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The Importance of Information Communications for Natural Disasters Management

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Resume. In the context of global warming, catastrophic events have become considerably more frequent. This phenomenon is closely linked to scientific and technological advancements, which are a consequence of human economic activity. Additionally, it is associated with the disruption of established societal relationships, which arise from the encroachment of society on the natural environment. Notably, most natural disasters occur in mountainous regions, underscoring the paramount importance of sustainable development in these regions.

The mountainous region of Georgia is also characterized by the presence of natural phenomena that significantly impact the country's natural environment and economy. Consequently, it is imperative to conduct thorough studies and analyses of these natural conditions and phenomena.

Warning/informing is important when a natural disaster begins or has already occurred. Warning commences when the imminent threat of a natural disaster is detected. Consequently, information communication assumes paramount importance in the management of natural disasters. Prevention and the avoidance of complications are directly proportional to communication and the timely dissemination of information. It is imperative to utilize diverse communication channels to ensure that each citizen receives timely information regarding a specific event, thereby mitigating the anticipated negative consequences.

Keywords: natural disaster, catastrophe, crisis communication.

Introduction. Global warming has led to an increase in the frequency of catastrophic events. Consequently, researchers worldwide are intensively studying the factors that contribute to the formation of natural disasters.

In the contemporary era, this phenomenon is closely linked to scientific and technological advancements, which are the outcomes of human economic activity. Additionally, it is associated with the disruption of established relationships resulting from societal encroachment upon the natural environment. Recent studies and empirical evidence indicate that the majority of natural disasters occur in mountainous regions, underscoring the paramount importance of sustainable development in these regions. [2022 S.Gorgijanidze]

Georgia, akin to numerous other mountainous regions globally, is characterized by the presence of natural phenomena that exert a profound impact on the country's natural environment and economy. Therefore, it is imperative to conduct thorough research and analysis of natural conditions and phenomena to mitigate the anticipated catastrophic and detrimental consequences.

It's crucial to emphasize the significance of issuing warnings and providing information when a natural disaster begins or has already occurred. The warning phase commences when the threat of an impending natural disaster is detected, from the moment it emerges until it materializes. Additionally, evacuation may be necessary, depending on the magnitude of the disaster. It's essential to consider the population's development in this context. Furthermore, determining the nature and mechanism of the natural disaster is crucial. For instance, in the case of an impending flood, which is a recurring occurrence in our country due to excessive atmospheric precipitation, both warnings and evacuations are feasible. However, we must be aware of the scale of its spread and the approximate coverage area, excluding floodplains, which are always inundated during floods. In today's world, information is readily available in almost every populated region of the globe, presenting a significant opportunity for enhanced disaster management. It's worth noting that since November 2007, the European Union's Directive on the Assessment and Management of Flood Risks (EU, 2007) has been in effect, establishing specific requirements for flood risk assessment and management:

1. Preliminary Flood and Flash Flood Risk Assessment.
2. Flood and Flash Flood Hazard and Risk Maps.
3. Flood and Flash Flood Risk Management Plans. [RECC]

Research. As we've discussed, information communication plays a crucial role in managing natural disasters. Prevention and avoiding complications are directly linked to effective communication and the timely dissemination of information. It's essential that citizens receive relevant information about an event promptly through various communication channels. In emergency situations, information becomes as vital as food and water for people. [2014, FEMA]

During natural disasters, public communication becomes paramount in emergencies. Emergency communications encompass warnings, instructions, and directives that may include evacuation orders, curfews, and actions that im-

pact a person's ability to defend themselves. It is crucial to stay informed about family members and the issues that may affect response and defense during emergencies. Well-crafted and effectively delivered emergency messages play a vital role in ensuring public safety, safeguarding personal property, and facilitating prompt response efforts.

