest territorial area is Roccafiorita (1.17 km^2) (Table 1) (ASC). At the time of the ISTAT census of 2019, there is a total population of 36,965 inhabitants, about 6% of the province. In this panorama the costal municipality of Santa Teresa di Riva is affirmed for number of inhabitants (9394 units), with a number of inhabitants more than double the number of the second municipality, Roccalumera (4119 units); while Roccafiorita (186 units) is the least populated.

The average density of the entire area is 223.70 people/km^2. In detail, the centers with a higher population concentration are those in the coast side (Santa Teresa di Riva, Roccalumera, Alì Terme and Scaletta Zanclea), while the centers with a lower concentration of inhabitants by surface area are the innermost (Antillo, Casalvecchio Siculo, Mandanici and Ali). Finally, analyzing the variation of population 2019–2011, it is observed that most municipalities recorded a significant depopulation in 2019, with a total of 1419 units less (Praticò 2021; Filippone 2021). The municipalities most affected were those of Scaletta Zanclea, Fiumedinisi, Limina and Casalvecchio Siculo; while the municipalities with a more marked positive variation are the municipality of Santa Teresa di Riva and Sant'Alessio Siculo.

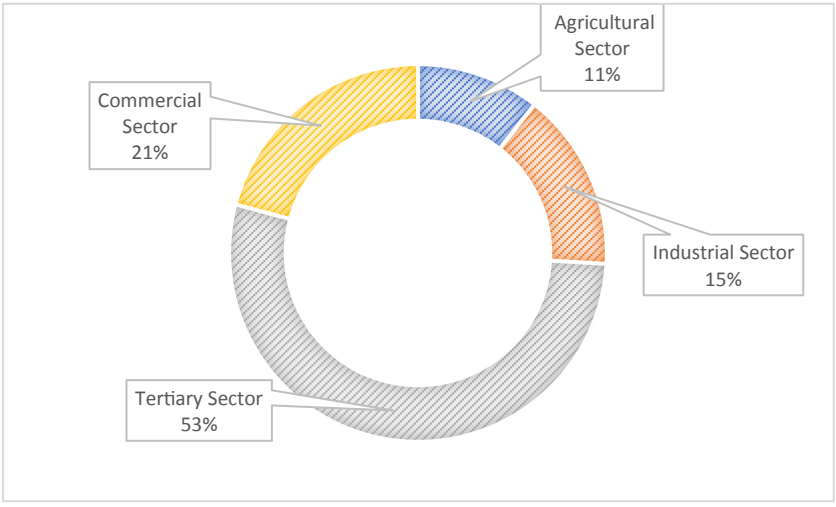

Fig. 2. Employment sectors case study - ISTAT 2011 (8milaCensus)

Looking at the Economic activities and employment dynamics, the analysis show that the average employment rate in the area is 36%, about one percentage point lower than the provincial data (37.2%), which in turn is almost 8 points lower than the national one. It exceeds 40% in the municipalities of Sant'Alessio and Furci Siculo, it stands at 25% in the municipality of Limina (Table 2) (Istat8milacensus). The unemployment rate

(about 18%) is lower than the provincial average (about 20%) with a range of about 12% of Fiumedinisi to almost 25% of Forza d'Agrò. The difficulty of young people entering the world of work is highlighted by the lack of employment between generations: the figure of 45-year-old and over is on average over 3 times higher than that of 15–29, in line with the provincial figure. The highest difference is found in the municipality of Limina (5 times higher), the lowest in the municipalities of Antillo and Alì (230%).

Regarding the structure of employment, in 2011 the professions with medium-high level of competence and specialization represent on average 26.47% (provincial figure 30.6%); the weight of the craft or agricultural professions is 15% as in the province of Messina, while the low-level professions are at 25.35% (20.8% provincial data). Figure 2 shows the employment distribution in the four sectors identified by ISTAT: The extra-commercial tertiary sector, which also includes the public sector, covers 53%, follows the commercial sector with 21%, the industrial sector at 15% and the agricultural sector at 11%.

