

Tourists as a Vulnerable Group in Emergency Management: An Air Raid and Shelter Scenario

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Abstract

Vulnerable groups in society are particularly important and have been addressed in many emergency management scenarios, as well as how to save them. However, this concept is often associated with old people, children, and people with disabilities. We considered how millions of tourists in Europe potentially could be a vulnerable group with situational disabilities in case of air raid attacks. The Ukraine-Russian war has witnessed new technologies to attack civilians from air, and public bomb shelters are important safety measures to be considered. We discuss behavioral, environmental, affective, social and technological situational disabilities in all sensory aspects as well as biases tourists have. We concluded that disaster alert information systems in Europe must consider multiculturalism and language barriers tourists bring into air-raid sheltering, as this type of response is not included in fire drills, floodings or earthquake response plans. We propose a framework to strengthen the emergency management plan that affects tourists, alongside metrics to measure biases using technologies.

Keywords: vulnerable groups, tourists, universal designs, communication technologies, air-raid attack.

1. Introduction

Tourists and tourism in emergency and disaster management have been discussed in the literature (Becken & Hughey, 2013; Bhati et al., 2016; Chan et al., 2020; Ha, 2023; Ritchie & Campiranon, 2014; Ritchie & Jiang, 2021), but leave behind the possible scenario of air raid attack. This is particularly considered relevant in some European countries that may be affected directly and indirectly by the current Russian-Ukrainian war. In 2023, Europe had more than 709 million tourists and even after the war in Ukraine it is the most popular region in the world to

travel (Statista, 2024). Furthermore, more than 2 million foreigners crossed the state border of Ukraine in 2023 during the active war (Visit-Ukraine-Today, 2024). Previous studies also have categorized tourists as one of the vulnerable groups in a disaster situation (Nagai, 2021), due to their unfamiliarity to the local hazards and language barriers.

The terms ‘vulnerability’ or ‘vulnerable groups’ are a multidimensional concept that are often applied in various contexts, but the meaning is interpreted differently by different practitioners (Hooegeven et al., 2004). There is a long disagreement on the definition of the concept, and which groups can be categorized as vulnerable. Limantè and Tereškinas (2022) point out that the term is often conceptualized in terms of “disadvantage” and “the risks” at root of disadvantage of becoming vulnerable groups in the society. Solbakk (2015) call it as “groups at risk”. Vulnerable groups are not easy to define as it is also related to what context we refer to such as a sociological, legal, or ethical perspective.

When it comes to the crisis context, in Norway for example, specific groups are considered as “vulnerable” such as elderly, sick people, people with different sensorics and motoric disabilities, or people who don’t have such good expectation to guide themselves or to save their own life (FFI, 2023). The last category is often associated with children and minority groups. While in the humanitarian crisis setting, the Norwegian Red Cross defines 10 vulnerable groups: 1) Children who are exposed to abuse, violence, bullying and neglect; 2) People who have serious drug problems; 3) Inmates in the jail; 4) People with serious mental health problems; 5) Poor family; 6) People with both health problems and poor economy; 7) Receiver of social help; 8) Older people with dementia; 9) Asylum seekers and irregular migrants; 10) Sexually oriented minorities and child minorities (Røde-Kors, 2022).

Knowledge on who are the vulnerable group in society is especially important in the emergency management context, and has been addressed in many emergency management scenarios, especially how to save or evacuate diverse types of vulnerable groups from a disaster area. However, none of the examples of the vulnerable groups are tourists. Moreover, in the humanitarian crisis, “war” is captured as the reason these vulnerable groups emerge. Thus, it is slightly different from the tourist case near war-zone we try to raise in this paper. In short, current coverage and understanding of vulnerable groups may be comprehensive and adequate, but not fully sufficient when considering “tourists” and new, unknown disaster scenarios.

Tourists are an exceptional group that often travels to different countries and does not know the local languages. It is said: “/.../tourists tend to be the most vulnerable group because of their unfamiliarity with the place and language” (Banerjee et al., 2023). In the crisis that may involve war and air-raid attacks, the tourist may have not heard about sirens alerts, or don’t know what to do due to lack of information, and potentially can create confusion and panics among them. Indeed, there are already practices how the government evacuates the tourists and encourage them to travel back to their countries or evacuate from disaster areas (such as in the case of fire, bomb threats or actually bomb explosion). There may be a plan that involves tourists in the disasters, even though the emergency situation has not yet happened in the previous history like in the Covid-19 case, as earlier many countries have protocols on treating pandemic.

