



Natural hazards: key concerns for setting up an effective disaster management plan in Greece

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Abstract

National governments worldwide are faced with the issue of managing the effects of natural disasters on the natural and manmade environment and the everyday lives of local communities. As the effects of natural hazards vary with spatial level and category on a case-by-case basis, new parameters such as climate change have been found to have a dramatic influence on the occurrence and development of natural disasters in recent years. Hence, there is an increasingly urgent need to establish a disaster prevention and management strategy. Spatial planning is becoming a particularly interesting aspect of disaster prevention and management, especially in a context where nongovernmental stakeholders of various forms are beginning to play a critical role in decision making and are thus establishing a new social actors' network. Against this backdrop, the activation of civil society structures is an emerging challenge, while volunteer action is acquiring new significance, highlighting how crucial it is to ensure that the population is continuously informed and educated in order to maintain awareness and preparedness. This article focuses on Greece, and argues that it is necessary to update the disaster management strategy to ensure that the severe impacts of both traditional (e.g., earthquakes) and emerging (e.g., climate change) threats are dealt more effectively. It is claimed that this strategy should be based on thorough knowledge of the spatial layout and population distribution across Greece. The key to drafting such a strategy is collective consciousness. Proposals identified at this stage of investigation can be integrated into the policy choices for disaster management in Greece as well as in other countries or regions. Preparedness is everything, and preparation is clearly a matter of education.

Keywords Natural hazards and disasters · Disaster management and spatial policies · Spatial environmental planning · Climate change and sustainable development · Carrying capacity and resilience · Volunteer action

Setting the context for the discussion

In Greece, there is a remarkable paradox: although this country is exposed to multiple natural (and other) hazards, it has paid little attention to structuring preparedness and developing a disaster management plan that will ensure an immediate and effective response to an emergency. Hence, despite the efforts made to date, emergency prevention and management are still being addressed in a rather fragmented manner at the

political level, regardless of the scope of spatial planning. This is happening in a country constantly faced with various hazards due to its particular geomorphology and seismicity,¹ as well as its important geopolitical position.² Unfortunately, this lack of attention to disaster preparedness and management is apparent at all spatial planning levels.

The absence of an organized preparedness and disaster management plan is a major gap in Greek spatial and socio-economic planning. The primary reason for this is that, at

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¹ Greece is one of the most seismically active countries, but it also has the tenth longest coastline globally. Most Greek settlements/cities and human activities are concentrated along the coastline, and the country has a strongly island-based character (19% of the country's area derives from islands).

² Located at the crossroads of three continents, Greece is the cradle of ancient history and civilization. It is one of the main entry points into Europe from the East, many international land/sea routes pass through it (e.g., trade, marine, military, energy, migration/refugee routes), and it is an energy hub in the SE Mediterranean.

the political level, the spatial dimension tends to be depreciated when structuring a development strategy and selecting development models. This tendency intensified during the economic crisis, resulting in a nonspatial approach to planning at all geographic levels, even in areas that are particularly vulnerable to hazards, such as seismic, coastal, riparian, insular, and forested areas, where a different treatment would be expected.

There is undeniably a need for a more efficient preparedness and disaster management plan that can also be applied to new threats. However, one may then ask: what preparedness and disaster management plan are we talking about? In particular, what is the optimum reference spatial level of such a plan? Who will be responsible for drafting, financing, and implementing it? Whom is such a plan intended for, and to what end? There are multiple possible answers to these questions, and those answers can affect (a) the scope and content of the plan, (b) the methodology and tools used to investigate/recode problems and to assess/prioritize interventions, as well as the mechanisms employed to warn the population of an impending disaster, (c) the actions performed and the implementation timeline, (d) the participants, their individual roles, and the levels of cooperation, and (e) the sources that are drawn upon to supply the materials and human resources required to meet the needs of the affected area.

This article aspires to contribute to this discussion by proposing a broader approach to emergency management regardless of the disaster considered. More specifically, the main aim of this article is to reopen this debate by formulating principles and guidelines for establishing a new and more effective disaster management plan that is strategically integrated into the spatial planning process. Hence, this article begins with an overview of the relationship between natural disasters and spatial planning in order to highlight the need for a preparedness and management plan. It then introduces the phenomenon of arbitrariness as the primary reason for the occurrence and evolution of disasters as well as the amplification of their impact on the natural and man-made environment, due to the multiple effects of arbitrariness on the spatial planning process. Then, recognizing that the key to disaster management is educating the population, it considers the valuable contribution of voluntary work. The article concludes by formulating proposals for the drafting of an emergency management strategy while stressing that it must be included organically in the Greek planning and spatial policy system as well as underlining the importance of using volunteer action at all stages of catastrophic event management (see Fig. 1).

