

Laser-induced graphenization of textile yarn for wearable electronics application

Original

Laser-induced graphenization of textile yarn for wearable electronics application / Parmeggiani, M., Stassi, S., Fontana, M., Bianco, S., Catania, F., Scaltrito, L., Lamberti, A.. - In: SMART MATERIALS AND STRUCTURES. - ISSN 0964-1726. - ELETTRONICO. - 30:10(2021), p. 105007. [10.1088/1361-665X/ac182c]

Availability:

This version is available at: 11583/2929292 since: 2021-10-06T09:52:13Z

Publisher:

IOP

Published

DOI:10.1088/1361-665X/ac182c

Terms of use:

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

IOP postprint/Author's Accepted Manuscript

"This is the accepted manuscript version of an article accepted for publication in SMART MATERIALS AND STRUCTURES. IOP Publishing Ltd is not responsible for any errors or omissions in this version of the manuscript or any version derived from it. The Version of Record is available online at <http://dx.doi.org/10.1088/1361-665X/ac182c>

(Article begins on next page)

*Landscapes of Care. Public housing across multiple
geographies: crossing theories and practices*



SOPHIA
scopio EDITIONS

volume 9, issue 1 | publication year: 2024
issn: 2183-8976 [print] 2183-9468 [online]
isbn: 978-989-53640-8-4

...

homepage: <https://www.up.pt/index.php/sophia>

Fenix architecture: Can a new and youth liveability for inner areas be based on the third and fourth-age community facilities?

Federica Serra

Abstract

The article takes its cue from the population ageing phenomenon in Italy, focusing on the country's inner and marginal areas. These areas, which cover nearly 60% of the national territory, are facing significant challenges due to depopulation and the migration of young people to cities, leading to their marginalisation and reduced access to essential services. However, in recent decades, these regions have been reevaluated, viewing them not only as a problem but also as an opportunity for development and regeneration.

The article explores how population ageing, traditionally seen as a challenge, can be transformed into a resource for the revitalization of inner areas. By analysing institutional policies such as the Strategia Nazionale per le Aree Interne (SNAI) and the Piano Nazionale di Ripresa e Resilienza (PNRR), the text emphasises the importance of attracting new communities, including younger generations, to revitalize these territories. In fact, ageing can become a development factor, especially when combined with strategic planning and targeted architectural design projects, as illustrated by the case of Castel del Giudice, a small village in Molise that has managed to turn population ageing into an opportunity for economic and social growth.

The case study of Castel del Giudice demonstrates how an innovative approach to managing welfare services, particularly for the elderly, can help to reverse the depopulation trend and create new job opportunities for young people. Through the establishment of an assisted living facility and other community initiatives, the village has not only improved the quality of life for the elderly but also generated economic activity that has attracted new families to the area. This example shows how inner areas can become laboratories for good practices and social innovation if adequately supported by targeted policies and investments.

In conclusion, the article argues that population ageing in Italian inner areas should not be seen merely as a problem to be addressed, but as an opportunity to stimulate sustainable and inclusive development. Through targeted interventions that promote proximity welfare and community cohesion, it is possible to create new forms of liveability that can attract both young and old, contributing to the revival of territories currently considered fragile. Ageing, therefore, can become a catalyst for the revitalization of inner areas, transforming their fragility into a driving force for future development.

Keywords: territorial resilience; inner areas; multigenerational community.

THEORETICAL PAPERS

Federica Serra is an architect and a Ph.D. candidate at Politecnico di Torino, where she conducted research for years as a member of IAM research center (Mountain Architecture Institute). Engaged in research on inland and mountainous areas in architectural and territorial scale, she is also member of the editorial board of ArchAlp, Alpine architecture journal. She has recently earned the title of Master Arint at University of Naples Federico II.

Introduction

The phenomenon of population aging in Italy and youth migration from inner areas has transformed small towns into 'fragile' places, depopulated, socially undervalued and lacking in cultural vitality and welfare services. This issue is part of a broader national and international debate over inner and marginal areas, anchored in the wider concept of 'territorial cohesion' defined by the Treaty on the Functioning of the European Union (TFUE). This issue finds its Italian reflection in the 'Barca Report', which is the basis for targeted policies oriented to bridge the gap between inner and urban areas in terms of essential services and local development.

Institutional policies, such as the Strategia Nazionale per le Aree Interne (SNAI) and the Piano Nazionale di Ripresa e Resilienza (PNRR), and the numerous studies conducted by the 'Riabitare l'Italia' association, have laid the groundwork for a cultural and economic paradigm shift aimed at revitalizing these territories, emphasizing the need to attract a new and young community of residents.

This essay aims to investigate the development potential held by the new generations of elderly people in generating various forms of community living for inner and marginal areas. To achieve this, it will be crucial to understand the role of local welfare in these contexts and then to highlight, through a specific case study, how strategic planning and architectural design projects of welfare services can act as catalysts for resources and new best practices. In the selected case it is described how the small village of Castel del Giudice (IS), known as the winner of the Bando Borghi A for the Molise region, has long experimented with new forms of community liveability. In that context, maintaining and resettling the elderly in the village is seen as an innovative tool for local development and youth employment. From this approach, that goes beyond the idea of population aging as a problem and turns it into a resource, it emerges as a virtuous model applicable in many inner territories already subject to reverse migration.

