

Article

Ecovillages as Living Labs for Social Innovation: The Case of Torri Superiore

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Abstract

Italian inner areas face population decline, limited access to services and fragile infrastructure; however, the micro-mechanisms through which community practices generate tangible improvements often remain unclear. Still, local communitarian initiatives, such as those represented by ecovillages, can be an effective response to the ongoing process of marginalisation, becoming true living labs for place-based transitions. Through the analysis of the Torri Superiore Ecovillage (Imperia, Italy), a recognised and well-known good practice in the national and international ecovillage circuit, we want to find answers to three research questions: (RQ1) To what extent can an ecovillage act as a living lab for social innovation and ecological transition in inner areas? (RQ2) Which demographic and governance conditions enable territorial resilience and which ones block it? (RQ3) Which environmental practices generate locally significant improvements and with what limitations? Based on qualitative and interpretative evidence (2016–2025)—field observations, internal documents and testimonies—and on essential demographic indicators (ISTAT/SNAI), this study examines the Torri Superiore Ecovillage as a small-scale living lab. Torri Superiore and the surrounding municipalities are ageing and have reduced demographic bases; however selective immigration and heterogeneity of skills act as partial buffers. The governance of the Torri Superiore Ecovillage combines clear rules, participatory routines and coordination mechanisms, promoting problem solving while remaining sensitive to leadership burdens. The “bridging” between multiple actors enables terrace maintenance, local water resource management, agroecological practices, renewable energy adoption, waste prevention/composting and light mobility to achieve tangible environmental improvements on a small scale. We frame transferability as analytical (not statistical), specify the enabling conditions (sufficient active participants, stable routines, territorial management) and outline the relevant policy implications for SNAI classes and a lightweight longitudinal observatory.



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1. Introduction

Italy's inner areas constitute a large and polycentric part of the country. They are characterised by low population density, discontinuous access to essential services and long-term demographic fragility. The National Strategy for Inner Areas (SNAI) proposes a place-based interpretation, based on criteria of travel time to services (education, health-care, mobility) and on a development perspective that aims to integrate quality of life,

socio-economic cohesion and sustainability. This approach has been confirmed in the most recent programming cycles and technically updated in the 2020 mapping [1], reinforcing the idea that “innerness” is a functional condition, not just an administrative one. In this context, municipalities classified as intermediate, peripheral and ultra-peripheral systematically experience greater difficulties in accessing services and decreasing density, with cumulative effects on socio-economic opportunities and demographic trajectories [2]. Studies on sustainable transitions have emphasised the importance of spaces and processes for social innovation capable of mobilising local actors, local knowledge and forms of co-production of goods, services and rules. The approach of Moulaert and colleagues, in particular, clarifies that social innovation does not coincide with mere organisational “novelty”, but implies a combination of meeting needs, changing social relations and empowering individuals and communities, with attention to power asymmetries and possible side effects [3]. In parallel, the literature on sustainable transitions and social innovation highlights the role of co-creation devices in real contexts (living labs) as mechanisms for learning and coordination in complex territorial ecosystems; recent reviews discuss their constructs, limitations and conditions for effectiveness, including in terms of integration with regional innovation ecosystems [4–6].

On the intentional communities/ecovillages side, new studies show how such contexts can serve as sustainability laboratories with environmental and organisational micro-performances such as water and energy management, agroecology, waste reduction/reuse, and mutualism, but with limited scalability and selective dynamics (sustainability-oriented migration, transformations “from traditional village to ecovillage”) [7,8]. Furthermore, recent empirical evidence suggests that digital connectivity and ultra-broadband influence productivity, services and tourist appeal precisely in peripheral areas, indicating a crucial infrastructural hub for local resilience trajectories [9,10]. Within the Italian context, ecovillages occupy different niches across inner areas. Some are converted traditional hamlets—e.g., Torri Superiore (Liguria) or Granara (Emilia-Romagna)—that repurpose existing stone fabric and terrace systems; others are purpose-built intentional communities with stronger cultural/associative infrastructures, such as Damanhur (Piedmont). While these models vary in size, governance and economic profile, they share a common emphasis on in situ learning, routine-based management, and multi-actor bridging typical of living labs. Alongside enthusiastic interpretations, the literature that pays closer attention to transitions highlights the ambivalences: risks of a “showcase effect”, dependence on leadership, limits of scalability and transferability, and possible distributive inertia [11–13]. In the Italian case, these issues are intertwined with complex demographic dynamics: ageing, reduced resident bases and new selective mobility (neo-rurality, returns, multi-locality), which can produce differentiated outcomes at the sub-regional level. Part of the rural geography also draws attention to phenomena of rural gentrification and “class colonisation”, which are possible when environmental and cultural attractions are not accompanied by measures of accessibility, services and socio-economic inclusion. These readings are useful in order not to naturalise outcomes considered “virtuous” and to maintain a critical lens on who benefits from the transformations and how [13,14].

Our contribution is dedicated to the case study of Torri Superiore Ecovillage (Province of Imperia, Italy), which we selected as a recognised and well-known good practice in the national and international ecovillage circuit. The ecovillage, located in the hinterland of the municipality of Ventimiglia, despite having some characteristics typical of inner areas such as distance from essential service centres (education, health, transport), depopulation and ageing populations, high emigration of skilled young people, shows significant environmental and cultural resources, has strong links with national and international networks and it is home to innovative European projects with a high socio-territorial impact (Horizon,

Erasmus, European Voluntary Service, training initiatives). Furthermore, the choice of Torri Superiore as a case study is also motivated by our decade-long involvement with the ecovillage (2016–2025), which has allowed us to establish a lasting relationship of mutual trust that has seen us collaborate on site-specific educational projects and interdisciplinary research over the years.

Our analysis, which focuses on the role of community practices in local sustainable transition, has two objectives: (i) to contribute to the debate on social innovation and living labs in decentralised Italian contexts, with a focus on enabling conditions; (ii) to provide useful evidence for the development of place-based policies and the definition of shared monitoring tools. Three research questions (RQ) guide the work: RQ1. To what extent can an ecovillage in an inner area function as a living lab for local sustainable transitions? RQ2. What demographic and governance conditions (including social capital) enable or hinder territorial resilience? RQ3. What environmental practices (energy, water, waste, land use/agroecology) generate locally significant improvements and with what limitations? We consider RQ1–RQ3 through a combination that connects territorial resilience, living labs and social innovation: resilience provides the outcome orientation, living labs provide co-creation and in situ learning, and social innovation provides the reconfiguration of governance around needs.

To answer these questions, we combine an essential set of demographic indicators [1,2,15], documentary analysis and qualitative field observations. The methodological choice favours parsimony: rather than estimating extensive impacts, we aim to identify mechanisms and conditions that make environmental and organisational micro-innovations replicable—under certain conditions. In this sense, we treat Torri Superiore as a small-scale laboratory: a context in which to verify how participatory routines, bridging links with external actors, minimum scale thresholds for light infrastructure and coordination constraints coexist (or come into tension). The argument we propose is that the value of ecovillages in inner areas lies less in “big numbers” and more in their ability to weld practices and governance into cumulative trajectories, while recognising the risks of social selectivity and the need for accompanying public instruments.

2. Materials and Methods

2.1. *About Resilience and Social Innovation in Inner Areas: Conceptual Background*

To analyse the capacity of ecovillages to enable transformative processes that can lead to sustainable transitions in inner areas, we have chosen to intertwine two key concepts: territorial resilience and social innovation.