The proposals discussed in this paper are the result of experience acquired from addressing issues of spatial arrangement and planning at academic and research levels, as well as volunteering during the urgent intervention stage



Fig. 1 Framing the discussion: the basic stages in this research (Designed by Theodora 2020)

in emergencies induced by a natural disaster. Personal experience gained from direct contact with people affected in the field, in real time and under real conditions, is a critically important influence on the emergency management strategy proposed here. This because it is only possible to obtain an accurate perspective on the situation during a disaster and to understand its various dimensions in practice through physical contact with the multiple effects of a disaster. It is in practice that any errors or flaws demonstrate the share of responsibility of both the state and all of us, individually and collectively (experts and nonexperts) in preventing and managing the effects of catastrophic events.

Natural disasters and spatial planning—dealing with emergencies

According to the World Health Organization (WHO), a natural disaster³ [as well as any disaster⁴ caused by human intervention (e.g., technology, an epidemic, a conflict, etc.)] is an *emergency* (i.e., a sudden event) requiring an immediate response as there is a sudden and unexpected disturbance of the balance between the needs of the population and the goods/services available immediately after it has occurred (Khanal 2020; National Geographic 2020; WHO 1995; WHO Panafrican Emergency Training Centre 2002). Hence, disaster management requires an appropriate *preparedness plan* to ensure immediate—and mainly

³ We refer to the adverse effects of a naturally occurring event that may be a result of geomorphological characteristics (e.g., earthquakes) or human intervention (e.g., floods, fires).

⁴ Any incident that results in material damage, ecological disorganization, loss of human life, or the deterioration of public health and healthcare services on a scale that justifies the urgent intervention of agencies from outside the affected area.

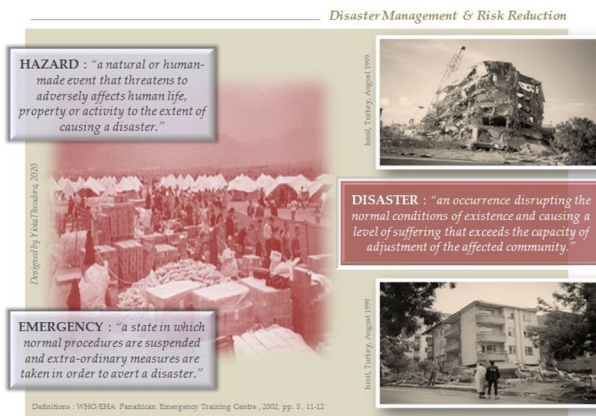


Fig. 2 Disaster management and risk reduction (Definitions: WHO Panafican Emergency Training Centre 2002: 3, 10–11; photos: M. Theodora, Turkey, 1999)

effective—fulfillment of the urgent needs that arise from the sudden event (see Fig. 2).

However, experience has shown that actions taken in response to disasters cannot (and should not) be limited to providing assistance immediately after the emergency (Heide 2006; IFRC 2020; IUCN 2020; Lipper 2016; Médecins Sans Frontières 1996; OECD 2019; UNDRR 2020). On the contrary, *disaster management* must respond at three crucial time points: during the *immediate postevent phase* (immediate response); during the *subsequent phase* (referring to the recovery, reconstruction, and development phases), which may have a short or long duration; and during the *pre-event phase* (a preventive stage aimed at mitigating the impact), which consists of preparation, precaution, and assessment aimed at reducing the likelihood of repeating similar mistakes on the one hand and ensuring the best possible adjustment to the current conditions on the other (see Fig. 3). In particular, prevention—an extensively discussed and critical stage—rarely appears to receive the attention it deserves in practice. This intensifies the multiplicity and complexity of the impacts of a disaster on the character and growth dynamics of areas (settlements, cities, regions), most tragically in terms of the loss of human life.

