

Italy and earthquakes

The Emilia case: difficulties of reconstruction

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Abstract: The earthquake that hit the plain of Emilia starting in May 2012 has not yet stopped to fear, the seismic swarm continues.

The buildings most affected were historical and productive ones. Apparently unrelated to each they are very connected if you look at the Po Plain as a whole.

The seismic crater is comprised in a quadrilateral very particular on three sides is crossed by highways, one, in the north, by Po river, so the inside area is among the most productive in the country; at the vertex there Mantova, Ferrara, Bologna and Modena and Reggio Emilia, some of the most dense history of central Italy, architectural and cultural tourism destination.

The coexistence of these two vocations, productive and historical, has up until now “peaceful”, although “chaotic”: the area of the earthquake, in fact, has the connotation of “City widespread” or Sprawl, to this the reconstruction can also be used as a reorganization and redefinition of margins, roles and functions of the nuclei in the future of the area, but could also erase the traces historical under a continuous and unformed urbanization.

Carrying out a documentation work about the historical buildings, the urban and the territorial elements wants to serve highlighting the values which are useful for reconstruction and to limit the risk of “burying” the assets in the name of economic development needs.

Keyword: Earthquake, Emilia, Identity, Architecture, Regenerative reconstruction.

Emergency

In the contemporary language (mostly the media communication one) the word emergency is so abused to have lost its proper meaning.

The “stato di eccezione” (state of exception) as described by the philosopher Agamben seems to represent our “normality”. It is not necessary to appeal to the etymology of the word emergency to discover that it become from the verb “to emerge”: an emergency it’s something latent and pre-existent.

Nowadays the emergency concept it’s addressed mainly in connection with the concept of “time”: being obliged to act, decide and choose in hurry, without any alternative.

Talking about earthquakes, the emergency phase is due to the trauma affecting the urban tissue since it loss most of his connections as a network in a very short time. As regards the residential issue the problem of time is obvious since the main problem is to procure a decent shelter to the population as soon as possible.

Unfortunately the prevailing culture focus the attention on the crisis-followed action rather than thinking about causes and pre-existent factors; more of the times that means losing sight of prevention and the ability to react the seismic event.

Emergency should become culturally something “emerging” because most of the times natural disasters are just part of the history of cities and territories, this is particularly true for earthquakes.

The “seismic hazard map” (Fig. 1) is a very easy-to-read and useful graphic instrument and it’s quite clear how it is extrapolated from statistical and analytical analysis: the “dangerous” areas are the one most affected in the past and with the strongest intensity. However the vision of this graphical instrument is distorted by the static media: the earthquake is still perceived as an “uncontrollable” and unpredictable event, rare and far from our knowledge, only theoretical. In this situation prevention became a minimum law restriction, an necessary nuisance.

Mapping the most powerful earthquakes occurred in Italy in the last centuries (Fig. 2) (the examined seismic events are only the ones more powerful than 5,5MW) it’s easily notable that there are no surprises and a perfect correspondence between the events and the dangerous areas. What is very different is the perception achieved with this new graphical representation: a “rhythm”, a pattern in time is noticeable, the demonstration that the earth is “alive”.

Considering the macro areas and not only the epicenter of every quake it’s clear how this regions have periodically been stricken during their history.

In every seismic area all the town centres and ancient buildings have had to deal with earthquakes and it is possible nowadays to notice a lot of traces of this past in the architecture of that cities.

Bigger is the macro-area used as reference and smallest is the frequency of earthquakes; in some modern Italian Region such as Abruzzo, Campania or Sicily it’s possible to affirm that every century had its own earthquake.

If earthquakes are such a big part of Italian history, more in some regions, a question is a must: Why have we forgotten? Why every time after a while an earthquake became a myth and a distant thought?

“Non ci sono catastrofi che si dimentichino più velocemente del terremoto, quando la ricostruzione si compia...

...Dimenticare è una reazione necessaria per voler continuare ad abitare la terra.

...La seconda rimozione è individuale, e consiste nella rinuncia a comunicare l’esperienza. L’evento esce dall’attualità e non è più raccontabile...