In territorial sciences, the concept of resilience denotes a dynamic reactive process through which a given socio-spatial system manages to adapt to external stimuli. In particular, it indicates the system’s ability, in the face of disruptive events, to reorganise and innovate in order to achieve a new state of equilibrium [16,17]. As already discussed in Gambazza [18], the analysis of this type of transformative resilience has two fundamental characteristics. Firstly, scholars have highlighted how pre-existing fragilities can influence adaptation pathways, showing that resilience is never neutral: it serves to understand where the system risks reproducing imbalances and to identify margins for change. Furthermore, attempts have been made to deconstruct the emphasis placed on restoring the initial equilibrium, promoting policies that advocate a “bouncing forward” towards a new stage of environmental and social evolution. Political strategies inspired by the new theory therefore aim to provide areas affected by shock with new opportunities for sustainable development, to be achieved through the active involvement of civil society [19–21]. In the case of inner areas in Italy, territorial resilience should be understood above all as the ability to cope with long-term structural shocks, not so much exceptional events as slow and cumulative

processes: depopulation, demographic ageing, infrastructural marginalisation, limited access to services, as well as the impacts of the climate crisis. These aspects constitute the framework within which to interpret the social innovation practices and sustainable transition trajectories presented below. However, applying the concept of resilience to the social sphere is not without its problems: in fact, there is often a risk of neglecting regulatory dimensions and power relations, making it necessary to always ask “resilience of what, and for whom?” [22]. This reinterpretation of the concept of resilience paves the way for reflection on which practices and tools can act as vectors of transformative resilience: among these, social innovation (SI) stands out as a key interpretative and operational factor. This approach is part of a broader debate that has sought to intertwine resilience, social innovation and sustainable development. One example is the Portugal Inovação Social (PIS) programme, which has supported collaborative networks and community response capabilities, while at the same time highlighting the ambivalence of SI between emancipation and the risk of neoliberal co-optation [23].

From a territorial point of view, SI involves the transformation of social relations in space, the reproduction of place-based identities and cultures, and the construction of place-based and multi-scale governance structures. SI therefore presents itself as a mostly local or regional phenomenon, often negotiated between actors and institutions with a strong territorial affiliation. It is therefore configured as a practice anchored in specific territorial contexts, capable of constituting a tool for local development according to models alternative to the dominant neoliberal ones [24,25]. The exploration of epistemological perspectives on SI revolves around two main schools of thought: the so-called North American Practical Stream, which considers it a managerial-entrepreneurial response to major social issues; and the Critical Stream, developed in the Euro-Canadian context, which focuses more on the collective processes that drive social change [26,27].

According to MacCallum et al. [28], SI is divided into three fundamental interconnected dimensions: satisfaction of alienated needs, innovation in social relations, and socio-political empowerment. The first dimension, satisfaction of alienated needs, concerns the response to material and immaterial needs not covered by the market or the state, such as access to resources and political participation. Although needs are manifold and changing, they can be traced back to alienated basic needs, which include the aspiration to decent living conditions and a recognised political voice. The second dimension, socio-political empowerment, refers to strengthening the empowerment of communities and local actors. In the start-up phase, it is essential that they share, at least partially, common values featuring resources, practices and norms prevailing in a given territory. This awareness allows material and immaterial resources to be mobilised to respond to collective needs [28]. The third dimension, transformation of governance relations, concerns the creation of new decision-making structures, collaborative networks and participatory practices. In this context, programmes such as LEADER have partly operated as laboratories of social innovation, activating partnerships and new forms of governance [29].

It has also been observed that SI practices often operate according to a neo-endogenous model of rural development, enhancing the impact of trans-local elements in regional development initiatives and, at the same time, the importance of local practices in promoting resources, territorial competitiveness, innovation and inclusion. Additionally, it can transform the traditional roles of innovators and users and involving the latter in open processes of co-creation, co-production and exchange [30]. From a methodological point of view, it is worth reiterating that SI must be evaluated not only on the basis of the results achieved, but also on the processes activated. Once triggered, SI reconfigures (or should reconfigure) the social practices of a community and promotes consensus building and learning on issues of collective interest. In this sense, it strengthens the social network of communities, involv-

ing local actors in decision-making processes and paying particular attention to the most vulnerable individuals, thus strengthening their sense of belonging to the territory [31].

As suggested by Fougère & Meriläinen [32], it is nevertheless important to emphasise that the discourse on SI also has its dark sides, which are even present in the Critical Stream, in which this paper is framed. On the one hand, it can be a tool for transformative resilience, but on the other, it can produce undesirable side effects, be exploited in a neoliberal way, or be captured by powerful actors who distort its original aims. This confirms that SI, like resilience, must always be situated and problematised in terms of power, inequalities and selective appropriations. From this perspective, social innovation in inner areas can be seen as part of a broader ecosystem of rural resilience, in which place-based solutions, community networks and human knowhows combine to address shocks and transformations [33]. In inner areas, SI manifests itself in practices such as the co-management of commons, social farming, community cooperatives and ecovillages. These experiences promote forms of transformative resilience, capable of reinventing local economies, maintaining basic services and attracting new inhabitants [34,35].

2.2. Research Design

As is well known, the demographic structure of inner areas (small and ageing resident population, migratory movements, commuting, negative birth rate) influences the enabling of social innovation processes and the launch of experiments such as living labs. In these contexts, socio-territorial structures based on the commons can produce significant micro-performance in terms of water and energy savings/reuse, circularity and agroecological land management. However, the viability of these practices is conditioned by the number of people involved, the presence of infrastructure and the costs of multi-actor coordination. Awareness of these processes motivates our decision to complement the analysis of the essential demographic profile of the surrounding municipalities with a qualitative reading of community governance and environmental practices at the Torri Superiore Ecovillage.

In deepening the analysis of the chosen case study, we adopt a qualitative approach that leads us to an interpretive design that combines mixed evidence and is calibrated to the availability of documentation. The evidence considered integrates: (i) an essential set of demographic indicators at the municipal level (provided by the databases of the National Institute of Statistics ISTAT [36,37]; inner area classifications according to SNAI), (ii) documentary analysis (internal regulations, project materials, activity logs), and (iii) qualitative field observations conducted during site-specific activities with our Bachelor students in Geography over the ten-year period 2016–2025, including informal conversations and 12 semi-structured 45 min interviews (see File S1 in Supplementary Materials) to the members of the intentional community (4 elderly founders, 2 cooks, 2 responsible persons for the cultural association, 2 responsible persons for the landscape managing, 2 responsible persons for the volunteers). Our qualitative-interpretative approach is based on triangulation of sources and methods and on analytical generalization rather than statistical inference. Triangulation took place both between types of sources (observations, testimonies, documents) and along the time axis (recurrence of the same patterns in different seasons/years), favouring recurring mechanisms over isolated events. The interviews were recorded and transcribed; coding was conducted in an iterative and inductive-deductive manner, and the content was organised by theme. To reduce observation bias, we diversified the locations and times of observation (ordinary routines, seasonal activities, events with outsiders). All activities followed the University's ethical standards; participants provided informed consent; data were pseudonymised and managed according to minimisation criteria. Direct quotations, where present, are paraphrased to avoid re-identification. Interviews followed an outline reported in the Supplementary Materials and are discussed further in the paper.