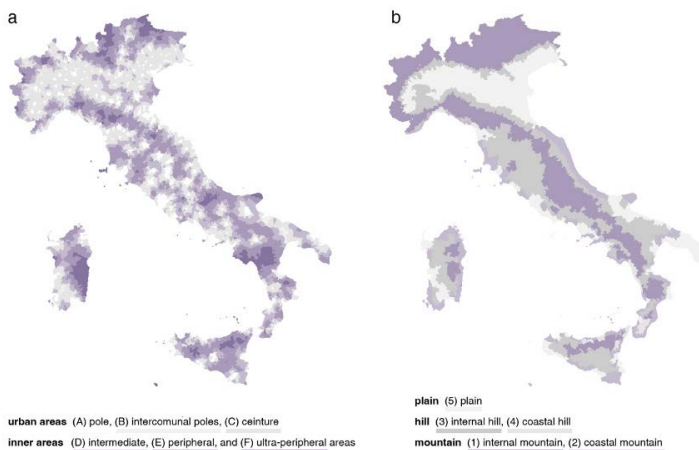
Italian policies for inner areas

Since its unification, the consideration of Italy as a territory of multiplicity, composed of the 'pulp and the bone' (Rossi Doria 2005) has led national policies to pay special attention to rural areas. For a century and a half, these places, perceived as fragile and problematic contexts from a socio-economic perspective, were considered territories to be saved, supporting them through funding and specific strategies. Indeed, although a significant portion of the Italian peninsula is characterized by places with limited access to essential citizenship services, the fragility and the regression of the marginalities have not been solved and sometimes even increased. Therefore, these territories, considered backward and resistant to innovation for a long time, started to be defined 'inner areas' as if to emphasize their marginalization, exclusion from national policies, and worsening inequalities compared to urban areas.

THEORETICAL PAPERS

In the last decades for the first time these areas have started to be seen not only as a weakness but also as an opportunity. This paradigm shift, result of a profound institutional (Barca and others 2009) and cultural (De Rossi 2018) change, start to rediscovery inner territories as experimental physical laboratories of a new re-habitability that turns inherent criticism into strengths.

Marginalized territories cannot be ignored anymore: they cover 58.8% of the entire national territory and host around a quarter of the Italian population, according to the 2020 data highlighted by the Istat Report of July 2022. Among Italian municipalities, artificially classified in six ranges of peripherality in the map drawn up by Cipess, Comitato interministeriale per la programmazione economica e lo sviluppo sostenibile, 3.834 of them (48.5% of the total) are considered inner areas according to their time distance from the poles, identified by those places that can offer simultaneously health, education, and mobility services (Fig.1).



[Fig. 1]

a) Map of the peripherality through the classification of municipalities according to the new typology of internal areas made by Cipess in 2022 (source: politichecoesione.governo.it);

b) Map of the Italian municipalities according to the classification in altimetric zone (2024) (source: istat.it)

– elaboration of the author.

Moreover, this large portion of Italy, where marginalization, depopulation, and ageing phenomena are more evident, is where can be found most of the national environmental and cultural resources that are also relevant for urban and peri-urban areas. Starting from the national and European debate of the last twenty years, which highlighted the limitations of those spatial policies focused only on the urban development, the interest in rural areas has gradually grown in both their limit and possibilities. In any case, the urban-rural divide, even more pronounced after the 2008 crisis, has continuously intensified, generating a framework that considers marginal areas increasingly as a burden for different nations.

In the last decade, the 'places that do not matter' (Rodríguez-Pose 2018) have had the opportunity to demonstrate their impact on international governments and societies through symbolic political actions that highlight their geographical and territorial significance, even more so after the pandemic. COVID-19 led, in fact, to a paradigm shift in the interpretation of inner areas: a rediscovery of these territories as places where it would be possible to work and age (Perlik 2006) and where can be found a better quality of life in response to the inadequacy revealed by the cities during the pandemic.

In this context, from 2010s national and international institutions promoted some experimental policies focusing on marginal territories. The most relevant public policy is the Strategia Nazionale per le Aree Interne (SNAI), which, in its first season, involved 72 experimentation areas in both methodologically and conceptually innovative actions.

Unlike the other programs, the strategy was characterized by an important theoretical framework; starting from that the government could understand local and territorial vulnerabilities to lay the groundwork for the following improvement of service provision in pilot areas (Lucatelli, Luisi, and Tantillo 2022). The definition of interventions has been structured through a trans-scalar process, that involved local authorities, municipalities, aggregated and associated, regions, and various ministries coordinated by the Comitato Tecnico per le Aree Interne, dependent on the Dipartimento per le politiche di coesione e per il sud della Presidenza del Consiglio dei ministri.

In addition to the improvements of essential services related to education, health, and mobility, and the support of local development activities, the goal of the entire policy was to experiment with alternative and unconventional ways of managing sectoral policies to reorient ordinary state interventions with a place-based approach. (Agenzia per la Coesione Territoriale 2021). Thanks to the PNRR, Piano Nazionale di Ripresa e Resilienza, the SNAI experiment has moved beyond an experimental vision with the addition of 56 new areas that, added to the 72 of the first season, generate a new complete framework as a demonstration of the effectiveness of the initial programming in achieving the proposed objectives. (Storti 2021)

The PNRR also represents an unprecedented opportunity for marginal areas in terms of resources. In addition to specific interventions oriented to territorial cohesion, other funding lines aim to improve the quality of life in inner areas. The most interesting interventions regarding the welfare and the ageing population topic seem to be those related to territorial medicine in Mission 6, where the construction of new Community houses can make differences in the context of internal Italy, where the hospital network is increasingly sparse.

Among the actions oriented toward rediscovering marginal territories, there are two basic strategies to encourage new liveability in these places: on the one hand, the choice is to limit youth migration to urban areas, and on the other, to promote alternative modes of habitability for rural areas by city dwellers attracted by amenity migration (Perlik 2006). The first group of interventions aims to enhance, in inner territories, new forms of youth entrepreneurship, particularly those related to traditional rural professions, both culturally and economically. An important research on that issue (Membretti et al. 2023), argues that these actions could be implemented only after a series of surveys aimed at understanding both the desires of young people to stay in the villages and the reasons that drive them to leave.