The extent to which individuals respond to a warning message is influenced by numerous factors, including their personal characteristics and perceptions, the source of the message, the method of delivery, and the content of the message itself. (FEMA, 2014) The events that transpired in Georgia during the winter of 2025 were subject to controversy regarding public awareness. Nevertheless, the population was duly informed about the anticipated severe weather conditions. This process was executed through both telephone warning messages and by the LEPL National Environment Agency, which disseminated information on their website and through their official pages on social media platforms. (Fig. 1)

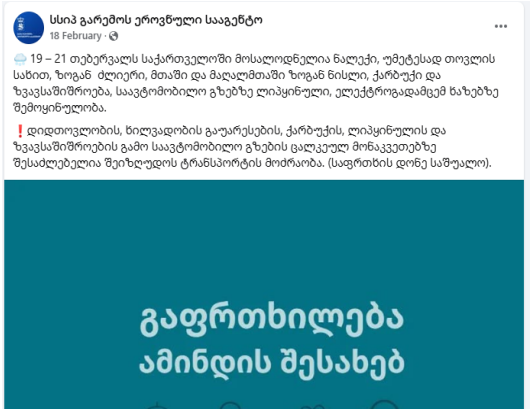

Fig. 1 Statement made by the LEPL National Environmental Agency on February 18.

Following the warning, heavy snowfall commenced on February 20. The regions of Guria, Adjara, Samegrelo, and Imereti experienced significant precipitation. In certain areas of Guri, the snow cover even exceeded two meters in height. (Fig. 2)

This in itself engendered intricate social and economic challenges. Regrettably, the calamity also resulted in loss of life. In fact, the nation endured prolonged heavy snowfall for an entire week. Information regarding the anticipated and ongoing events was predominantly disseminated through television and social media platforms. Nevertheless, there exist various communication tools, including personal communication, print and broadcast media, and the Internet/social media, from which one can select the most appropriate option. Each of these tools possesses distinct advantages and limitations, which are contingent upon the intended purpose of communication and the target audience.

Fig. 2 Ninoshvili. www.guriismoambe, Guria

Research methodology. During emergencies, it is crucial for the sender of a message to ensure its intended communication medium, audience, and clarity. The message should provide specific and adequate information, be synchronized with other disseminated information, and be accessible to the general public. [2014, FEMA]

In the United States, the Federal Emergency Management Agency's training manual [2014, FEMA] outlines four essential forms of communication during emergencies:

- Personal communication - public meetings, briefings;
- Print media - newspapers, magazines;
- Broadcast media - television, radio;
- Internet/social media.

Personal Communication

Personal communication, encompassing public meetings and briefings, serves as a powerful tool for disseminating information to the media and the public. When meticulously planned and executed, these events can effectively convey desired messages and garner media attention.

Print Media - Newspapers and magazines, collectively known as print media, facilitate the dissemination of non-time-sensitive information. Their primary effectiveness lies in providing in-depth analysis of emerging situations and preparing the public accordingly.

Broadcast Media - Television and radio constitute broadcast media that enables swift information dissemination through appropriate programs such as the Emergency Alert System (EAS), Public Service Announcements (PSAs), and news programming. Moreover, these platforms offer the opportunity to present more comprehensive information and materials. Notably, broadcasters that cater to diverse language options are crucial in effectively communicating with specific community populations.

Internet/Social Media - The Internet and social media platforms provide instantaneous messaging and a range of formats. Websites can incorporate various functionalities, including automatic notifications upon user registration. Additionally, social media's format facilitates the immediate delivery of messages to the audience.

As technology advances, novel methods for mitigating natural disasters and emergencies have emerged. Contemporary systems employ digital radios, satellite communications, and sophisticated data networks to facilitate prompt and precise information dissemination.

Geographic information systems (GIS) facilitate the mapping of disaster zones, monitoring resource movements, and forecasting the dissemination of wildfires or hazardous substances. (Fig. 3) [2024, Network Innovations,].

