



Protection from Seismic and Pandemic Risks of Fragile Suburbs. Coexistence with Risk and Distancing-Integration Scenarios

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Abstract. The research starts from the study of the different forms of marginal areas with low population density, mainly present in Central Italy, distinguished with visionary definitions: “filaments of lights”, “luminous serpentines”, “shining paths”, “urban comets”, “luminous constellations”, “necklaces of lighting candles”.

The research evaluates an overall strategy for the widespread residential model, supported by the resources, made available by the European Union “Recovery Plan”, for large strategic projects of widespread health care, risk protection, administrative reorganisation of small municipalities and telematic services, reduction of disparities between centralised urban areas and most fragile diffuse urban areas with high environmental risk.

The results of the work provide suggestions for risk protection of the most fragile diffuse residential systems in hilly and mountainous inland areas which can represent an alternative to the concentration and gathering of the population.

Finally, the paper proposes some operational strategic lines for a revision of the Urban Planning paradigms in the light of the Pandemic, adapting the most advanced disciplinary acquisitions in terms of protection from seismic risks to the wider needs of coexistence with pandemic dangers.

In conclusion, a rethinking of the widespread residential model is proposed, in synergy with the centralised residential model, where the need to avoid, in some temporal phases, concentrations of both people and densely built spaces, can be combined with the possibility of life in peripheral internal.

Keywords: Seismic and pandemic risks · Coexistence with risk · Fragile suburbs · Distancing-integration scenarios · Demographic concentration-diffusion

1 The Territorial Context

In Central Italy and, in particular, in the Marche, there is an unusual territorial characterisation of the peripheral areas (Bedini and Bronzini 2016): Green comet (a radiocentric systems of urban e rural fringes), Luminous serpentines (settlements over the hilltops of

Central Italy); Luminous paths (narrow lines of continuous settlements along the main valleys), Urban nebulae (chaotic constellations of scattered buildings).

In a time of economic recession, the transformation of these low density settlements might turn them into areas that attract investments and an experimental territory for the planning of innovation, social and equal-sustainable protection of rural-urban green areas, in an extensive landscape rich in social and ecologic interactions (Rauws and De Roo 2011). These urban structures, which are characterised by extreme and disorganised land use and a high risk of negative interaction, degradation and abandon, represent a new opportunity for a policy to relaunch local values (Stephenson 2010) and a way of life in environments with a low anthropisation level and high environmental landscape value: neither city, nor countryside, nor park. What is the future of these different typologies of peripheries? (Grant et al. 2013).

The research identifies numerous pathologies: the co-existence and competition of centrifugal and centripetal forces, settlement disorganisation without recognisability, identity, functionality, relationships between the parts; structural degradation including of the formal, functional and social quality of disintegrated urban settlements; a loss of the value of historical-cultural assets, dangerous interactions between vehicle and pedestrian traffic; an uncontrolled increase of costs per residential unit and the costs needed to resolve situations of unsustainable environmental incompatibility; a lack of functional organisation and rational management of the filiform settlement along the narrow urban sections, etc.

2 Objectives in the European Context

Some of the major objectives of the European Union (COM(2007) 621 2007) are:

- Mitigation of territorial competitions, which in the last decade has been established as competitiveness between institutions and territories, with the risk of degenerating into policies of “everyone against everyone”, to the detriment of the weaker areas (low anthropisation areas), is replaced by a new form of competitiveness (based on the essence of the values in question and not on publicity form) between integrated city, countryside and fringe territory systems, as a binding driving force, which is being considered in a new way in terms of planning, design and management.
- Incentive of cohesion: the result of inconsistency (and poor quality of life), reached in the territories of modernity, is reversed by the expected results, in the sense of rethinking the economy as a real valuation of contexts, able to generate products of quality both in the field of agriculture (according to the natural vocation of the land) and in the entrepreneurial world, with the valuation of the irreplaceable resources of history, art, culture and landscape, ancient production systems that have been created in the world through to a very high development potential growth, ranging from cultural, environmental and gastronomy tourism to the green economy and new energy sources.