So, *what should a preparedness and disaster management plan respond to, and why should it be drafted as part of the spatial planning process?* Considering that the primary aim of emergency management is to take immediate (and adequately documented) decisions and coordinate team efforts, a preparedness and disaster management plan is essentially “a programme of long-term development activities whose goals are to strengthen the overall capacity and capability of a country to manage efficiently all types of emergency, and bring about an orderly transition from

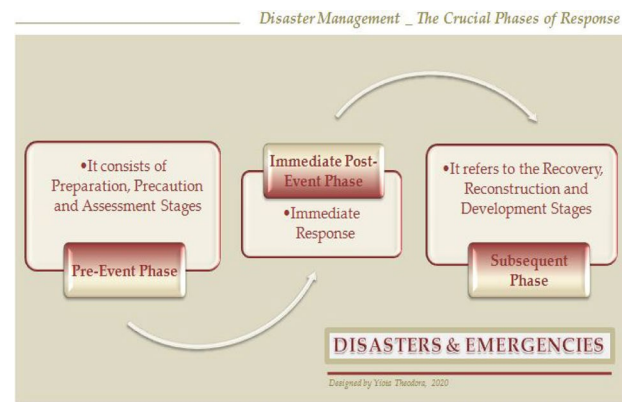


Fig. 3 Disaster management: the crucial phases of the response (Designed by Theodora 2020)

relief through rehabilitation, and to sustained development” (WHO 1995: 13).

It is therefore clear that *such a plan has to respond to issues pertaining to the triptych: space—user (recipient)—time* (Theodora 2018, 2019b). Thus, corresponding research into spatial constants⁵ as well as socioeconomic and administrative constants⁶ at various spatial planning levels during different time periods (immediately and in the short and long term) is of great interest. This also practically verifies the importance of ensuring that the preparedness and disaster management plan is correlated with the spatial and development plans for every locality. *An emergency management strategy should not be drawn up without considering the spatial planning process.* This is further reinforced if we consider the importance of two key structural constants that characterize the aforementioned plans. The first of these constants is that both plans (the emergency and spatial/development plans) are subject to dynamic cyclical processes that are politically important due to their multiple impacts on nature, society, and the economy, which may also vary depending on the case and timing. They are dynamic, cyclical processes because they are conducted in phases with a view to ensuring data and evolution trend updates, as this should facilitate the optimal response to current conditions and needs. In the case of preparedness and

⁵ Such as: geomorphological and natural characteristics; the organization of the urban network; the locations of human activities and functions (land uses); and accessibility, mobility, and transportation networks, etc. in terms of their type, distribution, interaction and resilience.

⁶ Parameters related, among others, to societal (population groups, vulnerable groups, etc.), economic (production structure, infrastructure distribution, etc.), and administrative (administrative structure, governance system, funding, etc.) issues.

disaster management plans, the main stages are: (a) immediate response; (b) restoration, reconstruction, and development; and (c) prevention for mitigation (preparation, early warning, and assessment). For the spatial arrangement and organization plans, the main stages are decision, planning, implementation, monitoring, and assessment. Difficulties arise when the correlation among stages must be ensured both per planning category and between the two planning categories. The second constant is associated with the main objective of the above plans, namely the development of localities in a manner that ensures the protection of the natural and manmade environment, social justice, and respect for human life and dignity. Thus, it is clear that any preparedness and disaster management plan should take spatial planning and policies into account. Acting otherwise would be perceived as ignorance of the importance of the local characteristics and specificities associated with, for instance, the form, configuration and population structure of the place; the type and distribution of activities and infrastructure; as well as the local actors network and its ability to intervene in a concerted manner as necessary (Theodora 2018, 2019a; b).

In this context though, *how can the effectiveness of a preparedness and disaster management plan be ensured? What are the conditions it should meet?*

Current practice has showcased that for a preparedness and disaster management plan to be effective, it has to be an integral part of spatial policies based on a rationale that relies on accurate knowledge of the spatial layout and population distribution in the various areas of the country. An equally important condition for the emergency response is to identify and capture the risk level and safety of specific spatial units in individual localities.⁷ Last but not least, the successful drafting/implementation of a preparedness and disaster management plan presupposes a very good understanding of the way in which structures deliver essential population needs (principally healthcare and housing needs) and the extent to which they covered such needs before the disaster (Chartoff and Roman 2019; Cutter 1996; Theodora and Theodora 2006) (see Fig. 4).

It is therefore interesting to collect and process data (qualitative and quantitative) on (a) *the place* (space dynamics, production structure, infrastructure locations, community characteristics, etc.) and *the actual population needs*, as well as on (b) *the local actors network, the preparedness level and cooperation nexus, and the type of relations developed with other supralocal networks* (national/international). The reason for this is that knowledge of local conditions

⁷ More specifically, mapping (a) open spaces where people can safely assemble in the case of an emergency as well as dangerous zones (to avoid accidents) at all spatial levels (settlements, cities, regions, and country) and (b) increasing awareness of the population through organized preparedness exercises.