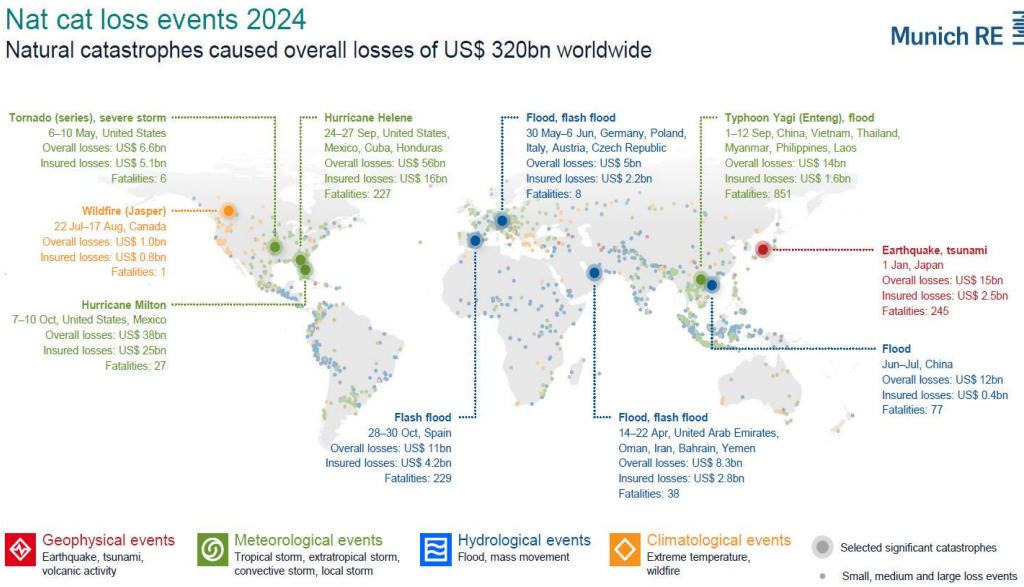

Fig. 3. 2024, natural disasters caused losses of 320 billion US dollars worldwide (Source: Munich Re, NatCatSERVICE, 2025)

Figure 3 presents a global analysis of natural disasters, detailing their geographical distribution and financial impact on affected countries. This data serves as a foundation for creating specialized thematic maps, 3D format materials, and typographic maps for each disaster, enabling precise documentation and analysis of specific facts and events.

For instance, local residents can anticipate floods with a seven-to-eight-day lead time, enabling timely measures to be taken. This visual and user-friendly resource presents local river flood maps and water trends, along with real-time flood forecasts and alerts. Advancements in technology have enabled the creation of such models and maps, ensuring that state and local government sectors respond effectively to disasters. Fig. 4. [https://sites.research.google/gr/floodforecasting/]

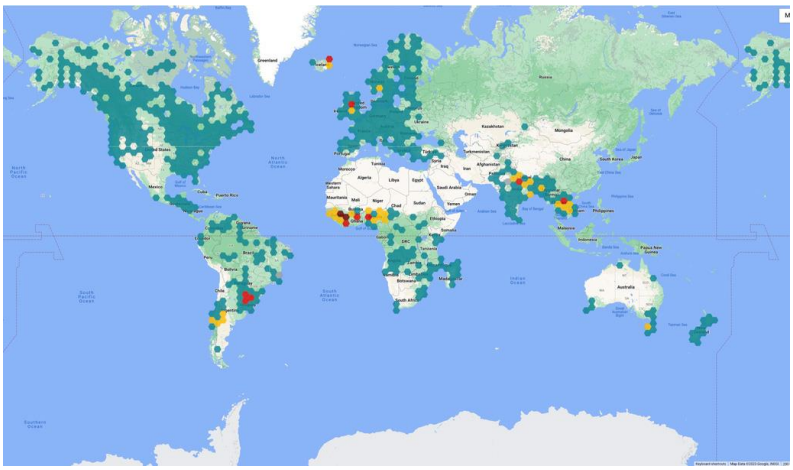

Fig. 4. The flood map encompasses river basins in over 80 countries globally, offering comprehensive flood forecasting for more than 1,800 locations and serving a population of 460 million.

A prominent example of a mountainous nation is Switzerland, which assumes the responsibility of issuing natural hazard warnings. Since 2008, Switzerland has been actively engaged in the development and implementation of a comprehensive warning system. Furthermore, the country has dedicated significant resources to practical field-work in the early warning sector. A notable instance of this is the early warning system installed on the Devdorak glacier by Swiss companies, namely GEOTEST AG and GEOPREAVENT AG. [Gorgijanidze, S. 2023] Presently, a public natural hazard portal and a collaborative Swiss information platform dedicated to natural hazards have been established. The outcomes of these initiatives are presented in Figure 5, which illustrates the efforts undertaken to establish a more coordinated, integrated, and consistent information and warning service. The platform offers real-time data sourced from various sources, including ground-based sensors, radar, satellites, model outputs, forecasts, text bulletins, and processed warning maps. Additionally, it provides interactive visualization and customization options. [Lienert C. 2025]

