

Earthquake in Italy: From the Past Decades to the Future. Strategies and Innovative Tools for Urban Planning and Territorial Regeneration



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Abstract Some results of the study on the past history of earthquakes in Italy and on the prospects of protection from seismic risks in the next decades are presented. The problems generated by the earthquake in various Italian regions and in particular in central Italy were evaluated, proposing an economic and integrated settlement system for a new economic and social model, aimed at the rebirth of territories in crisis. Finally, the conclusions summarize the objectives and strategic choices, which can be considered consolidated acquisitions by the scientific community in order to identify the disciplinary and management paths to be followed in the coming decades.

1 An *Excursus* from the Past History of Earthquakes in Italy: Positive and Negative Aspects of the Interventions Carried Out

It has very often not been possible in Italy to develop alternative economic, social and settlement models, after earthquakes or other natural disasters. Far too often, actions have been limited only to the actual emergency and reconstruction [4, 20, 49]. In order to define concrete operational solutions when planning prevention, emergency and resurgence actions, the economic and time gap between objectives and the desires of residents, and the possibility of satisfying the same, must be taken into account.

In Friuli region (1976) the earliest studies on seismic microzonation had a positive impact on future studies involving vulnerability, technical regulations and the classification methods used in the areas affected. The focus in this particular case was on risks, risk mitigation and the fact that interactions between different fields cannot be forgotten, even if the political world failed to make courageous and innovative choices.

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Temporary wooden structures (MAP) were constructed immediately after the earthquake, while the fact that the Municipalities involved were very small, made it possible to complete reconstruction in just two or three years.

In Marche region (1972; 1997) the experience of the Ancona earthquake dating to 1972 [16, 32] may be seen as an example where the Historical Centre was fully recovered, thanks above all to the very substantial funds received. Thanks to these funds, a traumatic event became a unique opportunity to turn the ancient Guasco and Astagno districts—built on two hills that were difficult to access, with interconnected buildings stacked on top of each other, and hundreds of small inaccessible spaces, overrun by nettles and mice—into hygienic and clean districts, with a tidy network of paths and courtyards, that ended up by becoming public areas, in a beautiful setting of historical buildings.

The distant remote experience, together with the new General Zoning Plan, were based on the use of private reconstruction in detailed sector Plans, that also defined the aggregation, separation and recomposition of public and private property units, by highly qualified architects, where the urban regeneration strategy was based, right from the start, on a *vision* of the collective good and urban socialisation.

In this case, post-earthquake reconstruction did not require specific planning, because the new General Zoning Plan had recently been introduced. The reconstruction of the historical centre, which took a decade to complete, was based on a “unitary project”.

Taking into account the question of reconstruction alone, the fitness for occupancy certificates—that were used in Italy for the first time in Marche Region, after the 1997 earthquake [44]—ensured a certain uniformity in assessing fitness for occupancy (resolving, at least in part, the enormous assessment differences that occurred in the past), although they did not help to identify buildings that were not demolished and reconstructed.

These experiences show that by creating a multi-sectoral system of economic, urban planning, a social system, and a geotechnical and hydrogeological protection system, while closing the gap between technical-engineering and geological studies and social and economic studies, it is possible to create an *intelligenza* to “manage the expectancy” of a territory of this kind.

Conversely, the uncertainty of the population and administrators of the small Communities in Central Italy is now quite evident, since all that is being done is run around in a sort of vicious circle created by the emergency, trying to understand where and when to construct wooden shelters for people and animals.

Moreover, most of the home owners involved in the drama of the earthquake, do not have the funds to carry out the works required on these historical buildings, despite the creation of consortia (Minimal Intervention Unit) [31]. And this is a very evident difficulty, despite the great urban planning consistency and value of the Minimum Intervention Units [60].

Everyone seems to agree on the need to plan Minimal Urban Structures (SUM) [3, 8, 23], above all taking into account the developmental stages of the SUM tool, intended as good risk planning practices [34].