The *paper* intends to answer the question whether the new awareness and urban and territorial scenarios that emerged following the pandemic will lead to a transformation of the diffusion-demographic concentration relationship, both in terms of settlement

structures and roles played on the one hand by the cities and on the other by the vast areas with low building density. These objectives are coherent with the provisions of the European Union and the requirements of the contents of the Recovery Plan.

Currently there are no known plans for regulating long settlements of isolated buildings, along the hill tops, the valley bottoms, and the expansion fringes of urban centers.

These new settlement systems involve many neighbouring and non-neighbouring municipalities and no attention is given to these settlement structures, seen in their supra-municipal development, that would on the other hand require decisive multi-scale planning. These low-density urban structures are characterised by extreme and disorganised land use and high risks of negative interaction (Mininni 2005; Nazio 2006).

The objectives of the Recovery Plan (Piano Nazionale di Ripresa e Resilienza 2021) can be summarised as: ecological transition, environmental regeneration, green economy, green city, expansion of digital activities, strengthening of widespread health care, streamlining of administrative procedures, and contrasting social inequalities and inequities between urban centers and small countries in inland areas, with high environmental risk.

3 Methodology and Research Results

In order to pursue the indicated objectives relating to risk assessment and mitigation strategies in urban and regional planning, it was decided to start from the reconsideration of the unstable balance of the relationship between suburbs, urban centers and urbanised countryside. We then proceeded with the identification of the seismic, hydrogeological and pandemic risks that threaten this balance to the detriment of widespread urbanised areas.

Subsequently, the research evaluates an overall strategy for the widespread residential model, supported by the resources made available by the European Union “Recovery Plan” for large strategic projects: ecological transition, digital transition, contrasting territorial disparity, administrative deburocratisation.

The research brought to light numerous pathologies and possible solutions at different scales of intervention with the aim of identifying, for each type of peripheral settlement, suggestions for their reinforcement and requalification.

Modalities for the reduction of the global risk are also identified, since the level of peripheralisation is strongly linked to the seismic and hydrogeological risk (Bedini and Marinelli 2021) which today, in the presence of a pandemic risk, poses new problems and potential.

The proposed solutions aim at overcoming the city-countryside dualism and controlling the development dynamics in the contamination between peri-urban and countryside settlements, in the landscapes in transit. The results of our research on these new settlement systems above all involve the serious shortcomings ascertained on the part of the public authorities in the management and planning of the territory.

In a phase of strong global change, even at a settlement level, with situations of abandon and degradation, a policy to relaunch local values and a way of life in environments

with a low anthropisation level and high environmental landscape value, may represent a new opportunity for economic and social development.

In the context of the current pandemic, the small countries in inland areas and urbanised countryside will again be able to play a propulsive role, returning to a form of territorial balance with centralised areas, re-evaluating the role of the peripheries (linear, radiocentric, hilly serpentine, masses urbane of uncontrolled urban expansion). However, this situation can consolidate provided that these systems remain interconnected with the world (Tira 2020).

It is therefore time to rethink the management model of urban and rural space, reconstructing new hierarchical, functional and interchange relationships between center and periphery, between metropolitan areas and internal areas, with the generation of positive effects on the «interpersonal relationships of proximity» (Balducci 2020a).

However, only with access to European funding will it be possible to pursue the new proposed settlement model in concrete terms (Tarpino and Marson 2020).

Ultimately, from the ongoing debate emerges the need for urban planners and territorial planners to give their own contribution to redefine balanced and equitable social and territorial relationships between high residential density and residential scarcity, public space and private space, eliminating the major socio-spatial inequalities to urban, regional and national level (Pasqui 2019).

Finally, the global changes in the behavior of the population and in the settlement structures imposed by the pandemic leads to a mutation of the disciplinary paradigms of urban planning.

The pandemic will therefore cause a modification of the dynamic relationship between areas of demographic concentration and areas of demographic diffusion. This change in unstable equilibrium will affect the functions performed, both by densely populated cities and areas with scattered residences in inland areas. The strategies and contents of territorial and urban plans must therefore be reconsidered to define a different settlement model (Bedini and Bronzini 2018) where small countries located in inland areas can play a coherent role in symbiosis with the centralised settlement model, which is place in turn for safety.