The tourist awareness, biases rooted in cultural background on the potential hazards in the destination countries have been reported in some studies. Taking Japan as an example of tourist destination, despite the tourists having knowledge and awareness of risks of earthquake and tsunami in Japan, but the perceived safety of Japan make them still willing to travel to this country (Nagai, Ritchie, et al., 2020). In general, this study shows that tourists often did not get involved in the hazard information seeking when travelling, as they often thought that such risks would not happen to them. Of course, this perception is not completely true. For instance, a study reported a strong earthquake event affected Kansai International Airport, Japan, where there were many tourists in the airport. They experienced difficulties accessing accurate and updated information in timely manner due to language issues (Nagai, Sano, et al., 2020).

Kelman et al. (2008) report similar accounts of tourists’ experience based on the well-known 26 December 2004 Tsunamis, especially on information awareness. While the thousands of tourists were killed

during this tsunami, most of survived tourists were interviewed in this study. They were surprised that there was a lack of previous information that a tsunami could occur so sudden with such destructive power, as they thought the sea would stay calm, and even before tsunami approaching, the curiosity has attracted a person near to the beach. These examples serve only to confirm that there is a need to understand the information awareness of tourists on the potential local hazards, understand what happens surrounding them, and what to do if the potential hazards are actually manifested. The example cases earlier pinpoint that tourists are indeed a vulnerable group.

Returning to our argument on the need of acknowledging the tourists as vulnerable groups are valid for new scenarios. The air-raid attack has not been a part of the identified threats for a long time after the cold war in Europe, or at least not a part of the scenarios applied to the civilian protection. In the previous examples (tsunamis and earthquake), there were already the cases of disasters where the tourists become the victims (injured and died), or panic.

In this article, we contend that there is a need to reassess emergency management plans to include war scenarios and the possibility of air raid attacks, especially in countries near war zones, such as those in Europe. We specifically focus on the role of emergency management response in relation to tourists as a vulnerable group. We also argue that there is a lack of frameworks demonstrating how to incorporate tourists into emergency management plans for war and air attack scenarios. Lack of awareness, and language barriers, are an example that sometimes tourists experience, despite the availability of information systems and alert systems, simply because they are not necessarily adapted to the tourist’s needs. And in such scenarios, tourists may not be aware of the availability of public shelters to protect themselves from the potential air-raid attacks for many reasons that will be discussed further in this article. In short, people often experience situations, contexts and environments that trigger the so-called “situational disabilities” (Gjørseter et al., 2019), or “situational impairments” (Wobbrock, 2019), i.e., temporary disabilities that occur due to specific, short-term circumstances that affect visual, motoric and cognitive capability of a person to act and make decisions. This applies to everyone, also in the tourist case.

The aims of this study are threefold: 1) to provide framework in order to understand the complexity of “tourists” as a vulnerable group relative to the potential local hazards and their biases; 2) to discuss why one needs to consider air-raid attacks scenarios for tourists in the region nearby war-zone; 3) to suggest a framework to include tourists and this

selected air raid scenario into emergency management plan. Moreover, we propose the following research questions:

- RQ1: What are typical vulnerabilities, situational disabilities and biases of tourists affecting their awareness of the potential disasters?
- RQ2: How to involve and include tourists in emergency plans in the air-raid scenario?

To answer these research questions, we combined the desk survey and focus group discussion with academicians and practitioners representing several countries in Europe which will be elaborated in Section 3. The contribution of this article lied in the framework that incorporate tourists and captured their situational disabilities, their biases and measurements to be integrated in the emergency management plan.

This paper is organized as follows: Section 2 contains literature review, illuminating the previous studies on tourist as a vulnerable group and emergency management, as well as the air-raid scenario. Section 3 describes the methodology of this study. Section 4 reports the findings from our study and discusses some biases that can appear as the implication of better understanding a tourist group as a vulnerable group. Section 5 discusses the possibility to measure biases in case of tourist with this specific air-raid scenario also suggests moving from passive to active disaster managements when it comes to the tourist-related disaster management. Section 6 concludes the overall paper findings and suggests future directions.