...per quanto concerne il culto della memoria, la guerra ed il terremoto sono agli antipodi, come il giorno e la notte. Se davanti alla guerra si prende partito, ci si assoggetta ad una qualche prolungata partecipazione, all’istante del terremoto si rimane passivi, sbigottiti, proiettati, nello stesso momento all’origine e alla fine del mondo”

[NIMIS 2009]

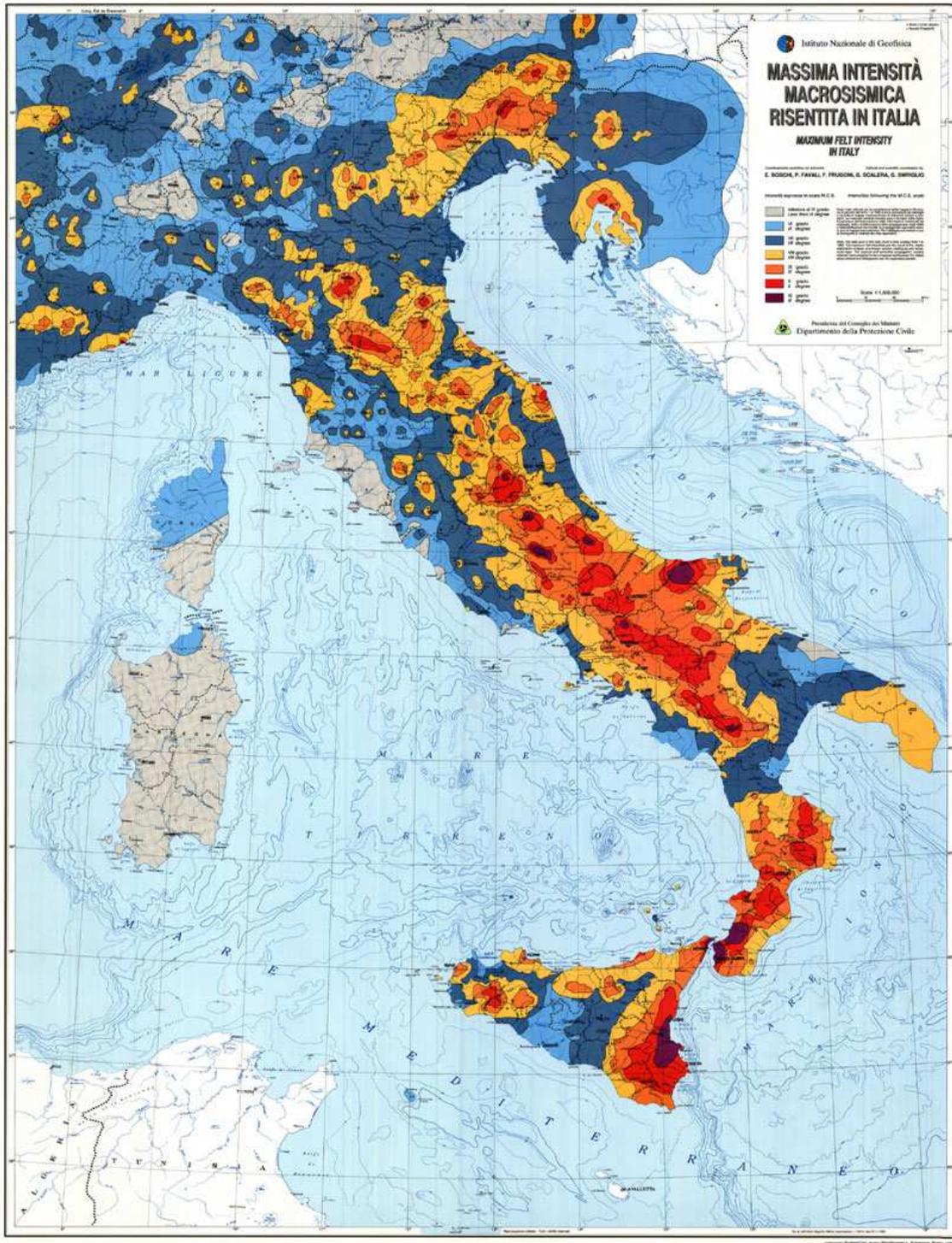


Fig. 1 – Seismic Hazard Map of Italy

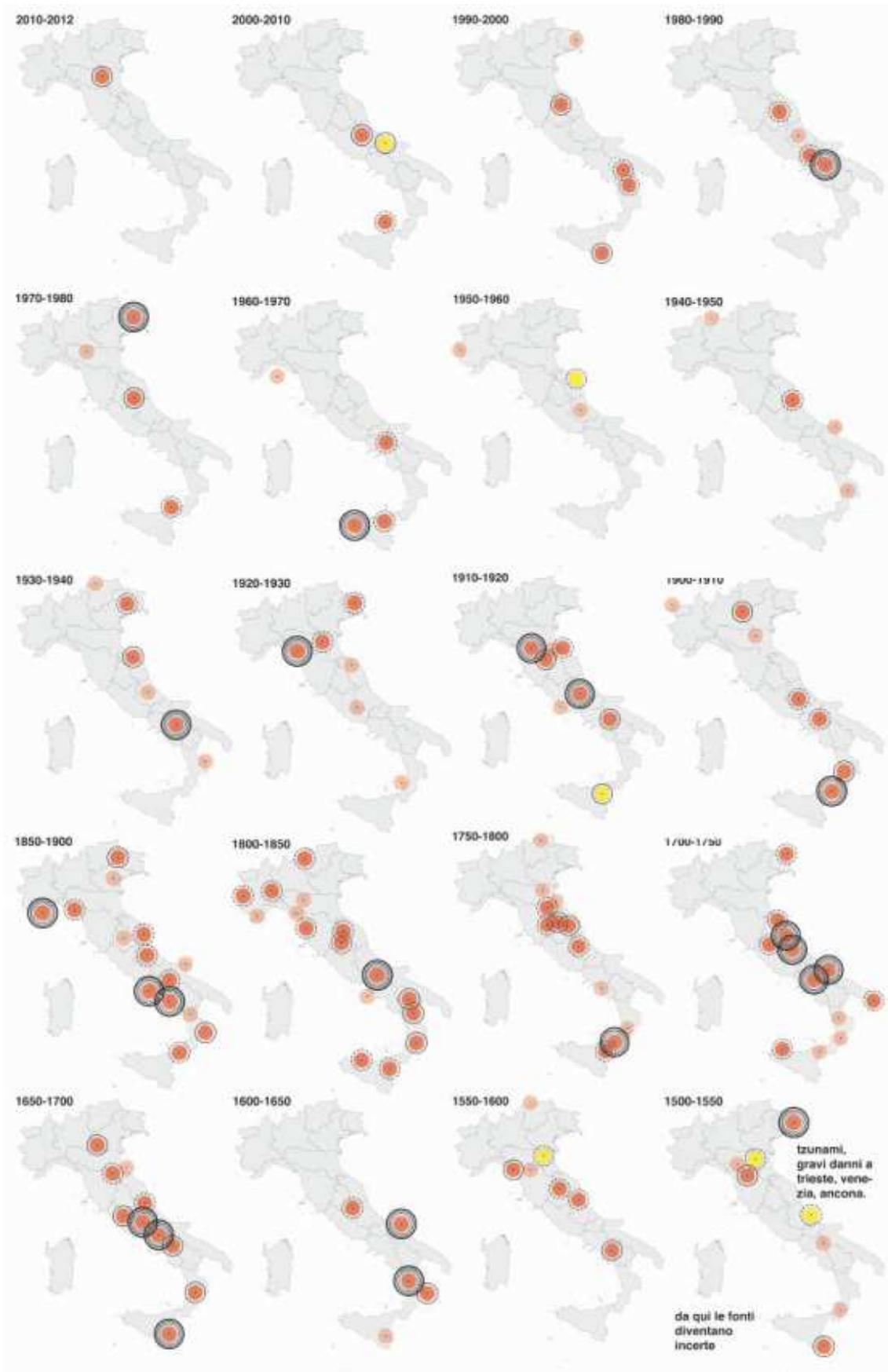


Fig. 2 – Seismic historical sequence

“There are no disasters more easily forgotten than earthquakes, when the reconstruction is accomplished...

...to forget is a necessary reaction to be able to want again to live on the earth.

...the second removal is individual, is the renunciation to communicate the experience.

The event goes away from the actuality and becomes no more tellable...

...as regards the cult of the memory, the war and the earthquakes are at odds, like daylight and night.

Facing the war everyone take a stand, being submitted by some kind of participation; in the instant of the earthquake the only reaction is to be passive, shocked, projected at the same time at the beginning and at the end of the world.”