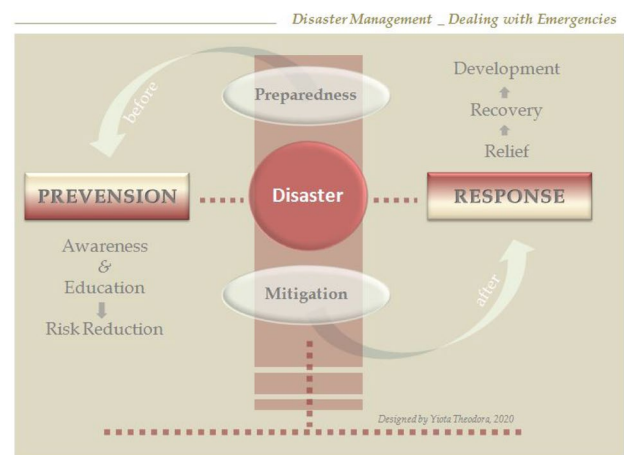


Fig. 4 Disaster management: dealing with emergencies (Designed by Theodora 2020)

and ongoing monitoring of their evolution and dynamics over time constitute a necessary and adequate condition for optimal emergency management, irrespective of whether the disaster has local causes or is the result of larger-scale phenomena such as climate change. On this basis, the key objectives when drawing up a national preparedness and disaster management plan should include:

- *Evaluating the hazards per area, ranking their risk levels, and prioritizing interventions with a view to setting up a single database and mapping such hazards at national, regional, and local levels.* This stock-taking and evaluation exercise will help to identify *vulnerable areas* and facilitate their typing based on the hazards and their preparedness level on the one hand, while ensuring the creation of cooperation networks to share know-how and good practices regarding disaster management on the other.
- *Determining the main spatial levels at which the preparedness and disaster management plan will act in concert with the current administrative structure* (i.e., the central as well as the decentralized government levels where decisions are made, and which are responsible for planning implementation and resource management). The strategic role of regions and the regulatory role of municipalities are currently being discussed.
- *Organizing a stakeholder network with a clear division of responsibilities and powers among agencies, and appointing a coordinator.*
- *Determining the role of volunteering so that it can be integrated into the disaster management process and the support mechanisms for affected areas.*
- *Ensuring active involvement of the academic and broader scientific communities* in order to benefit from expert

knowledge/skills, as well as *the active participation of those communities in emergency management agencies.*

- *Proper preparation of local communities* through the implementation of information and training programs as well as *preparedness exercises organized by decentralized government authorities.*

These objectives (among others) must be pursued in a concerted manner at every spatial planning scale, i.e., at strategic and regulatory planning levels under the responsibility of the state apparatus.

Natural disasters and arbitrariness—the framework for conditions and hazards in Greece

The prevalence of arbitrariness undoubtedly dramatically increases the probability of disasters while also escalating their impact on the natural and built environment. Regardless of who commits or tolerates arbitrary actions (i.e., central or decentralized government agencies, private entities or investors, or citizens), where and how they do so, and for how long, it is certain that they contribute to a severely adverse environment that is conducive to material and other types of damage. This is because arbitrariness (in a built or nonbuilt space, in streams, coasts, forests, etc.) hampers the carrying capacity of localities, threatens their resilience, and restrains their ability to adapt to a potential change such as a catastrophic event.

In such an adverse environment⁸ where short-term and long-term impacts on the microclimate (“heat islands” and “urban cracks”) are aggravated, managing an emergency can be a nightmare. Specifically, due to the disordered nature of urban development, there is a greater likelihood of an insufficient number of adequate assembly areas and escape routes for the population, and onsite access by emergency and rescue teams is impeded. This finding is self-evident if we visualize the first moments and hours following a sudden event—not knowing how to react and where to go, people gather in the streets and open spaces around their homes or other unsafe sites (beaches, next to power infrastructure or fuel storage facilities or plants, etc.) and then informally

camp in unsuitable areas that can turn into *death traps*.⁹ This occurs due to *an absence of both a preparedness and disaster management plan at the local level and the coordination required to implement such a plan at local and supralocal levels, which is closely linked to deficient (or nonexistent) preparation of the population* (Theodora and Theodora 2006).

