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Tangible and intangible multiple risks: achieving resilience by enhancing cultural heritage

Rischi multipli tangibili ed intangibili: ottenere la resilienza valorizzando il patrimonio culturale

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ABSTRACT AND KEYWORDS

Tangible and intangible multiple risks

Multiple kinds of crisis more and more occur simultaneously, making difficult to resolve challenging urban conditions as different risks are overlapped and involve social, economic, environmental, health and liveable topics. Furthermore, any place is different and has its peculiarities with respect to material and immaterial characteristics and, for this reason, has different times and modalities to face crisis. To achieve a sustainable adaptation and regeneration of the places affected by multiple risks it is important to study the questions by many points of view and using suitable urban methods. Starting from these premises, aims of this study (carried out in the framework of the 'PRIN2020 20209F3A37' research project, within the ISMed-CNR Unit with the author's responsibility and the relative agreement between Sapienza Università di Roma and ISMed-CNR) include: to define and identify what are the kinds of risk and the main kinds of overlapping among them in sites; to identify what are the main places which are subjected at multiples risks; to propose an original and ad hoc method to comprehend what are the better and sustainable solutions in terms of adaptation and regeneration of different kinds of places interested by multiple crisis and by enhancing cultural heritage. Finally, principles for multiple risk areas design will be reported.

Keywords: multiple risks, cultural heritage, urban regeneration, public spaces

Rischi multipli tangibili ed intangibili

Si verifica sempre più spesso che molteplici tipi di crisi accadono contemporaneamente, rendendo difficile la risoluzione di condizioni urbane fragili in quanto diversi rischi si sovrappongono, coinvolgendo temi sociali, economici, ambientali, sanitari e di vivibilità. Ogni luogo, inoltre, è diverso e ha le sue peculiarità e, per questo, tempi e modalità differenti per affrontare le crisi. Per ottenere un adattamento e una rigenerazione sostenibile dei luoghi interessati da molteplici rischi è importante studiare le questioni da molti punti di vista e utilizzando metodi di analisi e progetto urbani adeguati. Partendo da queste premesse, gli obiettivi del presente studio (svolto nell'ambito del progetto di ricerca "PRIN2020 20209F3A37", all'interno dell'Unità ISMed-CNR con responsabilità dell'autore e la relativa convenzione tra l'Università degli Studi di Roma Sapienza e l'ISMed-CNR) sono: definire e identificare quali sono le tipologie di rischio e le principali tipologie di sovrapposizione tra di esse nei siti; individuare quali sono i principali luoghi che sono soggetti a molteplici rischi; proporre un metodo originale e ad hoc per comprendere quali siano le soluzioni migliori e sostenibili in termini di adattamento e rigenerazione di diversi tipi di luoghi interessati da molteplici crisi e di valorizzazione del patrimonio culturale. . Infine, lo studio illustrerà i principi per la progettazione di aree multirischio.

Parole chiave: rischi multipli, patrimonio culturale, rigenerazione urbana, spazi pubblici

1. Multiple risks and holistic approach

A place with multiple risks is a place that may be affected by multiple types of risks simultaneously. Indeed, in contemporary territories it is increasingly happening that different types of crises occur simultaneously, making the resolution of fragile urban conditions complex as the different risks overlap, involving social, economic, environmental, health and liveability issues (Adger, 2000; Chanlat et al., 2013; Davoudi et al., 2013; Kaplan, 1981; Lopes, 1987; Opdam, 2020; Serre et al., 2012; Sepe, 2023; Zelinka, Brennan, 2001). Furthermore, each place is different and has its own peculiarities with respect to the material and immaterial characteristics and, for this reason, it needs different times and methods to deal with crises.

