

DECISION-MAKING TOOLS FOR SUSTAINABLE RECOVERY OF RURAL VILLAGES: PLANNING POLICIES AND IMPLEMENTATION STRATEGIES FOR VALORISING SMALL COMMUNITIES IN INNER AREAS UNDER THE NEXT GENERATION EU PROGRAMME

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ABSTRACT

The array of funding opportunities provided by the Next Generation EU programme has enabled numerous mountainous regions to initiate urban-scale recovery practices, including for Italian villages. These initiatives follow systemic and multilevel approaches aimed at ensuring sustainable development. Through a meticulous comparison of the practices approved by the competent Ministry (MiBACT) under the public notice, it was possible to deduce some general guidelines describing policies and strategies already oriented towards urban and landscape recovery. These practices encompass a holistic vision, which includes the renovation of historical and architectural heritage, the enhancement of water resources, the digitisation of primary services, and the valorisation of real estate assets and rural landscapes. These actions are implemented through mixed public–private partnership forms, which in the research have been isolated and traced back to a single matrix expression, based on the economic pre-eminence of the contracted investments. The research objective is indeed to discretise these policies into a synoptic framework of possible actions, in order to identify a useful tool in assisting administrations in decision-making and planning processes for the recovery of minor urban contexts. The case study analysed is provided by the practices directly experimented by the municipalities of Grotte di Castro, Latera, Proceno, San Lorenzo Nuovo and Valentano: local authorities originally characterised by progressive depopulation and predominantly agricultural economies, located north of Rome, Italy, and pre-identified by the Italian government within a single inner area, all benefitting from the same ministerial funding. The strategies adopted here in the implementation of the European programme have favoured the transformation of economic indicators in relation to the achievement of the expected milestones from the investment schedule, to the point of delineating unprecedented forms of governance and policies for the sustainable conversion of small historic towns.

Keywords: rural development, inner areas, rural village, sustainable tourism, sustainability, Next Generation EU programme, Bando Borghi, decision making, local scale, circle of sustainability.

1 INTRODUCTION

The pandemic experience has significantly accelerated the migratory and transformative phenomenon that has long challenged the paradigm of living within the urban–rural dichotomy [1], generating renewed interest in peripheral areas. Indeed, alongside the established centripetal attraction exerted by metropolises, there is currently an observable process of ‘return to the countryside’ [2]. A large portion of the community appears to harbour an unexpected fascination with ‘peri-urban’ contexts [3], partly due to the changes that have affected social, economic, productive, and locational assets in the post-COVID-19 era [4]. Specifically, this refers to a trend oriented towards rediscovering the liveability of rural villages, largely justified by the profitability that characterises the real estate market in peripheral and ‘ultra-peripheral’ areas, as well as the newfound need to live in larger, open, and green spaces [5], [6]. This trend also appears to be supported by the widespread adoption of remote working and digital innovation. It is crucial to carefully consider what effectively



represents a slow but inevitable reversal of established migratory processes, while also addressing the fragility of these territories, which struggle to establish themselves in terms of services, infrastructure, and economic competitiveness on the national stage. The aforementioned phenomenon predominantly affects a significant portion of the national territory, characterised by small or modest-sized urban centres that belong to the country's inner areas [7]. These areas are marked by a significant distance from the main centres offering essential services, yet they also possess important environmental and cultural resources. They are already characterised by heterogeneity and deep diversification [8], a complex mix resulting from differentiated dynamics and peculiar, centuries-old anthropisation processes [9]. To promote social cohesion across the territory, in accordance with the principles expressed in Articles 3, 44 (second paragraph), 117 and 119 (fifth paragraph) of the Constitution, the Italian government has initiated ambitious investment programmes aimed at the recovery and enhancement of these inner areas [10], launching a specific National Strategy (SNAI) [11], whose implementation is supported by both European funds (ERDF, ESF and EAFRD) and national resources. The SNAI aims to counteract the demographic decline of the inner areas in the medium term and create new income opportunities for residents, particularly by enhancing local public transport, education, and socio-health services [12]. Additionally, more recent legal instruments have been enacted to ensure concrete support for small municipalities, such as the 'Salva Borghi' law, which aims to promote and support the sustainable economic, social, environmental, and cultural development of small municipalities while protecting and enhancing their natural, rural, historical-cultural, and architectural heritage [13]. Within this framework, these areas have recently benefited from further opportunities for recovery and qualification under the broader investment programme known as National Recovery and Resilience Plan (NRRP). The Italian Ministry of Cultural Heritage and Activities (MiBACT) has allocated substantial resources for new projects aimed at the local regeneration of these marginal contexts through the so-called 'Bando Borghi' [14], the outcomes of which are examined in this research, with particular regard to five rural villages within a single inner area. On one hand, the regeneration strategies approved under Line B of the same call have brought significant public attention to the pressing issue of small village abandonment [15], [16]. On the other hand, these strategies can serve as original models for the sustainable recovery and re-planning of Italian rural villages, providing guidelines and meta-design strategies that can be repeated and replicated in similar contexts.