In Umbria region (1979; 1984; 1997), in the case dating to September 1997 [48], the choice of soft reconstruction made it possible for residents to return to the district within a reasonable period of time, when it was possible to repair the damages incurred with anti-seismic technical solutions. In this case, seismic microzation made it possible to identify areas with different geological and geomorphological characteristics, over and above the seismic aspect.

Pursuant to Regional Decree no. 64 dated 8 February 2010, the Region approved the guidelines to define the Minimal Urban Structure for the Reduction of Seismic Risks, pursuant to article 3.3.d of Regional Law no. 11 dated 22.02.2005. And with Regional Law no. 1 dated 21.01.2015, the SUM was structurally included in Urban Planning, in order to identify approaches, spaces, urban functions and strategic buildings to ensure an urban response to earthquakes during the emergency, and maintain and resume urban, economic, social and relational activities, after the earthquake.

The SUM includes the *lifelines*, the main railway communication routes and nodes, the escape routes, the secure open and closed spaces, key centres, collection points for the population. The SUMs include the critical elements: historical urban gateways, steep or very narrow sections of roads, sharp bends, hydrogeological hazards, buildings close to the road, etc.

In Emilia Romagna region (2012) the experience represents a milestone in the approach to dealing with the aftermath of earthquakes. For the first time in Italy, this was an earthquake that struck an enormous area with a dynamic industrial, urban and agro-industrial fabric. An experience that was developed with a laborious bottom-up process.

It was also the first time that a Special Reconstruction Commissioner was appointed in Italy; the Commissioner was the President of the Regional Council Vasco Errani, who supervised each and every step of the regeneration process of the Municipalities affected by the earthquake.

The Reconstruction Plan (Law No. 16/2012) for Emilia-Romagna [47], not applicable to ordinary urban planning management, made it possible to construct permanent essential services very quickly. The 2015 Special Area Programmes for 24 Municipalities (Regional Law no. 30/1996) [31] and the Plans for the historical centres, all reconfirmed the fundamental importance of the established fabrics, while the Operational Plan (OP) defined an innovative urban plan associated with economic and financial programmes for the social and economic regeneration of the urban historical centres [38].

In other words, this was a shared and planned urban planning strategy, which was part of a vision whose aim was to strategically relaunch a very large territory, that risks abandonment, by introducing preventive planning earthquake measures. The plan focuses on supporting the population, by reprogramming new production and tourist-cultural functions for the tiny historical centres scattered throughout the territory.

The experience of Emilia-Romagna (where reconstruction was carried out under a new Regional Law and Urban Plan), including the new Special Area Plan, is an example of effective concerted urban planning (in compliance with Regional Law

30/1996), that ensured cross-functional collaboration between municipal and private administrations. Not even this positive experience however, managed to ensure an integration of public strategies and policies with the national and international economic resources available.

The 2012 experience, involving the smaller centres of the Ferrara district, whose infrastructures dated to the Romanesque period and the early Middle Ages and later, the Renaissance period, revealed, with very few exceptions, the degradation and abandonment of the historical centres. These settlements were mostly occupied by low-income immigrant families, who were unable to carry out maintenance or renovate buildings.

The Department of Economy and Management of Ferrara University used its ReBuilding Project to coordinate advanced courses on reconstruction themes. A cycle of seminars, workshops and the experiences of experts were used to provide organic, rather than merely casual or improvised support to the populations in the affected areas. An initiative that Marche Polytechnic University is offering, for the 2016–2017 Earthquake Damaged Area, through its Master “City and Territory. Strategies and innovative tools for protection against the risks experienced by territories in difficulty”, with the direct involvement of the SIU (Italian Association of Urban Planners), the INU (National Institute of Urban Planning), the ISTAO (Adriano Olivetti Institute), and CeNSU (National Centre of Urban Planning Studies).¹

In Abruzzo region (2009) the choices made by the government, that are completely devoid of any urban planning and social culture, have led to the pseudo-inventions of the New Towns («19 tiny districts in the middle of nowhere») [17] after the Aquila experience, which Campos Venuti defined in *Urbanistica*, no. 154, as a «deplorable action» [15, 51]. An opinion echoed by Federico Oliva when he says that describing these as settlements as New Towns (15,000 people in 4,500 lodgings) is «a totally ridiculous and disrespectful description, in the history of urban planning, given their dimensions and the very poor urban planning quality».

