



4th Edition - 15th January 2025



INTRODUCTION

RESILIAGE is a three-year European research project (2023-2026) focused on enhancing community resilience through the integration of cultural and natural heritage in Disaster Risk Reduction (DRR). Funded by Horizon Europe, it explores how heritage, as a significant resource of local communities, can strengthen societal resilience in the face of natural hazards and extreme events. By conducting field research and engaging communities in multi-hazard scenarios, RESILIAGE aims to co-generate actionable knowledge, empowering communities to better prepare for and mitigate disaster risks, while also addressing the effects of climate change.

The project is led by Politecnico di Torino and involves 18 partners from 10 countries, including first responders, policymakers, citizen associations, and heritage organisations. Through its **five CORE Labs** (COmmunity REsilience Labs) established in 5 different countries - **Famenne-Ardenne (B), Crete (GR), Naturtejo (PT), Trondheim (NO), and Karsiyaka (TR)**-, RESILIAGE uses a **Sy**stemic **R**esilience **I**nnovation (**SyRI**) framework to analyse governance, social interaction, and other critical factors. This framework identifies and improves practices that strengthen community resilience, using cultural heritage in disaster risk management and climate change adaptation. In addition, each CORE Lab specialises in a specific governance scale, including city district, municipality, municipality network, regional, and cross-regional.

By engaging stakeholders in collaborative and participatory processes, the project seeks to **create digital tools** and **soft solutions** that strengthen community preparedness and promote long-term strategies for disaster resilience.

CONTENT

The Booklet #4: Lessons learned from social media analyses presents an analysis of social media communication during disaster events, drawing on data from past cases to assess the effectiveness of communication and their impact on disaster response and preparedness. By examining how information was disseminated during specific disasters, it aims to identify gaps in communication, evaluate the level of implementation of disaster risk awareness and contribute to a deeper understanding of the human factors influencing these outcomes.

It includes a **gap analysis for the five CORE Labs**, which assesses the current state of implementation and highlights areas requiring improvement. The results of this analysis will also serve as a foundation for **policy development initiatives** and will identify critical needs to be addressed through **capacity-building efforts**. Through this comprehensive approach, it aims to support the enhancement of **disaster preparedness** and **response strategies** across multiple facets of the project.

In these analyses, the potential of extracting and analysing data from multiple social media platforms was explored to assess disaster communication and its effectiveness. The platforms initially considered included Facebook, Instagram, X (formerly Twitter), and YouTube. These platforms were selected for their wide usage and ability to facilitate communication between influential actors and citizens. However, significant limitations were encountered when accessing historical data from these platforms, which impacted the scope of the analysis. Some platforms required subscription fees for data access, while others only offered data to eligible research entities. As a result, access to certain data was restricted, limiting the ability to conduct a comprehensive study.

The analysis was confined to **public Facebook pages** where no login was required and the data was **publicly accessible**. This constraint limited the type and volume of data available, as only **public posts up to a certain date** were collected. The data included the number of **reactions**, **comments**, **and shares per post**, while ensuring that no private data was collected.

CORE Labs were asked to identify the most influential social media pages within their region, which included those belonging to municipalities, firefighter departments, public figures, and other relevant organisations. Data collection was particularly challenging for pages belonging to newspapers, which often had high volumes of content, making it difficult to isolate relevant posts. Despite these challenges, no personal data or information identifying individuals was collected. The focus remained on the content of the posts and engagement metrics.

Given the CORE Labs' operation in regions with different primary languages, an auto-translation process was necessary to standardise the data for analysis. Post descriptions were translated into English using Large Language Model technology to ensure consistent analysis across regions.

Before analysis, the **data was cleaned and transformed** to ensure **usability**. This involved removing irrelevant or duplicate information, standardising data formats, and ensuring consistency. Once cleaned, the analysis focused on posts related to **identified disasters within a specific time window**. Posts were analysed both **before and after the disaster** to assess **disaster awareness and communication effectiveness**. Large Language Model technology was used to identify relevant posts, while human inspection ensured accuracy.

Numerical analysis of **engagement metrics** such as **reactions**, **comments**, **and shares** provided additional **insights into the effectiveness of the communication strategies used**. However, the analysis was limited by **restricted access to historical data**, the scope of data collection, and challenges associated with **high-volume pages**. These limitations highlight the **importance of accessible and open communication channels** for effective disaster awareness and preparedness. Further investigation may be necessary to gain a more comprehensive understanding and to **improve disaster communication strategies**.