To compensate for the lack of robust statistics on a hamlet scale and place Torri Superiore in its functional context, we consider the unit of analysis from a multiscale perspective: hamlet/ecovillage → municipality (Ventimiglia) → contiguous cluster of comparable municipalities in the inner area. This choice allows us to answer RQ1–RQ3, identifying enabling mechanisms and conditions in a parsimonious manner, without setting ourselves the goal of estimating large-scale causal effects.

2.3. Study Area: Torri Superiore

Torri Superiore is a medieval hamlet located on the inner edge of the municipality of Ventimiglia, in the valley of the Bevera River (a tributary of the Roia), about 11 km from the urbanised coast (Figures 1 and 2). Although it lies outside the SNAI perimeter that delimits the Imperia inner area, its valley morphology and slope, its position behind the coast and the discontinuity of public transport to service centres bring Torri Superiore closer to the functional conditions of the inner area than to the coastal urban fabric of the city of Ventimiglia. At the provincial level (NUTS ITC31), the Imperia inner area is the largest in Liguria in terms of surface area and number of municipalities (19 LAUs). It is mainly composed of intermediate and peripheral classifications, with no ultra-peripheral municipalities. The proportion of foreign residents is relatively high and partly compensates for the ageing population in the more peripheral municipalities. These factors justify our decision to consider Torri Superiore as an inner functional area, comparing it with the neighbouring SNAI municipalities (Olivetta San Michele, Airole, Dolceacqua), which have similar travel times to the Sanremo hub, analog distance from essential service centres (education, health, transport), depopulation and ageing populations, high emigration of skilled young people, similar morphology and slope.



Figure 1. Multiscale geographical context of Torri Superiore (Liguria, Italy). The maps show the geographical position of Torri Superiore within north-western Italy, in the Liguria Region and the Province of Imperia. The figure was produced in QGIS (v. 3.34) using open data from ISTAT, OpenStreetMap, and the Regione Liguria Geoportal.



Figure 2. Torri Superiore medieval hamlet. Photo credits: Alice G. Dal Borgo, April 2016.

2.4. Data & Sources

We use ISTAT historical censuses (1871–2011), the Permanent Census (2021), National Registry of Resident Population based administrative registers (post-2019), and annual series on foreign residents to reconstruct resident-population dynamics, age structure, age index, and the share of foreign residents across the four municipalities. Considering the discontinuity and level of data aggregation at the hamlet level, we contextualised the profile of Torri Superiore by comparing it to that of the three contiguous SNAI municipalities mentioned above. SNAI sources (2020 map; 2021–2027 documents [1,2]) provide information on municipal classifications and service accessibility metrics (travel time criteria). Documentary evidence, information obtained directly from municipal administrations and qualitative research tools (such as field notes and interviews) complete the picture for the analysis of governance and environmental practices. Data processing follows standard demographic metrics [38]; the indicators are reported in Table 1 and discussed in the Section 3. Lastly, we wish to make a note of validity explicit: we have decided to classify Torri Superiore as a “functional inner area” even though it is not included in the SNAI perimeter, based on evidence of accessibility to services, valley morphology and demographic convergence with the neighbouring SNAI municipalities (Olivetta S. Michele, Airole, Dolceacqua). This assumption, adopted with the aim of making the analysis relevant to the territorial context, carries certain limitations, such as the absence of systematic hamlet statistics, the need to use proxies for certain measures, and the limitation imposed on generalisations beyond the case studied. To mitigate these limitations, we decided to triangulate ISTAT/SNAI sources with documentary analysis and qualitative observations, and to verify the robustness of the results by comparing demographic patterns over several years and testing sensitivity to the perimeter of the municipalities being compared (RQ 1 and RQ2). Given that in the context of Torri Superiore, systematic statistics at hamlet level are not available for many dimensions (e.g., micro-consumption of water/energy, frequency of interventions on terraces, timely waste management), in order to answer RQ3 and reduce the risk of unsupported inferences, we adopt a two-step strategy. First, we identify and collect “operational traces” produced by the community in its normal management (maintenance techniques, shift schedules, notes after weather events, internal reports). Then we triangulate these traces with field observations and testimonials to reconstruct recurring patterns of action (e.g., frequency, seasonality, duration, and type of interventions), avoiding attributing strong causal relation-

ships in the absence of measured counterfactuals. In doing so, we consider these sources as contextual evidence that documents the “doing” of practices (what is done, when, with how many people, for how long); indicate organisational stability (continuity of routines, coordination capacity, distributed workloads); point to locally observable but unquantified outcomes (e.g., drainage systems kept active before heavy rains; restoration of damaged dry stone walls). Ultimately, documented routines and records do not replace instrumental or statistical measures but trace innovative processes and organisational capabilities that enable—by making them observable in the field—certain local responses to the condition of the internal area. This is why we speak of analytical generalisation (by mechanisms and conditions), not of estimates that are transferable in a statistical sense.

Table 1. Resident population in Municipalities Classified SNAI [1,2,15,36,37].

LAU Classification	Surface (km ²)	Population 1.1.2024	Variation% 2023–2043	Pop Ages % 2024			AI 2024
				0–14	15–64	Over 65	
Intermediate	75,837.00	8,020,876	13.6	12.1	63.2	24.7	205
Periferic	79,393.6	4,597,309	7.8	11.5	62.6	25.9	225
Ultra-periferic	22,310.1	706,942	1.2	11.0	62.2	26.8	243
Internal	177,540.7	13,325,127	22.6	11.8	63.0	25.2	214
Non-Internal	124,527.6	45,664,622	77.4	12.3	63.6	24.1	196
Total Italy	302,068.3	58,989,749	100	12.2	63.5	25.2	205

3. Results

In line with the qualitative approach adopted (see Section 2), we decided to organise the results by theme, reporting mechanisms and evidence related to RQ1–RQ3. Results are structured along a causal chain: demography constrains and enables governance, which in turn shapes environmental practices and their local outcomes. Each empirical block closes with an anchoring sentence explicitly linking evidence, mechanism and implication.

3.1. Demography of the Area

3.1.1. National Context and SNAI (Table 1)

The depopulation of Italy’s inner areas began in the late 19th and early 20th centuries and intensified after World War II, fuelled by rural exodus, industrial centralisation and greater job opportunities along the coast and in urban centres. This has resulted in smaller resident populations, declining birth rates and rapid ageing, with more pronounced effects where accessibility and services are lacking [39–41]. The SNAI 2021–2027 mapping identifies 3834 inner municipalities (intermediate, peripheral and ultra-peripheral), accounting for 48.5% of Italian municipalities, with 13.33 million residents (22.6%) in 2024: the population is on average older than in central areas, with the Ageing Index rising sharply over the last two decades. Forecasts for 2023 indicate a national decline of −4.3% over 20 years, more pronounced in inner areas (−8.7%, up to −11/−13% in peripheral and ultra-peripheral municipalities).

3.1.2. Provincial Focus and Study Area (Table 2)

In NUT ITC31—Province of Imperia, depopulation and ageing have been early and systematic since the end of the First World War. The SNAI defines two project areas: Alta Valle Arroscia and Imperiese; the latter is the largest in Liguria (442.2 km², 19 LAUs) and coincides with the western sector of the NUT. All municipalities gravitate towards the centre of Sanremo; there are no ultra-peripheral municipalities, but intermediate and peripheral

categories prevail. As of 1 January 2024, the Imperiese inner area has 13,862 residents (density 31.3 inhabitants/km²), concentrated mainly in intermediate municipalities (61.7%) close to the coast; in peripheral municipalities, the density drops to ~15 inhabitants/km². The ageing index is very high (268% in intermediate municipalities; 327% in peripheral areas), with over-65s accounting for 31–32% and under-15s close to 10%: levels higher than the averages for Italian inner areas. The proportion of foreigners is high (15.2%), with peaks in peripheral areas (18.7%): a contribution that only partially mitigates ageing.