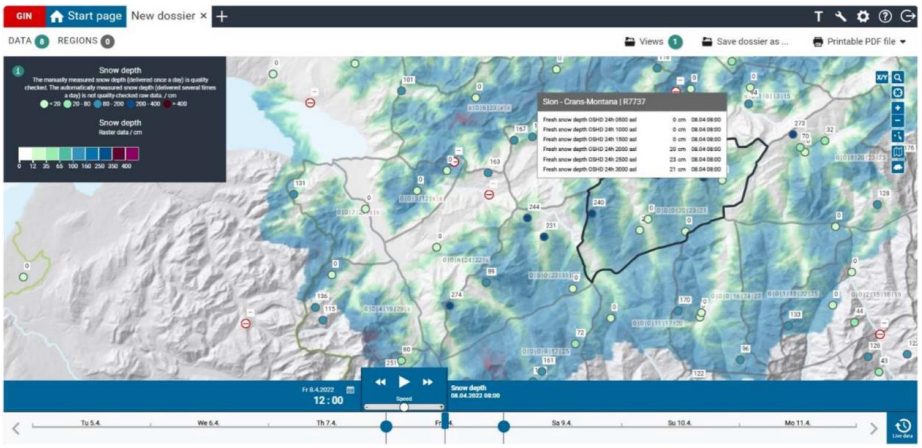

Fig. 5. Interactive Swiss Joint Information Platform Screenshot - The interactive Swiss Joint Information Platform presents a map displaying real-time snow depth for a customizable time interval. Additionally, it forecasts snow depth at various elevations within hydrological catchments. [GIN, 2024].

It is noteworthy that the widespread distribution of mobile phones has significantly enhanced their role in disseminating information during emergencies. Mobile notifications enable instantaneous communication with the intended audience, even when they are not actively utilizing social media or email. The concept of push notifications effectively mitigates delays arising from various circumstances. Cellular broadcast-based messages facilitate the simultaneous transmission to multiple devices. [2021, 2025 Osorno S. , Wilkerson K].

The United Nations document titled "Crisis Communication" [2023] was prepared in 2023 and is specifically designed for the use of member states in emergency management. This document comprehensively addresses other crucial components in the context of crisis communication.

The document provides information on different types of communication that can be used for different purposes in different situations:

- Crisis Communication
- Operational Crisis Communication
- Strategic Crisis Communication
- Crisis Management Team (CMT)
- Crisis Communication Team (CCT)
- Crisis Communication Framework

Effective communication during crisis situations can be conducted in both reactive and proactive modes.

Reactive communication is particularly crucial during the initial hour of ongoing natural disasters or other emergencies. In such situations, the dissemination of information should be recorded within minutes.

Proactive communication, on the other hand, allows for the dissemination of information over extended periods, spanning days, weeks, and even months. During this phase, the primary focus should be on providing general and educational information. This information serves as a foundation for building public awareness and fostering national unity.

In crisis situations, the dissemination of accurate and timely information is paramount for ensuring clear and consistent communication.

The 12 UN Principles for Crisis Management

There are 12 UN principles that are recommended for use when disseminating information in crisis situations:

1. Please provide a prompt response within the first hour.
2. Ensure accuracy by meticulously verifying all facts.
3. Maintain consistency in providing speakers with comprehensive briefings on critical events and salient messages.
4. Prioritize public safety above all else.
5. Utilize all available communication channels, including social media platforms, websites, and mass messaging systems.
6. It is imperative to demonstrate genuine concern and empathy towards the victim.
7. Please ensure that your response encompasses both internal audiences (e.g., staff) and external audiences.
8. Be prepared to manage the stress and trauma experienced by crisis victims and their families, including colleagues.
9. Effective leadership should be readily accessible to key stakeholders and the media, as circumstances warrant. In the face of crises, successful leadership hinges on exceptional communication, meticulous control, unwavering consistency, compelling storytelling, and ensuring that all stakeholders are fully aware of their roles and feel adequately supported.
10. Ensure that you are thoroughly familiar with the story before sharing it, and make certain that everyone is aware of its details.
11. Utilize guidelines to preserve objectivity, ensuring compliance with legal regulations and fostering effective communication.
12. Persevere in your learning and professional development amidst a crisis. [2023, United Nations].