2 BACKGROUND

Line B of the aforementioned 'Bando Borghi' aims to fund local regeneration projects (LRPs) for approximately 229 Italian villages, which are defined within the public notice as clearly identifiable and recognisable historical settlements, characterised by their original typological and morphological features. These characteristics are due to the preservation of a predominantly continuous historic building fabric and the value of their historical-cultural and landscape heritage. In this context, the experience of the aforementioned call, along with the vision inherent in SNAI policies, can serve as a highly relevant case study to understand the decision-making aspects guiding the judgment of public administrations (PAs) involved in drafting recovery programmes for such peculiar areas. Based on the funding from the NRRP, there is an opportunity to interpret the programmatic choices for the transformation and restoration of rural villages through a critical evaluation framework. This framework should consider the holistic aspects that the theme of sustainability entails, thus verifying the outcomes and results.



2.1 Evaluation of the actual sustainability of local cultural and social regeneration projects in rural villages: Premises and objectives

During the mid-term conference ‘Biosystems Engineering Promoting Resilience to Climate Change’ on 4 April 2024, organised by the Italian Association of Agricultural Engineering in Padua from 17–19 June 2024, the authors presented an initial research step aimed at evaluating the actual sustainability of the programming authorised by the SNAI for the inner area known as ‘Alta Tuscia Laziale – Antica Città di Castro’ [17]. From the investigation, it emerged that the programming approved by the municipalities, government, and the Lazio region [18] was particularly aimed at ensuring a territorial transformation in line with ecological, cultural, and economic performance requirements, albeit with notable gaps in the social dimension of sustainability. From the analysis of the government investments allocated to the investigated inner area, it emerged that there was a partial understanding of the regenerative transformations initiated for the entire territory. To develop a standardised model for the recovery of rural villages, the complexity of large-scale planning must consider the impacts of additional funding acting on the area. As mentioned in the introduction to this research, beyond SNAI policies, the fragile areas of the country today benefit from multiple regulatory and financial interventions aimed at ensuring their development and resilience (such as GAL projects, PRUS, etc.), especially in the current post-COVID-19 framework and in light of NRRP investments. This is notwithstanding the associated implementation difficulties inherent in the Next Generation EU programme [19]. This issue radically shifts the perspective within which the scenarios of previously approved area strategies must be evaluated, given the overlap of multiple investment programs. In this context, it seems reasonable to consider that the various LRPs funded by the ‘Bando Borghi’ can serve as highly interesting case studies, contributing, through their implementation, to ensuring the actual sustainability of an intermunicipal ensemble [20]. This is based on a dual hypothesis:

- That LRP can be considered as strategic planning tools, given their orientation towards local-scale recovery within the financial investment plans that characterise them.
- That the implementation of multiple LRPs located within the same inner area contributes to the development of the entire territorial ensemble, following a holistic vision of transformations that affect deeply interconnected local systems.

Building on the initial research step, in this instance as well, we have chosen to partially adopt the evaluative method previously tested by Serra et al. [21], De Montis et al. [22], [23], and Ledda et al. [24], concerning the effective adaptability to climate change of local urban planning instruments. Aligned with the objectives and premises of the literature just mentioned, this research aimed to experiment with the approved LRPs, pursuing a dual objective:

- To provide an assessment of the actual sustainability of the choices made by public stakeholders in their efforts to produce LRPs for small communities within economically depressed areas of the country.
- To experiment with an evaluative model for approved policies, aimed at enabling continuous monitoring of authorised planning and supporting decision-making processes that generate complex investment programmes.