[NIMIS 2009]

The causes of the loss of memory of people are part of everyone inner self but why does the whole society lost his memory cannot be just the sum of the individualities.

What we know is that the lack of memory creates every time a powerful sensation of impotence and acceptance for the whole society that make the emergency even more difficult to manage.

The main characteristic of the seismic damage is that there are no enemies: buildings became ruins just like after a bomb without any logic or rule. Earthquakes are just part of the entropy of the universe and the proof that our planet is alive. Nature is not the one that causes deaths; the way cities react to the events does.

What happen the day after? The shock, the fear and the pain for the deaths produce a strong trauma, but a second one comes in few days. People lost their houses and their infrastructure, often their workplace and their job. This oblige people to move and relocalize their activities: this situation is a subsidiary trauma with a deep and long term effect on the city.

The case of Kobe in Japan is a vivid example; after the shattering events of the 1996 the city was obliged to an emergency status and only after about 20 years the situation returned to the normality. After 20 years the city had lost its economical position: a lot of industries and productive activities had moved after the earthquake, undergoing this decision. It's evident how the real trauma consisted in the removal as well as the earthquake, and why was so difficult after 20 years to endure the same fate.

Kobe proofs how a city can be reconstructed while losing it's role in the territory.

Humans choices and governance strategies can be more important to determinate the “impact factor” of a natural disaster than the magnitude of the disaster itself: in the emergency phase logical and accountable choices should be mandatory.

The phases of the emergency

First Intervention

The first reaction of a city to a disaster is saving lives and maintain the main structure of the city operative. Every city threatened by nature should be “armored”: infrastructures like hospitals, police stations and highways are supposed to resist a higher damage than residences and productive settlements. A city should be like a tree: it can be damaged but there must be a solid trunk to resist the difficulties.

This first phase is related to the prevention phase, a good response has to be planned more than improvised.

Then come the so called “recovery phase”, it is an intermediate phase between a “broken city” and a city “returned back to normality”; all the structural function of the city such as work, residence and public services have to be restored in a different and temporary context. The result of a “re-connection of the system” is a new city within the old-destroyed-city, so the temporary and strategic nature of the intervention is substantial in order to avoid the loss of urban memory, identity and functionalities. This is the phase while the “social network” of the city it’s re-constructed while the “architectural city” needs much more time to be re-built. Both, social and physical city are vital.

Heavy Re-Construction

The final re-construction of the architectures (both functional and heritage) is the most discussed and coveted phase. The transition from the recovery to the actual reconstruction is what distinguish an accomplished reconstruction from a failed one.

Today, the meaning of the word “re-construction” is likely random. A damaged or traumatized city is not an object, it is not something repairable in few days, and if it was so we would have no doubt about it: everybody would agree reconstructing the city exactly as it used to be, with all tis problems and contradictions.

“Any architectural project we do takes at least four or five years, so increasingly there is a discrepancy between the acceleration of culture and the continuing slowness of architecture”

[KOOLHAAS]

“Today it is not the city but rather the camp that is the fundamental biopolitical paradigm of the West”

[AGAMBEN]

In this state of things its clear the contradiction between the time required for the reconstruction in the nowadays condition of the cities: it’s difficult to plan a city within 20 or more years.

Summarizing we can state that the “emergency state” of a city after a disaster is a very complex problem, more complex than in the past; a wide strategy for the future is more important than a specific project. Besides more complexity is introduced by what we call the “implicit project”, meaning the contradiction between the needed long term strategy and the desires of the population that miss and wish the old city.

Paradigms of reconstruction: the Italians past cases

Despite Italy is nowadays realizing that disasters cannot be evaluated only as isolated incidents, appear not to be any kind of accepted model of intervention to create a guiding principle for the reconstructions. It is true that every earthquakes its different, but it’s possible to study the past in order to point out the errors and the good practice and understand better an issue often scarcely recognized.

The considered case studies are the top five after-earthquake-reconstructions from the postwar period to date. The analysis has been made on bibliographic and scientific sources.