Conclusion. In light of the provided information, it is crucial to recognize that the provision of comprehensive and optimal information within the disaster zone necessitates the expertise of both scientific and practical specialists in managing natural disasters. Furthermore, effective communication with the local population is equally im-

portant. The communication approach should be non-aggressive and strategically designed to guide the dissemination of information about the impending disaster in a manner that minimizes negative consequences.

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ინფორმაციული კომუნიკაციების მნიშვნელობა ბუნებრივი სტიქიური მოვლენების მართვისთვის

ს. გორგიჯანიძე, გ. მაკარაშვილი, გ.ჯინჭარაძე, თ. ჩიტაძე, ნ. კობახიძე, გ. გაჩეჩილაძე. სტუ-ის ჰმი-ის შრომათა კრებული-2025.-ტ.136.-გვ.23-29. - ინგ., რეზ. ინგლ., ქართ., რუს.

მსოფლიოში კლიმატური დათბობის ფონზე საგრძნობლად გახშირდა კატასტროფულ მოვლენები. ეს დაკავშირებულია სამეცნიერო-ტექნიკურ პროგრესთან, რაც ადამიანის სამეურნეო საქმიანობის შედეგია. აგრეთვე, იმ აწყობილი ურთიერთკავშირების დარღვევასთან, რასაც იწვევს ბუნებრივ გარემოში საზოგადოების შეჭრა. სტიქიური მოვლენების უმეტესობა მთიან რეგიონებში ხდება, რაც მნიშვნელოვანს ხდის მთიანი რეგიონების მდგრადი განვითარების ეფექტურობას.

საქართველოს მთიანი რეგიონისათვის ასევე დამახასიათებელია სტიქიური მოვლენების აქტივობა. ისინი ქვეყნის ბუნებრივ გარემოსა და ეკონომიკაზე ძალზე დიდ გავლენას ახდენენ, ამიტომ მნიშვნელოვანია ბუნებრივი პირობების და მოვლენების შესწავლა და ანალიზი.

სტიქიური მოვლენის დაწყების, ან უკვე მომხდარი პროცესებისას მნიშვნელოვანია გაფრთხილება-ინფორმირება. გაფრთხილება იწყება მაშინ, როდესაც მოსალოდნელი ბუნებრივი კატასტროფის საფრთხეა დაფიქსირებული. ამიტომ ენიჭება განსაკუთრებული მნიშვნელობა ინფორმაციულ კომუნიკაციას სტიქიური მოვლენების მართვის პროცესში. პრევენცია და გართულებების არიდება სწორედ კომუნიკაციასთან და ინფორმაციის ოპერატიულად გავრცელებასთან არის დაკავშირებული. მნიშვნელოვანია, სხვადასხვა კომუნიკაციის არხის გამოყენებით, თითოეულ მოქალაქესთან დროულად მივიდეს ინფორმაცია ამა თუ იმ მოვლენასთან დაკავშირებით, რათა თავიდან იქნას აცილებული მოსალოდნელი უარყოფითი შედეგები.

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Значение информационных коммуникаций для управления стихийными бедствиями/ С. Горгиджанидзе, Г. Макарашвили, Г. Джинчарадзе, Т. Читадзе, Н. Кобахидзе, Г. Гачечиладзе. Сб. Трудов ИГМ ГТУ. - 2025. – том 136. - с.23-29. - Англ.; Рез: Груз., Англ., Рус.

На фоне глобального потепления в мире значительно участились катастрофические явления. Это связано с научно-техническим прогрессом, который является результатом хозяйственной деятельности человека. Также — с нарушением налаженных взаимосвязей, вызванных вторжением общества в природную среду. Большинство стихийных бедствий происходит в горных регионах, что делает особенно важным обеспечение устойчивого развития этих территорий.

Для горных регионов Грузии также характерна активность стихийных явлений. Они оказывают очень сильное влияние на природную среду и экономику страны, поэтому крайне важно изучение и анализ природных условий и процессов.

Во время начала стихийного бедствия или уже произошедших процессов особенно важно оповещение и информирование. Предупреждение начинается тогда, когда зафиксирована угроза возможной природной катастрофы. Поэтому информационной коммуникации в процессе управления стихийными явлениями придается особое значение. Профилактика и предотвращение осложнений напрямую связаны с коммуникацией и оперативным распространением информации. Важно, чтобы с использованием различных каналов связи информация о том или ином явлении своевременно доходила до каждого гражданина, чтобы предотвратить возможные негативные последствия.