

Article

Towns as Safety Organizational Fields: An Institutional Framework in Times of Emergency

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Abstract: According to the idea of safety structures as systemic, we developed a framework that emphasizes how the engagement of all relevant social agents could play an active role in the whole safety performance. The hypothesis of this paper is that a systemic approach should imply a precise shift of perspective from a unit of analysis embedded in a general environment, with mutual effects on a given safety performance, to a general analysis of a system where interdependent agents affect system performance. Through the lens of organizational field theory, safety performance is intended as the sum of the activities of multi-agents oriented by normative and cultural principles set out at the societal level, specifically within the urban area boundaries. In doing so, the analysis describes the key agents and their activities according to four different safety stages: Prevention, preparedness, response, and recovery. Institutional logics, distinguished as formal and informal, help to explain the behaviors and connections among agents. With the idea that a locally placed, organizational field reflects its peculiarity, we used four Italian towns located in two different areas of Campania, which live under the constant risk of a volcanic eruption, as examples. The results show how safety structures systems are contextual, characterized by locally embedded formal and informal rules, but not necessarily mutually aimed at orienting key agents to improve the safety performance. This contribution aims to support empirical analyses, natural experiments as well as qualitative studies to compare urban areas designed as safety-organizational fields from a multidisciplinary perspective. At the same time, we indicate some policy suggestions by emphasizing differences among organizational fields.

Keywords: safety system; organizational field; institutional logics

1. Introduction

Safety as a system is becoming an increasingly prominent topic both in political arenas as well as for scholars. It deals with an “all-encompassing perspective that considers human agents and technical artefacts embedded in complex social structures such as the organizational goals, policies and culture, economic, legal, political and environmental elements” [1].

In this direction, a narrower approach focused on human interaction with technology aimed at delivering outcomes as a result of their exclusive collaboration, functioning in isolation, seems to be a partial representation of the phenomenon. On the contrary, the systemic approach seems in itself to offer a profounder tool in understanding and estimating safety. Safety performance is usually deemed as the features of a system capable of preventing damage both to human life and property as well as adverse consequences to the environment [2]. It is a notion that originates from i) the kind of actions necessary to guarantee safety; ii) the rights safety involves, such as human well-being, property, and public right; and iii) the consequences: The safety performance in terms of social, economic, and environmental impacts [3,4].

While it appears a natural evolution of a flawed atomized perspective, it still cannot be considered a truism, neither in safety standards nor in any analyses. If briefly examining some of the international safety standards, even if safety is usually intended as an unacceptable risk for its complex implications, they are often related to either a single agent or organizational systems [5–7].

To date, there is not a more integrated approach to the safety system, namely an organizational theory of a given safety system. Consistently, structured frameworks aimed at understanding and managing the relevant social dynamics in such a system are also lacking. This paper hypothesizes that a systemic approach should imply a precise shift of perspective from a unit of analysis embedded in a general environment, with mutual effects on a given safety performance, to a general analysis of a system where interdependent agents affect system performance. We consider this by relying on an idea of the system as a relational space where social agents rather than a single unit of analysis are engaged in activities i) individually but aimed at collective aims, and ii) collectively, by interacting or referring to each other's. Constituents, such as the government, professional and civic associations as well as, in general, special interest groups, citizens, beyond the firms can have a part in a more comprehensive idea of safety. The aim of this analysis is therefore to offer a systemic view of structure and infrastructure (hereby structures) safety through a consistent changing of point of view. As for structures and infrastructures, where the notions are not necessarily aligned, the framework can refer to both. Nevertheless, structure is preferred as a synthetic notion since the examples proposed in this study are closest to structures rather than infrastructures. Furthermore, safety is a notion that does not include security. Although the difference is not clear, safety is limited to the unintentional hazardous events where security includes intentional events arising from human activity.

The focus is on key agents and their types of activity and their interaction. Through four examples of towns exposed to a volcanic hazard, located in the Campania region (Italy), we assess the behaviors as specific of any town. Local institutional logic helps to explain connections among the agents. We then indicate both the formal rules and common beliefs about safety that i) orient agents' behavior and ii) could be complementary as well as contrasting guiding principles.

A more integrated approach is a significant way to fill a gap in the studies on the topic. Any analyses that have been previously carried out are mainly focused on organizational systems. Socio-technical theory [8] is a notable approach that emphasizes how human agents and social institutions are integral parts of technical systems. However, a focal organization and the hazardous nature of its activity often represent the core of these types of study [9,10]. They mainly deal with understanding the interactions between the technical, human, and organizational aspects related to a reference environment where the organizations/unit of analysis are.

Furthermore, where the perspective is shared by several disciplines, studies are distinctly separated in terms of their concrete application. Thus, on the one hand, normal accident theory (NAT) [11,12] and high reliability organizations (HROs) [13–16] have addressed the organizational aspects of safety by distinguishing the kind of organization on the basis of its complexity related to the avoidance of accident events. On the other, from engineering disciplines, there are studies focused on the nature of complex accidents based on the relations among interconnected events rather than a simple cause–effect chain [17–19].

Differently, through the lens of the organizational field, we develop a framework that underlines how the engagement of all the relevant social agents could play an active role in the overall safety performance by emphasizing the case of a volcanic hazard. More importantly, this approach intends safety performance as the sum of the activities of multi-agents oriented by normative and cultural principles set out at the societal level. An organizational field is commonly accepted as a unit of analysis characterized by the dynamics of its institutional logics comprehensive of common beliefs and values both formalized in the law and not.