Accordinlgy, risks are also different from each other, determining that, for example, resilience to environmental risk is different from resilience to economic one. In order to achieve a sustainable adaptation and regeneration of places affected by multiple risks, in line with the principles of the 2016 Quito's New Urban Agenda and the Agenda 2030's 17 SDGs, it is important to address the issues from many and integrated points of view and an holistic approach, by using suitable urban methods. The NUA (UN Habitat, 2016) contains three important principles in this direction, namely: "14. To achieve our vision, we resolve to adopt a New Urban Agenda guided by the following interlinked principles": "(c) Ensure environmental sustainability by promoting clean energy and sustainable use of land and resources in urban development, by protecting ecosystems and biodiversity, including adopting healthy lifestyles in harmony with nature, by promoting sustainable consumption and production patterns, by building urban resilience, by reducing disaster risks and by mitigating and adapting to climate change"; "65. We commit ourselves to facilitating the sustainable management of natural resources in cities and human settlements in a manner that protects and improves the urban ecosystem and environmental services, reduces greenhouse gas emissions and air pollution and promotes disaster risk reduction and management, by supporting the development of disaster risk reduction strategies and periodical assessments of disaster risk caused by natural and human-made hazards, including standards for risk levels, while fostering sustainable economic development and protecting the well-being and quality of life of all persons through environmentally sound urban and territorial planning, infrastructure and basic services". "67. We commit ourselves to promoting the creation and maintenance of well-connected and well distributed networks of open, multipurpose, safe, inclusive, accessible, green and quality public spaces, to improving the resilience of cities to disasters and climate change, including floods, drought risks and heat waves, to improving food security and nutrition, physical and mental health, and household and ambient air quality, to reducing noise and promoting attractive and liveable cities, human settlements and urban landscapes and to prioritizing the conservation of endemic species".

Accordingly, the 17 SDGs (UN Department of Economic and Social Affairs Sustainable Development, 2015), that follow this approach are almost all and among these: "9: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation", "11: Make cities and human settlements inclusive, safe, resilient, and sustainable", "13: Take urgent action to combat climate change and its impacts".

The holistic approach of both Agendas is also at the base of the method which will be proposed; resilience and adaptation should be obtained through policies and strategies which involve all the elements and factors which compose a place.

Starting from these premises, the main objectives of this study, carried out as part of the research project PRIN 2020 SUMMA Sustainable modelling of materials,

structures and Urban spaces including econoMic-legal iMplicAtions – within the ISMed-CNR Unit (with the author's responsibility) and the relative agreement between Sapienza Università di Roma and ISMed-CNR, are the following.

First, to define and identify the types of risk and the main types of overlap between them in the sites. The identification of the risks requires a precise analysis of the places, while any overlap could require a certain degree of uncertainty, since it is difficult to know in advance the periods in which the different crises will occur. Second, identify which are the main places that are - or could be - subject to multiple risks.

Third, with particular attention to public spaces, to propose an original and ad hoc method to analyse the places affected by multiple risks in order to be able to direct research, plans, programs towards sustainable and innovative solutions in terms of both adaptation and regeneration understood in its three-fold meaning and enhancement of cultural resources. The paper is organized as follows: in the second section, the kinds of multiple risks are showed; in the third part, the resilience and adaption concepts are illustrated; the fourth part illustrates the DYNAMO method; the fifth part the guide lines derived from the case studies which were carried out. The observations and conclusions relating to the proposed method, also in relation to the cited topics, will complete the study in section 6.

2. Multiple risks

The risks that can occur in a place are of different types. Some of the main risks and related causes will be mentioned below, as well as the places that may be affected by them (Paton et al., 2001; Parry, 1996; Komendantova et al., 2016).

The social risk can be caused by a) a significant use of virtual places, typical of social networks, followed by little use of real places and b) lack of physical places of socialization in good state of maintenance, that can lead to a loss of socialization between people. The cultural risk can be caused by rapid consumption of culture as, in case of places with intensive use due to mass tourism, this can lead to a consequent degradation of cultural heritage. The urban risk can be caused by poor quality of urban design, materials used in the built environment, and lack of connections and this can lead to disuse or degradation of the sites in object. The anthropic risk can be caused again by mass tourism and therefore overcrowding of places, that can cause degradation. The identity risk can be caused by invasive territorial marketing operations and can lead to homologation of places and loss of uniqueness. The safety risk can be caused by poor quality of materials of the built environment, low public light and disuse, that can lead to deterioration of the place. The environmental risk, which can be caused by earthquakes, floods and other natural disasters, can lead to partial or total destruction of places. The landscape risk, which can be caused by poor maintenance of green or its lack, can lead to unhealthy and unliveable places. The pandemic risk can be caused by health emergencies and can lead to public places characterized by social distancing.

The places that can be particularly affected by the aforementioned risks are the historical places in a poor state of maintenance, historic centres with mass tourism, public spaces, parks and gardens, places with a high degree of seismic vulnerability or subject to flooding, places characterized by isolation due to lack of adequate mobility networks and depopulation, peripheral, mountain or internal areas.