Belice (Sicily)

The earthquake of greater intensity occurred in the night between the 14 and 15 January 1968 with an intensity between VIII and IX grade of the Mercalli scale. There were then a less powerful repetition ten days after (25 January)



Fig. 3 – Belice (Sicily) 1968

This event struck almost the whole hilly area of south-west of Sicily, a 6200 square kilometers area with more damage in the Belice valley (about 2800 square kilometers). At the administrative level 1 Region, 3 Provinces, 12 Town were involved (then 14 town).

The governance strategy adopted in this process can be defined as “Top-Down”. Scilicet the central national government centralized the decision making process depriving the local actors the ability to have any kind of control during the reconstruction phase.

The aim of this attitude was the industrial development in a mainly agricultural area, and to propose a new “territorial asset” through the abandon of the historical hilly hamlets in favor of modernists “new town” down in the valley.

Friuli

In the early afternoon of May 6 of 1976 an earthquake of 6,4 Magnitude interested the northern part of Friuli-Venezia Giulia. The city of Udine was not directly hit but the foothills and mountains areas were almost completely destroyed with the epicenter between Gemona and Arterga. The intensity of the seismic event was X in the Mercalli scale.



Fig. 4 – Friuli 1976

There were 2 replies at the beginning of the next September with a magnitude close to 5,8/6,0. The 45 affected municipalities, both in the Udine and Pordenone provinces, were declared disaster zone. Another 40 municipalities were classified as “highly damaged” in the same 2 provinces. 52 more towns were declared “damaged” of witch 3 in the Gorizia province. The total area covered more than 6.000 square kilometers. The involved population was of about 600.000 residents of whom 100.000 homeless, so the 17%. 32.000 people had they homes completely destroyed.

In this occasion the reconstruction governance followed a “bottom-up” pattern. The local actors played the most important roles in the whole process: they managed the money, approved the transformation projects and controlled the different phases.

The main objectives were to preserve the urban structures and the villages rebuilding “As it was, where it was” and at the same time propose an economic development based on small and medium-sized enterprises able to promote the reconstruction itself.

Irpinia

On November 23 of 1980 the strongest seismic event occurred; the magnitude was 6,9 and it reached the X grade on the Mercalli scale. The central Campania and part of the Basilicata region were mainly affected, an area of about 17.000 squared kilometers, eight times the Belice area and more than three times the Friuli one. The interested regions were two at the beginning, Campania and Basilicata, then also Puglia was added. With the succession of decrees the initials three provinces (Avellino, Salerno and Potenza) became eight and from the initials 158 involved municipalities the number reached 687, one of which huge: the city of Naples.



Fig. 5 – Irpinia 1980

The homeless at the beginning were 200.000 but with the addition of Naples they became 300.000. On a total population of 6 million the percentage of the displaced was about 3-4%.

In this case the governance was mixed. Indeed there were many decision-making powers controlled by local actors (municipalities, provinces), but they were as a matter of fact unable to technically manage it. So the

state promoted many big projects and major work designed however to enlarge the bureaucracy and slow down the reconstruction.

The aims of this approach were the creation of a new model of industrial development, which never left off, and a territorial reorganization which planned new production plant and new settlement in the valley. Most of this “modernization projects” failed, some of which due to the opposition of the population.

Umbria-Marche

In that case there has never been a single powerful seismic event, but a sequence of earthquakes from September 1997 to March 1998. The maximum registered magnitude was 5.9 with a destructiveness of VIII-IX grade of Mercalli scale. Due to that repetitive pattern the earthquake was called “endless” by the media. The earthquake at the beginning stroke the Perugia and Macerata provinces (including both Umbria and Marche region) with 48 municipalities affected that, with the looming succession of quakes, became 76.



Fig. 6 – Umbria

Due to this fragmented sequence of events, the number of homeless it's quite difficult to calculate, however at the end of the seismic activity they were about 24.000 that compared to a demographic basin of 50.000 reached about the 50% of the population.



Fig. 7 – Onna

The governance can be compared to the one applied in Friuli, so “bottom-up”. The role of municipalities alongside to the regions was considerable. The central government collaborated to the reconstruction, but the operation were directed by locals with the collaboration of “Protezione Civile” a recently born entity.

Abruzzo

On April 6, 2009 at 3:32 in the night a quake with a magnitude of 5,9 shock the city of L’Aquila and a big portion of the surrounding area. The damage was considerable indeed the event was classified between the IX and X grade of the Mercalli’s scale. The L’Aquila province was mainly affected and only few municipalities were in the Teramo province. In total the municipalities affected were 49.