2. Literature Review

2.1 Tourist as Vulnerable Groups

As pointed in the introduction, vulnerable groups are an elusive concept as the term can mean several things in different domains. However, for example Newnham (2021) discusses high-risk groups in disaster situations and highlight that “those who are less well connected to mainstream communication services due to language restrictions, educational level, migration status or other means of marginalization, may not receive adequate guidance on disaster risk management”. While not mentioning tourists explicitly, the lack of connection to mainstream communication services would indeed be the case for most tourists abroad. However, one might argue that the more adventurous individual self-organized tourists may be significantly more vulnerable compared to tourists travelling with a group, who may have their own local guides leading and assisting them.

Disaster tourism (Tucker et al., 2017) i.e., intentionally travelling to sites of recent disasters for

morbid curiosity or other personal reasons as well as Volunteer tourism (Guttentag, 2009), i.e., travelling to post-disaster areas with the clear intention to help as volunteers, of course introduce a plethora of risks compared to traditional tourism.

Islands have a particularly challenging situation, depending heavily on tourism, while being prone to flooding and tsunamis (Becken et al., 2014; Kelman & Khan, 2013).

It is suggested that the tsunami risk posed to tourists can be reduced with following three measures: emergency management officials' collaborations with tourism agencies; development of accurate evacuation simulations to support preparations, and educating tourists about evacuation plans (Fathianpour et al., 2023).

Kelman et al. (2018) point to four areas of particular interest to support tourists in a disaster, based on experiences from the 2004 tsunami: *information and awareness*, *warning systems*, *personal preparation*, and *livelihoods*. Access to information and awareness about their surroundings may be low when the tourist is seeking “sun, sea and sand”, while staying alert and informed might have saved many lives. Learning to identify warning signs combined with early warning systems would similarly reduce the risk. Personal preparation such as learning first aid and CPR, as well as assisting in rebuilding a livelihood for the locals after a disaster are similarly mentioned.

There is abundant literature on tourism as a vulnerable industry. For example, the overall impact on tourism demand is negative if the early warning system Acqua Alto is used in Venice to warn the public at least 48 hours (about 2 days) before possible floods (Angelini et al., 2024), and (Zhang et al., 2023) point out that tourism is a highly sensitive industry and is vulnerable to various types of emergencies ranging from road disruptions to being trapped under rubble after an earthquake.

2.2 Tourist and Emergency Management

Ritchie and Jiang (2021) has conducted extensive survey of the current state of research on risk, crisis and disaster management in tourism and hospitality domains. The article mentions the importance of crisis communication and sharing meaningful information among all stakeholders to build relationship, collect information, disseminate information and manage the crisis across various phases. It involves response organizations include government, industry partners, affected organizations, medical assistance and emergency services. The public include victims, volunteers and other people affected by the event. The

authors point out that tourists and hospitality sectors received a lot of attention from the scholars, especially after Covid-19, as this sector was affected heavily. However, only few articles concern tourists' information seeking behavior, but are not taking a clear position on how to handle them, as the overall approach is looking at the broader picture including tourism industry economic recoveries after disasters.

International tourism is sensitive to hazards such as in the Japan case combined with Covid-19 which shows the vulnerabilities of tourists and international tourists. Nagai (2021) discusses that the international tourist communication should take care of the case of providing accurate information for tourists, which should be done in a coordination with authorities and industry stakeholders, which is considered a way to build better strategy to face tourists and tourism issues.

Faulkner (2013) re-emphasizes that the increased volume of global tourism has exposed tourism to greater level of risks. At the same time there are relatively few studies that have been carried out on disaster phenomena in tourism due to the limited development of the theoretical and conceptual framework required to underpin the analysis of this case. The author suggests a tourism management framework, consisting of three parts: first, phase disaster in progress; second, elements of the disaster management responses, and third, principal ingredients of the disaster management strategies. The framework is defined in a higher strategic level, especially in the risk assessment part (risk assessment of potential disasters and their probability) and disaster contingency plan (assess communities and visitors capability to cope with the impacts). Risk and scenario analysis, often a starting point for defining the strategy to cope with disasters, which in our case involves air-raid scenario and tourists.