The general framework presented in this paragraph highlights how the increasing attention to the habitability of inner areas, and consequently the policies and resources dedicated to it, must relate cultural and demographic changes to the causes that have generated them, according to an antifragile approach (Lupatelli 2022) that allows further development starting from the problems.

Aging in inner areas: a problem or an opportunity?

In a polycrisis Age (Juncker 2016), where the population role is fundamental in the daily economic and social challenges, communities aging worldwide, in particular in developed countries and in a more noticeable way in rural areas than in urban ones.

Eurostat demography dataset of 2022 (Eurostat statistics 2023) confirms this trend, the percentage of the population aged 80 years and over in the European Union increased from 3,5% to 6,1% in twenty years (2002–2022), especially in the rural areas where 6,3% of the population is over 80 in 2022 (in the cities only the 5,8%). Furthermore, the pattern is the opposite for those aged 20 to 64, in that case, the share is higher in the urban (60%) than in the rural regions (57%). This double phenomenon, the aging population and youth migration to the city due to the weakening of local economies, emphasizes the disproportionate distribution of older Europeans, concentrated in inner and mountain areas, where the distance from services and the lack of care structures seem to reduce health equity and highlight the rural–urban divide.

Aging in rural areas as an international topic

Aging in inner and mountain areas is a transnational and transdisciplinary topic: researchers and scholars from all around the world tried to understand the impact of the context in an increasingly aging society, from economic, social, and political perspectives evaluating both the criticism and the resources of a new rural elderly life. This issue is characterized by its double face; on one side older adults may decide to stay and live in these regions or they choose to settle there after retirement because they can find a better quality of life, on the other side, elderly inhabitants move from the villages to the cities to be closer to social and healthcare services. The reasons for these choices are all related to the context, in rural areas people can often find better living conditions, lower costs, natural and cultural benefits, and closer community cooperation (Glasgow and Brown 2012)

Furthermore, the increasingly frenetic and chaotic urban dynamics limit the interpersonal relationships between older individuals, who become more and more alone. On the contrary, the isolation processes can be faced in a smaller context, where solidarity and social interactions are enhanced (Gucher 2018). Nevertheless, rural ageing could still be problematic because of the physical distance from the welfare poles. Despite lots of services having digital access, personal welfare infrastructures are still visited in person, and fewer elderly people living in remote areas can easily reach them; even encouraging forced reversed mobility phenomena (Cholat, and Daconto 2021).

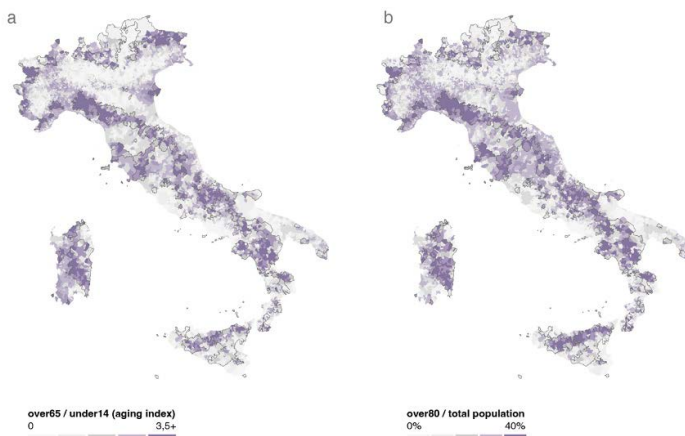
A map of the elderly Italy

The Eurostat statistical data for 2022 describes Italy as one of the European countries most economically and socially dependent on the third and fourth age groups. National demographic parameters show a national average age of 48 years, 3 years higher than the European Union one. Moreover, the dependency index, representing the ratio between the number of elderly individuals to the working-age population, significantly exceeds the European average of 32.5%. Particularly, a higher concentration of elderly people compared to the resident population is found in the inner areas.

Reading the map of the ageing index (Fig.2), defined as the percentage ratio between the population aged 65 and over and the population aged 0–14 years, it is evident that the municipalities characterized by a higher ageing index are in the mountain and inner areas on the Alps, the Apennines and in the Sicilia and Sardinia Island. In these territories, the number of older people is even 10 times more than the younger ones because of the reduction of natality and the emigration of young families to urban areas.

THEORETICAL PAPERS

The geography of elderly Italy can be also superimposed on the map of the inner areas, drawn up by the Cipess; the comparative map (Fig.2), which shows the percentage of over 80 years old individuals in the total municipality's population and delimitates the municipalities classified as peripheral and ultraperipheral, clearly outlines the critical coincidence of the places with a high percentage of elderly presence and those far from the healthcare and mobility services. The ultraperipheral municipalities, far from the pole at least 75 minutes, have an average older people percentage of 8,72% much higher than 5,95% of the city belt ones. In peripheral and ultraperipheral municipalities, the elderly population is more than twice that of those under 15 (206.8 and 223.4 respectively), with an average value for inland areas close to double (196.1). The over-65 population, representing over a quarter of the total resident population in inland areas, is expected to increase further due to the rise in life expectancy, a positive sign of life quality and advancements in healthcare.



[Fig. 2]

a) map of the ageing index for each municipality made on Istat data of 2024; b) map of the population percentage over 80 years of age superimposed to the inner areas' boundaries (source: politichecoesione.governo.it) – elaboration of the author.

What possible future?

As already mentioned, the limited assistance services in marginal areas combined with a steadily increasing number of elderly individuals threatens to overwhelm the entire system, if governments and local communities do not implement specific interventions for territorial assistance and support for active ageing. In this condition, ageing in rural and inner areas is a conscious choice for elderly inhabitants, who sometimes are reluctantly forced to move away from their hometown to access elderly care services, especially in conditions of isolation without family care.

