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Editorial

Preface to the Special Issue "Natural and Human-Made Hazards Impacts on Urban Areas and Infrastructure"

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1. Aim of the Special Issue

Hazards, all the way up to disasters, in urban areas can be approached in various ways, but by far the most suitable way of examining them is that of focusing on their impact. This has been the approach of choice for scientists in the fields of natural sciences and of engineering, and more recently, also social sciences. By contrast, planning to improve prevention or even post-disaster intervention has not been as deeply researched.

In the study of hazards, we follow the classification from the book by Gociman [1].

The complex relationship between natural and human-made hazards results in complex hazards. We give the example of fire as one of the possible complex hazards (but migration, e.g., climate migration, and epidemics as current hazards can also be considered). It can be investigated how drought or lightning from a storm can lead to forest fires as in the recent example in Australia but also recurrent fires in Portugal, Greece and California which affect urban areas and transport infrastructure. Drought and pollution and neighbouring fire can lead to urban heat islands. Recent examples of fire hazards affecting heritage sites in restoration include Notre Dame in Paris, which is only one example from several of this kind (Bistrița church and Banu Manta in Bucharest, Manege Militaire in Quebec City, the Glasgow school of arts, etc.) which can be connected with the potential of how wildfires may have an impact on the protection of localities against risks. All these can be considered addressing the following research questions.

The aim of this Special Issue is to gather multidisciplinary views from (landscape) architecture, urban planning, seismology, geography, structural engineering, communication sciences and history on a set of problems.

2. Critical Discussion of the Papers

The paper by Cantatore et al. (https://doi.org/10.3390/su141912301, accessed on 22 October 2022) deals with the terrorist risk to which modern European cities are increasingly exposed. The authors provide the phenomenological analysis of terrorist threats in European Urban Built Environments (UBEs) and the related Outdoor Areas (UBEOAs), which are especially vulnerable to terrorist attacks. The qualitative assessment of terrorism is based on the Occidental European events registered in the Global Terrorism Database during the last 20 years (1999–2018). The method is supported by the creation of matrices of risk levels, which combine the frequency of events and their consequences, assessed as the sum of injured persons and victims. The sample has been parameterised according to two main relevant characteristics: the Attack Types and the Environmental Classes. The second level of analysis is related to the risk assessment procedure, which is involved in the quantification of the risk class for real cases in possible future scenarios. It includes the parameterisation of elements influencing the Determinant of Risk (Vulnerability, Hazard and Exposure) in the most hazardous risk classes. The analysis is BE centred, overlooking the psychological and economical relevance of effects, and it considers the relation

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between UBE and UBEOAs and their effects on users. The paper identifies the parameters influencing the terroristic risk of the most recurrent and efficient attacks identified in European UBEOAs.

Kalogiannidis et al. (https://doi.org/10.3390/su14020981, accessed on 22 October 2022) investigated the impact of civil protection on economic growth and the development of the urban economy. As a case study, a small-sized Greek city, Kozani, is used. The paper analyses the data of 160 questionnaires of selected local experts. The majority of the participants (30%) identified crisis preparedness measures as the key focus area of civil protection, followed by a national early warning system (30%) and economy rescue operations (22.5%), and only 14.4% identified public safety as a key focus area. As for strategies to improve civil protection, the majority of respondents (36.9%) identified government support as the key strategy, followed by public involvement (29.4%) and favourable policies (20.6%), and only 13.1% indicated that maintaining strong international relations is a suitable strategy. The majority of the participants (46.3%) indicated that business continuity is the key aspect of economic growth and development, followed by improved GDP (33.1%) and then improved standards of living (20.6%). The authors conclude that civil protection requires significant attention from the government since it contributes to economic recovery, public awareness and improving people's living standards.

Chiu et al. (https://doi.org/10.3390/su12198262, accessed on 22 October 2022) wrote a paper dedicated to post-disaster search and rescue (SAR). While pre-earthquake prevention and the connected retrofit as well as other non-structural measures—such as land use and the involved prescribed functions—are desirable, the upgrade of the existing building stock from pre-code times to contemporary safety standards may exceed the time span until the next earthquake. Some other times, as the Central Italy earthquakes have shown, retrofit might decrease the resilience of buildings as vernacular construction incorporates a century's worth of knowledge to deal with the site, which in architecture is called genius loci. The same applies for hydrometeorological disasters. Thus, it is important to also improve SAR techniques. In order to have a magnitude estimate of the toll of victims when the buildings do not meet the minimal safety requirements, there are several methods and the paper included in this Special Issue proposes one, which transcends the usual focus on earthquakes by also dealing with rainfall-induced disasters. The considered case study is China.