In pursuing these objectives, and in order to assess the actual sustainability of the LRPs adopted as case studies, the method employed here involves a qualitative comparison



between the design choices underlying local planning (action line) and the broader profiles of ecological, political, economic, and cultural sustainability initially explored by James et al. with the circle of sustainability (CoS) [25]. This methodology follows a logical-deductive framework succinctly described in Fig. 1.

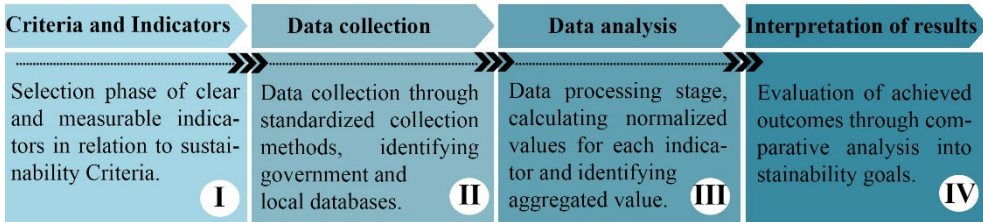


Figure 1: Graphic summary of the sustainability evaluation method adopted.

2.2 Establishment of criteria and indicators for assessing the sustainability of local regeneration plans: Methodological approach

Considering the multitude of factors contributing to structuring a programme aimed at the social and cultural regeneration of an entire area, the chosen investigative method adopts the established structure of the CoS. This approach aims to synthesise the complexity of the strategy into discrete domains, organised within a flexible assessment framework coherent with broader sustainability principles [26]. Through this method, achieving a comprehensive and balanced understanding of sustainability is deemed feasible, thereby facilitating subsequent planning and the potential implementation of effective strategies to shape decade-long policies aligned with environmental, economic, and social objectives [27]. These criteria are systematically detailed in Table 1.

Once the evaluation criteria are defined, it becomes possible to isolate the various actions related to the selected LRPs chosen as case studies, using the investments from funded programmes as performance indicators. This allows for the systematic categorisation, within a single organised framework, of the different design choices adopted by the distinct LRPs, comparing them for similar purposes. It is important to specify that, even if they share abstractly comparable economic indices, these indicators are heterogeneous because they relate to various infrastructures, services, and destinations. Therefore, it is necessary to establish normalised score (NS) using the following equation:

$$\text{Normalised score} = \frac{\text{Current value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}} \quad (1)$$

Having defined the NS as per eqn (1), it is considered feasible to determine the aggregate score for each action contemplated by their respective LRP, using eqn (2). The dimension score (DS) achievable can thus be seen as representative of the intervention concerning the overall complexity of the programme, regardless of the characterisation of the analysed area.

$$\text{Dimension score} = \sum_{i=1}^n (\text{Normalised score}_i \times \text{Weight}_i) \quad (2)$$

Table 1: Evaluation criteria derived from CoS profiles.

Criteria	Perspectives and aspects	Definitions
Ecology	<ol style="list-style-type: none"> 1) Materials and energy 2) Water and air 3) Flora and fauna 4) Habitat and settlements 5) Built-form and transport 6) Embodiment and sustenance 7) Emission and waste 	We refer to the overall scope of practices attributable to the interaction between the social and environmental spheres, concerning the achievable impacts on the physical, human-altered, and natural systems.
Economics	<ol style="list-style-type: none"> 1) Production and resourcing 2) Exchange and transfer 3) Accounting and regulation 4) Consumption and use 5) Labour and welfare 6) Technology and infrastructure 7) Wealth and distribution 	We are referring to the realm of interactions pertaining to practices associated with productive activity, use, consumption, and management of available resources.
Politics	<ol style="list-style-type: none"> 1) Organisation and governance 2) Law and justice 3) Communication and critique 4) Representation and negotiation 5) Security and accord 6) Dialogue and reconciliation 7) Ethics and accountability 	We are referring to the purely social sphere, closely related to the organisation, authorisation, and legitimisation of processes, management, and regulation of shared procedural elements.
Culture	<ol style="list-style-type: none"> 1) Identity and engagement 2) Creativity and recreation 3) Memory and projection 4) Beliefs and ideas 5) Gender and generations 6) Enquiry and learning 7) Wellbeing and health 	We are referring to the realm concerning educational and cultural aspects, which over time can lead to significant discontinuities in the social dimension.