It is therefore not a matter of investigating the correlation between arbitrariness and the triggering of disasters; this relationship is a given. Instead, it is crucial to *eliminate the arbitrariness*—which is not an easy task (as history has shown) because it entails political costs. This explains why such a course of action is not actively pursued. Hence, even though we condemn arbitrary actions, we still pursue them while ignoring their implications, as we know that a relevant regulation will soon be enacted that will enable us to legalize them. It should also be noted that some people have chosen not to act arbitrarily, but they are still asked to pay the price of the arbitrary actions of others even though they have not contributed to the deterioration of the natural and built environment. This is where the issue of justice arises, which is intrinsically linked to the inability of the state to implement the laws. It is not logical to reward arbitrariness through special legislative regulations while also attempting to modernize the legal framework to ensure sustainable development, to protect the natural and cultural environment, and to promote social justice and democratic planning that is respectful of citizens and their safety. It is unfair and dangerous, and has to stop. *We must make sure that the perception of arbitrariness is that it has disastrous consequences.*

It seems rather odd that in terms of planning practice, Greek urban development has been realized through options aimed at organizing/regulating areas that have either been built arbitrarily or have suffered some form of disaster. Interestingly, the majority—if not all—of these options largely focus on serving specific interests rather than safeguarding the identities and carrying capacities of localities and meeting the actual needs of the population (i.e., the needs perceived by the users rather than the administration). Another strange aspect is the rewarding of arbitrariness through special legislative regulations.

It is not, therefore, a matter of whether there is legislated planning in Greece; the issue is: who decides upon the temporal, spatial, and planning priorities at national,

⁸ In other words, increased building density with limited free space and a lack of escape routes and safe assembly points, the presence of dangerous materials that may act as injury and death traps (inflammable materials, etc.), absent or inadequate technical networks, and the presence of residential developments next to coasts, streams, and rivers (danger from rising water levels) or forest areas (fire danger), etc.

⁹ The likelihood of accidents and mortalities can be considerably higher in the aftermath of a sudden event, mainly to disorganized escape attempts (traffic congestion, bottlenecks, road accidents) or disorderly assembly and informal camping at unsafe sites that are difficult to supply with utility services in a safe manner (e.g., energy or water may be inadvisedly obtained from affected houses by extending power cables and water pipes to the tents or containers).

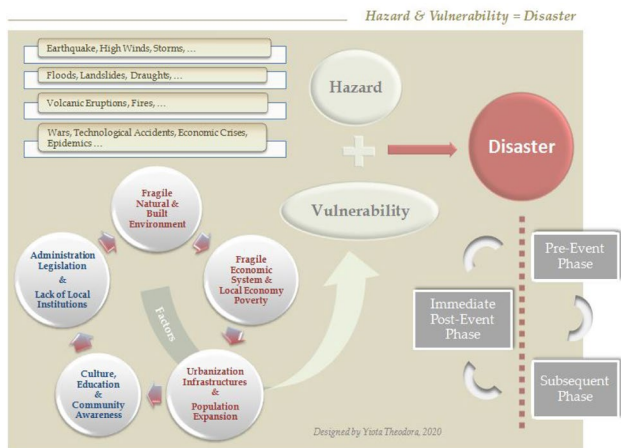


Fig. 5 Hazard and vulnerability = disaster (Designed by Theodora 2020)

regional, and local levels, based on what criteria, and for the benefit of whom? The real problem lies with the level of implementation of the laws, or a failure to implement them. We should all take a moment to decide if it is more important to protect human life and the natural and cultural wealth of our places or to perpetuate a politically safe model of urban development that relies on arbitrariness and lack of planning. There must be repercussions for those who act arbitrarily, as this is the only way to restore the trust required between citizens and the state. We must all take a share of responsibility for this ongoing situation, whether we actively contribute to it through our deeds or passively tolerate it through our silence.

Experience has shown that “a disaster occurs when hazards and vulnerability meet” (WHO PanAfrican Emergency Training Centre 2002: 13). Thus, *fostering a social conscience, responsibility, and knowledge of the space and clearly designating responsibilities and coordination agents can be beneficial* (see Fig. 5). This is because, in practice, there is no mechanism that can permanently capture the needs and hazards, and no emergency response plan that can ensure that professionals and emergency teams are onsite within the first minutes following a disaster. At the same time, any disaster management actions need to go beyond postevent assistance; they must focus equally on pre-event preparation (Wisner et al. 2007) (see the previous section and Figs. 3 and 4).