Recent studies conducted in the in-Age project (Melchiorre et al. 2021) by the Politecnico di Milano show that assistance to the elderly in rural areas is almost entirely provided by the family or the community and in small part by public or private services. In urban areas, the role of un-institutionalized care is limited in favour of more effective public service utilization by more than half of the survey respondents. So, where assistance services are present, they are used, although the networks of relationships built over time, including family and community, are crucial to limit the isolation of the elderly and promote active ageing (Gucher, Mallon and Roussel 2007).

The other side of the coin, which has become more evident in recent years, is related to the quality of life of a silver generation increasingly conditioned by the challenges of our time, especially in urban areas. Diseases like the heat islands, the pollution, the noise, and the crowding, combined to a higher cost of life, are some of the liveability challenges that the elderly face in cities. Moreover, the pandemic has shown how inland and rural areas can offer an alternative life standard that allows a reconnection with the nature and the community to benefit from those 'village care' that investments in proximity welfare services could guarantee.

The ageing of the population, therefore, represents an important territorial resource; the maintenance or the migration of the elderly to inland areas influences the ability to attract in these places ever-growing market demands. Alongside the idea of the silver economy, which defines the economy generated by the older population, the concept of the longevity economy has recently emerged, overcoming the previous definition linked to the idea of ageing with a positive perspective of physical and mental well-being for those over 50. In this context, demographic changes will be capable of generating technological innovations and new jobs in a new immense business where the natural and community potential of inland areas could fully manifest itself.



Proximity and community welfare spaces as tools for territorial development

An intergenerational approach

From a territorial development perspective of the inner areas, the over 65 years old population growth can be seen as an opportunity to arrange new living scenarios for both the older and the younger generations. This purpose can be achieved through dynamic welfare spaces that can provide the elderly with the conditions for living in a community with other citizens, promoting new housing paradigms based on mutual exchanges and common intergenerational values (Boccacin 1999; Dykstra 2010). Indeed, population ageing is not only a matter of older persons because it also affects the other generations. Despite the implicit assumption that demographic ageing mostly impacts elderly people, the combination of increasing longevity and decreasing birth rates generates a marked shift in the balance between old and young, changing their relationship. In this context, the increasingly necessary intergenerational collaboration is not limited to bringing together old and young people, but becomes a systematic approach oriented to a community development and a better life condition; these goals are achieved only through valuing the contribution of all the generations living there and setting up the context generative conditions (Ruggeri 2014).

[Fig. 3]

The mural 'Nonne a la fresca' by Marina Capdevila with the artist and some local ladies at the Borgo Artistico Borgo Universo in Aielli (AQ) in Italy – credits of the photo Virto560.

In this regard, the offer of services for the third and the fourth age, such as assisted living facilities, clinics, and community spaces, encourages the habitability of inner areas on several intergenerational fronts. If, on the one side, these spaces could generate job opportunities for younger inhabitants and contribute to the economic growth of the whole territory; on the other side, non-institutionalized experiences of residential care for the elderly could lead to some community exchanges benefiting both the older and the younger population (Lacorazza 2022).

For example, the role of the elderly as caretakers of the children for a few hours a day, within a trusting educational community typical of inner areas, becomes a priority for the lifestyle choices of young couples in terms of both economic and educational aspects related to bringing up children. Moreover, the care of the elderly by young families, combined with territorial socio-healthcare assistance services, would promote active ageing in place, limiting the isolation of older adults and the migration to urban areas of those who are left alone (Rossi, Bramanti and Moscatelli 2014).

The role of proximity and community welfare

The recurring terms in this vision are proximity and community. Policies supporting the third and fourth age in inland areas, by their nature, do not have a single destination and involve different local actors in the implementation and management of physical-digital welfare services. Investments in these specific services, made by third-sector organizations, public entities, and private collaborations, address various aspects of the elderly's life, not limited to mere emergency or health prevention management but fostering social and cultural exchanges and relationships among peers and across generations, serving as support services in place for the younger population as well.

The concept of proximity service is based on three specific dimensions (Barcet 1997): geographic, relational and of everyday life. The issue does not have an unambiguous definition and generally involves public and private actors together with informal expressions of society in shaping community needs and fostering social cohesion (Horgues-Débat 2008). Therefore, they take on the role of 'new common goods' (Lorenzetti and Leggero 2024) based on the sharing and the provision of rights to each person that is guaranteed by accessibility to the same services through both the new forms of experimental mobility and the public-private partnership interventions at the inter-municipal scale.

Compared to institutionalized welfare practices, the generative and proximity ones (Bongiovanni 2017) draw attention to the active involvement of the citizen and the personalization of the service. Co-participation and proximity to the users allow a better adaptation of the proximity welfare to the specific conditions of both the elderly and the internal territory. Perceiving a

person-based and place-based service it is, therefore, necessary to overcome the rigidities of the institutional model by challenging new self-organized experimental forms (community cooperatives, limited liability companies) in which the public and private components interact to structure innovative practices of community welfare provisions in fragile territories (Osti 2016).

The spatial dimension of welfare devices and their architectural design

The proximity welfare devices and their spatial dimension in rural areas are traditionally and radically linked. In the past, the public services design and construction were mainly focused on the function to be performed; schools, ambulatories, and post offices were mostly located in pre-existing buildings often by sacrificing functional and formal considerations. Before the increasing of the depopulation and ageing phenomena, services historically had a community and proximity character but later, the auto-promotion and the efficiency associated with unique and specific service building led municipalities and private investors to build something iconic and recognizable characterized by specific functions like little schools and retirement homes. The more structured services, centralized in strategic locations, covered a supra-municipal catchment area and were configured as mere single-functional provisions that maintained a certain distance between provider, user and local community denying the pivotal role of welfare services in the spatial construction of social relations.

