

EVACUATION AS ONE OF DISASTER MANAGEMENT ACTIONS

Dragisa Jurisic¹

¹Security Research Center, Nikole Pasica No 60, Banja Luka, Bosnia and Herzegovina,
dragisa.jurisic@fbn.unibl.org, ORCID ID [0000-0002-7225-0493](https://orcid.org/0000-0002-7225-0493)

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Abstract: *In order to protect and rescue people and material goods from dangers caused by natural disasters and other accidents, among other measures, evacuation should be conducted. Evacuation is an action that should be executed in the response phase of disaster management. Importance of this action is tremendous, in order to protect human lives and material goods in natural and other disasters. Using the comparison method, previous researches and designed questionnaire this paper is going to show that importance of good evacuation planning, early warning, previous experiences and trust to the institutions, are crucial precondition for successful evacuation in a case of natural and other disasters.*

Keywords: *evacuation, disaster management, planning, early warning*

1. INTRODUCTION

Understanding how people perceive risk and decide when and how to evacuate is critical for designing effective alerts and evacuation strategies. The none "Evacuation" has latin root from the word „ēvacuāre” (prefix: ē- has meaning “out of” or “away”). Also, the root of the verb: vacuāre (from vacuus, meaning “empty”) is in close rations with the none “evacuation”. So, ēvacuāre literally means “to empty out”. The term entered English around the 15th century, influenced by Old French “evacuacion”, which came from Latin, too (Online Etymology Dictionary). In modern time, originally, “evacuation” referred to the emptying of bodily waste (still used in medical contexts). From English that word “evacuation” was spread all over the world and in the Serbian language also become accepted. Over time, it expanded to mean depending on it who use that word. In military it was related to withdrawal of troops from a position. However, in Disaster Management it was related to moving people away from danger. At the end in general use, it was related to clearing a building, area, or vessel.

According to the Law on Protection and Rescue in Civil Emergencies (Official Gazette of the Republic of Srpska, Nos. 121/12, 46/17, 111/21, Article 72), evacuation is defined as “a protection and rescue measure that represents a planned, organized, and temporary relocation of the population and material goods from an area that is estimated to be affected by a natural or other disaster, or from an area already affected by such a disaster, to unthreatened or less endangered areas of the same, neighboring, or another municipality or city, provided that other protection and rescue measures cannot ensure the safety of people and material goods.”

Evacuation is closely related to the broader concept of population displacement and is often implemented alongside it. According to different scholarly perspectives, there are various classifications of evacuation. For example, Maric and Teskeredzic (2006) identify four main types of evacuation. Based on the time of execution, evacuation can be divided into timely and subsequent, and based on the extent of coverage, into complete and partial.

A more detailed classification is provided by Dr Dragan Mladan (2021), who categorizes evacuation according to multiple criteria. These include: type of hazard (e.g., flood, wildfire, earthquake); direction of movement (Horizontal evacuation (residents relocate outside the threatened area), Vertical evacuation (residents move to safer locations within the same area)); evacuation method (e.g., by vehicle, on foot); distance (local, regional, national); duration (Temporary (return within a few days), Medium-term (up to one month), Long-term (more than one month), Permanent (no return to original residence)); coverage (complete or partial); obligation (voluntary or mandatory by order of disaster management); timing (timely or subsequent).

In general, no country in the world today, under modern conditions marked by economic, financial, and logistical constraints, is capable of constructing enough shelters to accommodate all residents and protect all material assets. Therefore, evacuation is often adopted as a practical and essential action for the protection and rescue of people and property during emergencies.

However, this article will show importance of evacuation as action to protect human lives and material goods in natural and other disasters. Using the comparison method, previous researches and designed questionnaire, this paper is going to show that importance of good evacuation planning, early warning, previous experiences and trust to the institutions, are crucial precondition for successful evacuation in a case of natural and other disasters.

This paper is organized into five main sections. It begins with an introduction that sets the context and outlines the research objectives. The second section presents an overview of the theoretical and literature framework, including key findings from previous studies. The third section explains the methodology used in the research. This is followed by the presentation of research results and their discussion. The final section concludes the paper by summarizing the main insights and emphasizing their relevance for the future development of evacuation planning in the Republic of Srpska and Bosnia and Herzegovina.

LITERATURE REVIEW

Most countries, based on assessments of vulnerability to natural and technological hazards, identify areas where evacuation is necessary. This is particularly important in densely populated areas, which often lack sufficient shelter capacity for the entire population, or where the number of shelters does not meet even basic needs.

Evacuation is fundamentally a social process, not merely an individual decision (Drabek, 1969). In his research, Drabek explored how social relationships, family dynamics, and communication networks shape evacuation behavior. He emphasized that families do not act randomly; rather, their decisions are rational and influenced by social norms and interactions. For instance, most families prefer to remain together during a disaster, even if it delays their evacuation. Additionally, people tend to trust information from familiar sources—such as family and friends—more than from official channels. Drabek also found that individuals with prior disaster experience respond differently than those

encountering such events for the first time. Ultimately, he concluded that effective evacuation strategies must incorporate social and psychological dimensions, not solely physical risks. He recommended that evacuation plans include communication strategies that promote family cohesion and deliver clear, trustworthy information.