We base the discussion on several arguments:

1) Organizational field boundaries are defined by relying on town boundaries. This could be an imperfect way to describe the dimension of an organizational field. Organizational fields are

usually the reflection of the agents' behaviors through which formal and informal logics can orient the relations they create [20,21]. In this sense, a field is the product of the analysis aimed at mapping the interdependences among agents based on a common institutional rationale. However, as underlined in other studies, "urban area fields can be considered complex social organisms characterized by idiosyncratic processes of hybridization between different institutional logics, relational networks and rules" [22]. Therefore, each town as a safety field results in an institutional environment that is unique to a particular place. Thus, the city context is, in its nature, marked by systematic relationships between the local government, the citizens, and the local systems of entrepreneurs, civic associations, and group interests. Their activities together with their interconnections reflect the institutional logics that are the particular property of a single organizational field.

2) This analysis is limited to the structures safety. The concept includes structures and property as well as buildings, all crucial in reference places: Any type of partial or total damage they would affect could produce negative effects on the safety, economy, health, and, in general, welfare of a population. It deals with a technical artefact as the final product of an industrial activity in place of an industrial activity in itself. The involvement of more agents is more observable, especially when putting towns as a safety field. For example, regulation in terms of safety standards can depend on the government as well as on professional associations and finally on the capacity of the construction industry in implementing those standards. Specific relations among these agents can directly impact on the structure's safety. In the same direction, interest or civic groups can exert institutional pressure [23] in the organizational field through their specific actions, such as community information campaigns or municipal interpellation until filing judicial causes.

3) Key agents can be involved in different stages of the safety performance, commonly described in the case of hazardous events as prevention, preparedness, response, and recovery of their effects. This will be up to the specific safety field to analyze.

The main contributions are as follows. We develop a framework for the configurational analysis of urban areas, viewed as a safety-specific organizational field, by evaluating the kind of involvement and interconnections of the agents. This is crucial for two essential reasons: 1) It helps in contextualizing the organizational field as a specific dimension with its own political, social, and economic factors; and 2) it mirrors how much institutional logics orient the agents' behaviors in sharing a common objective that the safety performance expresses. This contribution aims to support the empirical analyses, natural experiments as well as qualitative studies to compare urban areas designed as safety-organizational fields.

We set out the article as follows: Section 1 is the introduction; Section 2 is a brief review of the organizational field; Section 3 describes key agents related to the town as an organizational field; Section 4 is about institutional logics; Section 5 discusses some examples of safety as an organizational field in the particular case of a volcanic hazard; and Section 6 presents some conclusions.

2. Organizational Fields Characteristics

In their seminal paper, DiMaggio and Powell [24] defined the organizational field as "those organizations that, in the aggregate, constitute a recognized area of institutional life": An organizational field consists of a relational space, a meaning system, and a set of rules [25]. In its recent evolution, many studies shifted the focus from the idea that an organizational field aims to shape new organizational forms as an answer to the institutional pressures to the nature of the interconnection among agents. In this context, institutional logics are often fed with the field agents' activity rather than external pressures to resignedly accept [26]. Thus, two elements are both necessary to define an organizational field: 1) The field's agent—those agents who share codes of conduct or more generally common values. This implies interactions between these subjects that are more frequent and at the same time driven by a mutual confidence than those with external actors [20]. It may include both public and private actors, with it being applied at the global, national, regional, or local levels. 2) Institutional logics are the organizing principles' guiding field participants: The cultural-cognitive, normative, and regulative

structures that underpin social behavior. They are all key elements in defining institutions [20]. Governance systems characterized by rules, roles, and obligations mirror the normative aspect of institutional logics. They deal with civil and administrative norms, professional standards that, together with the judicial execution, address a given activity both public and private. In regulative structures, the contextual extent of these kinds of rules is emphasized rather than the more general normative rules of society at large [27]. These governance systems are composed of a combination of public and private regulations that coordinate the relations between agents [28].

The cognitive aspect [29] focuses on the conceptual beliefs, mental models, and interpretations of shared meanings. An institutional logic is a field that shares an understanding of both the goals and the way to be pursued [30]. Logics, when shared, act in two ways. First, the action they generate is perceived as the appropriate one. The degree of diffusion of the action within a set of agents is in itself sufficient to recognize a certain value in the action. Thus, action supported by a shared logic becomes institutionalized. The transmission of social facts from one set of agents to another causes them to take on a rule-like and taken-for-granted status and thus become institutionalized [31]. Moreover, some studies [32] show how institutional logics work differently according to the different field agents. Fields with a greater number of underlying logics or with greater variability are reflected in a greater freedom of agents. In these contexts, some members, usually in a marginal position, can more easily promote new alternative or even conflicting logics than the dominant ones. Institutional theorists state how organizational fields are usually supported by a prevailing institutional logic. However, this does not exclude the presence of further logics operating in smaller spaces, such as in subsystems [27,33].

A key issue that emerges from these studies is the necessity to integrate the agents' behaviors. When contextualized to this analysis, safety is recognized as a complex system, in it being based on the roles people play in system performance [34]. The question is not only who are the agents involved? The right question is what are their roles in safety performance? From this point of view, the number of agents is greater than that if strictly considering who has built the structure and what the municipality involved is. Agents are not those strictly tied to the technical artefact. They are those of the wider structure system. Mapping these aspects under a consistent theoretical approach is a first, necessary, step to understanding their behaviors and as a consequence how they critically influence performance. Secondly, the town structure field, as the result of agent interaction, should consist of a set of consequential stages: Preventing—knowing what to expect; responding (as recovering and mitigating)—knowing what to do; and finally learning—knowing what has happened—such a system works because the agents can adjust their behavior and modify how they interact with technical systems as the conditions change [35]. Finally, where institutional logics underpin an organizational field, it is necessary to understand what kind of logic there is. While it seems that logics should go in the same direction, both as originating from formal and informal rules, this is something that is not taken for granted.