The listed risks have several points in common - rapid consumption of culture, low quality of urban design, poor maintenance of both natural and built environment - as well as the typology of places can be further expanded. What is important is the use

of a dynamic and flexible approach to the analysis of the places that makes possible different options of solutions to unexpected events.

The method that was created has the purpose of being able to be applied in these typologies of areas characterized by high possibility of presence of at least two of the mentioned risks obtaining resilient and adaptive places.

3. Defining resilience and adaptation

Resilience and Adaptation are two closely related and interconnected terms and have several points in common, as can be deduced below, so these will be illustrated here together.

Zolli and Healey's (2012) definition of resilience understood as "the ability of a system, firm, or person to maintain its core purpose and integrity in the face of dramatically changed circumstances" integrates ecology and sociology and gives an insight into the multidisciplinary nature of the issue.

Resilience often considers events that cause a crisis in a system to be the same even though these have different characteristics and does not differentiate sudden events from undesirable ones, leading to some ambiguities. Among them, for example, since there is no definition of how to pursue it, the degree of resilience of communities after a sudden event may be not the same and even within the same community different behaviours may occur.

Considering an evolutionary approach (Bohland, et al., 2019; Davoudi et al. 2012; Russo, 2018), there is no single equilibrium in ecology but there are multiple equilibria; however, the issue to focus on is the type of equilibrium to refer to rather than the causes that could alter it.

A crisis of social or cultural type must be faced with different approaches than one due to a catastrophe of environmental type and, moreover, even the same type of crisis can have different durations of effects, presupposes variable response times. The characteristic of multidimensionality of resilience makes the concept of resilience flexible on the one hand and elusive in its entirety and complexity on the other, requiring continuous updates and insights (Vale, Campanella, 2005). The current studies are focusing on environmental risks and, more recently, on those due to epidemics as in the case of Covid-19, allowing to highlight more clearly the inherent problems.

It is also true, as Vale (2014) writes, that resilience is used in different fields in similar ways. Management analysts use resilience to measure a company's ability to recover from a disruption of a key element and recover as usual, just as economists measure it in relation to a place's ability to recover after the loss of a particular industry, ecologists are concerned with how a system can be restored to its previous equilibrium after a sudden environmental event (Banica et al., 2020; Borsekova, Nijkamp, 2019), psychologists use resilience to describe an individual's ability to withstand trauma and continue to function well. IT professionals measure the resilience of a communication network by relating how effectively a communication network copes with an outage exemplified by a massive power outage.

Applying the concept of resilience to socio-environmental systems such as cities means anticipating crises and strengthening cities with proactive solutions that can at the same time enhance both public and private places.

However, preventive resilience requires choices that require upfront spending and investment and also decisions about which people and places are at risk and which should be protected, regardless of whether the hazards are man-made, natural, or a combination of them. A holistic view of preventive resilience should include

consideration of the needs of all stakeholders and the different types of places potentially affected.

Resilience is also a concept that in addition to environmental quality is combined with the definition of safety in which a resilient place is a place where people live safely within improved places.

Indeed, cities are not uniform landscapes of people that are randomly distributed, but organized places that produce socio-economic differences; therefore, it is not easy to describe a city as resilient in its entirety. Only referring to the Covid-19 pandemic for example, it brought to problems of safety, fragility and differences in resilience not only between the cities affected, but also between areas within them.

Furthermore, informal urban spaces are more vulnerable because in many cases there is a lack of infrastructures and services and the presence of a large population with socioeconomic hardship, which can result in a wide variety of risks and less resilience.

Uncertainty is another important component in the study of resilience because lack of knowledge about future crises of an environmental nature and beyond makes people and places particularly vulnerable. To mitigate the impacts due to uncertainty of future events, policy and urban risk planning and management must be taken into account in advance.

Integrating uncertainties within the planning process and improving collaboration between different institutions and organizations, both public and private at all levels, are key components of resilience. Similarly, social diversity must be considered in order to reduce it through a more balanced distribution of resilience resources.

Resilient planning should therefore be oriented towards uncertainty and go beyond traditional approaches, preparing cities for possible changes. Adaptation in this sense is key to limiting damage from climate change and, more broadly, from economic, social, and health crises. Planning should include a wider range of conditions and, in particular, develop ex-ante and ex-post analyses to adapt appropriately to sudden situations.