2.3 Air-Raid Scenario

Even if according to Sankaran (2024), the Russian Aerospace Forces have failed in Ukraine, people in Ukraine have been seeking shelter during air-raid attacks already for more than two years. Beside airplanes, drones are used as a new form of warfare to attack critical infrastructure and other so-called civilian cities (Angelini et al., 2024; Hijazi et al., 2019; Peptan, 2022). To warn the civil population of an impending airstrike, air-raid sirens are used in Ukraine (Stieger et al., 2023). These siren systems still exist in several European countries like Norway (DSB, 2024) and Austria (Oesterreich.gv.at, 2024), and for example in Estonia (Päästeamet, 2022) the early warning system using sirens is built now due to the Russian-Ukraine war. To test the sirens, a specific time is

announced, however tourists might not be aware of that. These airstrikes (with airplanes, drones, Zeppelins, balloons etc.) do put a large psychological pressure on the civil population because of the ambiguity of the place and time airstrikes could take place (Stieger et al., 2023). Beside sirens, several countries in Europe have developed SMS-based warning systems, but unfortunately language can be an issue there to understand the message. Therefore, in case of air-raid attacks, tourists might not understand the threat and the urgent need to seek shelter. If they understand they need shelter, they are not familiar with the environment and probably do not know where public bomb-shelters are. Public shelters should be marked with civil defense signs (an equilateral blue triangle on an orange ground), however this sign might not be recognized by tourists from countries and cultures where it is not used. Media sources study in Sweden concluded that “abundance of shelters in urban settings do not guarantee that discussions will concern air-raid shelters actual function as a risk reducing technology” (Bennessved, 2024).

3. Methodology

Literature review survey and focus group discussion are applied in this study. To conduct the literature review survey, the following terms were used “air raid attacks”, “bomb shelter”, “air-raid shelter”, to understand the air raid attack problem. Moreover, “Tourist” and “Disaster” were used to understand the tourists' vulnerabilities, biases and situational disabilities. We used Scopus and Google Scholars to conduct this survey, and purposively only select the most relevant articles. The efforts were not intended for conducting extensive systematic literature review which often used to dig more extensive research agenda. This effort aimed at getting the overview what have been done in the field.

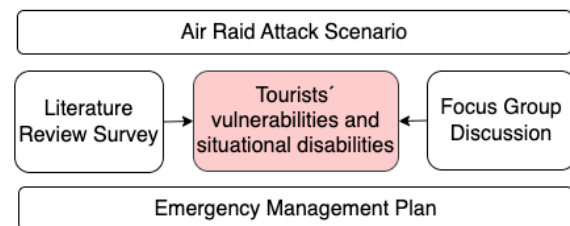


Figure 1 Methodology

Focus group discussion was conducted with a group of international researchers and practitioners consisting of 8 persons representing the following countries: Estonia, Norway, the Netherlands, and Germany. Moreover, a couple of participants have immigrant background. The discussions are directed more on

asking them what to do if there is an air-raid attack, and what they will do. We had a reflection session and discussed perceived right action in such situation, considering multi-cultural background of the participants. To analyze the data and information from the literature, thematic analysis was employed. We adapt the framework from Wobbrock (2019) to capture situational disabilities applicable to tourist context, i.e., *Behavioral, Environmental, Attentional, Affective, Social, and Technological*. As the original framework applied for the behavior toward the use of the mobile devices, the framework from (Gjørseter et al., 2019) can complement the framework, as this study suggest this concept for emergency setting and biases based on touch, vision, hearing speaking, moving and cognitive.

4. Results and Analysis

This section presents the study's results. *First*, we summarize the findings from the literature review on various situational disabilities that can manifest during a crisis, based on perception and action. *Second*, we report and analyze the outcomes of the focus group discussion on the multicultural dimensions of tourists in disaster situations and the role of information biases. *Third*, we address the role of information systems.

4.1 Factors Triggers Situational Disabilities

The factors that trigger situational disabilities in a tourist context during disaster situations are illustrated in Table 1.