Next, the findings from the **analysis of social media pages** identified as influential within the region of the **specific CORE Lab** will be presented. The goal is to understand the role these pages play in shaping **public awareness**.



FAMENNE-ARDENNE CORE LAB



EXAMINING PRE- AND POST-HAZARD COMMUNICATION ON SOCIAL MEDIA: FAMENNE-ARDENNE CASE STUDY

Identified Facebook public pages (by July 2024)

- VilledeMarcheenFamenne
 Municipality 15 000 followers
- VilledeRochefort
 Municipality 4 600 followers
- VilledeDurbuy

 Municipality 2 800 followers
- AC.Nassogne
 Municipality 2 900 followers
- HottonOfficiel
 Municipality 2 800 followers



Registered disaster:

14 July 2021: **Flood**

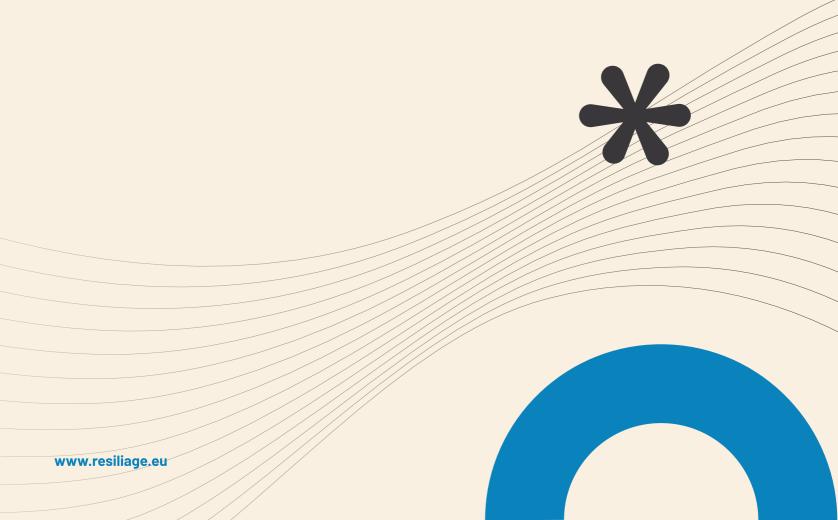


Data and awareness analyses

For the analysis related to awareness, only the **VilledeDurbuy** page and the **HottonOfficiel** page produced useful material that could be analyzed as disaster risk awareness. Other pages lacked data or produced results that were not useful for those analyses.

The content of social media posts is analysed to assess the level of awareness related to the target disaster type. The analysis focuses on posts made during the **60 days leading up to the disaster as well as the 60 days following it**, examining whether they discuss topics relevant to the event. Additionally, we evaluate the engagement metrics of these posts, including the number of Reactions, Comments and Shares they received.

The analysis of the social media posts from both **VilledeDurbuy** and **HottonOfficiel** surrounding the flood on **14 July 2021**, reveals similar communication patterns and highlights critical gaps in disaster preparedness awareness. Both pages demonstrate a reactive approach to disaster communication, with a strong emphasis on post-disaster recovery and support but a notable lack of pre-disaster awareness efforts.



Pre-disaster communication

Absence of awareness posts:

- VilledeDurbuy: No disaster awareness posts
 were identified before the flood. This absence
 suggests a significant gap in proactive
 communication about flood risks, early
 warning signs and preventive measures.
 Without such posts, the community may not
 have been adequately informed or prepared for
 the flood.
- HottonOfficiel: Similarly, this page also showed no pre-disaster awareness posts. This indicates a critical shortfall in engaging the community on flood preparedness, potentially leaving them underprepared for the event.

Post-disaster communication

Focus on recovery and support:

- VilledeDurbuy: After the flood, posts focused on practical advice for managing flood damage, avoiding flood-affected areas and safety during cleanup. The communication emphasized immediate recovery needs, including directing individuals to resources, providing mail redirection services and offering safety advice.
- HottonOfficiel: The page concentrated on providing essential items like furniture and appliances for flood victims, directing them to dedicated assistance pages and discussing financial compensation. The focus was on meeting the immediate needs of those affected by the flood, ensuring they had access to critical resources and support.