Another component of uncertainty is the sustainable urban form, which relates to many aspects of resilience: liveability, urban health, change, climate, multiculturalism are just some of the elements that influence contemporary public policy and must be taken into account for good city form (Lynch, 1984). Urban compactness and contiguity, high-density planning, sustainable transportation and equitable access, mixed land uses, diversity of housing and built form, passive solar design, greening in particular cities, and renewal and use with the rehabilitation and refunctionalization of brownfield sites constitute key criteria for assessing the sustainability of urban form (Jabareen, 2006, 2013).

In this regard, as Desouzae and Flanery (2013) observe, the social sphere is composed of three types of elements, namely people, institutions understood as the set of individuals converging towards common goals, and activities, understood as the tasks that people and institutions design, carry out and use. In this framework, people play the most important role because it is around them that the other two components are built. Moreover, the physical and social spheres often overlap and many activities within a city occur from the encounter of these two spheres. In public spaces, for example, interactions between different people, activities (walking) institutions (services), processes (permits of various kinds) and resources (artwork and artifacts of various kinds) can be observed. Each of these components interacts in intentional and unintentional ways that are important to identify for the creation of resilient and adaptive places (Desouza, Flanery, 2013).

Spaces with a good degree of resilience are spaces that are able to adapt to change.

It is also true that adaptivity, like resilience, is a term that lacks an unambiguous interpretation (De Roo, Porter, 2007).

To clarify its limits in the planning domain, it is possible refer this domain (De Roo et A. 2020) to the material dimension and the organizational and institutional dimensions. The material dimension is about people, the environment, and the land, while the organizational and institutional dimensions are about the domains in which planning and activities act to link institutions with the material dimension. Adaptive planning can thus involve: that the people, places, or situation that are the objects of planning have dynamic behaviour and can exhibit that behaviour in the future; or that the processes of designing and implementing interventions are capable of being adaptive.

Traditional approaches to planning do not consider adaptive behaviour as an initial point in the planning phase. These are situations that require interventions that are decided upon later through planning action such as, for example, building a road to improve deteriorating traffic conditions or building a residential neighbourhood in response to an increase in population.

These cases could have been resolved even early in the planning process; instead, traditional planning deals with planning based on current realities not on unforeseen changes.

The uncertainty and unpredictability of an event and its subsequent, often unknown, development are difficult elements to manage. In fact, the system as a whole cannot be understood only by observing the parts that compose it, which must instead be analysed together with their context, noting the reciprocal relationships and the ways in which the system reaches the best possible configuration.

Traditional approaches to spatial planning often do not take adaptive behaviour as a starting point, believing that urban interventions can be decided on the basis of facts and estimates that are available at the time of decision-making. If reality did not change by remaining similar to that considered during the decision-making process or otherwise predictable, there would be no reason not to continue with this form of planning. This form of planning is based on a static perspective, which assumes a transformation according to predictable patterns, whose starting points are: "actual: eliminating the anomaly responsible for the disturbed order in the here and now"; desired, i.e. ideal and evidence of context; potential, i.e. the tools to achieve a predefined end on which there is consensus.

This static perspective is also used in contemporary planning, where deliberate actions will lead to the results of the decision intended. However, the assumption of a static world can lead to strategies that may be obsolete at the time of the decision, resulting in much divergence between expected and actual effects.

Resilience and adaptation are to be considered fundamental in dynamic planning, where the uncertain and the sudden become components of the planning process with the same weight as the others, and where urban planning tools are renewed or modified in order to contribute to the management of any crisis in an appropriate way. While it is true that unforeseen events by definition occur suddenly, it is also true that adaptive and dynamic planning can better support the creation of a new equilibrium.

Urban regeneration consists of an integrated approach between vision and action for the resolution of various problems related to disadvantaged urban areas in order to improve their socio-economic, physical and environmental conditions with actions such as the requalification, recovery and conservation of heritage (Zheng et Al, 2017).

To the term regeneration must be added the term sustainable (Nijkamp, Perrels,

1994) understood in its triple meaning (Sepe, 2020a,b; Sepe, 2023), although as Evans and Jones (2008) affirm it can create ambiguity on what weight to give to the environmental, social and economic component, determining that greater emphasis can be placed in the regeneration processes on one element instead of another depending on the developers' goals (Astleithner et al, 2004; Davies, 2002).