Table 2. Resident population Internal Area Imperiese [1,2,15,36,37].

LAU Classification and Quantity	Surface (km ²)	Population 1.1.2024	Pop%	Pop Ages % 2024			AI 2024	Foreign %Pop
				0–14	15–64	Over 65		
Belt (2)	47.9	2153	15.5	9.8	59.0	31.3	205	14.9
Intermediate (10)	186.1	8562	61.7	10.4	61.8	27.8	225	14.0
Periferic (7)	208.2	3147	43.6	9.7	58.6	31.7	243	18.7
Imperiese (19)	442.2	13,862	100	10.1	60.6	29.2	214	15.2

3.1.3. Torri Superiore and Comparison Cluster

Torri Superiore, an inner hamlet of the coastal municipality of Ventimiglia, is located in the Bevera valley (a tributary of the Roia), in an impervious, retro-coastal orographic context. Although outside the SNAI perimeter, it has the functional characteristics of an inner area (travel times to services, infrastructure discontinuity with respect to the coast), so the analysis compares it with a contiguous cluster of SNAI municipalities: Olivetta San Michele, Airole, Dolceacqua. The comparison at the same scale (municipal) allows for a proxy reading for the hamlet, given the scarcity of micro-statistics for hamlets.

3.1.4. Essential Historical Series (1871–2024)

1. Torri (hamlet)

From the end of the 19th century to 1911, the hamlet grew to 660 inhabitants; followed by a marked decline between 1921 and 1951 (−34%), then a brief recovery between the 1990s and 2001 linked to the regeneration of the village, a new decline to 265 inhabitants (2011), and a slight recovery in recent years to 290 (2024).

2. Airole and Olivetta S. Michele

After peaking in the late 19th century, they lost population almost continuously: Airole went from 1188 (1921) to 520 (1981) and 359 (2024); Olivetta from 659 (1931) to 304 (1981) and 190 (2024). Both have a negative natural balance and an unstable/negative migration balance in the long term; the 2024 Ageing Index is very high (367% in Airole; 355% in Olivetta). Although the foreign presence is significant in Airole (31.8%), it does not overturn the structural balance.

3. Dolceacqua

This town follows a divergent trend: after reaching its lowest point in the 1900s, it began a period of growth linked to tourism, property development, the landscape and more accessible service networks, rising from 1806 (1951) to 2145 (2021) and 2155 (2024). Foreigners 13.3%, relatively less unbalanced age structure (Ageing Index 198% in 2024, down 22 points from 2011).

4. Ventimiglia (municipality)

Strong growth 1951–1981 (peak 26,283 inhabitants), then contraction to 23,018 (2021) and 22,934 (2024) due to a combination of negative natural balance and reduced migratory attractiveness after the 1980s; Ageing Index 2024 238%. Sectoral economic events (floriculture crisis) and border issues in 2014–2016 accentuate instability.

3.1.5. Indicators for 2024 (Table 3)

1. Reduced total population in inner municipalities; Ventimiglia remains the main demographic attraction but is declining.
2. Age structure: under-15 s 9–12%, 65 + 25–36% in the cluster; resulting in an Ageing Index > 300 in Airole/Olivetta, ~200 in Dolceacqua, 238 in Ventimiglia.
3. Foreigners: 31.8% in Airole, 6.5% in Olivetta, 13.3% in Dolceacqua, 12.5% in Ventimiglia; higher incidence in the peripheral municipalities of the Roia/Bevera valley (amenity + work), with a partially compensatory function.
4. Accessibility: travel times to services superior to the coast and infrastructural fractures (Roia/Cuneo line historically intermittent), consistent with the SNAI classification and with Torri's idea of functional innerness.

Table 3. Torri Superiore and comparison clusters [1,2,15,36,37].

LAU Classification	Surface (km ²)	Population 1.1.2024	Variation% 1951–2024	Pop Ages % 2024			AI 2024	Foreign %Pop	Accessibility Min **
				0–14	15–64	Over 65			
Airole	14.6	359	−44.6	12.1	63.2	24.7	205	31.8	39.9
Dolceacqua	20.3	2155	+19.3	11.5	62.6	25.9	225	13.3	40.2
Olivetta S. Michele	13.8	190	−64.2	11.0	62.2	26.8	243	6.5	44.7
Ventimiglia	53.8	22,934	+44.7	11.8	63.0	25.2	214	12.5	32.3
Torri *	0.12	290	−15.2	-	-	-	-	-	49.1

* Data of population ages distribution and foreign population are not available for Torri; ** the calculation of actual distances (in terms of average travel times in minutes) from Pole centre of Sanremo [2].

The critical mass in inner municipalities is often below the threshold for continuous services and economies of scale, affecting the scalability of practices. However, selective migration (amenity and work) and the foreign component bring diverse skills and opportunities for bridging links with external networks: elements that can support organisational resilience and social innovation, especially in small-scale living-lab configurations such as ecovillages. The case of Dolceacqua shows how relative accessibility, local policies and relational capital can mitigate structural constraints; Airole/Olivetta warn of the risks of demographic hyper-weakness (Ageing Index > 350) and incomplete transitions. Torri, although part of a coastal municipality, shares functional conditions with the internal cluster that justify its interpretation as an “inner area” for the assessment of ecovillage practices and governance. This demographic profile defines the operational constraints and enabling conditions discussed in Section 3.2.

Data note: The indicators are based on ISTAT series and SNAI classifications at municipal level; for Torri, proxies (contextualisation on the contiguous cluster) are used given the absence of systematic fractional statistics. Specific hamlet estimates should be read as indications of order and triangulated with qualitative field evidence.

3.2. Community Governance and Social Innovation

3.2.1. Structure and Rules

Life at Torri Superiore is coordinated by three interlinked entities: the Torri Superiore Cultural Association (TSCA), the resident community, and the Ture Nirvane Social Cooperative (TNSC) [42]. Across TSCA, the resident community, and TNSC, the combination of role rotation, consensus-based decisions, and lean documentation operates as a coordination device. Below we show how this governance texture conditions the observed practices and their local outcomes, especially in the decision-making processes. Established in 1989 on the initiative of two residents of Ventimiglia, Gianna and Piero, TSCA set out to

reconnect the fragmented fabric of the hamlet and to experiment with community living inspired by phalanstery-like principles [43]. Today the association counts about thirty members and holds ownership of the common areas. The resident community includes 12 adults and 8 minors—four of whom are teenagers—and is internally diverse by age, nationality, education, and gender. Entry is open and gradual: newcomers follow a trial period before applying for permanent residence. Founded in 1999 to oversee building and land restoration, the TNSC also manages the guesthouse, which offers 19 beds and seating for around 70 diners. The three bodies (TSCA, TNSC and the resident community) make decisions using a consensus-based procedure, whereby proposals are discussed until a shared position is reached. The first stage of the decision-making process is debate: each proposal is presented and discussed by all participants, who can make minor or substantial changes until a formulation is agreed upon by the whole group. The next stage is called the decision-making stage, in which community members can take one of three positions: those who give their consent and therefore also guarantee direct participation in the implementation of the project; those who agree but do not participate for personal reasons. The third position is that of blocking, a position that must be openly explained to everyone. In the event of a block, even if expressed by only one person, the proposal is not approved. Over time, this governance arrangement has helped Torri Superiore become a local hub with cultural and economic relevance, visible in national/international media, and home to a stable intentional community well rooted in its surroundings. Earlier tensions with the neighboring settlement of Torri Inferiore (dating back to the 1990s) have been resolved [44].