Assuming the weight factor as the actual interaction between selected criteria and indicators according to the weights specified in Table 2, it is believed possible to compare the aggregate score derived for each performance indicator with the pre-identified criteria. This comparison represents, also graphically and chromatically [28], the alignment between design choices and sustainability principles identified by the CoS. It is specified that the assignment of the identified weighting factor in the adherence system is carried out on a subjective basis. The analysis in question is intended to serve as an intermediate structure between quantitative (evaluation of the DS based on the economic value of the assessed allocation) and qualitative (in the case of adherence evaluation).

Table 2: Evaluation system for adherence.

Legend	Assessment of adherence between indicator and criterion	Weight factor
	Full adherence between indicator and criterion	1.00
	Partial adherence between indicator and criterion	0.50
	No interaction between indicator and criterion	–



The authors are aware of the limitations that a qualitative research model entails, particularly concerning the replicability of the experiment. However, it is believed that, at least at this stage, the interdisciplinary characterisation that contemporary discourse assigns to the theme of sustainability cannot exclude an interpretative analysis, the results of which are directly related to the overall contextual framework.

3 MATERIALS AND METHODS

As mentioned, the focus of the research involves analysing five LRPs adopted by five rural villages and funded under component 2.1 ‘Attraction of Villages’, component MIC3 of the Next Generation EU programme. Specifically, we are referring to proposals approved by MiBACT [29] within the framework of the same inner area, known as ‘Alta Tuscia Laziale – Antica Città di Castro’, an area characterised by particular social vulnerability. This section provides a concise representation of the LRPs.

Among the municipalities funded by MiBact following the evaluation process of the ‘Bando Borghi’, five local communities benefitting from the community grant have been identified within the same inner area. These include the municipalities of Grotte di Castro, Latera, Proceno, San Lorenzo Nuovo, and Valentano, located in the province of Viterbo, in the northern part of the Lazio region, not far from the capital city (Fig. 2).



Figure 2: Territorial identification highlighting the inner area.

These are five municipalities belonging to a single mountain community, characterised by an extensive territory primarily dedicated to agriculture, despite a sparse residential population. All have been beneficiaries of a total European funding amounting to €7,575,981.50. Despite their rural economic base [30], the area faces a gradual depopulation phenomenon, although it boasts significant landscape, natural, and environmental assets, as well as notable geological features deserving extensive protection, especially in the area between Latera and Valentano [31]. In particular, it is noteworthy that the competent Chamber of Commerce of the Province of Viterbo has recorded a negative trend for almost all major sectors of the local economy even in the last 4 years [32]. As shown in Table 3, considering the years from 2020 to 2023, the net balance of businesses operating in the area is negative. The balance across various annual reports indicates the disappearance of over 1,415 businesses in the same area, of which 1,151 belong to the agricultural sector. The agriculture, forestry, and fishing sector appear to be among the hardest hit by the economic downturn affecting the area, exacerbated by the region’s environmental characteristics. This

is considered to be one of the main causes of depopulation and one of the primary reasons that led the Italian government to invest in the tourism attractiveness of rural villages, in an attempt to change the traditional economic vectors that have proven unsustainable.

Table 3: Number of registered and active businesses annually across different economic sectors. Analysis covering the period from 2020 to the first half of 2024. (Source: *Annual Reports of the Chamber of Commerce of Rieti and Viterbo.*)

N.	Economic sectors	Number of businesses registered				
		2020	2021	2022	2023	2024
1	Agriculture, forestry, fishing	11,757	11,746	11,483	11,162	10,606
2	Mining and quarrying	50	52	52	44	44
3	Manufacturing activities	2,042	2,004	1,938	1,876	1,909
4	Supply of electricity, gas, etc.	44	39	37	41	41
5	Supply of water, sewage systems, etc.	55	58	57	55	55
6	Construction	4,930	5,132	5,077	5,082	5,080
7	Wholesale and retail trade	7,928	7,868	7,580	7,435	7,347
8	Transport and storage	533	526	493	489	482
9	Restaurant and accommodation activities, etc.	2,398	2,440	2,408	2,440	2,423
10	Information and communication services	544	568	562	588	575
11	Financial and insurance activities	554	545	533	538	539
12	Real estate activities	934	973	986	1,009	1,002
13	Professional activities, etc.	776	802	796	826	835
14	Rental, travel agencies, and similar services	938	971	959	975	980
15	Health and social assistance	207	219	225	236	237
16	Artistic, entertainment activities	409	410	406	405	407
17	Other service activities	1,352	1,372	1,368	1,376	1,375
18	Unclassified enterprises	2,323	2,352	2,206	2,189	2,422
Total		37,774	38,077	37,166	36,766	36,359

These characteristics have led lawmakers to adopt specific policies to promote the development of these territories, aiming for economic, social, and territorial cohesion and addressing economic disparities, in accordance with Article 174 of the Treaty on the Functioning of the European Union. This includes dedicated allocations through the Cohesion and Development Fund (FSC) [33].