Hence, the key to disaster management, as noted earlier, is *educating the population*. This education should include informing the population and raising their awareness of various groups, but mostly promoting *self-help* and *mutual help* (Antypas et al. 2005; Pelling 2003). In this sense, *volunteers* can be very helpful if they have been properly prepared. However, the contribution of the scientific community is also critical, as scientists can impart specific knowledge and

exercise criticism at the various levels of centralized and decentralized administration where decisions are made and the directions for action and intervention are given.

Below, we discuss the valuable role of voluntary action, and make suggestions regarding the planning of a more comprehensive disaster management strategy, which will contribute to the emergence of new areas of research that are worth studying at a later stage.

The valuable contribution of volunteer action to disaster management

Following a sudden event such as a natural disaster, the panic and anxiety of residents in the affected area can dramatically exacerbate the effects of the disaster. Under such volatile conditions, the human resources of competent agencies are usually unable to respond to all the needs of the residents. The problems that arise, coupled with the potential shortage of human resources (as some of the staff may also be affected), generate the need for additional human resources. However, hiring more permanent staff to deal with a potential hazard is usually (albeit not always) impossible for administrative and—predominantly—financial reasons. This is where *volunteer action can act as a catalyst*, provided that there has been proper preparation/coordination beforehand and organic integration into the national disaster management system has been ensured (MSF 1996; Rudolph et al. 2013; Theodora and Theodora 2006).

Volunteers are an essential and indispensable component of immediate intervention, but also—and most importantly—a crucial element in the preparation and maintenance of a preparedness plan. Especially when they work in teams acting at the level of local communities, volunteers can effectively contribute at all stages of a disaster/emergency management plan, given that they have a great awareness and understanding of their municipality (in terms of space planning, vulnerable population groups, needs, etc.). More specifically, volunteers can assist the work of professionals and emergency teams immediately after a disaster. Equally important is their help in organizing those who are not in immediate danger and providing relief to the population that is affected at a later stage. This is significant because, when the emergency has been addressed, a large part of the population continues to have needs that cannot be met by the existing infrastructure. Finally, the role of volunteers is decisive at the prevention stage, namely during the preparation and maintenance of the preparedness/disaster management plan (mainly at a small scale) before the occurrence of the catastrophic event.

Volunteer action is primarily valuable at the levels of information gathering, observation, and recording, as the work done by volunteers can help to (a) avoid human,

natural, and financial losses at individual and collective levels, (b) mitigate personal suffering, and (c) promote recovery efforts and provide protection. Under no circumstances should volunteers take the place of competent government agencies during disaster management, and their presence should not release the state from its responsibilities (Antypas et al. 2005; Chartoff and Roman 2019; Fainstein and DeFilippis 2016; MSF 1996; Rudolph et al. 2013; Wisner et al. 2007; WHO 1995; WHO PanAfrican Emergency Training Centre 2002).

An overview of the contributions of volunteers during the different stages of disaster management is provided below, highlighting the importance of volunteer training to harness their full potential (see Figs. 3, 4, and 5).

Volunteer actions immediately following a disaster and at a later stage

Following the impact of a catastrophic factor, it is necessary to reassess the conditions (Cutter 1996; Lipper 2016; Wisner et al. 2007). This is a crucial stage, as it will determine the need for assistance and the precise actions to be taken to relieve the population. Volunteers can help in the following ways at this stage:

- By assessing the needs that have arisen or proliferated following the impact of the catastrophic factor.
- By prioritizing those needs, as in most cases it is impossible to meet all of them at the same time. It is therefore imperative to identify and prioritize the pressing needs that must be met immediately.
- By implementing actions such as searching, collecting information, organizing and informing victims' groups, providing medical assistance, carrying out supplementary and social work, maintaining and supervising materials and facilities, keeping records, and even providing educational activities and entertainment.