Table 1 Situational disabilities in the tourist context

	Perception and Action
Behavioral	<p><i>Touch</i>: loss of sensation due to protective gear, making it difficult to quickly touch buttons on public screens or mobile phones.</p> <p><i>Vision</i>: difficulty in distinguishing important visual information, which can lead to incorrect actions.</p> <p><i>Hearing</i>: ignoring information provided in the local language.</p> <p><i>Cognitive</i>: curiosity leads a person to approach the danger source instead of withdrawing.</p> <p><i>Speaking</i>: inability to communicate necessary actions to local rescuers.</p> <p><i>Moving</i>: carrying luggage or children impedes smooth evacuation.</p>

Environmental	<p><i>Touch</i>: humidity or wet surface prevent effective use of technology</p> <p><i>Vision</i>: darkness, colorization, or fog make it difficult to read information, understand sign colors, or use technology</p> <p><i>Hearing</i>: important information may go unheard due to background noise.</p> <p><i>Cognitive</i>: awareness of local environmental hazards, such as landslide areas and slippery terrain, is essential.</p> <p><i>Speaking</i>: the use of specific terms related to environmental conditions can make it difficult to communicate the tourist's situation or location; dust or smoke in the throat can also hinder communication</p> <p><i>Moving</i>: unfamiliarity with moving in difficult terrain, such as slippery or icy roads, flooded roads, and the location of shelters.</p>
Attentional	<p><i>Touch</i>: confused about which button to click or push due to attentional distraction</p> <p><i>Vision</i>: distracted, e.g., by multitasking and colorization</p> <p><i>Hearing</i>: alert announcement unheard</p> <p><i>Speaking</i>: asking inaccurate questions due to lack of attention/ language misunderstanding</p> <p>emergency signs displayed in unfamiliar icons or language</p> <p><i>Moving</i>: confusion about where to evacuate due to lack of attention.</p> <p><i>Cognitive</i>: limited knowledge of local hazard, signs, and foreign language</p>
Affective	<p><i>Touch</i>: push a wrong button due to haste or thrill</p> <p><i>Vision</i>: overestimating/ underestimating the severity of hazard based on limited visual cues.</p> <p><i>Hearing</i>: voice or scream originating from family members</p> <p><i>Speaking</i>: inaccurate verbal communication due to stress or panic</p> <p><i>Moving</i>: panic leading to incorrect directions</p> <p><i>Cognitive</i>: stress and anxiety leading to incorrect actions</p>
Social	<p><i>Touch</i>: socially, holding group members and family to show care can lower stress, but it is often forgotten in emergencies.</p> <p><i>Vision</i>: checking the whereabouts of family members instead of directly evacuating.</p> <p><i>Hearing</i>: hearing crowd screams</p> <p><i>Speaking</i>: chaotic multi-language information exchange</p> <p><i>Moving</i>: intuitively following the misleading crowd movement or contraflow</p> <p><i>Cognitive</i>: lacking situational awareness due to misinformation echoed by the crowd; lacking of cultural understanding of the local environment</p>

Technological	<p><i>Touch</i>: confused with navigation tools (such as pressing arrow or certain buttons in mobile devices); unable to find designated SOS button.</p> <p><i>Vision</i>: warning SMS messages are in unfamiliar language or symbols</p> <p><i>Hearing</i>: the alert is not comprehended</p> <p><i>Speaking</i>: Tourists are more focused on "speaking" and sharing their situation on social media than seeking information from people around them.</p> <p><i>Moving</i>: the available technology is either not useful or not understandable to the tourists</p> <p><i>Cognitive</i>: There are challenges in understanding the technology and information presented in local language</p>
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It worth noting that despite our focus is the air-raid scenario, the results in Table 1 are valid in many disasters scenarios.

4.2 Multiculturalism and Biases

The findings on multiculturalism aspects are derived from the focus group discussions. These discussions reveal that participants never imagined air-bomb attacks occurring in their countries. The stories of the Second World War are taught in schools only as part of history. The peaceful environment enjoyed over the last 40 years since the Cold War has caused the younger generation to no longer recognize the concept of bunkers and air raid shelters. At least, not to a degree that would trigger their feelings of insecurity.

There are three interesting themes reflecting the multiculturalism dimensions of air-raid scenarios. The group is asked to reflect on action to take if they were a tourist in other European countries and suddenly received alerts that air raid was happening.