3.1 Overall objectives: towards a model of territorial interaction

The case study of this investigation is represented by five villages deeply interconnected with the reference territorial system, where it becomes increasingly urgent to adopt actions primarily aimed at ensuring their protection and enhancement [34]. In this territorial perspective, the village exhibits hybrid characteristics, typically premodern, synthesising both urban and rural elements [35]. To ensure the sustainable development of these territories, it is necessary to adopt an integrated approach that considers both these components and their various combinations. In this sense, LRP are structured as 'place-based' programmes based on a systemic approach, resulting from shared and co-designed



decisions facilitated by direct engagement with local public and private actors [36]. This innovative approach, coupled with the relevance of regenerative perspectives for villages and the preservation of urban–rural dynamics, underscores the importance of the case study, particularly in response to the environmental urgencies [37] inherent in sustainability [38]. Following the method outlined in the Section 2, below is a concise description of the aforementioned strategies, highlighting the action lines absorbed and aggregated in a table based on the terms used in the ‘Bando Borghi’, along with the respective investments, impact percentages influencing each intervention’s implementation, and the NS calculated based on the predetermined financial commitments.

3.1.1 LRP – Municipality of Grotte di Castro

As highlighted in the documents accompanying the approval resolution of the LRP proposed by the municipality of Grotte di Castro [39], the project encompasses a multitude of interventions aimed at connecting the village with the lake resource, promoting the enhancement of archaeological assets and water-related goods, as well as the restoration and repurposing of several buildings in the historic center and the creation of digital tools. The various designs comprising the examined programming are detailed in Table 4.

Table 4: Summary framework of the LRP of Grotte di Castro (top) and evaluation of interactions between criteria and indicators (bottom).

Code	Line of action	Cost (€)	Impact (%)	NS
GC-01	Implementation of cultural infrastructures	556,046.00	34.75	0.92
GC-02	Initiatives for conservation	97,600.00	6.10	0.13
GC-03	Increase in cultural participation	21,960.00	1.37	0.00
GC-04	Development of tourist infrastructure	601,948.00	37.62	1.00
GC-05	Increase in residential attractiveness	152,500.00	9.53	0.23
GC-06	Actions to support communication	133,346.00	8.33	0.19
GC-07	Activities for service management	36,600.00	2.29	0.03

Code	Ecology							Economics							Politics							Culture						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
GC-01	■			■		■	■					■	■	■								■	■	■	■	■	■	■
GC-02		■	■	■							■			■							■	■	■	■	■	■	■	■
GC-04			■	■	■	■	■					■	■	■								■	■	■	■	■	■	■
GC-05	■	■	■	■	■	■	■					■	■	■								■	■	■	■	■	■	■
GC-06							■							■								■	■	■	■	■	■	■
GC-07							■				■	■		■														

3.1.2 LRP – Municipality of Latera

The needs identified by the LRP of Latera [40] can be understood within three main areas defined as repopulation, redevelopment, and revitalisation. In order to address these specific needs, the project will enhance social and cultural infrastructure, fostering public–private partnerships with investors interested in revitalising some of the currently vacant structures in the historic centre. The planned interventions and allocated resources for this purpose are summarised in Table 5.

Table 5: Summary framework of the LRP of Latera (top) and evaluation of interactions between criteria and indicators (bottom).