Observing the housing and potential use issue, the study highlighted that in 2011 the living space available to each occupant reaches about 38 m^2 as in the province, about 2 m^2 less than the national data. The incidence of residences in property stands at about 70%, in line with the regional and national data.

The proportion of unused buildings in 2011 was 5.1% in Italy, 7.6% in Sicily. It reaches 12.4% in the province and 15.38% in the case study. In detail, Fig. 3 shows the incidence of unused housing in the centre and periphery per municipality, highlighting differences by category and territory. While the average potential for residential use in the core and scattered houses in the case study is in line with the national figure (37.27% and 37.5%) the potential for residential use in the center in the case study is 41%, 20 percentage points higher than the national average. It is not surprising that the highest incidence of unused housing is found in the more internal areas such as Antillo, Limina, Sant'Alessio Siculo and Pagliara. More particular is the data of Roccafiorita and Roccalumera, municipalities in which there are no unused housing.

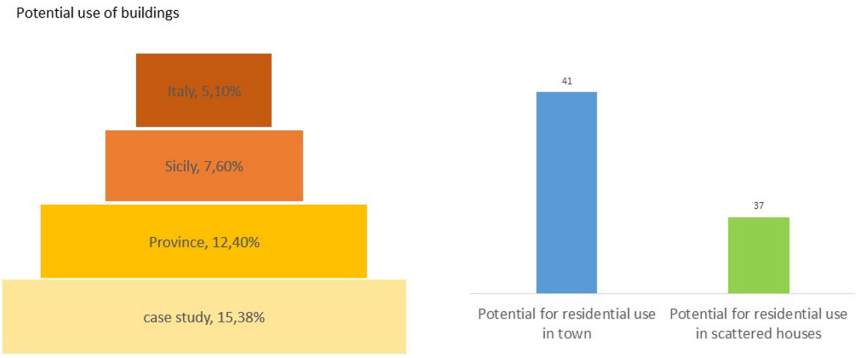

Fig. 3. Potential use of buildings - Istat 2011 (8milaCensus)

Table 3 summarizes the main data relating to the size of the housing stock and in particular: the size of the historical dwellings occupied given by the percentage ratio

of dwellings occupied before 1919 to the total of dwellings occupied; given about two percentage points higher than the regional average, but still lower than the national one (case study 7.80%, Sicily 5.3%, Italy 10.2%). To highlight the case of Limina 0% and Alì Terme 0.5% and the case of Alì and Fiumedinisi 40% and 35%. The average state of conservation of the buildings is less good than the national one. Forza d'Agrò, Nizza di Sicilia and Alì Terme are the municipalities with buildings in a better state of conservation, Antillo and Roccafiorita those with the highest incidence of buildings in a bad state of conservation. Finally, the age of the recent housing stock reflects the regional and national average.

Studying the Welfare and social vulnerability matter, the average percentage of families who are in a situation of potential hardship in the care of the elderly coincides with the national and provincial percentage of families who are in a situation of potential hardship in the care of the elderly, around 3%. Higher than the national and provincial data is the share of young people outside the labor market and training (case study 18.20%, province 16.2%, Italy 12.3%).

In 2014, Istat took over the Social and Educational Services for Early Childhood in the area for a total of 80 users with a total expenditure of approximately 750 thousand euro. The only municipalities in which these services have been identified are the municipality of Santa Teresa di Riva, Furci Siculo, Nizza di Sicilia and Scaletta Zanclea.