Indeed, in the most recent studies for this purpose, additional key elements of sustainability in relation to the planning system have been identified, namely: cohesion and social inclusion; protection and enhancement of the natural environment; prudent use of natural resources; sustainable economic growth; integration of sustainable development into development plans (ODPM, 2004). This highlights the importance of integrating the components and not just ensure their presence (Forrester, Snell, 2007).

Accordingly, the DYNAMO-DYNAMic Place Design MethOd will be proposed.

4. DYNAMO method

The DYNAMO-DYNAMic Place Design MethOd is a method that analyses the elements and risk factors of a place - in particular public spaces - the perception of them by their users and the quality of the site and identifies policies and/or design interventions for its safeguard and enhancement. Attention is therefore paid to detecting both tangible and intangible aspects of the place in question. The purpose of this method is to transform risks into opportunities for valorisation of local resources. The final products are two dynamic mosaic maps: the first returns risks, user perceptions and local resources, the second identifies possible policies and planning interventions for protection/enhancement.

The DYNAMO is a method that has the purpose of identifying which are the present or possible risks, both single and above all multiple, that may affect public spaces, the factors that determine them and the perception that users have of the places and interventions of project for an adaptation that aims at the same time to enhance the places. The final product is represented by two maps, one that systematises and integrates all the data collected separately in the previous phases in order to obtain a mosaic of risks, factors, user perceptions, the other that presents the identified adaptation and enhancement interventions.

The first phase concerns the analysis of the place with the identification of the single present or presumed urban risk. This is carried out by detecting these risks with the use of a specific database: the risk is detected through the observation of the places and it is quantified with respect to its presence in slight, medium and significant.

The present risks that can be detected from the observation concern: the risk of degradation, the environmental risk, the social risk, the cultural risk, the anthropic risk, the seismic risk, the health risk, the risk of low liveability, the risk of insecurity, the risk of loss of place identity.

This survey is connected to the subsequent one concerning the factors that can determine the risk, since the risk is detected through the identification of these factors. It is therefore a mainly qualitative survey as it is based on the observation of the place.

The second phase is carried out by observing which elements and factors influence or can influence the present or possible risk or risks. This observation is carried out with a database which indicates the type of risk identified and the factor or factors that determine it.

Factors that can determine risk include: lack of shelters or shelters in open spaces with extreme temperatures; presence of mass tourism in historic places; poor state

of conservation of public places and spaces including floors, furnishings and equipment; presence of buildings without maintenance; presence of fast food, street vendors and shops selling poor quality products with use of the street for display in historic places; presence of environmental events such as floods or seismic phenomena, albeit periodic; presence of architectural barriers; presence of furnishings, equipment, maintenance with little attention to the identity of the places. For example: the anthropic risk can be determined by factors such as mass tourism, territorial marketing actions; pedestrianization of a single road within the tourist route; the environmental risk can be determined by earthquakes or floods; the urban unliveability can be determined by low quality design of spaces and scarce maintenance of furnishings and equipment.

The result is a mosaic of factors that influence or can influence the emergence of risks of various kinds.

Table 1. DYNAMO's scheme

Phase	Objective	Actions	Product
1	Identification of single "urban" risks	Observation of the places	Mosaic of the single risks
2	Analysis of factors contributing to the risks	Identification of the factors	Mosaic of concurrent risk factors
3	Analysis of the effects due to the coexistence of risks	Observation of the effects	Mosaic of effects
4	Risk perception questionnaires	Questions asked onsite to users of places and social network analysis	Mosaic of risk perception by place users's
5	Analysis of plans/ projects/programmes/policies for adaptation	Identification of projects and plans that provide for adaptation to risks	Mosaic of plans/projects/ programmes/actions
6	Analysis of potentialities and qualities	Identification of factors which contribute or can contribute to the quality of the place	Mosaic of the quality elements from the urban point of view
7	MultiRisks analysis	Identification of all present and probable risks, related factors, and user perceptions	MultiRisk map
8	Dynamic area identification	Identification of areas with potential flexible use	Mosaic of flexible uses
9	Dynamic project interventions	Identification of project interventions of adapatation/enhancement	Dynamic Map

Source: Marichela Sepe.

The third phase concerns the observation and analysis of the effects that may occur if several risks analysed in the first phase occur or may occur simultaneously.