1) *Perceived floods as the main threat*: Participants from the countries that exposed and trained most for the flood scenario would be confused and worried because the recommended action to protect themselves in underground, closed shelters. In such countries, they would reach higher floor to avoid flooding. Escaping to the basement room would expose them to risks of being unable to open the door and locked in the underground room. One of the participants said: "...It is scary if you are unable to open the door due to water pressure... or you die drowning under the water leaking to the room..." Such new air-raid scenario indeed would create confusion for tourists on the right action to take.

2) *Perceived earthquake as the main threat*: Focus group participants come from countries where the earthquake is the most urgent threats where everyone should know how to seek shelters in such event, would

experience a similar confusion. In earthquake, people are typically trained to stay outdoors and take a distance from the buildings. Running outside is not recommended if people are inside and learned to protect themselves from falling debris, such as get under the desk or table, or avoid rooms that likely things can fall onto people.

3) *Perceived fire as the main threat*: In many countries in Europe, people are trained for fire alarm. This is also especially important in countries where most buildings are made of easy to burn materials such as wood. The recommended action in case of fire is to gather in the meeting point outside and stay away from the fire. Thus, going downstairs, seek refuges in the shelters has never been trained, especially as a part of the public training. In certain countries, public shelter infrastructure is available but has been abandoned for many years and has not fully been a part of situational awareness. One participant said: "...In my childhood, I often saw a place nearby with sign [for shelter], but I never know what that means. Moreover, we are more familiar with saving ourselves from fire scenario. We should go outside. Bombs were never introduced in school scenario but maybe it is good alternative as well for protecting children in likely school shooting scenario...". But another participant also adds: "...however, it is scary to introduce such ideas into school kids... in case it is necessary to introduce the concept of shelters, the scenario should be explained carefully and not scared them..."

Such a multicultural background can explain the difficulties, or even biases, when an air-raid attack occurs and involving tourists. Many shelter signs are written in the local language. But there is a more important concept often occur among tourists: *biases*.

Kunreuther and Botzen (2022) discuss the role of biases in the disasters in their study. The authors specify that many individuals who reside in hazard-prone areas do not consider potential emergencies and disasters, leading to an avoidance of precautionary measures. Due to cognitive limitations, individuals rarely make decisions optimally and often use heuristics or rules of thumb in their daily decision-making. This is similar to how tourists behave in disaster-prone areas (Nagai, 2021; Nagai, Ritchie, et al., 2020; Nagai, Sano, et al., 2020): despite being aware of potential hazards at their destinations, tourists tend not to believe that disasters will occur during their visits and tend to feel safe while traveling to these destinations. Moreover, many people, including tourists have biases due to stereotypes, and misjudge the possible cascading events. For example, individuals may underestimate the risks of flooding from hurricane, if disasters are perceived as primarily wind-related events (Kunreuther & Botzen, 2022). If

individuals have not experienced disasters in particular countries when travelling, they prefer not to envision future occurrence until after experiencing the harm directly.

Kunreuther and Botzen (2022) also list several relevant biases and heuristics influencing disaster preparedness decisions that are relevant for tourist case such as:

- **Amnesia:** people are emotional about the damages due to a disastrous event and regret for not being prepared for disasters, but such emotion fades away over time. (“*The disaster has happened before, it created damages, but I was not there, and it won’t happen too often*”)
- **Optimism:** people tend to underweight the probability of a disaster if one has not recently experienced the event and preventing them to take risk mitigation measures. (“*It is unlikely to happen to me*”)
- **Simplification:** people tend to focus on a subset of facts such as low probability of an event occurring or its potential consequences without realizing that both facts are relevant for preparedness decisions. (“*If it happens, the damage will be low, I will take a chance*”)
- **Herding:** people tend to follow other’s decision, actions or social norms under uncertainties. (“*I will have extra preparedness to disasters when travelling as others do the same thing*”)
- **Prominence:** people tend to prepare for future disasters based on weighing the prominence attributes relative to the perceived likelihood of the event (“*I was hugely suffered from the impacts of disasters, if future event occurs, I will prepare better*”)

Welsh et al. (2017) report a series of experiments on biases in disasters. It turns out that familiarity with disaster type and the presentation format of the disaster probability have a clear effect on humans’ possible behavior at disasters situations and encourage people to do something. On contrary, despite the clear effect of the disaster familiarity condition, the number/proportion of disasters recalled by participants had no bearing on their responses. Interestingly a study suggested that the “the effects of personal experience and awareness on self-protective behavior are weakened by external attribution” (Mishra et al., 2009). Return to the discussion on the scenario of air-raid attacks, there is no single solution on how to prepare tourists toward the likelihood such event to happen, and multiculturalism and biases play role in taking serious actions for disaster preparedness.