At L’Aquila, after rapidly erecting metal scaffolding, to “jail in” the inaccessible “red zones” of the historical centre, there was a great deal of coverage of the nineteen tiny settlements constructed in the middle of nowhere. An explosion of the attention-seeking behaviour of engineering seen as an anti-earthquake cure-all (that has so

¹Master “City and Territory. Strategies and innovative tools for protection against risks of territories in crisis” was promoted in 2017 by Marche Polytechnic University, with scientific coordinator prof. Fabio Bronzini. 40 Italian Universities and more than 60 professors from the most prestigious universities, took part in the Master. Graduates from many parts of Italy subscribed to the Master. The scope of the course was to train researchers, for the complex inter-sectoral and inter-cultural task of starting a prevention and planning process for the future of these territories in difficulty. The Master deals with preventive protection from seismic risks, hydrogeological instability, degradation and abandonment, including post-earthquake planning. This is a high-profile course, which represents one of the few professional skills in high demand on the professional Italian market. The concrete results attained include that of supporting typical local products, a revaluation of the excellence of the territories in terms of innovative companies in the agro-food and wine sector, tourism-culture, typical handicrafts and recreational-creative activities, receptivity even for “new social members” and organising improved urban-territorial and technological protection for the territories, in event of future natural disasters.

far produced no other strategy than basic technical building regulations for seismic zones).

And given their irreparable vulnerability, it has also become apparent that it will not be possible to reconstruct many of the residential settlements as they were before [50].

The time has come to acknowledge that rebuilding and seismic engineering skills are simply not sufficient to protect these territories from permanent abandonment.

Bruno Gabrielli made no bones about this when he said that when one poses a single objective (that of the immediate construction of new non-temporary buildings), while neglecting objectives linked to the system of interconnected and perspective activities, the result is bound to be unsuccessful [37].

Far from the media spotlight, in Abruzzo (57 municipalities in 3 provinces), the negative recovery model that was being implemented in the historical centre of L'Aquila, was not followed. A completely different regeneration model for small Municipalities was being developed and proposed by university groups 9 uniform Areas were identified, where the scope was to ensure coordinated administrative management and pooling of services between different Municipalities. Forms of governance involving several municipalities, interrelated at a wide-area level, were also introduced the Reconstruction Plan also acts as a Strategic Plan. The Reconstruction Plan, that involves other building aspects, also acts as a Strategic Plan, namely for social-economic and territorial planning. The Minimal Urban Structure (SUM) was again used, at an urban and territorial level. The possible locations and conditions of collapse of the Minimal Urban Structure were also identified. The places, with the highest level of protection and urban connecting areas, were on the other hand identified. It was in this way possible to integrate the historic centre and the rest of the urban area. And these locations will moreover be safe and beautiful, becoming not only functional elements of the SUM but also areas of cultural, environmental and social value with which the local community can identify itself.

The use of resurgence strategies based on the SUM can therefore guarantee to residents who have moved from the disaster area to other areas, that they will return, because with respect to the past the SUM ensures a social organisation of spaces where citizens are informed of the safe areas, where to collect and the escape areas in order to accelerate the intervention of civil protection services.

2 Post-earthquake Experiences in Other Countries

Post-earthquake experiences in other Continents. The references to post-earthquake experiences on other continents (Chile, 1960; Alaska, 1964; China, Tangshan, 1976; Japan, Kobe, 1995, Tohōku, 2011; United States, California, Los Angeles, 1994; Mexico, Mexico City, 1985; Sumatra, 2004; New Zealand, Christchurch, 2010–2011; Chile, Maule coast, 2010, Mexico, Chiapas and Mexico City, September 2017, etc.) are interesting but are not directly pertinent to this study, given that many studies focus above all on the technical aspects of the emergency [28], on protecting buildings

from seismic risks [62], on the post-earthquake reorganisation of transport [46], on models to forecast seismic risks [57], on the attitude of citizens to seismic risks [39], on the dangers and opportunities of the peculiar Japanese experience [27] or on the expected “big one” [26], as stated by Tom Jordan [40] at the National Conference on the Danger of Earthquakes, in Long Beach in 2016, all of which are unrelated to this paper. Other devastating earthquakes (Iran and Iraq) have just happened in November 2017.