Effective communication is central to a successful evacuation (Mileti & Sorensen, 1990). The speed, accuracy, and clarity of messages directly influence whether people evacuate promptly. People are more likely to act when messages come from multiple sources, such as sirens, television, radio, and officials. Furthermore, traditional evacuation timelines are inadequate for the evolving dynamics of climate-related disasters (Lavell et al., 2012).

Mileti and Sorensen (1990) also emphasized that warnings must be specific and concrete. Messages are more effective when they clearly state what is happening, who is at risk, what actions should be taken, by when, and where people should go. People rarely react instantly to warnings; instead, they often seek confirmation. Trust in the source of information is crucial. The most effective alerts come from credible and familiar sources, such as local authorities, the police, or fire departments.

Eisenman et al. (2011) emphasized that comprehensive evacuation planning should include compelling risk communication that overcomes false-alarm fatigue, recognizes and utilizes social networks (e.g., neighborhood coordination), and ensures equity in access to transportation and shelter resources.

Demographic factors also significantly influence evacuation behavior. Older adults, individuals with lower levels of education, or those without access to transportation are more likely to delay evacuation (Mileti & Sorensen, 1990). Higher-income neighborhoods tend to evacuate earlier and more efficiently than lower-income ones, indicating that socioeconomic status impacts both the speed and safety of evacuation (Naushirvanov et al., 2024).

Researches also shows that both physical and social accessibility affect the ability to evacuate. Infrastructure (e.g., roads, traffic flow) and social networks (e.g., neighbor support) are critical (Mileti & Sorensen, 1990). Additionally, public health concerns, such as disease outbreaks, can decrease evacuation compliance (Kim & Sherman, 2022).

Several real-world cases offer valuable insights into evacuation as part of disaster management. The experience of Hurricane Katrina (2005) in New Orleans revealed that evacuation in catastrophic events depends less on official orders and more on social bonds and improvisation. People often evacuate in trusted groups—families, neighbors—using any available means. Panic was rare; instead, solidarity was common. As Quarantelli (2006) argued, effective catastrophe planning should support these organic evacuation patterns, enabling authorities to assist rather than replace community-based responses.

The Katrina experience underscores the multidimensional nature of evacuation, where simply issuing warnings is not enough. Effective strategies must integrate risk perception, available resources, demographics, and social dynamics. Dash and Gladwin (2007) similarly concluded that evacuation planning must holistically address communication, logistics, social structures, and population diversity.

Turning to the Fukushima Daiichi Nuclear Power Plant accident, research has shown that the mental health impacts of the disaster were more closely linked to the evacuation process itself than to radiation exposure (Bromet, 2014). Hiroaki et al. (2015) reached similar conclusions, stressing the importance of comprehensive health management and

support for displaced populations. Like Katrina, the Fukushima case demonstrates the complexity of evacuation, especially in nuclear disaster contexts, and the need for tailored communication and psychosocial support strategies to ensure public safety and compliance.

Together, these findings highlight the complex and multifaceted nature of evacuation in disaster settings. Lessons drawn from these international cases were as the basis for analyzing evacuation preparedness and response in the Republic of Srpska and Bosnia and Herzegovina, with the aim of understanding public attitudes and opinions regarding the importance of evacuation planning and execution.

METODOLOGY

This research was conducted using a Google Forms questionnaire, which collected 310 responses over a period of seven days. The sample consisted of 32% women and 68% men. In terms of age distribution, 50% of respondents were between 46 and 65 years old, while 49% were aged 18 to 45. Only 1% of participants were pensioners.

Regarding education level, 44% of respondents held a university (faculty) degree, 37% had completed high school, 14% held a master's degree, and 4% held a PhD. Only 1% of respondents had completed only elementary school.

In terms of employment status, 79% were employed, 8% were students, 7% were retired, and 6% were unemployed.

As for their place of residence, the majority of participants (67%) lived in urban areas, 18% in suburban areas, and 15% in rural (countryside) areas.

All respondents completed a questionnaire consisting of ten questions about evacuation. Each question was formatted as a Likert scale, where 1 indicated complete disagreement with a statement and 5 indicated complete agreement.

The questionnaire was published in early June 2025 and was specifically designed for the purposes of this research.

RESULTS AND DISCUSSION

Taking under consideration length of this paper, analysis of this paper was done only za approximately values for each question. In that context, in this Likert Scales, number 1 represents complete disagreement with the statement, and number 5 represents complete agreement with the statement. In table 1. were given approximately values for each question. Top-rated statements show law agreement and last ones in the table show very high agreement.

Top-rated items show very high agreement. Investments in evacuation planning and infrastructure (4,9) and community training and awareness campaigns (4,8). Respondents clearly recognize the importance of preparedness and strongly support proactive measures from all levels of government.

According to the Law on Civil Protection and related documents in the Republic of Srpska, evacuation plans are not specifically regulated, and there is a noticeable lack of information regarding this aspect of civil protection. A similar situation exists in the Federation of Bosnia and Herzegovina. While the Law on Civil Protection in the Federation mentions evacuation as a protective measure—and even references the

existence of evacuation plans—subordinate documents related to civil protection planning do not elaborate on the structure, content, or implementation of such plans.