The data collected concern the type of risk, the effect or effects and the relative quantity of the effect detected, indicated as slight, medium or significant. For example, if the public space concerns a city affected by seismic risk or flood risk and at the same time the space it has been created or rebuilt with a design that pays little attention to the identity of the places, the place will not fulfil its function as a place for socialization, as the lack of security could be joined by that of the perception of space not linked to tangible and intangible cultural aspects.

The result will be a mosaic of the risks present with their effects and quantities detected.

The fourth phase concerns the Risk perception questionnaires. In this phase, two types of surveys will be carried out: the first relating to the perception of the risk by the people who use the place, through the administration of a questionnaire; the second related to the perception of the place present on social networks - including Facebook, Tripadvisor, Instagram, Twitter - from where to extrapolate useful information for the study being carried out.

Questions that will be asked include:

1. What general perception do you have of this place?
2. Do you think this place is affected by one or more types of risk?
3. What perception do you have of the risk or the risks to which it refers?
4. Do you think that these are permanent or transitory risks?
5. How do you think citizens can contribute to the resolution of the risk/s?
6. What are the quality of this place?

This aspect of the analysis is very important as from the answers it will be possible to understand how much and if people perceive each risk and if they think they can contribute to their resolution.

The fifth phase concerns the identification of the plans, programs and policies that are active in the place under analysis. An overview of the area will be carried out and research on the actions, if any, aimed at mitigating the different types of present or possible risk will be carried out. These can be on different scales and of different types, of a general nature or very specific and sectoral.

The product will be a sort of mosaic of plans, projects, programs and policies that may be present in the territory in question which will make it clear whether the risks under analysis are already object of attention and what actions, if any, have been undertaken.

The sixth phase is the identification of the quality factors and elements of the place. The identification of the quality of the place is understood here as the presence of historical monuments of interest, historical buildings, public spaces with good quality design, easy accessibility, greenery, historical urban fabric, perspective views. The identification of the presence of these factors is also linked to the current use. This information is important to understand what resources that place possess and if the uses of it can be flexible.

The result is a mosaic of the quality elements of the place with their relative uses.

The seventh phase concerns the multiple risks analysis, i.e. the creation of a map that presents all the risks which are present. The map will contain: all the risks present in relation to public spaces; the factors that contribute to the perception of present or possible risk; the results of the questionnaire on risk perception by people and those identified on social networks; and the quality elements of the place with its use.

The eighth phase consists in identifying the dynamic potential of the area. In this phase, by observing the multi-risk map, the most flexible spaces for resilience and improvement/enhancement project are identified. The result will be a sort of mosaic where areas of greatest risk are indicated where an action of adaptation and improvement/enhancement is most necessary.

Finally, the ninth phase will be the identification of the dynamic project interventions, located in the areas already surveyed in the previous phase. These project interventions concern the possible actions to be carried out to adapt to the risks and at the same time enhance the places. The result will be a dynamic map that will identify flexible interventions to be implemented both in the case of risks that are already present and of possible risks. The map is defined *dynamic* as it can be

updated according with changes of the risks and their effects - also in the perceptions of these by people, and of the cultural resources. This is useful for administrators to design suitable resilience plans which take into account multiple aspects of prevention, adaptation and enhancement of a territory with a holistic and evolutionary approach.

5. Principles for dynamic enhancing of places

The various case studies that have been carried out have led to the identification of guidelines, always following the idea that the risk can be an opportunity to review aspects of the territory that can be improved and enhanced and therefore resilience can be interpreted as a component of sustainable regeneration. The case studies include: Cittaducale and Leonessa in Lazio Region, Siena, Naples, Paris, Madrid and Rotterdam. The case studies have been chosen for the presence of one or more present or probable risks: Cittaducale and Leonessa are interested by seismic risk and depopulation; the historic centre of Siena, Naples and Madrid by mass tourism and globalization; Rotterdam and Paris by flood and possible lack of place identity as regard the first and by flood and mass tourism as regards the second.

According with the concept of flexibility and adaption, the following guidelines are meant as an output that can be continuously updated depending on possible new kind of risks or combinations of them which could be detected in further case studies.