3. Key Agents

An organizational field is not a simple list of its agents distinguished by their characteristics. On the contrary, it is the nature of complex relationships that these agents generate to determine the boundaries of the field and to continue to foster the scientific debate. With this aim, key agents are described in relation to their critical contribution to the safety field. The focus is on volcanic hazards, in line with the cases that we discuss in the next section, but extensible to different unintentional hazardous events.

As previously mentioned, agents are those who (are expected to) play an active role in the co-creation of the safety performance. What follows specifies who the key agents are and the way they (are expected to) contribute to the structure safety field placed in an urban area, according to the single stages.

3.1. (Central and Local) Government

It is obvious when discussing a safety system that it is locally placed and therefore related to local structures. Its regulation is mainly an issue defined both through local and central competencies. Although laws can differently discipline structures safety among countries, some general principles can be considered as commonly shared. Urban planning is often a means of the local authorities disciplined by central law together with building codes. Principles of decentralization can guide the distribution of the regulative competencies that in some countries can involve further political institutions with an intermediate function between the central and local levels. The bulk of the regulations is developed in a stage of prevention, and, when possible, of preparedness³. Thus, urban planning is the municipal means that regulate land use via areas according to both the population density and the hydro-geological characteristics. It is the first way to locate any vulnerabilities. Building standards are, on the contrary, national and sometimes integrated on a regional basis due to specific characteristics of the region, where cities should provide their enforcement. One of the issues highlighted by Perrow [36] which can be easily generalized, refers to a lack of law source coordination: Central standards risk being weakened on a local basis when local properties constitute a lobby and, at the same time, a consistent number of votes for local government or even a part of it. Contrarily, where the local public authorities (namely the municipalities) express full disclosure and stringent standard enforcement, some cyclical national “building amnesty” could cancel any efforts on a local basis. The response stage should suggest at least the existence of an evacuation plan together with the coordination plan of the first respondent. Theoretically, the seriousness of any structure damage should be oriented on a centralized or decentralized response. The more serious the damage is, the more a national first responder (such as the national army) and national emergency plans should be relied on. On this point, scholars highlight how a response stage usually receives poor implementation: Evacuation plans are often unrealistic, out of date, or completely missing. The cost of response is immediate while any future benefits are uncertain and, above all, they do not produce any electoral benefit. Finally, a recovery stage necessarily requires local intervention: City ordinances are the best way to reduce the effects of an accident. For example, the municipal ordinance that provides communal conventions for any commercial activities damaged by a structure accident is a means to sustain the local economy. A decontamination ordinance, where necessary, is a clear way to protect the citizens’ health. When a structure accident has more serious consequences, the national intervention can pass through the form of an extraordinary plan or specific funding program for the city affected by the accident.

3.2. Professional and Environmental Organizations

Professional associations are organizations, in a given territory, that unite professionals in the same field. The organization is called an order when the membership is a compulsory prerequisite of the professional activity. Professional orders are constituted on a local basis and engaged in a variety of activities, such as: Representing the member, promotion of the profession, education, professional updating, consultancy work, and resolving conflicts between professionals. All these activities aim at enhancing the members’ proficiency. Professional profiles, such as engineers, architects as well as surveyors, are all necessary actors of the structure’s safety performance as technical roles in both the local public offices and construction industry.

It is a matter of individual competencies that should be increased through the professional orders. Even though many studies consider them conservative associations [23], orders can also have an important role in exercising institutional pressures on a local basis by channeling social requirements.

They could take action in all the different stages of the safety performance. Regarding the pre-event stages (prevention and preparedness), technical intervention could be supported by orders. The monitoring of structures is one of the essential instruments to check for weaknesses inside the structural system and then elaborate opportune solutions. Professional associations have an important role in terms of professional education and updating, often in collaboration with universities.

The technical know-how on the indicators and methods is indispensable for establishing crisis and ever-changing scenarios. Moreover, professional associations can contribute directly to the land-use planning activities of the local government.

During or in the immediate aftermath of a hazardous event, the principal requirement is responding to the crisis. In this stage, the knowledge of the professional is essential in defining the temporary activities needed to avoid further damage to the structures and inconvenience to the communities.

In the last phase, the focus is on the recovery from the effects of the crisis that, in terms of the technical aspect, deals with the reconstruction/re-operationalize of the structure. During this phase, professional associations could help to understand what happened as well as to find a lasting solution to reduce the vulnerability of the structure enhanced by the hazardous event. Learning from the experience is the final step of the phase, it helps to mitigate the effects of a crisis. Environmental organizations are associations that focus principally on problems related to the environmental and urban degradation due to human activities. They are engaged in the monitoring and protection of the environment and the education of citizens. Environmental organizations can transpose the collective needs, not perceived by local and national governments, into actions that restore or maintain a system as ecologically viable [37] while also dealing with the education of the citizens, especially the younger ones. In the prevention phase, environmental organizations are agents capable of producing institutional pressure inside the system. They can enhance problems of the structural system and raise public awareness. The institutional pressure provided by environmental organizations is not limited to the prevention activity but is fundamental in the recovery of the effects of a disaster, too [38]. In this phase, their activities of monitoring and promotion are important to create a more shared vision for the reduction of the effects of a structural crisis.