Table 1: Results of questionnaire

Rank	No. ques.	Statement	Avg. Score
1	4	There are adequate resources (eg, transportation, shelters, supplies) to support evacuation in the event of a natural disaster or other disaster in my area!	1,8
2	2	Local authorities regularly inform the population about evacuation procedures in the event of a natural disaster or other accident!	1,9
3	1	I am well informed about evacuation plans in the event of a natural disaster or other accident in my local government unit!	2,2
4	5	Evacuation plans in the event of a natural disaster or other disaster in my community take into account the needs of vulnerable groups such as the elderly, children and people with disabilities!	2,2
5	3	I know the evacuation routes in my area that I will use in the event of a natural disaster or other accident!	2,3
6	8	I believe that local governments and emergency services are adequately prepared for evacuation procedures during natural disasters or other accidents!	2,3
7	6	In the past during floods, fires, etc., the evacuation process in my area was efficient and well organized!	2,4
8	7	The infrastructure in my area (eg roads, bridges, public transport) is sufficient for large-scale evacuation during a natural disaster or other disaster!	2,4
9	9	I think there should be more training programs in the community as well as raising awareness about evacuation in case of natural disasters or other accidents!	4,8
10	10	Governments at all levels in BiH should invest more in improving evacuation plans and infrastructure, as well as capacity, for its implementation!	4,9

In contrast, Serbia has established a more comprehensive legal framework. The Regulation on the Content, Method of Preparation, and Obligations of Subjects Regarding Disaster Risk Assessment and Protection and Rescue Plans (Official Gazette of the RS, No. 102/2020) mandates the inclusion of evacuation as a compulsory component in all protection and rescue plans across all levels. Furthermore, the Rulebook on the Content and Manner of Preparation of Protection and Rescue Plans (Official Gazette RS, No. 106/19) provides detailed guidance on the structure of evacuation plans, including the

number and profile of evacuees, analysis of evacuation routes, triggers for evacuation, the use of public transportation, and shelter capacities.

Similarly, in Croatia, the Law on the Civil Protection System (Official Gazette, Nos. 82/15 and 118/18) requires counties, cities, and municipalities to develop civil protection plans in which evacuation planning is a mandatory component. The Ordinance on Civil Protection Planning (Official Gazette, No. 36/19) further specifies the required elements of evacuation plans, such as the description of threats necessitating evacuation, identification of evacuation zones and vulnerable groups, modes of transport, responsible operators, and shelter and medical service capacities.

These differences highlight a significant legal gap in the Republic of Srpska and the Federation of Bosnia and Herzegovina, where evacuation planning is not comprehensively covered by either laws or sublegal (underlaw) documents. As a result, it remains unclear how evacuation plans should be developed or what they should contain in these jurisdictions.

The lowest average scores in the questionnaire were related to the adequacy of resources for evacuation (1.8) and to the regular communication from local authorities regarding evacuation procedures in the event of a natural disaster or other emergency (1.9). These results suggest that people feel unprepared due to a lack of available resources, such as transportation, shelters, and essential supplies, and insufficient communication from institutions. The lack of effective communication is closely linked to the absence or inadequacy of legal and sublegal (underlaw) documents that address evacuation planning in detail.

Moreover, the scores related to knowledge of evacuation routes, inclusion of vulnerable groups, and past evacuation experiences were moderate. This suggests that while some individuals are aware of what to do, many still lack full clarity, and previous evacuations are not perceived as entirely successful. A similar situation exists regarding infrastructure readiness and the preparedness of local services, there is some level of trust, but it is not strong. These areas would benefit from targeted investments and a clear demonstration of institutional readiness. Additionally, improvements in legal and sublegal (underlaw) documents that address evacuation planning in detail are necessary to strengthen overall preparedness.

CONCLUSION

The findings clearly demonstrate that while citizens strongly support proactive investments in evacuation planning and preparedness, reflected in the highest-rated items such as investments in evacuation infrastructure (4.9) and community training and awareness campaigns (4.8), there are significant structural and institutional shortcomings that undermine overall readiness. Most notably, respondents reported very low satisfaction with the adequacy of evacuation resources (1.8) and the frequency and clarity of communication from local authorities (1.9), pointing to critical gaps in implementation.

These weaknesses are mirrored in the legal and policy frameworks of the Republic of Srpska and the Federation of Bosnia and Herzegovina, where evacuation plans are either not specifically regulated or insufficiently detailed in sublegal documents. While both entities acknowledge evacuation as a protective measure, the absence of clear guidance on the required content, responsibilities, and integration of evacuation planning into broader civil protection strategies significantly hampers preparedness.

Moderate public knowledge regarding evacuation routes and procedures, combined with skepticism about the effectiveness of past evacuations and local services, further highlights the need for legal reform and practical engagement. Targeted investments, legal clarity, and institutional transparency are urgently needed, particularly in BiH's entities, to build trust, enhance public preparedness, and align evacuation planning with modern standards of civil protection.

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