Code	Line of action	Cost (€)	Impact (%)	NS
La-01	Implementation of cultural infrastructures	353,100.00	29.43	1.00
La-02	Initiatives for conservation and enhancement	149,000.00	12.41	0.19
La-03	Increase in cultural participation	100,000.00	8.33	0.00
La-04	Development of tourist infrastructure	180,000.00	15.00	0.32
La-05	Increase in residential attractiveness	217,900.00	18.16	0.47
La-06	Actions to support communication	100,000.00	8.33	0.00
La-07	Actions of inter-territorial cooperation	100,000.00	8.33	0.00

Code	Ecology							Economics							Politics							Culture						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
La-01	■			■		■	■				■	■	■	■								■	■	■	■	■	■	
La-02		■	■	■		■				■	■		■	■						■		■	■	■	■	■	■	
La-04			■	■	■	■	■				■	■	■	■								■	■	■	■	■	■	
La-05	■	■	■	■	■	■	■					■	■	■	■							■	■	■	■	■	■	

3.1.3 LRP – Municipality of Proceno

The LRP of Proceno [41] aims to counteract demographic depopulation affecting the municipality by facilitating residency and creating job opportunities, as well as promoting temporary habitation in the village through continuous structuring of training and research courses, also functional in activating new economies for the territory. Simultaneously, the activation of new services, including digital ones for pilgrims and tourists interested in the nearby Via Francigena route, is planned. Summary in Table 6.

Table 6: Summary framework of the LRP of Proceno (top) and evaluation of interactions between criteria and indicators (bottom).

Code	Line of action	Cost (€)	Impact (%)	NS
Pr-01	Implementation of cultural infrastructures	538,240.64	34.07	1.00
Pr-02	Initiatives for conservation	175,000.00	11.08	0.29
Pr-03	Increase in cultural participation	361,964.39	22.91	0.65
Pr-04	Activities for service management	61,000.00	3.86	0.06
Pr-05	Development of tourist infrastructure	175,796.00	11.13	0.29
Pr-06	Increase in residential attractiveness	60,000.00	3.80	0.06
Pr-07	Actions to support communication	178,000.00	11.27	0.29
Pr-08	Actions of inter-territorial cooperation	30,000.00	1.90	0.00



Table 6: Continued.

Code	Ecology							Economics							Politics							Culture						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Pr-01	■			■		■	■					■	■	■									■	■	■	■	■	■
Pr-02		■	■	■		■					■	■	■								■		■	■	■	■	■	■
Pr-03													■										■	■	■	■	■	■
Pr-04								■	■	■	■	■	■								■							
Pr-05			■	■	■	■	■					■	■	■								■	■	■	■	■	■	■
Pr-06	■	■	■	■	■	■	■						■	■													■	■
Pr-07							■						■														■	■

3.1.4 LRP – Municipality of San Lorenzo Nuovo

The LRP approved by the municipality of San Lorenzo Nuovo [42] aims to recover part of the environmental, historical, and artistic heritage, enhancing its usability and accessibility, and promoting the participation of local actors in the development of innovative local services. The investment programme includes interventions aimed at increasing the attractiveness of the village and thereby combating its progressive depopulation, leveraging the use of new network technologies, especially in relation to the local entrepreneurial fabric and the untapped potential of the area. See Table 7 below for details.

Table 7: Summary framework of the LRP of San Lorenzo Nuovo (top) and evaluation of interactions between criteria and indicators (bottom).

Code	Line of action	Cost (€)	Impact (%)	NS
SL-01	Implementation of cultural infrastructures	427,643.20	26.79	1.00
SL-02	Increase in cultural participation	199,700.00	12.51	0.00
SL-03	Development of tourist infrastructure	394,720.00	24.73	0.86
SL-04	Increase in residential attractiveness	271,660.00	17.02	0.32
SL-05	Actions to support communication	302,260.00	18.94	0.45

Code	Ecology							Economics							Politics							Culture						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
SL-01	■			■		■	■					■	■	■									■	■	■	■	■	■
SL-03			■	■	■	■	■					■	■	■									■	■	■	■	■	■
SL-04	■	■	■	■	■	■	■						■	■													■	■
SL-05							■						■														■	■

3.1.5 LRP – Municipality of Valentano

The municipality of Valentano, in implementing the LRP known as the ‘New Renaissance of Valentano’ [43], aimed to focus the programme’s objectives in alignment with further complex developments affecting the area. Alongside the need to create an integrated system to promote territorial marketing and community wellbeing, the LRP aims to structure an interconnected territorial ecosystem, counteracting the depopulation. The programme addresses these issues by leveraging the enhancement of historical heritage through events dedicated to local traditions and gastronomic products, as indicated in Table 8.

Table 8: Summary framework of the LRP of Valentano (top) and evaluation of interactions between criteria and indicators (bottom).