3.3. Construction Firms

Structures are the end of a complex process in which the competencies of many professionals are involved: Architects, engineers, financial advisors, firms etc. This is particularly true for large-size structures. They are often regarded as the key products of a project-based industry. Thus, construction projects are by their nature complex, both for the phases that characterize them as well as the combination of enterprises and private individuals, according to inter-firm agreements that are seldom replicated, which are more suited to a single project. This excludes any form of repetition and routinization achieved in other industries [39]. In addition, activities involving new building structures take the form of particularly wide-ranging measures, which require a large amount of investment [40]. On the contrary, there are small construction firms that usually work on one-off products, characterized by a significant bankruptcy rate together with a high level of illegal employment due to the low skill levels required for this type of construction. For this reason, the construction industry is notoriously difficult to regulate. In addition, the sector has considerable professional heterogeneity, where many professionals, such as engineers and architects, also act as consultants external to the construction firms [41].

However, construction firms have an important role in determining the safety of structures. During the prevention phase, firms should provide the competencies and knowledge of construction standards necessary to properly realize and maintain structures. Respecting standards means to behave legally.

The lack of coordination in multiple organizations as well as the turn-over of small firms during the construction of the structure can increase the vulnerability of buildings and structures [42].

After a crisis, in the response and recovery phases of the effects on the structural system, construction firms should work together with professionals to prevent further damage to the structural system and its re-construction. Firstly, they make the solutions identified by the professionals operational and suggest other solutions based on previous experiences. The recovery phase helps to identify the weak points in the structural safety system and supports the identification of durable solutions.

Rebuilding after an event requires the coordination of all the key actors in order to achieve a recovery that is both effective and timely for the affected community. A framework developed for legislation and procurement is therefore essential to prevent reconstruction from being governed by isolated actions closely linked to contingency, unable to look at the needs of the community in the long term.

3.4. Citizens

Both individually and collectively, humans should be considered essential components of structure safety: Structure systems are the sum of the technical artefacts at the service of the citizens [43]. When taking into account the single safety stages, prevention and preparedness represent the crucial activities in engaging citizens, which is necessary if expecting an active citizen role in the following stages. There are several tools in the field of prevention that could be shared or even assigned to citizens. First of all, plans should be conducted in full consultation with local communities [44]. Beyond the aim of this analysis, several studies on citizen participation highlight their capacity to detect needs before city administrators, leaving the perspective of citizens as passive “recipients of services to key actors to improve the quality of life” [45]. As the main stakeholders in a town, scholars unanimously suggest their participation in the processes, as an interacting part in the system of decision-making for the development of the city [46]. The costs in participation in planning are clearly defined as a predefined level of competence on the part of public participants or alternatively the necessity of a facilitator or analyst to transmit information to the decision-makers. However, the benefits seem to outweigh the costs. Thus, public meetings that genuinely dialogue with the citizens and are based on an effective interaction between subjects are very likely to result in a successful experience. Moreover, a process involving community members is perceived as both fairer and more positive by those citizens who have not taken part [47]. Moreover, these types of processes not only enhance the mechanism of participation but also support the development of mutual trust mechanisms [48]. More in line with the objective of this analysis, several studies highlight a number of positive consequences in the case of public participation in risk decision-making processes in different urban contexts [49,50].

Education campaigns and training programs are an equally essential means for involving citizens in the pre-event stages. They should stimulate an awareness of the risks as well as improve the competencies in facing eventual accidents. All the studies that deal with prevention in the case of structure accidents focus on a prototype of the event, which is generally unpredictable and above all, not dependent on the responsibilities of the people. Many accidents that regard, in particular, buildings could depend on the bad habits of their residents or people present in a public building. Gas leaks, or the incorrect use of house appliances, as well as smoking in a confined room belong to those risky habits that are difficult to identify and avoid. For example, people in organizations will have no incentive to disclose information related to their own erroneous or even illegal behavior [51]. People tend to define as “legal” all the behaviors that refer to private property. In sum, there are two possible levels of prevention: The first is related to something perceived as unpredictable and not dependent on people’s responsibilities; the second, which should be oriented toward modifying people’s habits to avoid accidents is, in our opinion, more difficult to implement.

The response stage can be conducted by local authorities in full consultation with local communities [44]. This involvement could represent the community’s response to an accident. In an emergency, the risk of randomly involving unrepresentative or self-selected community members is higher than in a consultation during the initial stages. However, there are always symbolic benefits of engaging community stakeholders, such as a sense of ownership over plans and belonging to a community in a crucial stage [52]. Moreover, even if focusing on disasters, scholars have long shown the nature of immediate post-disaster public participation as active and largely altruistic. Contrary to common opinion, the surrounding communities work as first responders ahead of trained professionals [53].

Communities have often shown a great ability to interact with support organizations, a high degree of understanding of their own risks, as inherent in that particular scenario, and are more ready to manage them. The result is that these experiences make communities more resilient [54].

Recovery is the stage where the community actions are difficult to predefine. The actions will be the expression of being a community, in contributing to making urban life ordinary again, for example, respecting the emergency rules and activating funding initiatives. The degree of being a community both in the case of a disaster or simply in an accident will lead to the kind and degree of community initiatives.