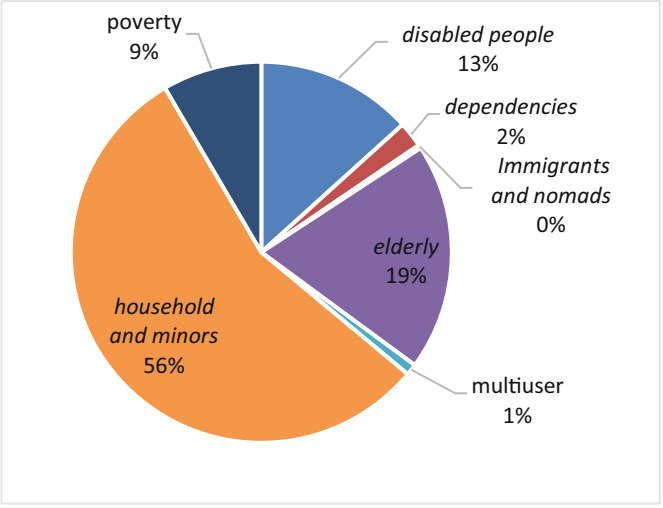

Fig. 4. Municipal social interventions and services

Finally, in terms of interventions and social services of municipalities, Fig. 4 shows the percentage of public expenditure committed by municipalities in the area in 2014: more than half of the funds were used for household and child care services, about 20% for the elderly, 13% for the disabled and about 10% for the fight against poverty and for services aimed at adult and homeless hardship.

2.3 Atlas of Natural and Cultural Resources[1]

The survey of cultural heritage resources, both tangible and intangible, required a taxonomic effort to reconstruct the anthropic development of the places under consideration. The evolution of the communities living there contributes to the rich and complex natural, cultural and productive landscape. According to this complexity, the analytical tool of the atlas accounts for the variety of features that shape such a heterogeneous heritage. The ancient origins can be traced back to the Sicans, the Phoenicians and the Greeks and can still be seen today in the location of the current hillside settlements. For defensive reasons, the urban settlements 'slide' along the valleys, moving from the coast to the hills, while the coastal villages are more recent. The material and immaterial heritage of the Peloritani valleys can be seen in the rich religious, civil and military architecture legacy as well as in the cultural and identity features.

The religious heritage ranges from Christian and Orthodox places of worship, strongly linked to local traditions and rituals, with evidence of Judaic and Islamic worship. Numerous examples of historical and archaeological value can be found among the military architecture, with the numerous fortifications, ruins of watchtowers and castles on the coastline. Oral traditions and expressions, performing arts, social customs, folkloristic events, knowledge related to agriculture and craft production, represent a social tool for teaching and sharing that respects the balance between man and nature. The shared identity, religious, historical, cultural and folkloristic values testify to the strong link between the villages according to their common origins and the historical events they have witnessed. In the light of these considerations, the economy of the valleys, historically based on agricultural activities, is gradually turning to cultural and environmental tourism. The territory is rich in environmental and landscape resources of great value. The valleys are home to several sites of Community interest: the municipality of Antillo is part of the ITA030019 SCI called 'Tratto montano del bacino della fiumara d'Agrò'; the municipality of Roccafiorita is part of the ITA030004 SCI 'Bacino del Torrente Letojanni'.

Origins of the territory

The origins of the first settlements date back to the Neolithic period, with the presence of the ancient peoples of Sicani and Siculi. From the 9th century B.C. onwards, the valleys began to be frequented by the Phoenicians, whose main town Phoinix is identified with the present-day Santa Teresa di Riva. This evidence confirms the strategic importance of the area for trade between Sicily, Greece and the East even during the Imperial period. The Valleys were the field of a battle during the First Punic War between the Carthaginians and the Romans, which took place near the town of Limina.