3.2.2. Participation and Routines

The ecovillage operates with clear rules and shared procedures: regular meetings, defined operational roles (e.g., water, energy, vegetable gardens, hospitality), participatory decision-making mechanisms and conflict management. Internal documentation (statutes/regulations, summary minutes) facilitates the traceability of decisions and the rotation of responsibilities. Participation is supported by weekly routines (common tasks, shifts) and seasonal planning. The continuity of routines contributes to coordination between permanent residents and temporary guests/workers (including over 100 young people per year from international volunteer projects) but is affected by seasonality and infrastructure maintenance times (water, vegetable gardens, maintenance).

3.2.3. Social Capital: Bonding/Bridging

Participant observation carried out over ten years of visiting the ecovillage shows (2016–2025) that internal cohesion (bonding) is high in terms of daily tasks and the management of common spaces. External links (bridging) with local associations, schools and universities, public bodies and national and international networks (Global Ecovillage Network) are also active and stable. External collaborations facilitate the exchange of skills, small projects and situated learning (visits, workshops), increasing the visibility of the village and its ability to mobilise resources. An example is the partnership with the Bachelor degree course in Geography at the University of Milan, which since 2017 involves students in site-specific training activities. Another example is the two-year Community Learning Incubator (CLIPS) project, funded by the European Union's Erasmus+ programme in 2023, which involves nine European national ecovillage networks in the Sustainable Community Incubator Partnership Programme (SCIPP). CLIPS is an incubation programme for collective and community initiatives focused on sustainability, created to guide projects in their initial stages and, more generally, to support relational, organisational and strategic dynamics: how to mediate conflict or foster the creation of a group identity, create a common vision, make decisions in a participatory and horizontal manner, and structure

a strategic plan. As part of CLIPS, a practical manual for community development and a game simulating group dynamics using a horizontal approach have been developed. Several training courses have also been organised, both at other ecovillages in the project network and at Torri Superiore, making it a centre of reference for social innovation in sustainable communities.

3.2.4. Organisational Capacity and Workloads

The presence of technical advisors and onboarding procedures for new members reduces coordination costs; at the same time, dependence on key figures (the founding members of the ecovillage) and turnover can lead to longer decision-making times and loss of know-how. Labour-intensive activities (terrace maintenance, water management, holiday home management) require sufficient number of active participants; below this threshold, individual workloads increase, as does the risk of organisational burnout.

3.2.5. Inclusion and Skills

The arrival of new residents and the presence of diverse skills (crafts, agroecology, languages, digital) support the evolution of practices and operational resilience. Barriers to entry (available housing, costs, work compatibility) influence the stabilisation of pathways of socio-economic integration of new residents into community roles and routines.

Periods of income uncertainty and the difficulty in achieving full economic autonomy create a situation of uncertainty for several members. As it is no longer possible to further divide the common income, the community is exploring new paths for development. With the exception of those who work full-time in the TNSC, resident-members are largely self-employed, often in collaboration with or within the cooperative. Tourism has become an essential lever. The initial concerns of some residents about the holiday home have gradually been absorbed; today, hospitality is considered central both to supporting agricultural activities and to revitalising the village. At the same time, the organisation of hospitality is calibrated so as not to compromise the needs of the community, preventing discontent, tensions or conflicts. When tourism generates local benefits while respecting residents, a virtuous circle is triggered: a cohesive and peaceful community welcomes visitors with greater care, improving the quality of the experience for guests. The observed configuration shows that the ecovillage functions as a small-scale living lab when (i) participatory routines are stable; (ii) active bridging ties exist with external actors; (iii) leadership burdens are distributed; (iv) minimum scale thresholds are reached for labour-intensive work. In the absence of these conditions, coordination costs increase and the transferability of practices and micro-innovations is reduced. Furthermore, this configuration is reflected in the environmental responses described in Section 3.3, which we interpret in relation to the critical issues affecting the territory.

3.3. Environmental Practices and Small-Scale Environmental Improvements

The environmental practices of the Torri Superiore ecovillage were analysed as responses to a complex set of recurring territorial emergencies in inner areas of Liguria, such as the abandonment of terraced slopes, loss of protection linked to depopulation, hydrogeological instability, the impacts of climate change (intense rainfall alternating with periods of drought), the decline of agricultural activities and the deterioration of the cultural landscape. The analysis conducted is qualitative-interpretative and is based on field observations, the study of documentary materials and the collection of internal interviews with members of the intentional community living in the ecovillage. It organises the evidence by theme with the aim of highlighting enabling mechanisms and conditions rather than quantitative results (summarised in Table 4).

Table 4. Environmental practices in Torri Superiore: content/form, enabling conditions, and limits (synthesis of Section 3.3). Evidence is qualitative and context-dependent; transferability is analytical (not statistical).

Environmental Practice	Content/Form (What Is Done)	Enabling Conditions (What Must Hold)	Limits/Risks
Terraced-landscape upkeep & local drainage	Preventive cleaning of canals; drystone wall repair; pre-rainfall checks; micro-drainage fixes.	Weekly routines; sufficient active participants; role rotation & handover notes; simple checklists; coordination with municipality for heavy works.	Seasonal labour peaks; reliance on key individuals; storm damage exceeding local capacity; safety/training needs.
Soil regeneration (minimal tillage & self-produced fertilisers)	Low-disturbance bed preparation; compost/vermicompost/green manures; mulching; moisture-retention practices.	Seasonal task calendar; peer learning; compost area and tools; availability of organic residues; simple bed logs.	Compost quality variability; material shortages during dry spells; knowledge turnover; plot heterogeneity.
Crop diversification & intercropping	Mixed rotations; intercropped beds; small plot mosaics; risk-spreading planting schemes.	Rotation plans; handover notes; seed/tool sharing; basic layout records; timely weeding/harvest scheduling.	Coordination complexity; timing conflicts; seed availability; small errors propagate across mixed beds.
Waste prevention, separation & composting	Packaging minimisation at source; bin triage/signage; periodic compost turning; safe storage for recyclables.	Clear rules; visible signage; light monitoring (bin checks); training for newcomers/guests; municipal collection alignment.	Contamination risk; odour/pest control in summer; visitor turnover; storage space constraints.
Renewable energy (roof-mounted photovoltaic) & load management	PV generation; time-shifting of energy-intensive tasks; basic tracking of production/consumption peaks.	Simple meters/dashboards; usage routines; awareness sessions; maintenance contracts; shading checks.	Weather variability; inverter/battery maintenance; upfront costs; limited winter generation or shaded areas.
Light mobility & access management	Walking/cycling where feasible; shared rides; bundling deliveries/visits; wayfinding for safe routes.	Mobility rosters; coordination with guests/partners; tool/equipment pooling; basic digital calendar.	Topography and distance; limited public transport; weather constraints; safety for children/elderly.
Rainwater harvesting & small water storage	Roof/gutter capture; first-flush systems; small cisterns; localized drip/soaker lines.	Routine gutter cleaning; seasonal inspection; simple maintenance logs; micro-funding for repairs.	Dry-season scarcity; storage-capacity limits; contamination risks without filters; regulatory constraints.
Bridging ties & respectful micro-tourism	Agreements with schools/associations/universities; capped group sizes; co-learning activities; volunteer days.	Clear time windows; space/use rules; host roles; minimal induction for visitors; insurance/permits where needed.	Risk of resident-function displacement; seasonality; coordination overhead; expectations mismatch.