The identification of the dangers related to a place must take place in a preventive manner, through analyses involving material and immaterial factors:

1. The identification of risks and possible damages must take place with reference to a single event or more potential events that can occur simultaneously.
2. The perception that the population or, more generally, the user of a place has, is a fundamental element in the study of dangers and risks and must be detected through *ad hoc* questionnaires.
3. Fragile individuals must be taken into particular consideration both for the survey of their perception of risk and for the project of adaptation to them.
4. The survey of the urban qualities of the place – cultural heritage, materials, equipment – are elements to be considered in risk adaptation projects/policies, in order to transform them into opportunities to improve liveability.
5. The resilience/risk adaptation project must be constantly monitored in order to be able to foresee sudden events and to be able to react in a sustainable manner.
6. Flexibility is one of the essential characteristics of the resilience/risk adaptation project and must be understood in an inter-scalar (from the building to the city) and interfactorial way, integrating urban, socio-economic, cultural and environmental aspects.
7. A resilience / adaptation project cannot be used in the same way in any place even if characterized by the same risks, but must be carried out respecting the different characteristics, as each site (historic centre, suburbs, regeneration area) has its own peculiarities to take into consideration.
8. The communication of dangers and risks as well as of projects, plans and policies for adaptation and resilience must be carried out in an appropriate manner for all age groups and abilities.
9. New technologies must be used to support both the communication of risks and dangers.
10. The disclosure of all the measures adopted or to be adopted in the case of a crisis of various types, should be clearly and widely illustrated through ad hoc web portals, apps, social networks, sensors, interactive maps.

Future steps with respect to the proposed methodology concern the design of indices that give a numerical value to these risks in order to achieve a ranking of the safest/liveable/flexible – only to give some examples – places/cities with respect to the identified risks.

6. Observations and conclusions

The DYNAMO method is a method which follows a holistic approach and that was created by the author to analyse complex urban situations where the presence of multiple risks makes the place in question particularly subject to degradation, disuse, or depopulation.

A method that can identify at the same time factors, risks and people's perceptions can support a sustainable project that is more attentive to urban situations where the coexistence of several overlapping crises makes resolution difficult.

In addition, users' perceptions are of great importance to understand their awareness with respect to important issues affecting the space in question.

The problematic aspects of the method concern: the survey of possible risks as it is not easy to analyse the unexpected ones; the indication of risk in quantitative terms; the collection of useful information on social networks.

The presence of a poor state of preservation of public space and little accessibility can predict a situation of disuse or degradation; but the presence of seismic risk and little accessibility, does not necessarily lead to degradation, as the seismic event may not occur for many years. Similarly, the presence of mass tourism together with a low quality of design of the places can predict a cultural risk and a loss of identity of the places. The presence of mass tourism together with the risk due to climate change could also result in a decrease of tourism due to difficult climatic conditions and therefore, paradoxically, to a better maintenance of the place.

Another aspect concerns the indication of the risk in quantitative terms, that is light, medium and considerable. Indeed, the presence of a risk is due to changing factors and therefore defining mass tourism as a risk for the identity of that place probably means approximating the quantity detected to a specific period of time (e.g. spring or summer). Furthermore, indicating the due effects of multiple risks in quantitative terms requires averaging as each effect will present different quantities of risks. Again, the collection of information on social networks requires a survey with parameters that can change from time to time depending on the type of risk to be detected, and, in any case, a complex interpretation of the data for the purpose of the case study.

The principles which were reported are the results of the different case studies carried out until now; because uncertainty is at the base of adaptive planning, new guidelines can be added if an update will be necessary.

Finally, the general idea is that the risk can be an opportunity to enhance the cultural resources – both tangible and intangible – of a territory and therefore resilience – following both a holistic and evolutionary approach – can be interpreted as a component of sustainable regeneration (Sepe, 2020-2023).

Conflicts of Interest
The author declares no conflict of interest.

Originality

The author declares that this manuscript re-elaborates and supplements the contents of the following paper: Sepe M. (2022), "Adapting spaces by facing risks with an olistic approach", in Moccia F.D., Sepe M. (a cura di), XIII Giornata Internazionale di Studi INU - 13°Inu International Study Day "Oltre il futuro: emergenze, rischi, sfide, transizioni, opportunità - Beyond the future: emergencies, risks, challenges, transitions, and opportunities" (Napoli, 16 December 2022), *Urbanistica Informazioni*, n. 306s.i., INU Edizioni, Roma, pages 461-464. The author also declares that the manuscript is not currently being considered for publication elsewhere, in the present of any other language. The manuscript has been read and approved by all named authors and there are no other persons who satisfied the criteria for authorship but are not listed. The authors also declare to have obtained the permission to reproduce in this manuscript any text, illustrations, charts, tables, photographs, or other material from previously published sources (journals, books, websites, etc).

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