During the Byzantine period, the valleys were at the centre of the political and religious scene: the town of Sant'Alessio presumably owes its name to Alexis I Comnenus, Emperor of Constantinople, who was a guest in the castle around which the town centre later developed. Numerous traces from that period testify to the presence of the Basilian community and the Greek Orthodox cult. In the Middle Ages, the Arab Emirate of Sicily was succeeded by the Normans, the Swabians, the Angevins and the Aragonese dominations. In this period, given the high exposure to Saracen raids, the fortified coastal

[1] All information on the tangible and intangible cultural heritage of the municipalities under study was gathered by consulting the institutional websites of the municipalities.

settlements remained less populated in favour of the hillside villages, where activities linked to trade and agriculture flourished. The culture and traditions of the Valleys and their communities are strongly related to the Spanish domination, which lasted from around 1400 until 1860 and the unification of Italy with the siege of Messina. The communities of the Valleys also actively participated in the events of the Risorgimento, narrated in the museum in Nizza di Sicilia.

Cultural heritage: material and immaterial features

The cultural heritage, both tangible and intangible, reflect the origins and history of the places (Fig. 5).

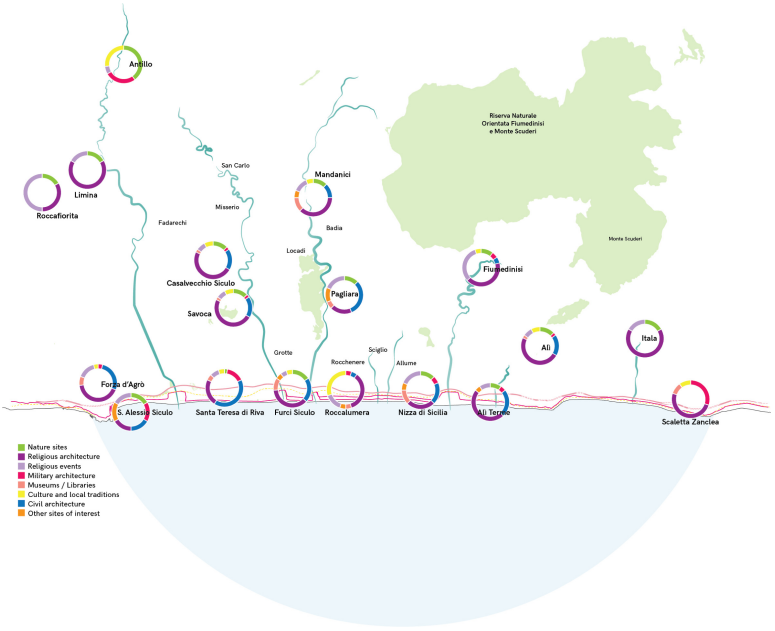

Fig. 5. The density of tangible and intangible cultural resources among the different municipalities.

Religious architecture is the most appreciable due to the high concentration of churches, mainly dating between 1300 and 1700, which host many ancient pieces of art, sculptures, paintings and frescoes. There are also examples of buildings from the early Middle Ages, such as the Monastery of S.S. Pietro e Paolo d'Agrò (in Forza d'Agrò) dating back to 1172. The military architecture, mostly dating from the 16th century, narrates the system of fortifications by the sea with castles and towers. There are also examples of fortified churches and bell towers converted from watchtowers. The civil architecture echoes the richness and elegance of the towns, with noble palaces from the 17th, 18th and 19th centuries. Towns such as Forza d'Agrò, are distinguished by their urban layout in which the houses, huddled together, overlook small internal courtyards. The typical balconies of the civic buildings are made of wrought iron with potholders for basil plant for good fortune. The predominant building materials are sand and local

stone, such as sandstone. The use of these materials forms a chromatic continuum within the surrounding landscape. All the dominations that have succeeded one another in the valleys have left their traces and influences on customs, toponymy and architecture. Civil architecture, in particular, reflects the Spanish influence in the decoration of 17th-century buildings and a minor Art Nouveau style in the bourgeois and working-class buildings of the 1900s. Of particular note is the Durazzesco Arch in Catalan Gothic style in Forza d'Agrò, dating from the 15th century. The lime kilns, the ancient spinning and oil mills, and mining quarries that can still be seen today witness to old knowledge and production activities, now almost completely abandoned, still alive in the memory and identity of the places and communities.