4. Safety Institutional Logics

Institutional logics shape the guiding principles of an organizational field [55]. In the same way, they define its boundaries by directing the behavior of agents according to shared values and codes [27]. In this case, institutional logics are those incorporated in formal rules (both regulative and normative) about safety and those expressed through common beliefs, or personal orientation, that underpin a given societal safety culture. Following organizational scholars that recognize the presence in the same field of competing institutional logics, we propose that an ordinary safety town scenario should show formal and informal rules working together through a mutual influence with the capacity to uniformly orient the agents in the field. However, the complementarity of the formal and informal rules should not be taken for granted: Competing logics could produce a different involvement of the agents, with consequent implications on the safety performance. Formal rules comprise all the codified regulations (e.g., policies, standards, and procedures) in the field of safety structure with a national, local, or professional application. Questions related to their efficiency find their answers in the current general literature about institutions [56]. Hence, the question whether and under what circumstances can formal rules ensure an efficient safety structure performance on an urban basis depends on 1) the number of legal sources and the degree of coordination among national, regional, and local regulations; 2) the degree of updating of local standards and the adequacy to the characteristics of the urban environment; 3) the degree of the enforcement both as local municipal control and the judicial judgments; and 4) the certainty of the punishment.

A very elusive idea is faced when trying to define societal safety culture.

Many studies about culture safety structures focus on the construction industry rather than on societal culture as a wider concept [15,34,57].

Hofstede's analysis [58] represents a reference study in its attempt to classify society based on the kind of culture that it expresses. In its five key cultural dimensions that characterize the differences among societal cultures, he describes that of a long-term versus short-term orientation to life. Uncertainty avoidance expresses the degree of an individual's perception of threats or uncertain situations within a given culture. Low uncertainty avoidance scores equate with a greater willingness to take risks. According to Hofstede, uncertainty avoidance is affected by the degree of individualism or collectivism within the dominant culture [59]. Other studies put safety as a latent variable to be empirically verified through more consolidated societal attributes. Thus, risk perception, workgroup dynamics, and attitudes to work, religion, technology, and time are cultural factors that affect safety culture [60]. Goszczynska, Tyska, and Slovic [61] identified the size of the country, the level of technological development, and occupation as significant influences upon individual risk perception. There is an ideological frame that distinguishes the representation of a harmful event. For industrialized societies, natural events are disasters—something that technology cannot control—while less technocentric societies consider the same disasters to be part of human existence [20]. Here, Hofstede warned that uncertainty avoidance “should not be confused with risk avoidance because uncertainty is to risk as anxiety is to fear” [59]. Many anthropologic studies underline how risk is mainly a cultural perception. Cognitive constructs and taxonomies are conditioning tools of the entity of collective risk [62,63]. In sum, safety culture is when the expression of a society's common sense refers to a collective frame, more likely depending on other societal attributes. It deals with what

a given society perceives as a common risk rather than an individual risk. It is both a matter of good collective habits and collective awareness. Safety should be intended as a public good that implies immediate individual costs outweighed by future collective benefits.

5. Some Examples from Italy, Campania

The next paragraph describes four towns, located in Campania, a region in the southern part of Italy, that live under the risk of a volcanic eruption. As examples taken from reality, the focus of the analysis is on the field of prevention, dealing with a threat, even if concrete, of eruptions. At the same time, the focus is on that stage of safety that is the necessary prerequisite of reduction of an event and recovery of its consequences. Furthermore, these examples give a particular emphasis on the centrality of construction safety and the role they play in the following scenario.

5.1. The Volcanic Area of Naples

The volcanic area of Naples includes two active and dangerous volcanoes: Somma-Vesuvio and Phlegraean Fields. Vesuvius is known for a historic eruption dated 79 A.D., which interrupted a period of quiescence that lasted seven centuries. Long periods of dormancy that end with significant eruptive activity have always characterized this volcano. The last eruptive activity was registered in 1944. There have been no further signs of activity. Not surprisingly, should there be new activity in the next few decades, it could be explosive. Therefore, Vesuvius is a volcano, with a lack of signs but highly dangerous.

Differently, the Phlegraean Fields are a vast area of volcanic origin with a unique structure: It is not a typical volcano, but a vast depression area—"caldera"—characterized by a phenomenon of bradyseism consisting of a slow movement of the raising and lowering of the ground. This phenomenon maintains a level of "yellow" alert in the area. Although in different ways, both volcanoes are dangerous: Strict planning of land development would be expected, in order to reduce vulnerabilities and facilitate risk recovery interventions. In contrast, since the second post-war period, the Neapolitan area has been a place of a wild urbanization that has led to dramatically increasing the risk conditions. There are about 1,000,000 people currently living in the area with the highest risk of Vesuvius and Phlegraean. Such a population density is already a significant vulnerability to any eruption event. What also aggravates the situation is the widespread phenomenon of illegal building. The disproportionate population density of these areas seems to have gone hand in hand with the illegal building phenomenon. To give an idea of how serious the problem of illegal building is, it is sufficient to consider that the municipalities in these areas are unable to define the phenomenon in its correct amount. It has been estimated that there are approximately 25,000 illegal buildings in both areas. An abusive building can be abusive for many reasons: First, it is illegal if it is built outside building standards. This kind of illegality means a structurally unsafe building, very often destined to inflate the interests of the local organized crime. If looking at the savings items of construction firms, they span from illegal labor, undocumented and un-certified materials, no architect's signature, and no urbanization burden. Under these conditions, the construction firm is only formally legal. Illegal structures can mean unsafety for the place where it is located. The constraint of building in this zone is justified by the current excessive use of the land together with the proximity to the source of danger. A construction firm behaves illegally in this circumstance too. Some public structures must be added, formally legal, just because they were built in years in which there were no particular constraints in respecting natural distances from the sources of danger. It is therefore not uncommon for the municipalities to have been principally responsible for high-risk structures, such as hospitals, schools, and courthouses.