Some experiences of European countries (Turkey, Izmit, 1999) focus on the emergency [53], pointing out the inadequate urban planning aspects.

Many Italian earthquake studies face the problem in terms of projects and “prevention” techniques [44] in order to mitigate risks during an earthquake. These important technical-scientific studies deal with an ex-ante approach to the event, which is completely different to the post-earthquake approach proposed by this paper.

3 The Earthquake in Central Italy

The Earthquake hit Central Italy in 2016–2017. The Damaged Areas include the hinterlands of four Italian regions, involving a number of settlement systems. This is an extensive area, which is mostly mountainous, with winter tourist facilities and animal breeding and agro-food product processing industries for well-known *brands* of many typical products (lentils, cured meats, cheeses, trout, liqueurs, etc.), as well as a University and paper manufacturing district.

The Italian government has allocated almost one billion Euro for urban redevelopment through to 2020, and another 6.1 billion Euro for extended tax credit deferment facilities until 2047.²

²On 24 August 2016, a violent earthquake struck the territories of Marche, Umbria, Abruzzo and Lazio in Central Italy. The most significant damages occurred in Amatrice, Accumoli and Arquata del Tronto. Thousands of people were involved.

On 26 and 30 October 2016, another strong earthquake occurred in the area between Marche and Umbria, in the provinces of Macerata, Perugia and Ascoli Piceno, with the epicentre close to Castelsantangelo sul Nera, Visso, Ussita, Preci, Norcia and Arquata del Tronto.

The Council of Ministers approved a number of Law Decrees to finance interventions for the areas affected by the earthquakes in 2016 and 2017 (Law Decree dated 11 November 2016, no. 205; Law Decree 8/2017; Law Decree 50/2017) subsequently extended the so-called earthquake damaged area, and on 11 December, pursuant to the 2017 Budget Law (Law 232/2016), the Parliament authorized a number of allocations for repairs, reconstruction, assistance to the population and economic resurgence of the territories affected by the earthquakes:

6.1 billion euro (100 million for 2017 and 200 million per annum from 2018 to 2047) for tax credits;

1 billion euro (200 million for 2017, 300 million for 2018, 350 for 2019 and 150 million for 2020) for the allocation of public reconstruction contributions (as set forth by Law Decree 189/2016).

The affected Regions were allowed to allocate another € 300 million.

The resources of the Fund are mainly to be used to ascertain the vulnerability of buildings, public and private reconstruction interventions, ten work sites for the seismic defence of public buildings, the purchase and maintenance of the resources required for rescue operations for the population,

This teamwork may well lay the foundations for a Law, that is long overdue, on risk protection, management, settlement and production reconversion processes.

In such an extensive settlement, like the Earthquake Damaged Areas, it would appear that there are still no territorial rehabilitation or local social-economic development projects. There still appears to be a hope that plentiful funds will be provided, to support the resurgence of a crippled economy, where there will be business for everyone, totally disregarding the confirmed and proven fact that reconstruction alone is substantially pointless [13, 14].

The key focus, “the mother of all objectives”, is to bring back the old and new populations to the areas affected by the disaster; but the institutions, at different levels, do not seem to be aware that they should be concentrating on the one truly important resource: people.

This emergency phase focuses on moving the population in order to build the temporary wooden houses, before commencing reconstruction, which is desired both by the former residents, who are alone and do not know what the future will bring, and the bevy of engineers who, on the other hand, are well aware of the opportunity they have of making money.