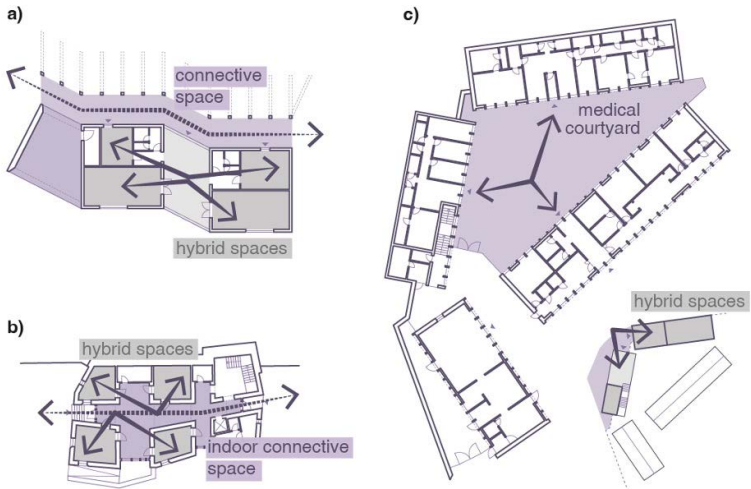
Nowadays, community services, especially those for the elderly, have rediscovered their local impact and the architectural project of these spaces takes on the role of a catalyst of social practices rooted in the local socio-economic fabric. The current design experiments in the inner areas mainly focus on the needs rather than the infrastructures and, therefore, the welfare devices acquire a sharing and community character. The overcoming of the segmentation and the functional specifications makes it possible to build two kinds of structures; on the one hand, some use destinations that require standard dimensions and building typologies, such as assisted living facilities and medical clinics, on the other hand, hybrid spaces where new practices can be experimented bypassing minimum user thresholds. These spaces, which integrate community, digital, and multigenerational components, could be configured as community kitchens, multifunctional rooms, and public green areas. In this perspective, the paradigm shift is crucial in those spaces where services are not merely tools for delivery and provision but also become devices generating local development and social innovation; therefore, their physical and spatial dimensions are not negligible (De Rossi and Mascino 2023).

Diverse experiences in small towns within the inner areas of Italy and Europe highlight how the built environment contributes heterogeneously to the development of intergenerational social and community practices related to welfare, which in various ways constitute a new habitability

of these places. In some cases, architectures, born out of emergency conditions, have become the centres of local development from which regenerative practices on a territorial scale were activated. A significant example on an international scale is the small municipality of Ostana, which between the 1920s and the end of the 20th century reduced its population from more than a thousand inhabitants to just six. Architecture in this context has been a driving force for the social and economic reactivation of the village, particularly thanks to the cultural centre Lou Pourtoun, designed by architects Crotti, De Rossi and Forsans. Throughout the year, the building takes on many forms of a community and aggregative nature (headquarters of the community cooperative, a rest area, event space, headquarters of associations) stemming from the internal distribution of the building and its design, which ensures functional multiplicity in isolated units but a connective tissue of a public nature suitable for informal and spontaneous activities by the entire community, which once took place in the open spaces of the different hamlets. Similarly, emergencies like the L'Aquila earthquake on August 6, 2009, led to the rethinking and reconstruction of new spaces for the community. In Poggio Picenze (AQ), the architects Burnazzi Feltrin built a community centre for young and old, replacing an old gathering structure that had become unusable in the centre of the village. In this case too, architecture reinterprets the conventional ways of using informal collective spaces, relating them to functionally undefined and adaptable spaces where different generations can engage in various activities in fluid environments with a constant connection to the nature and the surrounding landscape.

In other cases, the construction of new architectures for welfare, particularly for the elderly, has created new demands from the local population, establishing places where specialised services for a specific type of inhabitants are accompanied by other connective and informal spaces for the entire community. An example in this sense is the Maison De Santé in Vézelay, designed by Bernard Quirot Architecte + Associés. The complex of buildings, located in a municipality of about 500 inhabitants in the rural areas of central France, presents a spatial organization that alternates typologically defined spaces, such as medical offices and a pharmacy, with empty, multifunctional, and hybrid spaces serving as a civic centre. Once again, open spaces are fundamental for the relationship between the different functions, the surrounding landscape, and the historical city centre (Fig.4).

Moreover, the choice of locating these spaces in a specific place, within abandoned buildings, or in proximity to other catalysts, is a fundamental part of the territorial development process in which architects, by controlling flows and behaviours, play a fundamental role. Quality architecture, in fact, becomes a reference point for communities and, at the same time, a tool for cultural promotion and good local development practices (De Rossi and Dini 2020).



Castel del Giudice: A Virtuous Example

The chosen case study supporting the aforementioned thesis is the experience of Castel del Giudice, a small municipality in the province of Isernia in Alto Molise. The village perfectly fits into the definition of an inner area exposed in the previous pages; in fact, it experiences depopulation and ageing phenomena, and it presents a substantial distance from services, enough to be classified as an ultraperipheral municipality by Cipess.

In its historical evolution, Castel del Giudice started its development as one of the agricultural and pastoral villages of the Apennines even today traceable in the paths of transhumance (tratturi) still present in the area. The industrial development of the late nineteenth century has led to the development of the village, which reached the record of 1600 inhabitants, but since the twentieth century a progressive decrease in the resident population, with 301 residents in early 2024 (source dati.istat.it), led to a progressive abandonment of the municipality and a reduction in services.

[Fig. 4]

Planimetric schemes of

- a) Multi aged community center. Poggio Picenze (AQ), Italy (Burnazzi Fettrin Architetti, 2015);
- b) Cultural center Lou Pourtoun, Ostana (CN), Italy (Crotti, De Rossi e Forsans Architetti, 2015);
- c) Maison de santé du Vézélien, Vézelay, Francia (BQ+A, 2014) – elaboration of the author.