Thus, starting from a shared situation of significant vulnerability as a mix between the excess population and unsecure buildings, the general research question is "Is there space in such a context for a new safety system?" More specifically, the aim is to verify if and how agents act for a common purpose of prevention tied to the eruption events for their impact on safety structures and the safety of the citizens considering i) how regulation can orient the agents' behaviors and ii) whether a safety culture

is firstly recognizable and then capable of acting as a guiding principle, iii) we contextualize single municipalities, taking into account their respective institutional and socio-economic scenarios. We used Ercolano, Somma Vesuviana, Quarto, and Pozzuoli as examples due to the different institutional dynamics they express. The first two are in the Vesuvian area while the others are in the Phlegraean Fields. They are all in the red risk area. The risk in the Phlegraean fields is continuous due to the phenomenon of bradyseism while in the Vesuvian area, there are no concrete manifestations of volcanic activity. It is a way to exclude that the culture of safety is just the measure of the perception of the event (the more it is perceived possible, the more the behavior is correct in terms of prevention), where the culture is nothing more than a mere calculation of costs and benefits tied to the probability that an event could occur.

The data used for the analysis come from different sources. For the local and central interventions, we took the information from the municipality site, and when possible, from the Campania Region site. Regarding the associations, we consulted their websites, along with official regional registers and asked for any additional information via email. For the construction industry, we collected the information from the “Orbis” database and in the case of illegal activities from online archives on first instance judgements. We collected data regarding the citizens, mainly related to the socio-economic context, from the “Istat-8milacensus” archives.

The logical path is as follows: Guiding principles, where present, emerge from the normative sources or a common sense of cultural safety. Can they work together or not? They then lead to interconnecting agents in two ways: Is the agent’s behavior commonly aimed at the local safety prevention performance or do they cooperate in realizing safety prevention initiatives? The arguments are common. We highlight the differences between the four towns by firstly describing through descriptive statistics the public and private contexts, considering the institutional, political, and social factors. Where regulations are easily identifiable, safety culture has, in our idea, a reliable proxy in the number of associations active on the territory in the emergency management initiatives, together with the data about the correct use of the buildings. We then verify the kind of safety initiatives in terms of prevention, distinguishing whether legal or cultural, the kind of interaction among the agents and, where it is provided, the degree of enforcement. Specifically, for the types of interaction, we distinguish whether it is formal—if required by law as mandatory or optional—or informal as spontaneously developed. Furthermore, we take the types of initiatives selected from Perrow [36] and then slightly readapt them to the specific contexts according to the information received from three out of four of the mayors of the town considered for the analysis.

It is important to note that the examples are useful to reasonably support the hypothesis but not to empirically infer between the context characteristics and agents’ behaviors. This kind of analysis can be carried out in future works considering a more complete set of data.

5.2. *Prevention Local Initiatives*

5.2.1. Planning of Prevention

A.1) Prevention by planning: It represents the local means for the development of the territory. When focused on the structures, it defines precise constraints for building, according to national law [64]. It is first compulsory and then it needs to be updated. In the reference zones, the town development plans have been missing for many years, and if present they are so outdated as not to respond at all to the—predominantly negative—territorial dynamics that have crossed these territories. As mentioned in the previous paragraphs, when local governments do not comply with the legal obligation to arrange or update the urban plan, they express in this a precise political orientation. The choice to maintain or not out-of-date planning means favoring full freedom of private interests, and as a result consolidating electoral success. In high-pressure mafia-like areas, it further means to favor the form of private property that is inherently contrary to the law. The law explicitly provides [64] the obligation to convene professional, civic, and interest associations. Participation is optional, however.

The presence of associations both by number and intervention is for those who write an important indicator of the safety culture. As mentioned above, participating in the decision-making processes means sharing them and at the same time acting as a channel for the citizens and their awareness of the rules governing a territory [46]. It is a way of understanding its value as a public good rather than as a prerogative of private property.

A.2) The occurrence of a “building amnesty” shows a poor coordination of local planning with upper-grade legal sources. It is a peculiar Italian practice provided for through national or regional laws. Synthetically, an amnesty allows for the transformation against payment of some buildings illegally built into legal buildings. The only explanation for these measures is the recovery of money by the intermediary and central bodies and the obvious political consensus they entail. For this work, the amnesty is a genuine threat of local prevention. Currently, the Campania Region has extended an expired regional amnesty for another couple of years [65].

A.3) Enforcement administrative and judicial controls share the aim of detecting and sanctioning standards’ structure violations. While the administrative control is based on an administrative transgression, the judicial one is based on a transgression that has civil and criminal implications for which a complaint is necessary. Verifying the occurrence of judicial cases, it identifies a willingness on the part of the citizens to disclose structure irregularities. Therefore, under a judicial perspective, a breach for non-compliance with the standards implies not only the responsibility of the structure’s owner but also the construction firm. Defining how many firms are condemned, explains how they cooperate in lowering the level of prevention. The demolition order, both administrative and judicial, must be transformed into a concrete demolition for its immediate efficiency and deterrence. The presence of agreements for the implementation of the measures indicates good coordination between the institutions. The problem of demolition due to high costs is commonly shared and currently annuls any enforcement arrangement.

A.4) Information campaigns and training courses for technical skills on safety. As mentioned above, these are transversal means of increasing both the awareness and correct preparation of the population for the events. Initiatives to improve the technical skills of the operators, and the value of these activities is fundamental, and it measures, at the same time, the work of the institutions and that of the associations, being initiatives that when shared work better. Finally, forming and informing is the way to move away from the culture of the panic model in the case of the event occurring, preferring that of the “to do everything possible” to reduce its immediate effect.