Code	Line of action	Cost (€)	Impact (%)	NS
Va-01	Implementation of cultural infrastructures	519,974.56	32.50	1.00
Va-02	Increase in cultural participation	91,378.00	5.71	0.03
Va-03	Activities for service management	271,064.85	16.94	0.44
Va-04	Development of tourist infrastructure	442,728.02	27.67	0.82
Va-05	Increase in residential attractiveness	195,551.57	12.22	0.26
Va-06	Actions to support communication	79,300.00	4.96	0.00

Code	Ecology							Economics							Politics							Culture						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Va-01	■			■		■	■				■	■	■	■								■	■	■	■	■	■	
Va-02															■							■	■	■	■	■	■	
Va-03	■			■	■	■	■				■	■	■									■	■	■	■	■		
Va-04			■	■	■	■	■				■	■	■	■								■	■	■	■	■	■	
Va-05	■	■	■	■	■	■	■					■	■	■	■							■	■	■	■	■	■	
Va-06							■						■									■	■	■	■	■	■	

4 RESULTS AND DISCUSSION

The distinct line of action planned for each LRP are financially supported by European funds transferred to local authorities under the Next Generation EU programme, alongside additional measures adopted by the Italian government to ensure territorial cohesion in depopulated villages. These funds ensure the implementation of the lines of action as outlined in Tables 4–8. According to the regulations governing the preparation of multi-year, economic, and financial budgets of local authorities, assuming therefore that a significant allocation of economic resources corresponds to a predominant and prioritised public interest [44] underlying the implementation of the LRP, it is possible to compare each line of action according to the evaluation method described in Section 2.2. Based on these values, classified according to the research methodology previously outlined, it was intended to qualitatively identify the aggregated score (DS), experimenting with the interaction between the adopted strategies and the sustainability criteria previously identified. This adherence assessment, based on direct qualitative comparison of CoS profiles and the expected outcomes for each intervention, was carried out based on data derived from the LRP and summarised in Section 3 of this work. From the analysis conducted, a consistent framework emerges for the actions taken by the municipalities in the inner area, whose planning is strongly oriented towards ensuring the recovery, efficiency improvement, and enhancement of historical assets in their respective villages, even changing their original intended use (GC-01, La-01, Pr-01, SL-01, Va-01). Given the availability of similar assets (such as the Rocca Farnese complex in Valentano and the ‘Mons. Antonio Patrizi’ Municipal Library in Grotte di Castro), all municipalities have indicated a higher economic allocation for the enhancement of real estate. This fact undoubtedly creates interactions between lines of action and criteria related to the ecological, economic, and cultural sustainability plans, thereby promoting, on the one hand, the conservation of real estate heritage and, on the other hand, enabling the promotion of intangible cultural heritage associated with cultural elements, to be subsequently allocated within these aforementioned assets. Moreover, the experiences of the analysed LRPs show a

significant intention for territorial interaction, promoting the formation of a renewed partnership between the village and the natural environment (GC-04, La-04, Pr-05, SL-03, Va-04), aiming to protect the resources present there (the water basin of Lake Bolsena in the case of Grotte di Castro, rural hiking trails in Proceno, the geomorphological qualities of the area in Valentano). This is not dissimilar to what scientific literature proposes on the subject [45]. Even in the face of a more punctual and heterogeneous programming (Proceno) or differently aggregated into macro intervention areas (San Lorenzo Nuovo), the analysed LRPs find a common denominator in a strong inclination to respond to ecological, economic, and cultural needs, almost never adopting tools suitable to promote the governance dimension of the project (with the exception of communication support lines identified with GC-06, La-06, Pr-07, SL-05, and Va-06). This outcome appears to be in line with the expectations set by the 'Bando Borghi' and consistent with the milestone of the Next Generation EU programme that originated the public notice to which the municipalities responded. This strategy also seems to find broader support in academic theories that directly correlate ecological and social aspects inherent in the concept of sustainability. This is also specified as the adherence evaluation performed did not consider LA characterised by a DS score of 0, for which lines did not proceed to evaluate an aggregated score (GC-03, La-03, La-06, La-07, Pr-08, SL-02, Va-06). The overall outcome of the aforementioned thematic comparison between CoS profiles and strategy actions is subsequently reported in Fig. 3, whose infographic structure was proportionally drafted based on the identified DS.