3.3.1. Protection of Terraces and Widespread Maintenance

The terraced landscape is an important feature of the entire Liguria region, having evolved over centuries and recognised as a UNESCO World Heritage Site in 1997, in the list of cultural landscapes, with reference to the landscape and environmental system of the Cinque Terre. The slopes surrounding the Torri Superiore ecovillage were intensively terraced in the past and today show widespread abandonment of agricultural terraces and rural architecture. The ecovillage mitigates the abandonment of the slopes through the regular maintenance of the terraces and the walls that support them, and through small-scale water management works (channels, wells, drystone walls). The main effect is continuity of use: constant presence, even at low intensity, limits fragmentation and slows down the process of decay. The enabling mechanism is organisational: weekly routines, division of tasks and reactivation of practical knowledge (drystone walling, pruning, repairs after extreme weather events such as heavy and continuous rainfall). Where slope or access make interventions costly, the practice adapts by applying a priority criterion to the most exposed patches, in accordance with seasonal cycles (Figures 3 and 4). Taken together, maintenance logs, on-site observations, and post-event notes indicate a recurring pattern in which preventive care of canals and drystone walls functions as a risk-reduction mechanism by keeping runoff pathways open before intense rainfall; this mechanism seems to hold where weekly routines and a sufficient number of active participants are in place.



Figure 3. Terraced slope with olive tree cultivation. Photo credits: Alice G. Dal Borgo, June 2023.



Figure 4. Students and volunteers engaged in rebuilding a drystone wall that had partially collapsed due to excessive trampling by wildlife. Photo credits: Alice G. Dal Borgo, June 2023.

3.3.2. Local Water Management Between Droughts and Storms

The response to water variability combines conservation (mulching, shading, crop rotation), widespread collection (cisterns, channelling to perennial beds) and local drainage (post-event cleaning, small dispersed dams). The value lies not in “major works” but

in the implementation of coordinated micro-interventions which, by diversifying efforts, reduce environmental and landscape vulnerabilities at the local and micro-local level. The effectiveness of responses is enabled by operational coordination among community members: shared calendars, assignment of tasks and responsibilities, shared decision-making processes based on observation, feedback and responses, volunteer management and onboarding of newcomers support the maintenance of routines during peak periods.

3.3.3. Agroecology as a Way of Caring for the Cultural Landscape

Since its foundation, the ecovillage has adopted agroecological and permaculture practices. Crop diversification (intercropping, local species resistant to drought/wind), the use of self-produced compost and the limitation of deep soil tillage translate into effective forms of management that respect the terraced morphology of the slopes. Agroecology acts here as a means of regeneration and active conservation of the landscape: it maintains continuity of practices and transmits local knowledge through action (site-specific workshops, collective days—Figure 5). The scale remains small, but the social visibility of the practices, communicated through social media, encourages alliances with actors both nearby (local schools, associations) and far away (universities, research centres, international networks). Field notes and cultivation records suggest that minimal tillage combined with self-produced fertilisers acts as a soil-care mechanism supporting structure and moisture retention; effects appear tangible at plot scale when seasonal task calendars and peer learning sustain continuity over time. Planting records and bed-layout notes show a recurrent diversification–buffer mechanism: intercropping and mixed rotations distribute risks and micro-tasks, which is particularly effective when role rotation and simple handover notes avoid bottlenecks in key weeks.



Figure 5. Community garden cultivated using permaculture approach and with a rainwater collection tank in the foreground, on the right of the image. Photo credits: Alice G. Dal Borgo, June 2023.

3.3.4. Energy, Waste and Local Circuits

The energy required by the resident community comes mainly from solar and photovoltaic panels. The combination of roof-mounted photovoltaic (PV) and light-mobility choices reduce reliance on external inputs when usage routines and basic monitoring are in place. The ecovillage adopts advanced waste management practices. The reduction in packaging (bulk purchases, reuse), domestic/community composting and the use of internal micro-islands for separate waste collection are considered educational as well as

management tools: they make material flows visible and facilitate the learning of clear rules, stimulating a sense of shared responsibility as well as mutual example. The proximity dimension (shared kitchen, cellars, storage rooms) allows for rapid adjustments in the face of operational criticalities (seasonal work, peaks in guest numbers).

3.3.5. Light Mobility and Daily Logistics

In order to reduce costs and impacts, members of the resident community use scheduled carpooling for local travel, while for travel within the region outside the municipality of Ventimiglia and outside the region, they prefer to travel by train. In addition, the ecovillage has shared micro-depots where goods and tools can be stored. These choices reduce dependence on individual travel and shorten organisational distances: rather than a reduction in the number of kilometres travelled, what counts is the integration of light and shared forms of mobility into community routines.

3.3.6. Sustainable Tourism as a Territorial Alliance

At the Torri Superiore ecovillage, hospitality is interpreted as an alliance: it supports small economies (vegetable gardens, light processing, site-specific training courses), increases territorial protection and generates exchanges (workshops, visits, cultural events). The enabling condition is closely linked to compatibility with internal needs: the model adopted at the ecovillage avoids compressing the community's time and space. The spaces dedicated to hospitality are concentrated in certain buildings of the ecovillage: the holiday home, the large hall for workshops, the dining rooms and the terrace. Here, guests, community members and volunteers meet to share moments together, such as meals, before returning to their private accommodation to rest. This dynamic balance, which rhythms the typical day in the ecovillage, constantly feeds a virtuous circle based on internal cohesion → better hospitality → external recognition → legitimisation of the organization.

Three recurring mechanisms emerge from the evidence: (1) routines (shared weeks/tasks) that lower coordination costs; (2) diversification of small-scale interventions (many small actions instead of one large project), effective against risks and disturbances; (3) learning by doing (practical knowledge, observation, feedback and correction). Enabling conditions include a minimum critical mass of participants (the 12 adult members of the resident community), clear roles (contact persons, older or specialised members) and external links (municipality/associations/schools, universities and research centres, international networks) that offer support and visibility; risks include dependence on key figures, seasonality and saturation of volunteer capacity. Overall, bridging-based tourism appears beneficial when time/space caps align visitors with community routines, preventing displacement of resident functions.

The analysis conducted does not aim to estimate quantitative impacts, but to recognise interpretative patterns of local response to systemic critical issues. Its validity is based on the triangulation of the analytical tools used (observations, documents, testimonies), on the narrative consistency between themes and practices, and on the transparency of the limitations identifiable in the hyperlocal scale and in the non-automatic generalisability of what has been observed. Across blocks, the consistent pattern is that many small, routine-based interventions deliver tangible local benefits when coordination devices and a sufficient active core are reliably present—conditions that we discuss as enabling factors rather than universal requirements. In the following paragraphs, we discuss how these results respond to RQ1–RQ3, highlighting the practical implications and limitations of transferability.