A.5) Do not further worsen the natural vulnerability of the structures to extraordinary events. This action is intended as another indication of the citizens’ culture. Overcrowding in the apartments and not providing for their maintenance is, under ordinary conditions, a way to hasten their aging. Under extraordinary conditions, bad habits are those that make structures vulnerable to the verification of the event. It will depend on the magnitude, but a building in such conditions is easily attackable, with overcrowding not allowing for its correct evacuation.

5.2.2. Planning of Preparedness and Response

B.1) Strengthening escape routes is an institutional initiative, not mandatory but necessary, which should be carried out in consultation with regional and local authorities. Strengthening the road network, where it should prove insufficient to convey an emergency, relies on a planning and implementation effort that follows the entire trajectory of the propagation of the event to which correlating different routes to escape from. It is an effort not simply in terms of coordination but also for the costs it could imply. This would also produce the benefit of responding to the ordinary needs of the people and the mobility of goods.

B.2) Evacuation plans and simulations: Where a large-scale evacuation plan according to the law falls within the regional competence, simulations should be implemented on a local basis. A good simulation performance should involve all the stakeholders of the safety system. The local government should involve local associations, construction firms as well as the population. Communication of

the simulations could help. Considering the simulations an ordinary experience to replicate regularly could further help in involving all the stakeholders.

5.3. Place-Specific Characteristics

Regarding the four towns analyzed, Table 1 gives some statistics on i) the political and socio-economical context, and ii) information about the main actors involved in the functioning of the safety systems. Regarding the political context, the first three pieces of information relate to the political party dynamics over the last 25 years while the other gives socio-demographic information on the current mayor. The table shows how Quarto and Somma Vesuviana are characterized by a higher number of city councils dissolved before the end of the mandate, often due to the whole council resigning. All four towns are characterized by a low number of mayors being re-elected during the years and by a frequent turnover among political parties. Regarding the mayor's characteristics, Pozzuoli has the oldest mayor (57 years old) with the lowest level of education (a degree). As for the socio-economic context, Pozzuoli is the most populous with 80,357 habitants. Ercolano and Pozzuoli have the highest age index (more than 90), denoting a high ageing of the population, while Quarto is characterized by a very low percentage of elderly people. The towns have a homogeneous level of education and unemployment rates: Both variables indicate a worse situation when compared to the national mean. The vulnerability index, measuring the social and economic vulnerability of a population, is always higher than the national value (99.1), with Ercolano being characterized by a very high social vulnerability. Pozzuoli has the highest number of associations, which is probably due to its larger population, while Quarto has only two associations. A high number of construction firms are located in Quarto (73) and Pozzuoli (57). Moreover, Quarto's and Ercolano's construction firms are characterized by a very high bankruptcy rate (close to 30%) compared to the 6% of the other towns.

Table 1. Political, social, and economic information.

	Quarto	Pozzuoli	Ercolano	Somma Vesuviana
City Council dissolved	7	3	1	5
Number of re-elected mayors	2	1	1	1
Party Shift	5	5	3	4
Mayor's Age	50	57	52	53
Mayor's education	Graduation	Degree	Graduation	Graduation
Number association	2	18	11	12
Number of construction firms	73	54	17	27
Bankruptcy rate	28.8%	5.5%	29.4%	7.4%
Population	39,221	80,357	53,677	34,592
Age Index	52.7	90.6	90.2	73
Education Index	44.9	47.5	43.0	47.8
Unemployment Rate	28.5	30.7	27.3	24.9
Vulnerability Index	103.9	104.1	107.0	101.9

Finally, Table 2 provides a summary of the activities together with the respective agents in the field of prevention in case of an eruption during the last 2 years for each town. The table supports the arguments described after and at the same time addresses the research questions.

Taking into account the context identified in Table 1, Table 2 highlights how the towns situated in a limited area and threatened by similar hazards may be characterized by different dynamics between the actors. In particular, the actor of a field can show different attitudes to the safety problem expressed through different behaviors.

Considering the case of Somma Vesuviana, the town seems to show a more stable political situation in relation to the past. The new local government, unique due to being re-elected, has adopted a new urban plan under the national law provision. Moreover, the high participation of associations on the drawing-up of the plan shows a good level of interaction among the agents in the most important “statutory” of the land development. The high number of controls became 18 rulings with a demolition order and 7 demolitions. Although they are not encouraging numbers, they are when compared with the results of the other towns. Enforcement is essential, along with the presence of a regulation: Judicial cases need a private complaint when the local government directs the intervention. In the same way, the willingness to disclose structure irregularities seems to come both from the government and the citizens. Over the years, the local government and associations have promoted lasting information campaigns. The town shows a high number of buildings in a good state of maintenance and, in recent years, many works on escape routes have been carried out together with ANAS (The Italian government-owned company deputed to the construction and maintenance of Italian motorways and state highways). Considering all these aspects, Somma Vesuviana seems to be a town where the majority of the agents seems to behave both individually and interact for the shared objective of prevention. It is possible to argue that both the formal and informal institutions orient their behavior.

In the case of Quarto, the local government behavior is similar to that of Somma Vesuviana, in drawing-up an urban plan and promoting frequent information campaigns. In addition, the local government organized, together with the regional government, a simulation of the evacuation plan arranged by the regional government. Differently from Somma Vesuviana, Quarto shows, in general, a lower interest from associations and citizens in the issue of safety. This seems to be confirmed by the low number of information campaigns organized by associations, the low percentage of buildings in a good state of maintenance, and the low participation of citizens during the evacuation simulation. Quarto shows a different involvement of the agents, with the formal institutions working better with the agents than the informal ones. Respect of the law seems to orient the prevention initiatives more than a wide sense of safety culture.