4.3 The Role of Information Systems

One point discussed in the focus group is the role of Information Systems in overcoming the weaknesses for the tourists to get necessary information in foreign countries. With today technological developments, it is possible to send SMS for early warning systems. The location-based systems enable tourists to get timely message on the potential disasters, especially natural hazard (likelihood of hurricane, flash flood, wildfire). However, there still a likely problem in the SMS-based alert that the message is sent in local language (for example, Japanese characters), which still introduce the language barrier issues, and causing delay to take timely actions. Moreover, when one receives a message about “Seek shelter”, it can be interpreted differently on what is considered as shelter. Evacuation spots may be marked with local language that may not be understood by the tourists.

The problem also persists in the air-raid attack scenario. Unlike the natural hazard, the alert can be short before it happens, although the alert could also be sent between two countries on likely air raid attacks. The warning may occur on a short notice. Radio has been used traditionally for crisis communication, but it won’t be the first sources that a tourist will listen to. Moreover, some countries maintain regular siren messages which could alert people on emergencies and the need to search information, and when the threats are over. In short, the design of disaster alert information systems that will include tourists must consider multiculturalism and overcoming language barriers.

5. Discussions

Section 5 discusses the results and lays down a framework to consider when introducing new scenarios, such as air-raid attacks, in the context of tourists in disaster management. It highlights key stakeholders to take into account and offers ideas on understanding and measuring situational awareness biases. Additionally, it suggests ways to educate tourists about potential local hazards.

5.1 Framework for Measuring Biases and Technology-Based Training

Previous analysis shows that tourists typically are confused on how to deal with disasters in foreign countries. Ideally, to recognize threats and to act first thing, a tourist need to get or seek information about the threat, understand it and then predict the near future to make decisions what to do. Endsley (1995) names this situation awareness: “knowing what is

going on around you” (Endsley & Garland, 2000). But as shown from earlier studies, this is not the case for many tourists that are not familiar with the local hazards.

There are several techniques to measure human situation awareness, however, we propose that virtual simulations should be designed to measure tourist's situation awareness. Such technique has been used in the FireFront project that provides a free tool to measure awareness and situation understanding also information and relevance bias (Thoelen et al., 2020). This tool uses Quantitative Analysis of Situation Awareness (QASA) method (Edgar et al., 2018) and in combination with Collaborative Authoring Process Model for Virtual Simulation (CAPM) it allows to measure actual and perceived situation awareness as well as bias (Polikarpus et al., 2022; Polikarpus et al., 2024). This method can be used online as well as locally without internet, and feedback is generated to the participant right after finishing the scenario. Therefore, this can be a useful training tool to be used in pre-disaster phase of any disaster, but especially to prepare tourists for shelter seeking during the air raid attacks, as field exercises would be too expensive to do. These simulations could be set up in airports and museums, to train people and make them aware of their possible biases.

5.3 Framework for Tourist Disaster Management

In this section we try to wrap up the most important discussion on the nature of tourists as a vulnerable group and how we can include them in the air-raid scenario specifically, and emergency management in general. A comprehensive framework to incorporate tourism in the strategic level of disaster management planning has been suggested by Faulkner (2013) as described in Section 2.3.

Ha (2023) argues that not only the tourists are consider vulnerable, but also international tourism that is described as one of the most vulnerable and susceptible to the impacts of disasters. Ha (2023) strengthen the idea that tourists are vulnerable. This is not only about language barriers, but they are also frequently exposed to multiple risks and disasters because they often conduct extreme activities, climbing mountains and steep terrains, in the rivers with strong streams, paragliding, travelling to remote islands, visiting historical and old buildings, walking on glaciers, and other vulnerable environments. It is also affected by complex environments such as political situations, personal insecurities, unfamiliar environments, and not to mention the natural disasters.