Starting from the end of 1990s, in a critical context with reduced job opportunities and an increasingly elderly community, the municipal administration, led by the mayor Lino Gentile, initiated a local development process by courageously addressing one of the most critical elements: the elderly population.

The local government in 1999 carried out the first of a series of actions aimed at territorial regeneration: the construction of an assisted living facility (RSA) near the town centre in the former elementary school, closed for the lack of students due to the depopulation.

The success of the project, visionary due to the small size of the municipality, lies in the innovative management methods. If standard public procedures had been used to build an assisted living facility, bureaucratic obstacles for funding and time delays would have compromised the outcome on a first chance. Afterward, the establishment of a public-private partnership, composed of the municipality of Castel del Giudice, a local entrepreneur, and citizens interested in the development of the project as 'affective entrepreneurs', enabled the creation of a broader intervention that included the construction of both the assisted living facility and the assisted residences (RA) for self-sufficient elderly individuals.

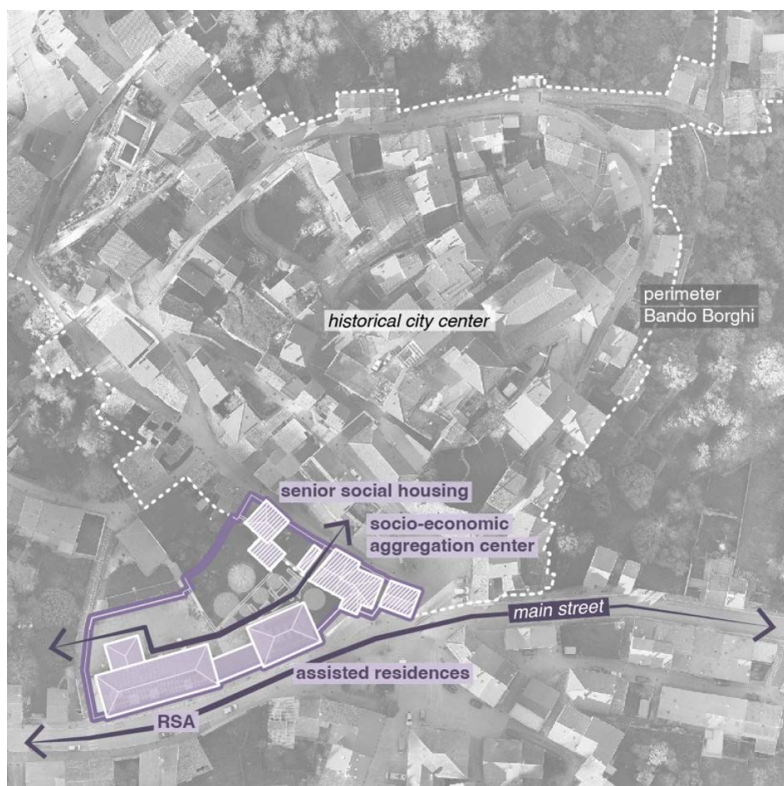
The active participation of the population in the limited liability company, evident from the economic contribution of some residents with 18,23% of the equity (Bartocci and Picciaia 2020), allowed all citizens to envision a future for their town, overcoming nostalgia for the school's closure and opening up to new perspectives. Moreover, the participation in founding the company, named San Nicola s.r.l, as the patron saint of the village, represents an investment by some citizens in their future, preparing conditions to age in Castel del Giudice.

San Nicola s.r.l, has played a central role in the town's territorial development, alongside the other two community-oriented initiatives promoted by the municipality for agricultural and touristic development of Castel del Giudice (De Rubertis, Belliggiano and Labianca 2018).

Regarding the impacts exerted by the elderly facilities on the context, some economic activities, such as the pharmacy and the grocery shop which were closed for years, were reopened. Moreover, approximately 20 healthcare professionals, mostly female, have been employed and, as a result, they relocated to the area with their families; among these workers, engaged in the elderly residences, there are also some Venezuelan nurses included in a specific repopulation action with migrant families. From the perspective of the elderly, the facilities represent an important reference point also for the inhabitants of the surrounding municipalities, who may need to be accommodated in later life in a homely and family-like context. Additionally, for those originally from Castel del Giudice but moved elsewhere for work, the facilities offer the possibility to return and spend their old age in the town.

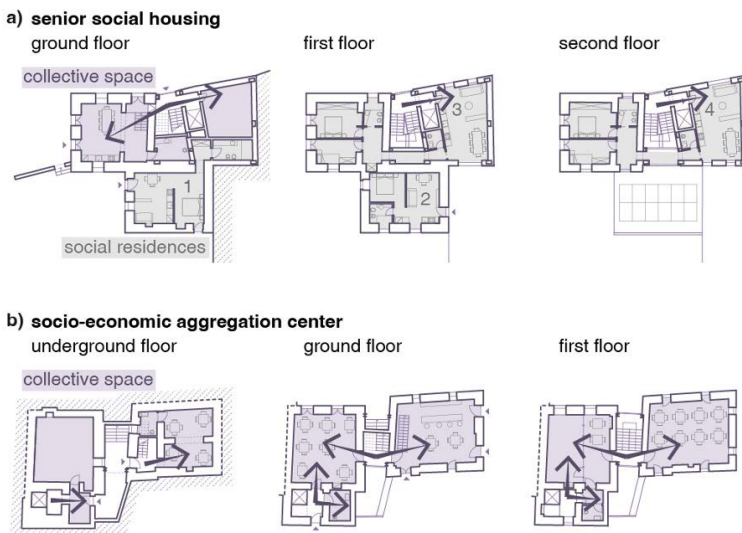
THEORETICAL PAPERS

Also the contribution of 20 million euros, granted to Castel del Giudice within the Piano Nazionale di Ripresa e Resilienza (PNRR) – Bando Borghi, intersects with the strategic project axis related to the elderly population and the community. Among the interventions involved in the proposal it is evident the desire to continue to invest in the elderly as a tool for territorial development: within the defined perimeters of the project and in a close spatial relation to the RSA and the assisted residences a community socio-economic aggregation center and senior social housing were planned, as generating a district of community welfare devices (Fig.5).