Murgante et al. (https://doi.org/10.3390/su12125064, accessed on 22 October 2022) try to provide some possible answers to questions related to the severe COVID-19 outbreak, which saw Italy as the first country in Europe to experience an outbreak after the South-eastern Asian ones. The authors analyse the issue from medical, geographical and planning points of view. The ecological approach was adopted because the physiological traits of the virus are combined with a wide set of selected relevant environmental variables. The analysis observed the spatial diffusion and distribution of the phenomenon with reference to some major groups of variables such as land use, air quality, climate and weather, population, health and life expectancy. These variables have been analysed considering their spatial autocorrelation by means of LISA (Local Indicators of Spatial Association). The authors revealed some similarities between the Wuhan area in the Hubei Province (China) and the Po Valley of the Greater Milan metropolitan area in Italy. These seemed particularly related to the geographical, climatic (presence of water bodies, flat lands, limited air circulation, similar climate zones) and socio-economic ones, industrial production, transport infrastructures and mobility, population distribution and density, as well as similarities in terms of the presence, concentration and persistence of pollutants in the atmosphere.

The Special Issue also includes one review paper by Bektaş and Kegyes-Brassai (https://doi.org/10.3390/su14052583, accessed on 22 October 2022). The paper deals with Rapid Visual Screening methods. These are methods to survey pre- or post-earthquake vulnerability of large city areas by completing a questionnaire on building characteristics. On the basis of what can be observed by walking, the structural system and its implica-

tions for earthquake vulnerability can be recognised. The method spread starting with the USA federal publication for disaster mitigation FEMA 154 accompanied by an ATC 2 part manual on the method. On this basis, various regions adapted it, considering the characteristics of the building stock in their area. One early example was also done by the Collaborative Research Centre on Vrancea strong earthquakes for Bucharest, comprising about 1500 buildings, approximately at the same time as the reviewed RISK-UE project which also included Bucharest. Exploring the city by walking is a method of psychogeographic mapping also common to architecture and related disciplines. Hence, through this method, the contribution to the decision of the architect is emphasised. Decisions can be made on the basis of this method either pre-earthquake on retrofit, change of function etc., in order to decrease the risk or post-earthquake in order to decide on whether the building is to be further occupied. In the latter case, national civil protection institutions such as in Italy, Greece, Portugal, Slovenia and Japan, as well as other overseas territories, are reviewed in the article. The Italian method made it into teaching more than 15 years ago in Pavia, with support of civil protection.

3. Future Work

The first editor would like to acknowledge, as the principal investigator, the support of PN-III-P4-PCE-2021-0609 in the final stage of this Special Issue—review, editorial and forthcoming launch of the Special Issue—and of UAUIM-FFCSU-2021-001 in the intermediate stage, while noting that the second mentioned project outlined a strategy of the university in the frame of which the first one is inscribed. The topic of the Special Issue represents a multi decade effort conducted through various support measures of the European Geosciences Union General Assembly (EGU GA): the convenership of the first author 2004–2010 of the session dealing with the same, excluding man-made hazards; co-convenership 2014–2022 with the second editor on a related topic, a local round table in Romania finalised with a book on Romanian-Portuguese collaboration in the field presented at the EGU GA which continued under UAUIM-FFCSU-2021-001 outlining the same Romanian-Portuguese collaboration and which continues under PN-III-P4-PCE-2021-0609 with Lisbon as a case study; and finally, theEGU seminar in Rome on the restricted topic of water disasters.Within PN-III-P4-PCE-2021-0609, the topic will continue at the EGU GA as a session.

The first editor was involved as an early-career researcher, when attendance to EGU also started, in research topics related to the last two reviewed papers in the frame of the mentioned Collaborative Research Centre SFB 461 as a graduate research assistant: in the survey in Bucharest and collaborating with fellow doctoral candidates developing 3D models on the basis of photography and construction machinery for search and rescue, respectively. Within SFB 461, the cooperation of the German part was with the Romanian civil protection, and later on, cooperation continued by involving a researcher from the Italian civil protectionin the organisation at the EGU session.

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