It is usually sufficient to have an onsite supervisor who will coordinate volunteers and ensure that they engage in tasks that are safe and suit their skill sets and abilities. In cases where there is prolonged engagement, there should be supervision at every stage (assessment, assignment, development, communication, reporting, final report, and withdrawal). *Volunteers must never be left without supervision.* Support and encouragement of volunteers by experienced supervisors are required for the successful recovery of the affected community as a whole. Similarly, it is important for professionals arriving at the scene to acknowledge the key role of the active involvement of volunteers in facilitating the arrival of the authorities. Therefore, professionals are expected to extend courtesies to volunteers, such as taking over from them in the same manner as they would do from

colleagues, and keeping the volunteers active throughout the duration of the incident. A final report that covers the operational aspects of their roles may reveal the facts up to that point. In disaster situations, these final reports may be compiled for several weeks as various aspects of the event and its consequences become the benchmark for mental and physical needs (Antypas et al. 2005; WHO 1995).

Volunteer actions at the prevention stage

Equally important are the contributions from volunteers to disaster prevention, which may include the following key areas:

- *Assessment of the population's needs*, which are expected to be greater following the impact of a catastrophic factor. Not all of the population's needs are fulfilled, even in well-organized societies. Capturing and meeting the population's needs (as much as possible) is the responsibility of the social services departments of the municipalities affected by the disaster. Volunteers can play a crucial role in defining the needs. Just as important is their involvement in social welfare and care programs, such as elderly care, organizing amateur sports or cultural groups, informing citizens about the measures they can take to protect themselves during disasters, and providing creative activities for children and young people.
- *Risk assessment*. The specific spatial knowledge of a region held by local residents gives them an awareness of *trap spots*, which can be dangerous or cause problems after the initial effects of a catastrophic factor. Such dangerous sites include fuel warehouses or stations, manufacturing facilities and industrial plants with flammable materials, old and/or derelict buildings, streams, etc. It is equally important to identify sites that can be used as shelters or assembly points in the aftermath of the disaster, such as open spaces in the event of an earthquake (e.g., parks or playgrounds, sports fields, etc.) or safe elevations away from the sea or waterways in the event of flooding.
- *Risk elimination through concrete strategic actions*. Exercising pressure to change or improve the conditions at dangerous sites within the affected area is yet another crucial action that can be undertaken by volunteer teams.
- *Recording vulnerable groups in the population and developing a rescue plan that prioritizes these groups*. It is well known that particular groups of people, such as children, the elderly, patients with chronic diseases (e.g., diabetes mellitus, arterial hypertension, etc.), and people with particular characteristics (e.g., those with motor disabilities, visually or hearing impaired people, etc.) are particularly affected following a disaster. They are population groups that cannot deal with danger, or at

least find it difficult to cope with. It is necessary to record their locations to ensure that they receive assistance or rescue; this action should be implemented directly in the context of a preparedness and disaster management plan.

- *Ensuring ongoing preparation of the volunteer staff.* Informing and upskilling volunteer team members is crucial to ensuring that the team is sufficiently prepared.
- *Enhancing the collective awareness of volunteer teams and establishing channels for continuous communication and cooperation with local and central government agencies.* It is necessary to organize and divide activities and responsibilities among volunteer team members appropriately to facilitate coordinated and effective action. Establishing an organization chart and clearly defining the responsibilities of each member are tasks that are easier to perform during periods of calm than during a crisis. It is equally important to ensure that there is strong collaboration with local and central government agencies (complementary and coordinated action).
- *Encouraging the social participation of citizens of all ages through voluntary offers and work in all sectors and at all action levels;* in other words, the systematic and methodical dissemination and development of volunteering by providing appropriate information, training, and awareness programs at all levels of education.

The importance of volunteer training in the emergency response

The great importance of the contribution provided by volunteers is indisputable. However, experience has shown that specific skills are needed to address emergency needs. When volunteers lack these skills, volunteer action can result in undesirable situations involving a lack of knowledge and coordination. In such cases, volunteers cannot facilitate the work of professional and rescue services (Antypas et al. 2005). Therefore, proper rescue training of volunteers is important, as it enables them to carry out important tasks and be truly irreplaceable. *Through proper training, volunteers can facilitate the work of professionals by ensuring that conditions are suitable for intervention.* Informed and coordinated volunteer action has been proven to lead to faster and more efficient intervention from the rescue services. In addition, training enhances the ability of volunteers to protect themselves and their team members. This is because they are aware of the risks involved in every rescue effort and are able to take precautions. Volunteer training and organization into teams are also conducive to better coordination. At the same time, by imparting administrative knowledge during their training and empowering teamwork, volunteers then recognize the need for people with greater responsibility in the team on the one hand and for different levels of decision making on the other. Cooperation between team members

and different volunteer or professional teams results in better action by volunteers. The above facilitate the achievement of the target: relieving the affected population and initiating the recovery of the affected area (Theodora and Theodora 2006; WHO 1995).