Once again, the resurgence of these places is strongly linked to the reconstruction of a strongly motivated social fabric, consisting of former residents who have ripped away from where they were born, and new residents: young people who want to rediscover social and economic values linked to the “land”, as a source of pleasure and livelihood, small centres of immigrants with paid, programmed and monitored activities, as well as a community of “carers” for the elderly, who do not intend to give up their history, or the places in which they have lived, and who refuse to accept the rooms allocated to them in hotels along the coast, which are places of isolation, with which they do not relate.

In this vision, the support provided to high-quality products, the provision of collective services for local businesses, and the creation of highly qualified “itinerant” consulting and promotional activities (such as the Itinerant Chair of AgriCulture of Valnerina, Giacchè, in press), to help local businesses, as already tested in part [42], are indeed of strategic importance.

As regards the suggestions and operational proposals for the Earthquake Damaged Area, no comparison is made with respect to what has happened in other countries, given the specific characteristics of the Italian territory: countless buildings of high historical and cultural value, buildings constructed in stone, environmental values and, in particular, a residential, social and production system that extends over enormous territories. This environmental situation makes it necessary deal with the post-earthquake phase of social, economic and urban-territorial regeneration, very attentively. A phase, that focuses on the absolute priority of repopulating the territories, that is even more important than reconstruction alone.

the creation of an urban free zone, greater economic resources in the payslip, seismic micro-zoning studies, prior to the presentation of projects for the construction of emergency structures, a regeneration coordination cabin, a fund to finance investments and the development of infrastructures of the Country, that will also be used for seismic risk prevention interventions.

This objective should be coded by law and become a cultural, social and economic choice, even through a different allocation of resources to reconstruction and territorial regeneration planning strategies.

The latter should, moreover be based on detailed urban planning projects (SUM Minimal Urban Structures) prepared by experienced urban planners, with concerted urban planning practices and without forcing private individuals to become members of expensive consortia.

The use of these valid urban planning tools (SUM) ensures greater safety in earthquake damaged areas, encouraging citizens to return to the area to take up their business activities and services.

A system of Smart land projects, that improve the services to the community and businesses in the territory.

A system of new functional relationships between small urban centres in earthquake damaged areas and urban centres outside earthquake damaged areas (transport, cooperatives, itinerant services for production activities etc.) and intangible relationships that strengthen the new ties between residents in mountain, hillside and coastal areas (historic-cultural memory, visual perception, identifying oneself with the emotional enjoyment of beautiful environmental areas, awareness of the quality natural and anthropized areas etc.).

The experiences in the past have produced successful (Emilia Romagna, Umbria, Marche), but also negative (historical centre of L'Aquila) results. The lack of a permanent guidance centre in the prevention, emergency, and post-earthquake resurgence phases is a particularly negative aspect, given that all these phases should be addressed simultaneously and not successively.

Contemporaneity based on assumptions: there should be no emergency Plan without prevention Plans for protection against Risks. There should be no emergency Plans with temporary settlements and building reconstruction as a separate and distinct phase, prior to the planning-management of resurgence. The management protocols should impose, in the case of an earthquake, the simultaneous implementation of emergency plans and social-economic regeneration plans.

This practice is applied in Umbria where, with Umbria Regional Law 11 dated 22.02.2005 called "Law for Governance of the Territory", the SUM is included in Territorial and Urban Planning. This practice is currently examined and tested at the weekly workshops of the national University Master (2017–2018) "City and Territory. Innovative tools and strategies for protection against risks for territories in difficulty", in which 40 Universities and Research Centres participate.

Moreover, as already confirmed by experimentation carried out in Lazio, different planning tools must be integrated, given that the territory regeneration system entails a more complex security, protection and maintenance system of the territory [18]: SUM, Minimum Urban Structure to reduce urban seismic vulnerability, QSV Strategic Valorisation Framework of Historical Centres, Civil Protection Plan, PAI, Hydrogeological Structure Plan, Seismic microzonation and risk theme maps.