Being the epicenter so close to the region capital L’Aquila, the destroyed houses were so many with the result of more than 70.000 homeless, about the 70% of the whole population.

From the beginning the proposed governance was a “top-down” type; municipalities and residents did not participate actively to any decision related to the reconstruction, until 2012 when some of the decision-making powers have been decentralized.

The objectives of this reconstruction have been mainly two: rebuilt an home for the homeless without resorting to temporary settlements and to protect the huge artistic and architectonic heritage of the city centre. Unfortunately the first objective has failed being the number of accommodation provided with the “Progetto C.A.S.E.” insufficient; at the same time the reconstruction of the city never started but the plan for the surroundings hamlets have.

The re-construction process: the metaphor of the tricycle

The re-construction process of a territory stricken by an earthquake is very complex because of the many factors that can affect it: the context (political and economic), previous trends, the entity of the damage itself. That's why it's so hard to evaluate the choices.

We can summarize the main nodes of this process:

The “regeneration planning”

After any disaster, politicians, administrators and technicians are called upon to make a “better city” than before. The reconstruction process, long and complex, cannot be a mere repetition of what was, what is needed is a “re-thinking” of the city and the territory, so a re-planning.

The re-plan can not and must not be total, meaning something avulsed from the previous situation. Too often the “tabula rasa” approach is a powerful temptation supposed to “solve” the problems; but the price of the operation would fall in full on the community, that would loose past, identity and essence.

The reconstruction on-site

It is the other side of the coin of the previous node, the “implicit project” that the community develop immediately is nothing more than the past “here it was and as it was”. We've already stated that it could be possible only if a city could be “fixed” in few days, but this is impossible. The modification in the community during the emergency phase and during the reconstruction summed to the socio-economics dynamics triggered by the reconstruction itself, make the “implicit project” something potentially dangerous and untimely.



Fig. 7

Local Decision Makers

The governance process is the result of the interaction between local and over-local actors. Most of the cases this interaction is not intentional but due to the disaster. All sides have both common and different interests. Neither can be excluded from the process; indeed the first are perfectly conscious of the territory asset and knows that their future will be there, the seconds are the only one capable to supply the substantial resources and the equipment indispensable for the process. The local wisdom and the right to choose should be supported by intervention duty and technical knowledge.

Temporariness

The function of the city are compromised by the earthquake and, waiting for the reconstruction, must be delocalized somewhere else. The community, the same that was before the seismic event, cannot not suffer the shock and the uncertainty condition. Provide and design a new temporary geography not only about buildings and infrastructures but also relationship, meeting and public spaces has priority. In the temporary solution destroy or fragment the community the whole process will be inexorably affected. The temporariness is the “place” where the community can regenerate, evolve and transform, metabolizing the trauma. We propose a simple simplification of the issue trying to represent in a dense and synthetic way the interaction between the choices and the actors.

The metaphor we chose is a tricycle. In this tricycle the rear axle represent the re-generative strategies of the process, that goes from the “how it was where it was” strategy, rebuilding principally on-site respecting the urban tissue, to the re-generative reconstruction that accept urban variation and implementations that generates an actual change to the urban asset.

The front axle is the most “tactic” and represent the choices and the practices of temporariness that have as primary objective the solution of the multi-level crisis that affect the city: production, residence, recreation, entertainment and mobility must be an always turned on engine, also in a such precarious and complex scenario.

The rear axle has to bring stability and balance to the planning strategy: the future city has to be a renewed city, not identical to the past and not completely changed. The city should follow the path of the community. The front axle, related to the rear one, is the traction: it has to preserve the community integrity while the regeneration evolve and at the same time has to supply the reconstruction. The traction function is so important and can only be entrusted to the temporary strategy: also with a complete, well balanced and ideal plan for the future of the city the whole regeneration project would fail without a forward-looking and smart temporary strategy. The result would be only a “physical city” without a community able to make sense of it. All this process is led by two hands: the two side of the governance. Local and Central powers hold figuratively the handlebars of the tricycle: they must necessarily coordinate.