[Fig. 5]
Castel del Giudice, the district of community welfare devices composed by exiting (RSA and assisted residences) and new PNRR facilities (senior social housing and socio-economic aggregation center) – elaboration of the author.

Especially in these cases, the role of architectural design of buildings and open spaces is fundamental as a tool for territorial enhancement. The job of the research group of the Department of Architecture and Design (DAD) of the Politecnico di Torino, composed by [reference removed to maintain the integrity of the review process], as consultants to the design of these spaces is experimental according to two dimensions: on the one hand as an innovative academic research activity in continuity with other design experiences of welfare spaces in the Alps and the Apennines (De Rossi and Mascino 2024), and on the other hand as a means to 'spatialize' political intentions of transformation (Fig. 6). The architect produces, with his practice, material responses to anticipatory and strategic inputs according to the practice of 'translating' into physical spaces not only mere functions but also ambitions, visions, and possible outcomes that are achievable only through quality architecture with civic and political responsibilities.



[Fig. 6]

Castel del Giudice, the plan of some of the new PNRR facilities (senior social housing and socio-economic aggregation center) – elaboration of the author.

On the other hand, imagining new forms of residential living and territorial welfare in inland areas leads to significant architectural and design challenges, in fact these experimental spaces are often located in pre-existing buildings situated in towns and villages that are frequently subject to historical and artistic constraints, with construction and formal characteristics that are historically consolidated. In Castel del Giudice, the buildings of the community socio-economic aggregation centre and senior social housing address contemporary architectural challenges re-interpreting the traditional typologies of welfare spaces in versatile and multifunctional spaces with a clear community-oriented imprint. The connection between spaces, whether in terms of internal layout or open areas within the 'district', is the key element of innovation through which are achieved gradients of privacy and inter-community and extra-community relationships. Although both projects involve the manipulation and/or expansion of existing load-bearing masonry structures, the chosen language—deliberately contemporary in the choice of openings and formal expressions—aims to enhance existing materials and technological solutions. It is crucial that the physical outcomes of local development interventions, aimed at fostering community-building, will be recognized by local inhabitants as part of their identity, even in the spatial and architectural forms proposed.

Conclusions

The presented case study fully embodies the concept underlying the term Antifragility, coined by Nassim Taleb in *The Black Swan* (Taleb 2008). Castel del Giudice is antifragile because, after experiencing the impact of an ageing population, youth migration, and economic crisis, the inhabitants absorbed the energy of the problems and converted it to improve its performance. Castel del Giudice has generated growth from a crisis condition, creating a new population from depopulation, a new economy from crisis, a new city from ruins.

In conclusion, starting from this example it is possible to argue that the development of marginal areas must increasingly be based on the factors that made them fragile, by converting the problems to advantages together with all the positive elements that characterize these territories. Perhaps, in a condition of progressive ageing, a new and young habitability for inland areas should be based on the third and fourth age as an initial development stimulus on which to build the entire strategy. In this context, architecture could accelerate and guide these experimental processes in which small municipalities in the inner areas become laboratories of good practices that, through the spaces of welfare and community, will condition their own future.