4 New Economic and Social Model for the Rebirth of Territories in Crisis

Programmatic suggestions are consequently required for the resurgence of the territories affected, based on the economic and social model of the so-called “productive landscape”. In other words, an investment in the human capital entrenched in these places, in the historical rural settlements, the environmental values and products of excellence, and on a new relationship of solidarity between abandoned areas, hillside areas and coastal areas.

This solidarity already exists in some environments, and consists of introducing common social, health and emergency services including assistance to businesses, producer-consumer associations, etc.

An integrated economic and settlement system that may become a driving force for a new lifestyle model: social and production reconversion of the countryside and protected regeneration of the extensive settlement system, with its historical and cultural values.

A model where services to agro-zootechnical companies in the territories, as in the case of Valnerina (Umbria), will once again become, itinerant: the itinerant Teaching Post of AgriCulture, the itinerant butcher and many other “door-to-door” activities, including advisory services for production, access to credit, cooperation.

In other words, to keep the population in the foothill settlements of the hinterland, it is not sufficient to construct houses, but it is necessary to bring back not only the original citizens, given that their sense of attachment is a part of its *genius loci*, but even new members of the community.

In order to encourage these residents to return [1], it should be remembered that reconstruction is closely linked to the financial situation of citizens and businesses before the disaster, given that it is citizens with more money who are better equipped to face a disaster. And as researchers have observed, reconstruction may lead to a “boom-and-bust” economy, where the reconstruction process fuels a temporary economic growth, at the expense however of the long-term sustainability of the local economy.

That is why it is so important to choose which economy to support.

For example, the decision may be made to support the so-called “Production Landscape” [2, 6], with a programme of strategic incentives.

The investment in rural settlements of landscape and environmental value may therefore be a driving force for development, for a new growth model based on the social and production reconversion of the countryside and the environmental and cultural revaluation of the network of widespread settlements, typical of central Italy.

An investment made, for example, with the substantial funds allocated by Marche Region to the so-called “Advanced Cultural District” (Regional Law 4/2010, involving 13 regional projects, 3.05 million Euro; 4 regional initiative projects, 1.75 million Euro), based on the concept that financing cultural and creative projects in areas of historical, architectural and environmental value, may attract businesses and people to the area.

Numerous studies have made it easier to understand the mechanisms and interrelations between policies, the landscape and social-economic and benefits [63].

In some Italian regions, above all in Central Italy, there are new potentialities for this type of development, based on the rural dimension and a new production-settlement model, such as that proposed by the rural policy of the CAP, the approach of Urban Agriculture [29, 54, 59] and the new Agropolitan forms [24, 25], Agroubanism [30], the Food Plans applied in Europe and the USA, or the urban horticulture projects [22] which appeared, in the late 90 s, as a way to reorganise Irish agriculture.

In order to reconvert the agro-zootechnical industry, in line with food and production requirements, and social, tourist and cultural needs, agricultural planning should include the introduction of Area Plans in Associated Districts Administration Areas.

This is confirmed by the successful experience of small groups of associated municipalities in Marche Region (in the hinterland of Pesaro) and other towns in Emilia Romagna, where it has been demonstrated that small Municipalities are unable to plan new and existing farming activities, that can only be done at a district level.

An economic-territorial policy is therefore required with diversified operational tools: urban plans, farm park plans [35], agro-urban programmes (SDRIF) (agro-urban programmes to protect farming areas and encourage the active participation of farmers in territorial planning choices) [7], *agriurbanism* projects [41, 61], Integrated Territorial Projects (PIT), [56], and tools to implement the structural funds of the European Union.

Consequently, in this moment of instability caused by the global and local crisis in Central Italy, and the difficult resurgence of lands devastated by the earthquake, the settlement filaments, the urbanised countryside and the hundreds of historic-rural buildings may represent an opportunity to reconsider values, in order to relaunch local values and lifestyles in areas of high environmental-landscape value with small populations.