The Emilia Case

An earthquake of magnitude 6.1 hit Northern Italy, on May 20th, 2012 at 04:03 am, in the region of Emilia Romagna. The event was preceded two hours before by a magnitude 4.0, which is the starting point of a long sequence of seismicity. The shake caused 7 victims and lead to evacuation of several cities. This event

was largely felt in Northern Italy. Important damages were reported in the cities of Finale Emilia, Cavezzo, Crevalcore, Novi, Mirandola, Ferrara and Modena, where significant cultural heritage buildings have been affected. Nine days later, on May 29th, 2012 at 09:00 am, a magnitude 5.8 occurred 15 km west from the May 20th event. The mechanisms involved in both events are similar. The region, already affected by the previous event, is experiencing important damages and casualties. At least, 16 people were killed. More than 12,000 people moved to temporary shelters. On June 6th, a M4.5 earthquake occurred near Ravenna, 50 km East of the recent earthquakes sequence.



Fig. 8 – Emilia

We believe, however, that it is important to emphasize a growing danger lurking, and that is the loss of a part of their cultural heritage with the reconstruction.

To better understand the real risks that exist in Emilia we took two symbolic locations: Cavezzo and Crevalcore.

Cavezzo has a very precious rural cultural heritage, a "dense network" formed hundreds of years of history.

Crevalcore however, as a result of the unavailability of the old town, therewith risks losing the historical identity represented by the "Corso" the main public buildings and all those that are the essence of the community

The hope is that the reconstruction being considered as an opportunity to regenerate a damaged area where the community has generated in centuries.

Cavezzo

Here the earthquake has shut down the agricultural economy, which was already facing a declining phase. In the same way the rural buildings already degraded before the earthquake came bringing the damage on a wider scale. All the previous tentatives to recover the value and the Cultural Heritage (tangible and intangible) like small museums, visiting area, minor activities, are reduced almost to zero by the heavy damage caused to all the architectural structures.

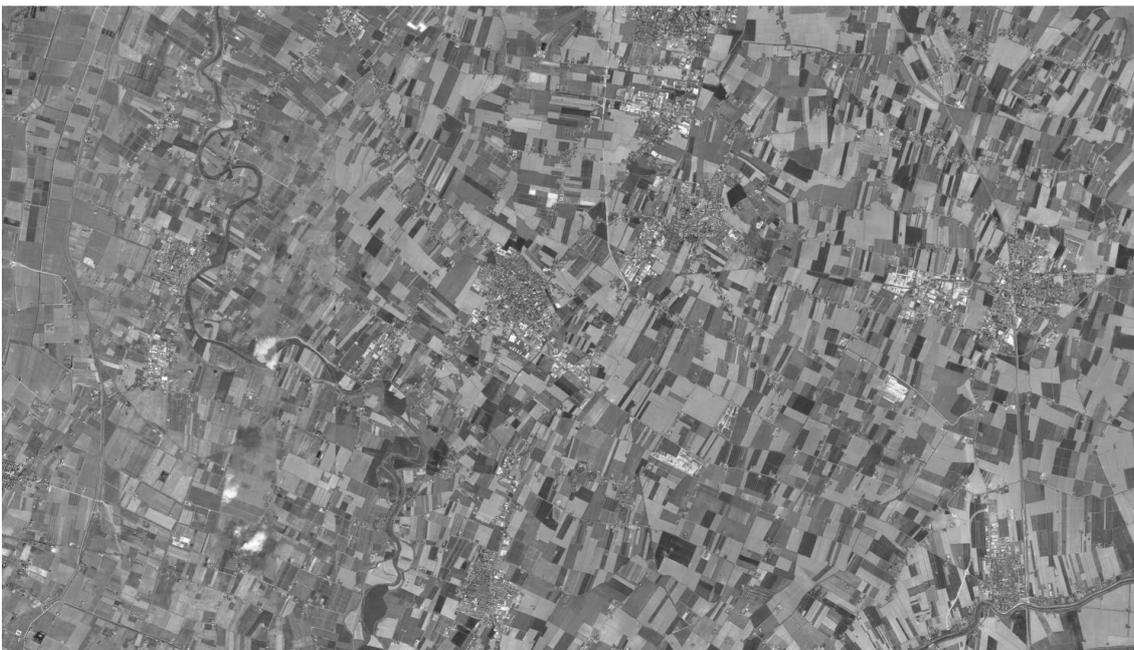


Fig. 9 – Cavezzo

Crevalcore

The Crevalcore town center is a typical centre of the Emilia region, it shows a clean sharp road axe between the two main gates accessing the town. The quality of the buildings, the special urban dimension, normally give a sense of peace and wellness, the porches and the commercial activities are the typical from a well developed small town, with good relationship between people and their town. The ancient, until now well preserved, high quality structures like the gates, the main church and the town hall show the overlapping of different phases, bringing to the eye a story sculpted by the work of humanity.