Equally rich is the intangible cultural heritage. Numerous festivals in honour of the Patron Saints and processions, festivals, cultural and folkloristic activities animate the months of March and April, around Easter, and the summer period around Santa Maria del Carmelo (16 July) and the first half of September. Another strong religious cult is linked to Saints Alfio, Filadelfo and Cirino, three brothers martyred in 253 AD in Sicily during the Christian persecutions by the Romans. The festivities in honour of the patron saints are important opportunities to recreate local traditions or religious events by using statuary ensembles (the "varette") or actual staged events. Among the many, the Via Crucis and the so-called "Cerca" of Casalvecchio Siculo, the people's search for Jesus Christ to free themselves from their sins and invoke divine forgiveness. These festivities are often associated with the production of typical dishes, such as the Easter 'Collure', loaves of bread handmade by the inhabitants and offered during the processions. Another widespread and recurring activity is that of the 'infiorata', which involves the involvement and participation of the entire community in the creation of floral installations in the main street of the town.

Literary and film culture also play a particularly important role in recognising the area on the international scene. Salvatore Quasimodo, the Nobel Prize winner for Literature, was born here, hence the literary park in Roccalumera. Numerous scenes from Francis Ford Coppola's The Godfather were filmed in the municipalities of Forza D'Agrò and Savoca. The scenery of the famous film is included in a tourist route that retraces its places. The subject of the filming was the church of San Nicolò, the streets of the old town centre and Palazzo Trimarchi, where Bar Vitelli, mentioned in Mario Puzo's novel and whose sign still stands, was reproduced. Some views of Casalvecchio Siculo were the setting for Michelangelo Antonioni's film 'L'Avventura'. There is no shortage of minor cultural events focusing on the dissemination of vernacular poetry and prose. The evolution of communities, in close contact with the development of local places and traditions, are reproduced thanks to the recent establishment of the Savoca Historical Ethnoanthropological Museum.

Landscape, production and environment

The landscape of the Geographical District can be described starting from the Peloritani mountains, which descends towards the Ionian Sea accompanied by the rivers that define its valleys. The highest peaks are between 12000 and 1300 m above sea level, such as Pizzo di Vernà (1287 m) at Casalvecchio Siculo and Mount Scuderi (1253 m), around which the Fiumedinisi Oriented Nature Reserve arise. The Monti Margi are the highest reliefs in the Agrò area, while Mount Kalfa overlooks Roccafiorita. Springs

spring from these mountains, such as the Mancusa spring in Savoca and the Canale and Fontana springs in Roccafiorita, which feed numerous urban fountains. There are also natural shelters carved into the rock and once used as hermitages. At higher altitudes, the forested Mediterranean vegetation is sometimes interrupted by the moonscapes of the pastures. Near the towns, the agricultural landscape with its mosaic of crops becomes prevalent. The presence of mulberry trees testifies to the flourishing cultivation of silkworms, introduced by the Saracens and developed until 1400 during the Bourbons' reign. The Geographical District is highly specialised in the production of citrus fruits such as the Limone Interdonato di Messina IGP and the Limone Verdello. The cultivation of citrus fruits, together with that of olive trees, distinguishes the landscape at lower altitudes, at the mouths of streams and close to coastal towns. The presence of water is fundamental to the area for urban and agricultural water supply and the tourist and seaside activities of the coastal centres. The latter are pivotal centres from which to explore the valleys towards the more inland areas.

The economy based on agro-pastoral activities has been documented since ancient times: the valleys were once defined as "the granary of the Roman Empire". Numerous historical agroforestry fairs attract the communities of the valleys: the Fair of San Francesco da Paola and the Fair of Santa Lucia in Savoca date back to the 17th century, and the Fair of S. Pietro in Casalvecchio Siculo. The culinary tradition emphasises local raw materials, such as pork, sheep and lamb, bluefish, mustard, pulses, sheep's milk cheeses and seasonal vegetable preserves, oil and wine.