Such a review of the planning tools starts from the assumption that the resources, made available to our country by the Recovery Fund, as part of the EU Next Generation plan for strategic projects to protect against global risks, constitute a unique and unrepeatable potential for concretizing the settlement structural model: internal areas, suburbs, urban centers.

Some changes to the planning contents can be summarised as follows:

- Definition of essential elements, at urban and territorial level, of Urban Minimum Pandemic Structures (SUMP).
- Realisation or reintroduction of neighborhood services and equipment in small inland urban areas.
- Computerisation of health services spread throughout the territory and forms of door-to-door assistance to businesses.
- Activation of high-tech equipped civil protection centers in the infrastructural nodes of inland areas, always accessible to first aid vehicles for mass health care.

- Planning of an urban-territorial structure that favors the consolidation of service hierarchies between urban centers and widespread urban areas (Bedini et al. 2019).
- Use of flexible and alternative land use destinations.
- Monitoring of buildings, at urban and territorial level, destined to accommodate functions required by post-seismic emergencies (Bedini and Bronzini 2018) or pandemic protection.
- Reactivation of infrastructures and equipment spread throughout the territory as a system of both safe mobility and emergency response in the event of a disaster.
- Creation of a territorial social and health protection system.
- Incentive to slow mobility.
- Variable delimitation of public spaces, squares, nightlife spaces, parks, to be inhibited or contingent upon in the event of a pandemic emergency.

Ultimately, the protection from the risks of the more fragile widespread residential systems of hilly and mountainous inland areas must be carried out in harmony with the safety of highly concentrated urban areas.

Some additions to the planning tools are now listed in line with the reforms required by the European Union, in the context of the Recovery Plan.

- Implementation of the concept of flexible, temporary and dynamic use of space, of variability of the times of the city, modifying the modalities of movement and access to urban facilities, social, cultural and sporting services;
- Enhancement of a symbiotic relationship between city, suburbs and countryside, for the reduction of territorial inequalities.
- Redesign of cities into more liveable neighborhoods, on a human scale.
- Creation of urban elements in countries of inland areas.
- Development of a “National and regional evacuation plan”, in the event of natural pandemic disasters (and also of terrorist attacks, with conventional, chemical or biological weapons) which provides for a sudden reuse of the enormous underutilised or abandoned property assets available in internal areas.
- Monitoring of the unstable balance between the neighborhood function typical of widespread settlements and the propulsive function performed by urban centers. Monitoring of the dynamic relationships between central locations, widespread locations and linear interconnection peripheries.
- Creation of alert systems for residents and civil protection centers on the possible multiple consequences generated by earthquakes and hydro-geological quakes.
- Application of flexible zoning, with flexible uses of spaces, alternating between a state of everyday life and a state of emergency, at the municipal, urban and neighborhood level.
- Preventive preparation of historical-rural countries where to spend quarantine periods in emergency situations.
- Preparation of some small historical-rural centers such as Covid Free “islands”.
- Setting up high-tech, protected and highly accessible centers located in a strategic nodal position serving wide areas.
- Reactivation, in internal areas, of small disused local hospitals as medical centers serving wide areas, construction of emergency centers, outpatient centers, strengthening of home medical care, telemedicine, school activities.

Ultimately, a revision of the times of the city is required (Zaoli 2020) in which to reorganize the city and a flexible use of the movement spaces (Monti 2020). Some initiatives (Milan, Bergamo, Prato, Bolzano, etc.) were also tested in implementation of Law 53/2000 or Legislative Decree 267/2000, with the rescheduling of the opening hours of businesses and public bodies (Tira 2020).

The “15-min cities” model (De Luca 2020) implies that each neighborhood is equipped with a set of neighborhood facilities and services, currently absent or abandoned (Balducci 2020a). The preventive delineation of spaces and functions and the planned distancing for risk protection was deepened in a city organisation model based on an integration between Epidemic Prevention Area (EPA) (Wei 2020) and “15 min city”.