The multi-scale strategy suggested hinges on the desires and involvement of residents [11], who are determined to return to the places where they born. The identity of these contexts should therefore be strengthened and supported more carefully. Plans for the hinterland areas, the intermediate hillside areas and coastal areas should be reconsidered as a whole, in order to create a new pact between city and countryside, an understanding of reciprocal usefulness, in order to overcome the current dead-lock, and relaunch the development and integration of resources which are, on one hand, widespread and underused, and on the other hand centralised and consolidated [5, 9, 10].

The pact for an integrated strategy between city and countryside becomes a coherent pact between the coastal and hinterland areas, the areas of the capital and neighbouring territories, putting aside one-sided development of competing Municipalities, in order to develop common territorial services (water supplies, maintenance of sewerage systems, waste disposal sites, waste recycling, distribution of zero-mile foods, health facilities and schools for several Municipalities, supra-municipal public transport systems for the hinterland areas, cooperatives of city-countryside consumers, etc.).

In the territories of Central Italy, the city-country dualism, that has been studied in great detail in other contexts [19, 58], has different and peculiar aspects. And these environments are perfect to regenerate a close relationship between consolidated systems and the rural environment, securely linked to the cultural, food and wine system, environmental and tourist networks and the network of over one thousand small historical-artistic “treasure troves”, to which the “advanced cultural districts” (in which cultural and creative projects create new production activities) are connected.

But an effective strategy must be adjusted according to the endogenous potential of places, involving different levels of operators: 1. local government authorities (responsible for protecting farm lands and functionality); 2. groups of agricultural entrepreneurs [45] (whose responsibility is to increase the quality of products and offer recreational, educational and social-environmental services); 3. tourist or food and wine entrepreneurial groups (who also supply sports, social services, environmental recreation); 4. cultural groups (in order to insert the historical rural and natural heritage in the economic network); 5. artisanal businesses (with typical products); 6. old and new local residents (with whom the preservation and functionality of places should be agreed).

This leads to a new planning approach of public spaces in the extensive territory, suggesting elements of recognisability, identification, the boundaries of the settlements and environmental qualification.

This approach was examined in great detail in the scientific paper published by Paolo Colarossi (*Urban planning*) and in the Urban Plans developed by the same authority in Cisterna Municipality (Rome) [21].

It should also be considered that “modifying an economic policy variable may produce different responses in different territories, in other words, modifications of this kind may have different local values rather than a single global value” [52]. It is therefore necessary to «evaluate and develop the endogenous potential of rural areas [...] with differentiated typologies» [43] and to plan interventions according to the different relationships between the rural areas and linear settlements of the territory.

Despite these strategic approaches however, there is a gap in the governance of the regional territory, at an Associated Districts Administration Area level, and a total lack of programming-management for these scattered settlements.

Given the shortcomings of the public bodies, that are evident in the governance of these territories with scattered high-risk settlements, the production Landscape approach and the new city-countryside relationship offers a new and unrepeatable opportunity for the economic and social development of production landscapes. It suggests a policy, which is perhaps the only possible option, to relaunch local values and lifestyles in more balanced man-environment settings. Planning should be holistic, given that it is not only a question of substituting damaged assets and infrastructures, but also a question of reconstructing communities, to ensure equity, access to resources and equal opportunities for disadvantaged persons. Only in this way will it be possible to reduce the community’s vulnerability to risks.

In a precarious economic and social scenario, the *intelligenza* of urban-territorial knowledge is called to take a stand against the deplorable shortcomings of risk protection and prevention, combating the abandonment of the hinterland, while focusing on a culture to safeguard the territory and regenerate the products of the landscape-environmental system. Without a regulatory front of this kind, the academic world will end up being an accomplice of the deplorable choices of political power.

5 Conclusions and Strategies to Live with Earthquakes in the Coming Decades

Examining the experiences of previous difficult post-earthquake situations, it is apparent that there has been a general difficulty to capture the right opportunity to rethink unsustainable settlement models that are today no longer sustainable: the population, activities, urban and rural homes, historical-artistic artefacts and environments, services scattered over enormous territories that are inadequately protected in the case of natural disasters and have no technological rescue networks, super-equipped urban shelters, or a constantly accessible network of central structures, located in strategic hubs at the service of the territory.