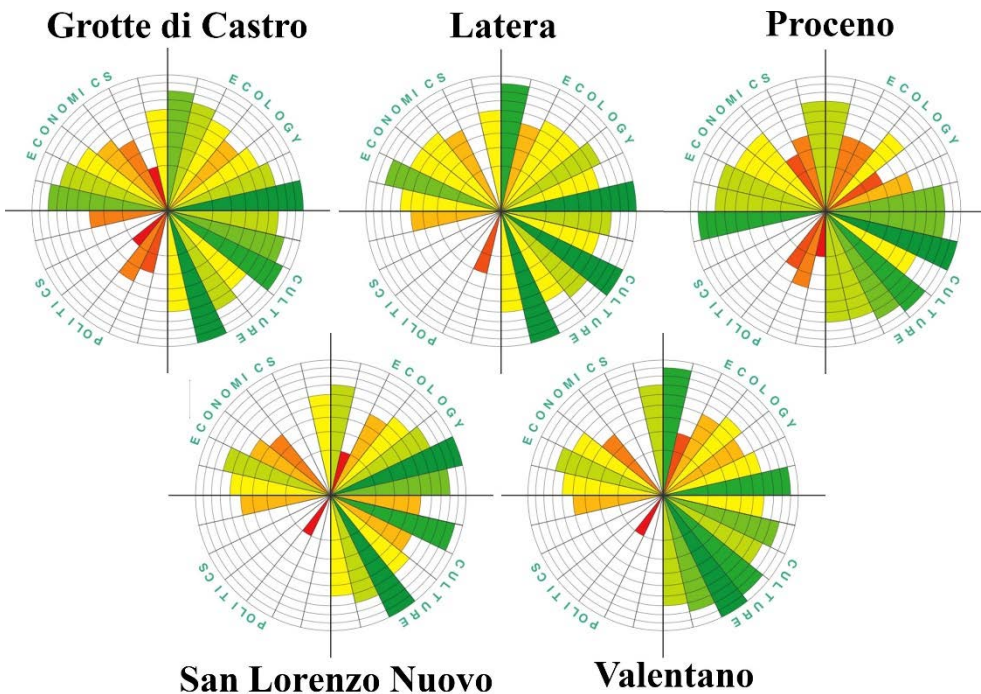


Figure 3: Assessment of sustainability according to the CoS infographic.

5 CONCLUSION

The historic village consists of a settlement type, on a local scale, in morphological and functional relationship with the agricultural context, characterised by the presence of multiple units typical of the territory outside the historic city and by the presence of a delimited urban layout, in which there are characteristic elements of identity, both tangible and intangible heritage. Based on these specificities, observed in each of the investigated case studies, all LRPs have focused on the need to ensure the proper enhancement, protection, and management of the existing real estate heritage, envisioning trajectories of economic development aimed at ensuring the touristic attractiveness of the reference context, also starting from the available natural resources.

The evaluative outcome reveals a significant inclination of the LRPs towards promoting aspects relevant to ecological and cultural development. At the same time, there is a progressive marginalisation of the economic and political aspects related to the social dimension of sustainability. In this perspective, any additional forms of financing, planning, and project design must ensure broader hypotheses for remediation, supporting actions aimed at bridging the highlighted gap. The proposed methodology allows evaluating in a flexible framework the actual sustainability of the decisions underlying the LRPs, identifying any gaps and potential criticalities in a complex programming, also to support the decision-making process in the eventual allocation of additional resources, thus also anticipating a framework of actions necessary to ensure the completeness of the Strategy in the CoS. Nevertheless, at the end of the LRPs implementation, the same verification tools experimented here can also be used in an ex post verification phase, thus achieving an exact match between the ambitions pursued by the PAs and the results effectively achieved. It is important to highlight how the results of the investigative study on the LRPs can also be directly compared with those already achieved by the authors in assessing the SNAI, in order to determine an overall assessment of the effective sustainability of the plurality of interventions affecting the same internal area. In this sense, this research can provide only a partial reading of the transformations acting on the territory, which must be evaluated within the broader framework of all the planning and programming adopted by each municipality, in order to determine the set of actions aimed at ensuring the regeneration of rural villages. Actions that, in turn, can enable a broader classification of strategies and recovery opportunities for local contexts of small scale, describing a possible taxonomy of conversion, qualification, and recovery opportunities, potentially replicable and repeatable for similar scenarios. These themes represent possible additional development scenarios for research aimed at identifying sustainable conversion criteria and methods for urban and peri-urban areas, also supporting the decision-making processes involving public actors in Italy.

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