2.4 Local Planning and European Financing

A first comprehensive analysis was drawn up on the basis of the public funding received during the two programming cycles 2007–2013 and 2014–2020. The term "public funding" in the context of this research means the contribution of European, national and regional funding. Details of the allocation of public funding in the case-study area, have been calculated using the source of the OpenCoesione dataset, updated at 31/08/2020 (Open Coesione).

Figure 6 shows the total amount of public funding in the area, about 3.2 billion, of which only ¼ was actually allocated. In addition, a total of private funding EUR 64.5 million are committed. As for the reading instead of the per capita financing, there is an issue related to the database of Open Cohesion: each municipality is associated with the entire financing of projects, even when the project is located in several municipalities. For example, the municipalities of Forza d'Agrò, Pagliara, Sant'Alessio Siculo, Itala, Savoca, Scaletta Zanclea, Alì Terme, Furci Siculo, Nizza di Sicilia and Roccalumera are all beneficiaries of the funding in the thematic area "Transport and infrastructure network" for the intervention "Messina-Catania itinerary: Giampilieri-Fiumefreddo doubling". For this intervention, 2.3 billion have been allocated and as a result each municipality is associated with 2.3 billion (Table 4).

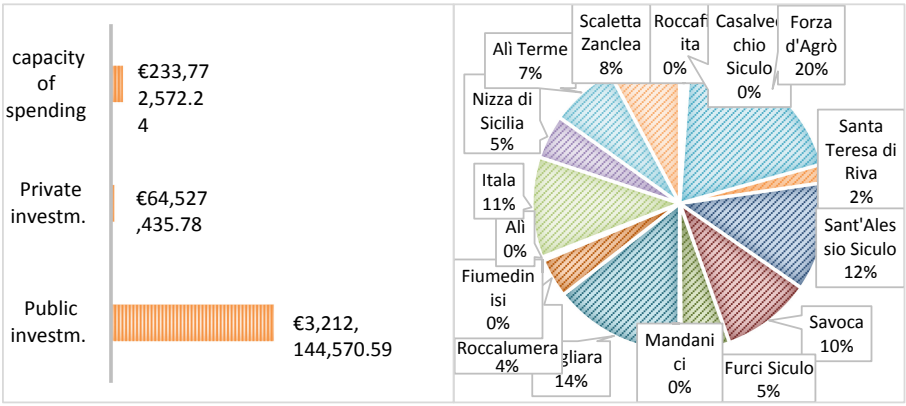

Fig. 6. Framework financing projects and financing distribution per capita

Table 1. Geo-demographic framework of the study area - ISTAT 2011–2019

Municipality	Area (km^2)	Altitude (msl)	Population 2019	Pop. density 2019	Variation of pop 2019–2011
Antillo	43,6346	480	868	19,89	−124
Limina	9,9924	552	761	76,16	−139
Roccafiorita	1,1681	723	186	159,23	−42
Casalvecchio Siculo	33,6218	420	775	23,05	−132
Forza d'Agrò	11,189	420	887	79,27	9
Santa Teresa di Riva	8,1175	6	9394	1157,25	154
Sant'Alessio Siculo	6,1676	15	1532	248,39	35
Savoca	9,0755	303	1761	194,04	−5
Furci Siculo	17,9132	9	3298	184,11	−130
Mandanici	11,8536	417	569	48,00	−60
Pagliara	14,4792	200	1140	78,73	−90
Roccalumera	8,906	7	4119	462,50	14
Fiumedinisi	36,6938	200	1362	37,12	−197
Alì	15,9386	450	734	46,05	−89
Itala	10,9835	210	1535	139,76	−128
Nizza di Sicilia	13,4154	9	3641	271,40	−82
Alì Terme	6,2744	9	2431	387,45	−136
Scaletta Zanclea	4,7618	12	1972	414,13	−277