An earthquake breaks the existing fragile balance of the territory and makes it necessary to rethink the lifestyle model in these places [55], based on: 1. A territorial urban risk protection system. 2. A system of Smart land projects, that improve the services to the community and businesses in the territory. 3. A system of new functional relationships between small urban centres in earthquake damaged areas and urban centres outside earthquake damaged areas (transport, cooperatives, itinerant services for production activities etc.) and intangible relationships that strengthen the new ties between residents in mountain, hillside and coastal areas (historic-cultural memory, visual perception, identifying oneself with the emotional enjoyment of beautiful environmental areas, awareness of the quality natural and anthropized areas etc.).

In this enormous and very beautiful area, involving a number of territorial systems, that are not easy to access, territorial—urban planning should focus on rapidly drawing up the projects for Minimal Urban Structures at an urban and an Associated Districts Administration Area level, that should include urban reconstruction objectives (mitigating risks and seismic vulnerability, *lifelines*, etc.) and strategic objectives (new associated forms of *governance*, future visions of cities, circular processes, privileged places of beauty, safety, social identification), based on six key points: a. the recovery, through social *housing* and self-reconstruction practices, of the small and very small historical centres that are scattered throughout the area, linked by a dense web of farm paths; b. the stable integration of “new social components”, through non-complex strategic public programmes, which are conducive to creating a new economic development model. A model concentrated on the resources available, resources that are under-used or badly used, cultural tourism, food and wine, modern agro-zootechnics, creative artistic activities, alternative ways of recovering

buildings, in new economic circuits [12]; c. the introduction of all the most advanced technologies in order to make these territories less isolated, less abandoned, and no longer heading towards a terminal phase of decline: from broadband networks to the remote management of public and private services, energy control, the reorganisation of the waste system and slow mobility for the re-appropriation of the values of the green heart of Italy. An advanced monitoring system [33] that alerts residents and the emergency services of the potential cascading effects of earthquakes, landslides and flooding. d. the localisation of territorial “hubs”, i.e. “functional equipped pivots”, at the service of extensive settlements and the conservation or re-localisation of primary services (schools, health care facilities, public offices, etc.); e. the identification of new business areas, and new protected areas to shelter animals; f. the identification, on detailed maps, of buildings, public spaces and protected routes, that, in case of natural disasters, ensure internal and external access and the continued efficiency of network services.

From what has been explained up to now, the following strategic choices can be considered consolidated acquisitions by the scientific community to live with earthquakes in the coming decades: a clear and decided “No” to focusing exclusively on reconstruction in post-earthquake interventions. “No” to the uncontrolled delegating for the reconstruction to the mayors of small municipalities, with little resources, experience and skills and many local conditionings, even illegitimate. “No” to abandoning home owners to a bevy of engineers, interested only in taking professional assignments. “No” to encourage the purchase, by residents of the earthquake zones, of new housing away from the affected areas. “No” to build new settlements, declared improperly temporary; in non-building areas, intended for environmental protection, by way of derogation from urban planning tools. “Yes” to planning multi-scale Minimal Urban Structures, at an urban and wide-area level, with forms of governance that include several associated Municipalities. “Yes” to simplification/integration of several interrelated Plans (SUM, Civil Protection Plans, Hydrogeological Defence Plans, Seismic Microzonation Plans). “Yes” to the Masterplan, intended as a programmatic tool in order to demonstrate the complexity of the urban planning regeneration strategy. “Yes” to Area Plans and Wide-Area Plans, in order to plan the reorganisation of a large urban widespread system, where the focus is on the economic, social, cultural and productive resurgence of the areas affected. “Yes” to the provision of advanced network technologies to allow coexistence with the earthquake in areas spread over large territory, ensuring the maximum protection, assistance, evacuation in case of recurrence of disasters. “Yes” to the main great objective: to bring back to the devastated places the population and activities present before the earthquake.

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