Therefore, scientific evidence from urban planning research shows that in the presence of a pandemic it is mandatory to proceed with the reorganisation of the city by neighborhoods, ensuring the presence of elements and values of proximity (Balducci 2020b). The activation or inhibition of attractive poles can be programmed, depending on the health and policy choices to combat the pandemic (Zaoli 2020). The Plans will therefore have to redesign the “cities of neighborhoods”, where always ensure the autonomy of essential services, and the ability to reach, in fifteen minutes, even the bus or metro stations (Tira 2020). In other words, planning must continually recalibrate itself by adapting to the differences between planned guidelines and actual situation (Monti 2020). And programming must always remain interconnected with the ecological transition, the green economy, health and social assistance spread throughout the area.

In this logic of strong dynamism, the times and methods of drafting, approval, management of urban plans will also have to be completely modified (Tira 2020). And this also in accordance with the needs of acceleration, equity, finalisation, efficiency, flexibility, required by public administration reform and European Union for the allocation of the resources of the “Recovery Fund”.

To counteract the inequalities between urban centers, suburbs and urbanised countryside with high environmental risk, policies to support more fragile areas must be supported (Ventura and Tiboni 2016), mitigating inequalities, not only between centralised areas and widespread settlements, but also between centers and suburbs and between north and south.

The small countries of inland areas will remain connected with a hierarchical structure of high technology health, energy, circular economy centers, protected from seismic, hydrogeological and pandemic risks. These villages will be able to make available, in case of emergency, many buildings and equipment, for the population forced to move from the cities.

Territorial planning will also be able to program the reuse of available resources, under or badly used, to favor cultural and food and wine tourism, modern agro-zootechnics, the spread of creative artistic activities (Bedini and Bronzini 2019).

4 Final Remarks

The pandemic has caused the dichotomies of the pre-existing city to explode: the relationship between space and time, between contrast and coexistence with global risk, between immobile city and city in transformation in conditions of uncertainty, between densification and diffusion, between deterministic and strategic development guidelines, between rigidity of intended uses and flexibility of use. It follows the need to redesign the centralised urban model by creating green cities, where the need to avoid, in some temporal phases, concentrations of both people and densely built spaces, can be combined with the possibility of life in peripheral internal.

Ultimately, the mitigation of territorial fragilities and inequalities is only possible with a dynamic, unstable and symbiotic relationship between new functions of scattered settlements, capable of favoring qualitative neighborhood relations, and the indispensable role of cities, which in turn are secured in pandemic time.

In this perspective, the results of the research can be extended to other areas of the European Union with similar characteristics of the types of suburbs considered.

In conclusion, it could be said that long linear peripheral areas, hilly and valley floor, play a functional role in the territorial structural system, as a link between centralised areas and widespread rural areas. This role evolves on the basis of an unstable equilibrium, which can lead to spatial and a-spatial degradation in the event of the absence or abandonment of proximity services and production activities. Following hydrogeological instability and seismic events, the fragile unstable equilibrium is broken in the absence of strong and rapid funding, and management efficiency. Otherwise, the conditions of territorial imbalance and inequity cannot be removed. Finally, in pandemic situations, following the need for deconcentration, thinning out, isolation, the areas of settlement spread can be called upon to perform an important alternative life function and the suburbs (linear, radiocentric, hilly serpentine, urban masses of uncontrolled expansion) can regain their structural balance between urban centers and the urbanised countryside, if supported by large focused funding.

The pandemic, therefore, will certainly leave an indelible mark even in the paradigms of urban planning which will be called, in situations of uncertainty, to redesign cities, linear or aggregated suburbs, internal areas, by introducing flexible, temporary and uncertain uses. And the disciplinary *intelligenza* will necessarily have to propose anti-pandemic strategies of urban and territorial policy, to reduce social and spatial inequities and differences in cities, regions and the Country.

To avoid such needs being accumulated in the limbo of good intentions without political and financial involvement, it must be clear that this opportunity can be seized immediately or never again in the context of the Recovery Plan.

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