4. Discussion and Conclusions

The analysis conducted on the case of Torri Superiore confirms how an ecovillage can operate as a small-scale living lab: environmental practices (terracing, local water management, agroecological approach, energy supply from renewable sources, waste disposal and recycling, light mobility) are tested in situ, iterated and adapted to the local morphology and organisation (RQ3). This is consistent with the literature on living labs, which considers them to be ecosystems of co-creation and learning in real contexts, effective when there are minimum resource thresholds, a representative governance model and adequate territorial orchestration [4,6,45,46]. In the context of Italy's inner areas, characterised by low density, difficult access to services and demographic ageing, the place-based interpretation proposed by SNAI and the updates to the 2020 map clarify how the condition of "innerness" is primarily functional (travel times to services) and differentiated at the municipal level. ISTAT profiles confirm structural imbalances in age groups and accessibility to centres [1,2,15,47]. In such contexts, the leverage of living labs lies less in big numbers and more in the integration of management and governance practices and routines that reduce coordination costs (RQ1, RQ2). On a socio-organisational level, clear rules, consensus-building, role rotation, onboarding of new members and essential documentation are enabling factors, while dependence on key figures, turnover and seasonality of attendance are critical factors. This ambivalence reflects the literature on social innovation, understood as the transformation of relationships and governance oriented towards unmet needs, but exposed to risks of capture if not accompanied by enabling networks and institutions [3]. The practices observed, such as continued use and care of the terraced landscape, constant maintenance to reduce water vulnerability, soil regeneration through minimal tillage and self-produced fertilisers, crop diversification and intercropping, reduction in packaging, proper disposal of solid waste and composting of organic waste, as well as a light approach to mobility, produce significant improvements at the local level (RQ3). As claimed above, while social innovation reconfigures relationships to respond to unmet needs, it also involves exposure to risks. In our case, we observe concentration of workload on a few qualified members during seasonal peaks; hidden work in coordination, cleaning and integration of new arrivals; asymmetries of participation (availability, skills, seniority) that can influence decisions; dependence on external flows (visitors, volunteers) with displacement of expectations.

The scalability of the practices studied is, in fact, limited by three factors: (i) a sufficient number of active participants (the 12 adult members of the resident community), (ii) stable and monitorable management routines, (iii) constant coordination with local actors and available services. These results are consistent with studies that view ecovillages as "sustainability laboratories" with incremental effects depending on the specific characteristics of the context, with recent research on transformation trajectories (from traditional villages to ecovillages) and on sustainability-oriented mobility [7,8,11,12].

4.1. Operational Implications

Our analysis indicates that the most effective policies should be those that recognise the functional innerness of places such as Torri Superiore. Innerness is determined not only by administrative boundaries, but also by the travel time required to reach essential services and by morphological constraints (valleys and slopes) and is reinforced by population ageing and emigration. We therefore believe that interventions should prioritise light infrastructure and distributed maintenance—small water collection systems and cisterns, local drainage, shared tool storage, compost bins, rooftop solar panels—supported by easily obtainable microfinance, avoiding overburdening communities with disproportionate bureaucracy. For these solutions to be effective and sustainable, we believe it is essential

to reduce coordination and management costs by supporting technical advisors. To this end, it may also be effective to provide tools for role rotation and the integration of newcomers and to adopt light monitoring that records what is being done (without becoming a burden). Similarly, links with local councils, schools, associations and universities should be strengthened through joint agreements and initiatives (workshops, festivals and other cultural events) in order to also benefit from outside. Finally, tourism can be an ally if it remains respectful of the rhythms and spaces of the community, generating local benefits and mutual learning rather than replacing or compressing the functions of residents. These elements should be orchestrated at the ecosystem level, in line with the approaches of living labs [6].

Based on these general assumptions, further specific guidelines for SNAI classes could help to adapt measures to the heterogeneous conditions of inner areas. For intermediate municipalities, we suggest prioritising light infrastructure (photovoltaic roofs, cisterns, local drainage) and microfinance, as tools that can help accelerate routine maintenance, combining these elements with light documentation models so that monitoring becomes a habit rather than a burden. Peripheral municipalities should strengthen partnerships between schools to stabilise participation throughout the year and reduce dependence on a few key individuals. Finally, ultra-peripheral contexts should support regular knowledge exchanges with external teams (through inter-municipal agreements or NGOs) using digital connectivity tools (calendars, alerts, shared registers, online platforms) to keep coordination costs manageable. These recommendations are intended as suggestions to be adapted to the context: the emphasis is on routines, enabling conditions and proportionate tools, rather than uniform models, in line with a living laboratory logic of in situ learning and iterative adaptation.

4.2. Limitations and Transferability

The results presented are rooted in a single case and are based on qualitative evidence such as field observations, internal documents and testimonies, albeit collected over a ten-year period (2016–2025). This has two immediate consequences. On the one hand, what we show concerns how the ecovillage responds to its context, not how much it does so in measurable terms; the emphasis is on mechanisms (routines, coordination, diversification of minute interventions, learning in use) rather than on magnitudes. From the other side, we observe how practices strongly rooted in the nature of the territory, such as the presence of agricultural terraces, local history, access to services, the structure and composition of the resident community, and the quality of relations with external actors, influence not only the responses implemented but also the outcomes of those responses.

The qualitative approach adopted, in terms of method, suffers from some distortions: from the selection of testimonies (who speaks, when) to the effect of simple observation on certain occasions in the community, from the selective memory of particularly critical individual events (such as heavy rainfall or prolonged drought) to the tendency to consider what is most noticeable or has happened recently. Through triangulation between different and complementary sources, such as field observations, direct testimonies, documentary materials, and a narrative habitus consistent across the different themes analysed (energy, agroecological production, soil, waste management, mobility), we were able to limit the above-mentioned risks. Of course, we recommend that the transferability of the results be understood in analytical rather than statistical terms. In fact, it is not the solutions themselves that are effective and transferable, but their organisation, which requires intensive coordination of weekly overall management routines, a minimum number of people able to carry out the work and tasks assigned, the ability to maintain relationships with national and international networks and institutions, and the ability to operate in an environment

characterised by morphological and structural constraints. Therefore, even if we cannot attribute the observed results to individual practices, the recurrence of the models and their consistency in the reference literature allows us to highlight the plausibility of causal links.

In contexts with much smaller populations, poorer accessibility or fragile decision-making cycles, the same devices risk mimetic isomorphism: the form is replicated (a cistern, a vegetable garden, a work schedule) without recreating the conditions that support its functioning (roles, shifts, maintenance, micro-budgets).

To encourage responsible transfer, certain precautions are necessary. First, a detailed description of the context (morphology, access, seasonality of presence, local regulatory framework) that allows readers to assess the adaptability of the practices to their own territory. The second precaution refers to a multiple interpretation of solutions, not, therefore, a single, rigid model, but elements to be combined and calibrated (tools, routines, shifts, agreements) according to objectives and management constraints. Finally, a third precaution invites us to consider failures and tensions generated by burnout, maintenance setbacks and interpersonal misunderstandings as part of community learning process.

4.3. Future Research Trajectories

The most useful next step seems to be to build a lightweight observatory over time, capable of tracking practices without weighing down community life. In concrete terms, we imagine minimal longitudinal indicators that reflect the progress of key activities: a maintenance log (when, where, with how many people), short post-event weather diaries (what happened, what repairs were necessary, what worked), and a basic record of attendance/shifts, in order to capture patterns and occurrences. At the same time, it would be appropriate to compare these areas with other inner regions that share similar critical issues but differ, for example, in terms of morphology and accessibility, such as more isolated terraced settlements, valleys far from essential services, or municipalities with larger populations and better internal and external connections.