The structure of the territory is originated from the division and morphological organization operated by the Monastic Orders between the end of the XII Century and the beginning of the XIV.

The process has generated over the centuries a series of "subsidiary system": small churches, hospitalia, mills, etc., often implemented by a "mother" abbey - in this specific case the abbey of Nonantola.



Fig. 10 – Crevalcore

These elements are the signs of a network management whose value goes beyond the single architectural object to invest the entire territory.

The “quadilatero” region

The seismic crater were in the center of a quadrilateral that on three sides is crossed by highways and by the Po river on the north.

For this reason the inside area is among the most productive in the country and not only in food industry but also medical, mechanical, textile and ceramic. Productivity is not the only characteristic, in fact in its vertices are Mantova, Ferrara, Bologna and Modena and Reggio Emilia city that are part of another "quadrilateral" as the particular "THE DISTRICT UNESCO" World Heritage Site important for art, culture , architecture, nature, food.

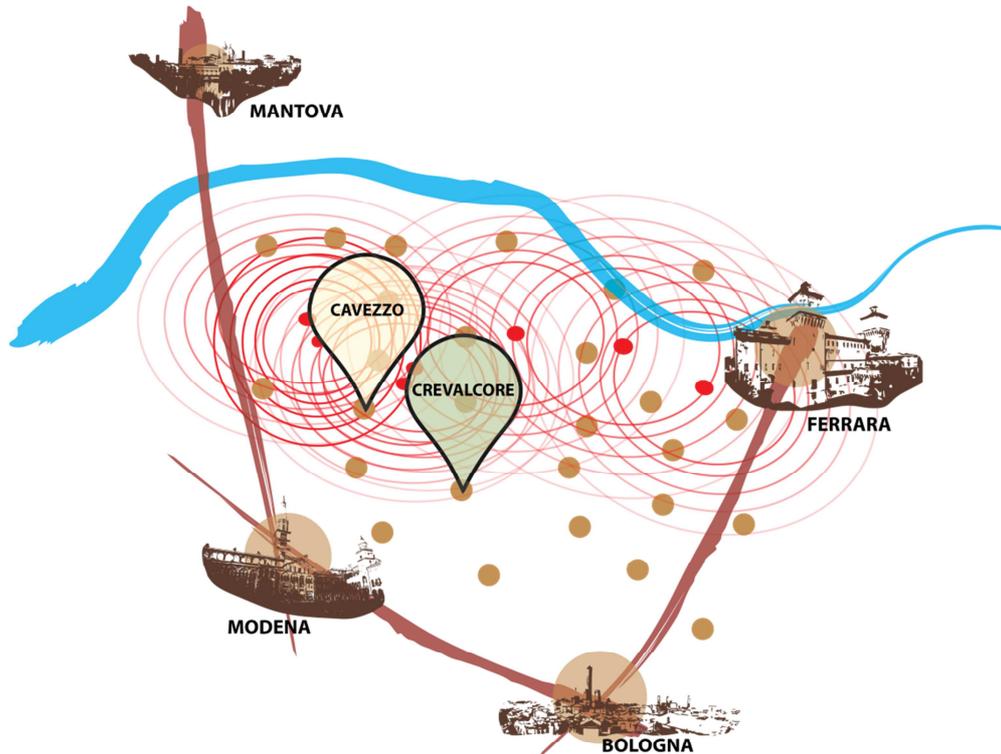


Fig. 11 – Crevalcore

Conclusions

Emilia Romagna has shown a better reaction than other Italian Cases. The heritage buildings and the old town centres are still a big issue that worry the residents. Despite all the municipalities have had a strong control of the whole process from the beginning. They were able to maintain the social cohesion of the community applying a smart temporary strategy for residences, shops and production sites. All that activities have been temporarily placed “close to” the old towns in order to maintain the identity and the networks of the community.

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