Ha (2023) introduces the idea of interlinkages between the structure of disaster management and the core of international tourism. Two models have been proposed, i.e., passive disaster management and active disaster management. The passive means that disaster management is induced or acted by external influences of forces. Active disaster management entails actively managing disasters in the field through anticipation and recognition (Ha, 2023). The original model consists of only four entities, i.e., tourist, tour industry, regional government and international organizations as illustrated in Figure 2. They represented the stakeholders that support the international tourism industries. The Figure 2 also captures two ways of disaster management operations, i.e., passive, where it is activated by external influences, but active means that it is governed by action and not speculating. When discussing the role of regional government, a majority of regional governments have failed to include tourists in emergency management plans. In fact, it has been placed as a low priority. Likewise in the international organization contexts such as UN bodies linking to disaster management and non-governmental organizations (NGO).

The author calls for more active disaster management, when tourists should actively seek information and not waiting for getting the help. The tourism industry as well as regional governments and international organizations should apply the multi-hazard management, safety, and business continuity plans and addressing the international tourists in their disaster management plans.

Notice that in Figure 2 we include the local volunteers as a part of the framework. Such local volunteers maybe act as the first helpers when facing unknown situations in the tourism areas. We also would like to reemphasize that when putting tourists and international tourism in the regional contingency planning, understanding their “situational” disabilities will results in better plan that can fulfill most special

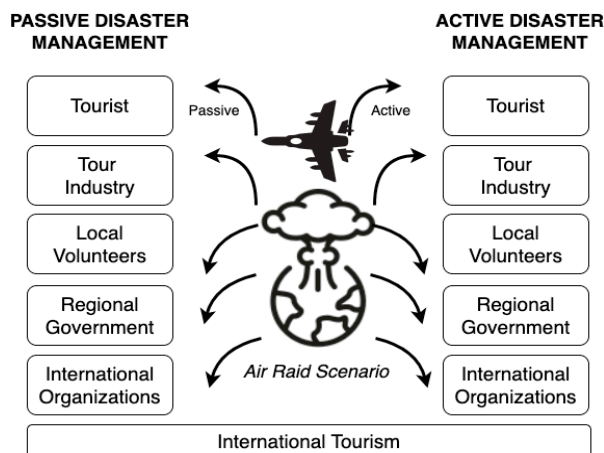


Figure 2 Framework (Adapted from Ha, 2023)

needs of the tourists in the disaster situations. This perspective can be considered as the most important contribution made in this paper

Lastly, in such mainstreaming of the emergency management among tourism stakeholders, analysis of the air-aid scenario and the involvement of the tourists in this scenario, should be scaled up into for formal emergency management structure.

6. Conclusions and Future Works

In this article we have discussed a novel issue concerning the tourists' situational disabilities, their vulnerabilities and biases in disaster scenarios. We focus especially on the "old but new" scenario i.e., potential air raid attacks. We reveal the role of multiculturalism and biases concerning perceived safety and hazards in foreign countries. We also envision alternatives and framework to enhance and improve the emergency management plan that involves tourists, alongside metrics to measure biases using technologies.

This study has several limitations: our scenario involving tourists only limited to specific region, i.e. Europe that is currently affected by the war scenario between Russia and Ukraine. The ideas of involving tourists in unthinkable scenarios can be adapted to wider regions and the real local challenges such as in the natural hazard-prone areas in Asia or bushfire in Australia. Inclusion of the vulnerable groups has been now practiced by many countries, especially after the global Covid-19 pandemic. However, in the events of air-raid, the time dimension should be incorporated in the planning for the tourists and how to inform them what to do.

In the future work we will elaborate further on the applicability of the air-raid attack scenario in much wider selection of countries in Europe and beyond. Moreover, how to educate tourists on local hazards, personal preparedness and response, using entertainment technologies such as virtual reality, augmented reality, and virtual-environment desktop-based tool. This action can be implemented in cooperation with airports (by providing the entertainment corner of local hazards and response) or museums, where tourists are likely to visit.

7. References

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