Towards a more effective overall disaster management plan that is strategically integrated into the spatial planning process

As discussed in the previous sections, *optimal disaster management requires the existence of a structured emergency plan that is intrinsically linked to the existing spatial planning system.* One way to achieve this would be a national preparedness and disaster management plan that sets out the priorities and lays down the principles and action guidelines (*strategic planning*), focusing on vulnerable settlements, cities, and regions. This management plan must be structured such that can be tailored to each level of planning (*regulatory planning*). Such a plan, whether it is incorporated into existing planning tools or stands independent of them (e.g., a *special emergency management framework*), must be integrated into spatial policies in a manner based on sound knowledge of parameters pertaining to the area, the local population and its needs, existing service structures, and a clear definition of the responsibilities assigned to the parties involved in emergency management and the coordinator. The state is responsible for drafting, coordinating, and implementing the actions of the preparedness and emergency management plan (Chartoff and Roman 2019; Lipper 2016; Pelling 2003) (see earlier sections of this paper). However, volunteer action can make a valuable contribution during the individual stages of disaster management on two conditions: that the volunteers are appropriately trained, and that the state acknowledges their importance to disaster management and integrates them into the emergency response system (see the previous section on volunteer action).

On this basis, *for a preparedness and disaster management plan to be effective in practice, it should permit the continuous updating of data, and it should be sufficiently flexible that it can be adapted to the current circumstances.* It is therefore important to emphasize the following points:

- *Clarify the content and main aspects of concepts, definitions, and relationships linked (directly or indirectly) to disaster prevention/response and spatial development/planning* in terms of protection, social fairness, sustainability, and considering spatial policies for various levels and categories (i.e., strategic and regulatory levels), in line with European policy. Of particular interest are certain concepts (many of which pertain to the broader spatial planning framework) that are deliberately

blurred, such as *resilience, carrying capacity, real and local needs, sustainable development, preparedness, and immediate response.*

- *Clearly define the desired spatial units based on location, geomorphological, spatiofunctional, and administrative criteria, so that the planning results in a preparedness and disaster management plan that is not limited to binding target implementation conditions, and space is treated on the basis of its characteristics and comparative advantages as well as the actual needs of the population. When defining such spatial units at national, interregional, regional, and local levels, it is particularly interesting to consider the types of areas that appear to be the most vulnerable. Namely, needs should be assessed and prioritized with a view to creating a typology of vulnerable locales.*
- *Develop a disaster management plan that takes physical and socioeconomic planning into account equally, considering the current administrative structure and delegating the competences laid down by the framework of the law to regions and municipalities.*
- *The emergency management strategy, and therefore the preparedness plan, must form an integral part of spatial planning and policies at all geographic levels. The emergency management strategy requires a new, more realistic basis if we are to provide more comprehensive tools to prevent, assess, and respond to emergencies. Therefore, emphasis should be placed on the following: (a) ensuring equal treatment of strategic and regulatory planning; (b) linking spatial planning and civil protection; (c) adapting and updating the institutional framework; (d) setting up an appropriate operational action plan; (e) imposing the application of laws and rules; and (f) putting a stop to arbitrariness by abolishing the adoption of special arrangements that perpetuate it.*
- *Include and utilize volunteer action in the planning, implementation, and action mechanism for disaster response (mainly at the local level) on equitable terms, recognizing that volunteer assistance is a key element during all emergency management phases, and educating the population to develop self-help and mutual help skills.*
- *Integrate advanced digital technology tools into the disaster management strategy and use them to search, collect, evaluate, prioritize, visualize, and monitor.*

However, in order for the disaster management plan to be meaningful, and for the above considerations to be helpful, the Greek government must be able to overcome local controversies and oppose interests that allow arbitrariness and intensify competition, thus ensuring that maximum consensus is achieved. This would suppress further encroachment of spatial planning and violations of the

rules. The academic and scientific community must also respond to the following question in the context of space devaluation: *how should space protection and development issues be approached and taught in universities to ensure that these centers of learning become a mechanism that assists planning at the various administration levels?* It is equally important for them to reinforce their social role by opening up to nonexperts through training and action programs, thus helping to strengthen social awareness and responsibility (Theodora 2014, 2016, 2018, 2019b, 2020). As Johann Wolfgang von Goethe stated, *there is nothing more frightful than ignorance in action.*

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Compliance with ethical standards

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