Table 2. Employment classification - Istat 2011 (8milaCensus)

Municipality	Employment rate	Unemployment rate	Turnover index
Antillo	32,79	16,57	229,79
Limina	25,03	22,90	555,00
Roccafiorita	34,63	14,46	260,00
Casalvecchio Siculo	32,25	17,23	230,36
Forza d'Agrò	38,12	24,94	302,13
Santa Teresa di Riva	39,71	15,82	423,94
Sant'Alessio Siculo	44,96	15,89	371,43
Savoca	37,69	21,57	264,89
Furci Siculo	41,34	16,18	398,64
Mandanici	31,49	19,55	341,67
Pagliara	33,61	22,86	312,73
Roccalumera	38,85	16,43	478,85
Fiumedinisi	37,56	12,26	257,47
Alì	36,30	21,39	229,17
Itala	35,23	22,74	262,20
Nizza di Sicilia	38,98	21,13	322,87
Alì Terme	36,38	15,46	349,11
Scaletta Zanclea	33,92	23,95	306,48

Table 3. Housing stock size- Istat 2011 (8milaCensus)

Municipality	Incidence of buildings in good state of conservation	Incidence of buildings in bad state of conservation	Consistency of historic houses occupied	Average age of recent housing stock
Antillo	67,68	14,64	2,08	32,95
Limina	74,79	1,32	0,00	35,33
Roccafiorita	72,32	12,43	10,19	21,70
Casalvecchio Siculo	49,10	5,20	1,57	42,50
Forza d'Agrò	84,30	1,81	4,87	29,19

(*continued*)

Table 3. (*continued*)

Municipality	Incidence of buildings in good state of conservation	Incidence of buildings in bad state of conservation	Consistency of historic houses occupied	Average age of recent housing stock
Santa Teresa di Riva	66,46	4,22	1,77	28,00
Sant'Alessio Siculo	73,74	2,26	2,38	25,72
Savoca	69,76	1,02	5,33	30,28
Furci Siculo	79,10	1,12	3,05	25,62
Mandanici	78,21	0,51	5,96	36,42
Pagliara	72,74	6,30	5,15	33,59
Roccalumera	66,21	2,14	9,06	24,79
Fiumedinisi	63,37	4,95	35,06	35,95
Alì	55,63	6,57	40,38	29,73
Itala	77,36	1,65	7,16	21,99
Nizza di Sicilia	82,57	1,59	1,14	24,88
Alì Terme	81,77	0,17	0,54	26,38
Scaletta Zanclea	48,09	7,27	4,77	30,98
Case study average	70,18	4,18	7,80	29,78
Sicily	73,8	3	5,3	31,2
Italy	83,2	1,7	10,2	30,1

Table 4. Interventions and social services of the municipalities Istat 2014

Municipal Interventions and social services - 2014			
Disabled people	259.309,00 €	*Multiuser*	18.600,00 €
Dependencies	42.514,00 €	*Household and minors*	1.081.869,00 €
Immigrants and nomads	5.750,00 €	*Poverty*	164.450,00 €
Elderly	376.363,00 €		
Total expenditure (EUR) - 2014			1.948.855,00 €

3 Conclusion

The research is in its first phase; the activities are still in progress, in particular as regards the cognitive aspects. In the continuation of the activities, particular attention will be paid to two aspects: the involvement of citizens and in particular of young people; inter-institutional dialogue and cooperation. At the same time, it will be necessary to refine the techniques to be used for the selection of strategic objectives and projects capable of pursuing them more effectively.

Note: The article is the result of the joint efforts of the authors. However, the following are to be attributed: paragraphs 1 to Francesco Calabrò; paragraphs 2 to Giuseppe Bombino; paragraphs 2.1 to Viviana Vinci; paragraphs 2.2, 2.4 to Giuseppina Cassalia; paragraphs 2.3, 3 to Lidia Errante.

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