The aim is not to create rankings but to test the robustness of the mechanisms: do routines, diversification of micro-interventions and coordination with external actors work in the same way on different slopes? At what critical mass do they begin to run without excessive effort? A comparative design, even with only 2–3 pilot cases, would give depth to the inferences and help to distinguish what is specific to Torri from what is transferable. A third line of future research could focus on the actual role of digital connectivity on the one hand and cooperation agreements on the other. In our opinion, it would be useful to understand whether super-fast, reliable broadband and simple digital tools help to reduce the costs of coordinating and managing activities. Or, indeed, whether agreements and conventions with neighbouring institutions can facilitate the flow of people and resources. A final proposal concerns the use of a mixed analytical-interpretative approach, which can capture processes and relationships as they unfold in order to produce consultable analytical sheets containing a description of the problem, the resources used, the routine and management practices implemented, and the expected and achieved results. These sheets could be used to put together a toolbox of technical and management tools, organised into principles and solutions, which would be useful for other communities. Figures 6–8 present a summary matrix linking the three RQs to empirical findings, observed mechanisms and related operational implications, including priority areas for future research.

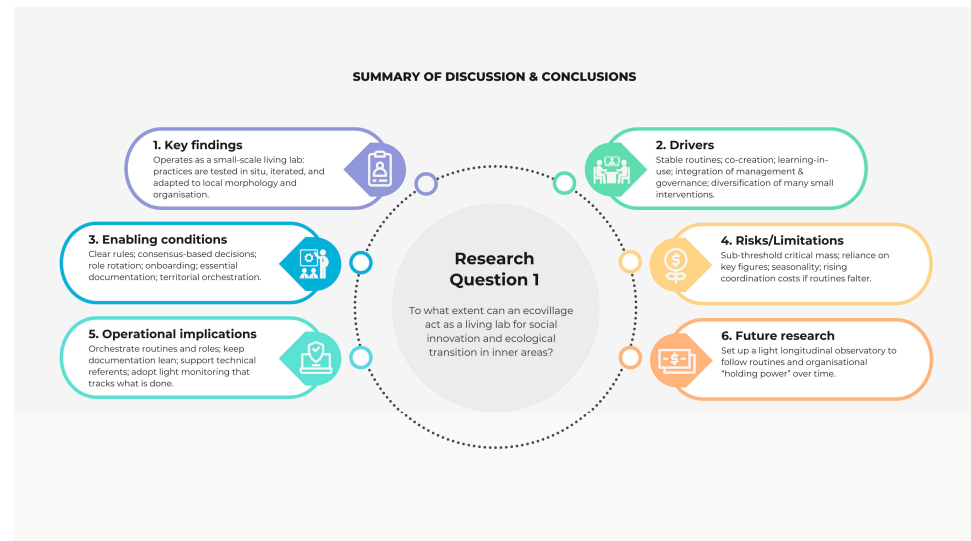


Figure 6. Summary matrix of key findings, RQ1.

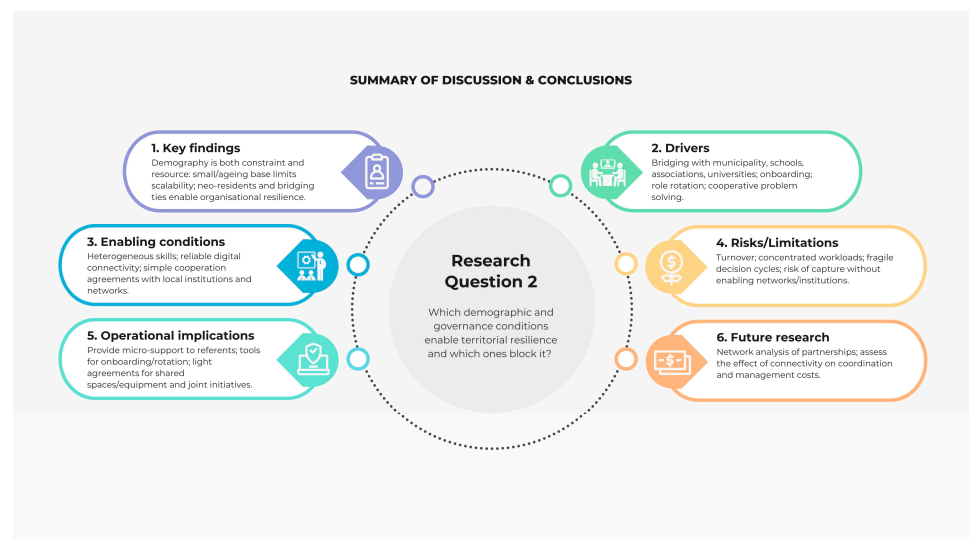


Figure 7. Summary matrix of key findings, RQ2.

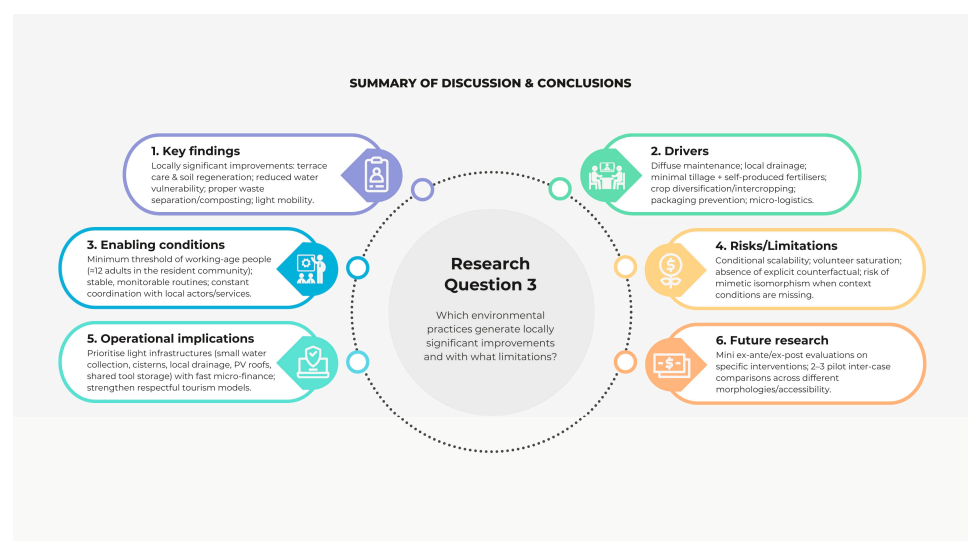


Figure 8. Summary matrix of key findings, RQ3.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su18010188/s1>, File S1; Focus Aree Interne 2021; Open KIT Regione Liguria; Piano Strategico Nazionale delle Aree Interne.

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Data Availability Statement: The original data presented in the study are openly available on national statistic database https://www.istat.it/wp-content/uploads/2024/07/STATISTICA-FOCUS-DEMOGRAFIA-DELLE-AREE-INTERNE_26_07.pdf and <https://www.istat.it/en/data/databases/> (accessed on 10 June 2025).

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Abbreviations

The following abbreviations are used in this manuscript:

CLIPS	Community Learning Incubator
ISTAT	National Statistics Institute
PV	Photovoltaic
RQ	Research Question
SI	Social Innovation
SCIPP	Sustainable Community Incubator Partnership Programme
SNAI	National Strategy for Inner Areas
TNSC	Ture Nirvane Social Cooperative
TSCA	Torri Superiore Cultural Association

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