Bibliography

- Agenzia per la Coesione Territoriale. 2021. *Informativa sullo stato di avanzamento dell'attuazione degli APQ nell'ambito della Strategia Nazionale per le Aree Interne*. Accessed April 26, 2025. <https://www.agenziacoesione.gov.it>.
- Arlotti, Marco, and Stefania Cerea. 2021. "Invecchiare a domicilio nei contesti urbani e nelle aree interne. Fragilità, isolamento sociale e senso di solitudine." *DASTU Working Paper Series* 4. Milan.
- Barca, Fabrizio. 2009. *Un'agenda per la riforma della politica di coesione: Una politica di sviluppo rivolta ai luoghi per rispondere alle sfide e alle aspettative dell'Unione Europea*. Brussels: European Commission.
- Barcet, André, and Joël Bonamy. 1997. "Les services de proximité à la recherche d'un modèle." *Revue d'économie industrielle* 80: 129–142.
- Bartocci, Luca, and Francesca Picciaia. 2020. "Looking for New Paths to Realize Cross-Sector Collaboration for Urban Regeneration: The Case of Castel del Giudice (Italy)." *Sustainability* 12.
- Boccacin, Lucia. 1999. "Lanziano attivo come risorsa sociale: alcune esperienze." In *Primo rapporto sugli anziani in Italia*, edited by Fondazione Leonardo, 87–150. Milan: FrancoAngeli.
- Bongiovanni, Laura. 2017. "Il valore generativo del welfare di prossimità: solo buon esempio o prassi da modellare? Una riflessione a partire dai dati di esperienza." *Welfare Oggi* 5: 25–32.
- Cholat, Florent, and Luca Daconto. 2021. "Reversed Mobilities as a Means to Combat Older People's Exclusion from Services: Insights from Two Alpine Territories in France and Italy." In *Social Exclusion in Later Life*, edited by Keiran Walsh, Thomas Scharf, Sofie Van Regenmortel, and Anna Wanka, 141–155. International Perspectives on Aging, vol. 28. Cham: Springer.
- De Rossi, Antonio, and Laura Mascino. 2024. "Case comunitarie e del welfare: esperienze e progetti in Italia a partire dal margine." In *I servizi di prossimità come beni comuni. Una nuova prospettiva per la montagna*, edited by Luigi Lorenzetti and Roberto Leggero. Rome: Donzelli.
- De Rossi, Antonio, and Laura Mascino. 2023. "Case comunitarie come inneschi (ri)generativi." In *Tanti paesi. Aree interne e insediamenti rurali*, edited by Giorgio Peghin, Adelina Picone, and Francesco Rispoli, 134–143. Melfi: Libria.
- De Rossi, Antonio, ed. 2018. *Riabitare l'Italia. Le aree interne tra abbandoni e riconquiste*. Rome: Donzelli.
- De Rubertis, Stefano, Angelo Belliggiano, and Marilena Labianca. 2018. "Partecipazione e identità territoriale. Il caso di Castel del Giudice (Molise)." *Geotema* 56: 48–54.
- Dykstra, Pearl A. 2010. *Intergenerational Family Relationships in Ageing Societies*. New York and Geneva: United Nations Economic Commission for Europe.
- Eurostat. 2023. *Statistics Explained*. Accessed April 26, 2025. <https://ec.europa.eu/eurostat/statistics-explained>.
- Glasgow, Nina, and David L. Brown. 2012. "Rural Ageing in the United States: Trends and Contexts." *Journal of Rural Studies* 28, no. 4: 422–431.
- Gucher, Catherine. 2018. "La participation sociale des retraités: Un atout pour les territoires ruraux." *Pour* 233: 163–169.
- Gucher, Catherine, Isabelle Mallon, and Véronique Roussel. 2007. *Vieillir en milieu rural: Chance ou risque de vulnérabilité accrue?*. Accessed April 26, 2025. <https://halshs.archives-ouvertes.fr/halshs-00371194/document>.
- Horgues-Debat, Jean. 2008. "La proximité: une autre logique pour les services publics." *Pour* 196–197: 25–33.
- ISTAT. 2024. *La demografia delle Aree Interne: Dinamiche recenti e prospettive future*. Accessed April 26, 2025. <https://www.istat.it/comunicato-stampa/la-demografia-delle-aree-interne-dinamiche-recenti-e-prospettive-future/>.
- Juncker, Jean-Claude. 2016. "Speech at the Annual General Meeting of the Hellenic Federation of Enterprises." Athens, June 21. http://europa.eu/rapid/press-release_SPEECH-16-2293_en.html.
- Lacorazza, Piero. 2022. "Appennino, la miglior politica per i giovani è investire sulla terza e quarta età." *Civiltà Appennino: La Rivista*. Accessed April 26, 2025. <https://www.civiltappennino.it>.
- Lorenzetti, Luigi, and Roberto Leggero, eds. 2024. *I servizi di prossimità come beni comuni: Una nuova prospettiva per la montagna*. Rome: Donzelli.

THEORETICAL PAPERS

- Lucatelli, Sabrina, Daniela Luisi, and Filippo Tantillo. 2022. *L'Italia lontana: Una politica per le aree interne*. Rome: Donzelli.
- Lupatelli, Giampiero. 2022. "Antifragilità." In *Rigenerazione Urbana: Un glossario*, edited by Giampiero Lupatelli and Antonio De Rossi. Rome: Donzelli.
- Melchiorre, Maria Gabriella, Sabrina Quattrini, Flavia Piccinini, and Giovanni Lamura. 2021. "Anziani soli e reti di cura: Una comparazione territoriale." *DASU Working Paper Series* 3. Milan.
- Membretti, Andrea, Stefania Leone, Sabrina Lucatelli, Daniela Storti, and Giulia Urso. 2023. *Voglia di restare: Indagine sui giovani nell'Italia dei paesi*. Rome: Donzelli.
- Osti, Giorgio. 2016. "Territori fragili e servizi di welfare: l'Italia come mediana dell'Europa." *Culture della sostenibilità* 17: 5–12.
- Perlik, Manfred. 2006. "The Specifics of Amenity Migration in the European Alps." In *The Amenity Migrants: Seeking and Sustaining Mountains and Their Cultures*, edited by Laurence A.G. Moss, 215–231. Wallingford: CAB International Publishing.
- Rizzo, Anna. 2022. *I paesi invisibili: Manifesto sentimentale e politico per salvare i borghi d'Italia*. Milan: Il Saggiatore.
- Rodriguez-Pose, Andrés. 2028. "The Revenge of the Places That Don't Matter (and What to Do About It)." *Papers in Evolutionary Economic Geography (PEEG)*. Utrecht: Utrecht University, Department of Human Geography and Spatial Planning, Group Economic Geography.
- Rossi, Giovanni, Donatella Bramanti, and Matteo Moscatelli. 2014. "Active Ageing e Socio-Generatività: Analisi delle reti e scambi intergenerazionali. Un'indagine quantitativa su scala nazionale." *Sociologia e politiche sociali* 17: 33–60.
- Rossi-Doria, Manlio. 2005. *La polpa e l'osso: Agricoltura, risorse naturali e ambiente*. Naples: L'Ancora del Mediterraneo.
- Ruggeri, Stefania. 2014. *Solidarietà intergenerazionali e sistemi di welfare: Una nuova geografia delle responsabilità familiari in Europa*. Milan: Ledizioni.
- Storti, Daniela. 2021. "Il punto sulla Strategia Nazionale Aree Interne e la sua integrazione nella nuova programmazione nazionale/ comunitaria." *Agriregionieuropa* 3: 2–7.
- Taleb, Nassim Nicholas. 2008. *The Black Swan*. Harlow: Penguin Books.
- Various authors. 2020. *ArchAlp – Per una nuova abitabilità delle Alpi: Architettura per il welfare e la rigenerazione*, n°. 4. Bologna: Bononia University Press.