The situation of Pozzuoli is the opposite. In this case, formal norms do not guide the agents’ behavior. The local government still maintains a dated urban plan, in spite of the significant social change over the last 20 years. Controls are lower than Quarto and Somma Vesuviana and only one campaign was promoted by the local government. In contrast, Pozzuoli’s associations are more active than the government in awareness campaigns. Moreover, even if overcrowded, the buildings are in a very good state of maintenance, which may denote good habits towards the citizen that are crucial for safety. Pozzuoli shows the opposite situation of Quarto, with associations and citizens that seem more active on the issue of the safety.

In the case of Ercolano, all the agents seem to not be very interested in the safety system of the town. Differently from the other towns, Ercolano has a more stable political context than the other towns, but with a higher social and economic vulnerability. In this context, however, Ercolano has a very dated urban plan: Both the associations and government were involved in the very occasional campaigns on safety and the town is very crowded and in a bad state of maintenance. Neither the regulations’ orientation nor the existence of a culture of safety seems to support the agents’ behavior.

Finally, the construction industry represents the only agent whose behavior seems in all the contexts disinterested in safety issues. It is surprising since the structures are the direct outcome of their business and any safety subsystem tends to consider them central in any activities. There were no interventions of any construction firms in any kind of initiative, neither as single firms nor as associations. In contrast, a sign of their legal weakness is a local bankruptcy rate that is significantly higher than the national mean.

Table 2. Summary of local activities.

	Quarto	Pozzuoli	Ercolano	Somma Vesuviana
Planning	Recent urban plan with good participation of professional and environmental associations.	Dated urban plan	Very dated urban plan	Recent urban plan with high participation of professional and environmental associations
Enforcement	A fair level of judicial control: 12 rulings on structural violations and 4 demolitions	A low level of judicial control: 8 Rulings on structural violations and 2 demolitions	A low level of judicial control: 5 rulings on structural violations and 1 demolition	A higher level of control increased by an agreement between institutions: 18 rulings and 5 demolitions
Information campaign	Frequent campaigns by local government (4); low participation of associations (1)	Limited number of occasional campaigns by local government (1) but higher involvement of associations (3)	Limited number of occasional campaigns by local government (2) and associations (0)	Long-lasting campaigns by local government (4) and associations (2)
Correct use of buildings	Apartments in a poor state of maintenance (58 ^a)	Overcrowded apartments (2.5 ^b) in a very good state of maintenance (94 ^a)	Very overcrowded apartments (6 ^b) in a very poor state of maintenance (64 ^a)	Apartments in a good state of maintenance (84 ^a)
Strengthening escape routes				Many projects with ANAS
Evacuation simulations	One recent simulation with low participation of the population	One recent simulation with low participation of the population	No recent simulations	No recent simulations

^a Data refer to the percentage of buildings in very good condition concerning the total number of building in the town. ^b Index provided by 8milacensus that provide the overcrowding degree of an apartment considering dimension and number of residents.

6. Conclusions

It is increasingly evident how useful a theoretical approach can be to provide a greater understanding of social and organizational dynamics for security systems. Through the lens of organizational field theory, this study developed a theoretical framework for analyzing and managing urban areas viewed as safety structure systems where the key agents are (or should be) guided by institutional logics. In doing so, the analyses described the key agents and their activities according to four different safety stages: Prevention, preparedness, response, and recovery. Institutional logics distinguished as formal and informal help to explain the behaviors and connection among the agents. In the idea that the organizational field reflects the peculiarities, four Italian towns located in two different areas of Campania were used as examples, since they live under the risk of a volcanic eruption. The context, including the political and socio-economic factors and their guiding principles, was discussed. Even if the study is limited to the phase of prevention, in considering the behaviors of the main actors in the safety field over the last two years, we noted significant differences. In particular, we showed how local governments and other agents, when they seem oriented by formal rules as well as common beliefs, may interact for a shared objective of safety, such as in the case of Somma Vesuviana. We then noted how institutional pressures can occur as exclusively formal or informal, such as in the cases of Quarto and Pozzuoli. The case of Ercolano shows how no regulation orientation nor any signs of safety culture seems to underpin the agents' behavior. Moreover, the example suggests that the perception of the hazard does not seem to influence the behaviors of the agents. In some way, this

shows how formal and informal rules do not necessarily go hand in hand when defining a trajectory for safety performance.

The proposed examples present some shortcomings. Firstly, the study is limited to the observation of the behavior of the main agents in a given context. The data are limited to describing examples aimed at giving concreteness to the framework described. The reduced number of towns analyzed does not consent to make any inference on the causes of this behavior. Second, the study takes into account only the last two years. A longitudinal analysis is more appropriate to describe the institutional dynamics, with it requiring longer horizons. The effect of an initiative, for example, the starting of an awareness campaign, may take years before producing any effects on the agents' behavior. Finally, the implications of this study are both in terms of the line of research and in terms of policy suggestions. Regarding the former, the theoretical framework gives a partial representation of the phenomenon that needs empirical support. At the same time, due to its nature, it favors interdisciplinary studies that could be aimed at investigating the determinants of the organizational fields both according to an economic and geographical perspective. Furthermore, in showing four different cases, despite the geographical proximity, we highlighted how safety is place specific. The main practical implication is a policy suggestion. Regulation consists of national laws and regional laws, with a local intervention based mainly on the implementation plan. The natural difficulty of coordination increases because of the difficulty of generalizing safety. A change of the trend is expected, with greater recognition of regulatory power on the local basis, and support during implementation, given the high costs involved. Where the local law is working well, it can also be expected to have positive effects on the safety culture itself.

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