Insights on communication changes

Shift from prevention to recovery:

 Both pages demonstrated a significant shift in focus after the disaster, moving from an apparent absence of communication on prevention to an intense focus on recovery. This reactive approach suggests that while the response was strong, there was little emphasis on preparing the community for the disaster before it occurred.

Lack of pre-disaster engagement:

 The absence of pre-disaster posts on both pages highlights a crucial gap in disaster risk awareness. This lack of engagement could have contributed to lower community resilience and preparedness, making the impact of the flood more severe.

Gaps in disaster risk awareness

Need for proactive awareness campaigns:

Both VilledeDurbuy and HottonOfficiel would benefit from implementing
proactive awareness campaigns. These campaigns should focus on
educating the community about flood risks, early warning signs and
preventive measures. Such efforts are essential for enhancing community
preparedness and resilience against future disasters.

Balanced communication strategy:

It seems that there is a need for a more balanced communication that
includes both pre-disaster preparedness and post-disaster recovery. While
the post-disaster communication was comprehensive, incorporating regular
posts about disaster preparedness and risk mitigation would ensure that the
community is better equipped to handle future events.

The social media activities of both **VilledeDurbuy** and **HottonOfficiel** following the **14 July 2021**, **flood** reveal a **strong commitment** to supporting the community **during the recovery phase**. However, the **lack of pre-disaster awareness and preparedness communication** represents a significant area for improvement. Moving forward, both pages could adopt a **more proactive approach to disaster risk communication**, ensuring that their **communities are well-informed and prepared** before a disaster strikes. This balanced approach will not only improve **community resilience** but also **mitigate the impact of future disasters**.





CRETE GREECE CORE LAB



EXAMINING PRE- AND POST-HAZARD COMMUNICATION ON SOCIAL MEDIA: CRETE CASE STUDY

Identified Facebook public pages (by July 2024)

- Protothemagr
 News 568 000 followers
- **METEΩKPHTEΣ**Private page 61 200 followers
- LIVE TALKS με τον Κώστα Μπογδανίδη Private page - 5 900 followers
- Makeleionew
 News 35 000 followers



Registered disaster:

1 June 2024: **Heatwaves**1 June 2021: **Earthquake**



Data and awareness analyses

Limitations on social media data collection process affected the analyses, restricting the examination to content within the specified date ranges. Due to limitations in obtaining data from the time range when the earthquake disaster occurred, it was not possible to include this event in the analysis.

After data collection, data was cleaned and preprocessed in order to make it possible to analyze the posts. For the analysis related to the Awareness, only the **Protothemagr** page produced material that could be analyzed for the disaster risk awareness. Other pages were lacking data or produced results that were not useful for those analyses.

The content of social media posts is analyzed to assess the level of awareness related to the target disaster type. The analysis focuses on posts made during the **60 days leading up to the disaster as well as the 60 days following it**, examining whether they discuss topics relevant to the event.



Information on social media pages

Given the **limited number of pages** available for this analysis, the results of this study are not fully conclusive and further investigation may be necessary to provide a more comprehensive understanding. The **challenges** encountered during this analysis, including the **presence of private pages**, **high posting frequency on news-oriented pages** and **inaccessible content lacking detailed descriptions**, underscore the difficulties in assessing social media communication effectively.

Private pages prevented data extraction, limiting the scope of the analysis. Similarly, the high volume of posts on news-oriented pages made it difficult to isolate relevant content related to the disasters, complicating the evaluation of their disaster communication. Additionally, posts on the "makeleionew" page lacked descriptions, offering only links to external news sites, which fell outside the methodology's scope. These limitations highlight the need for public, detailed and easily accessible social media content to facilitate effective disaster communication and analysis.

Considering the **Protothemagr** page, the analysis of social media posts related to the heatwave disaster on 1 June 2024, reveals **gaps in disaster risk communication**. Both **pre-disaster and post-disaster awareness posts were absent in the Protothemagr page**, indicating a lack of both **proactive** and **reactive communication**. This shortfall suggests that the community may have been left **uninformed** and **unprepared** to handle the risks associated with the heatwave, reflecting a broader issue in **disaster preparedness** and **awareness**.

The absence of any posts related to heatwave awareness before or after the 1

June 2024 disaster might point to a deficiency in disaster communication. This lack of engagement may have left the community inadequately informed about the risks and necessary precautions for heatwaves. To enhance disaster preparedness and response, it is crucial to adopt a more proactive and comprehensive communication. This should include regular pre-disaster awareness campaigns, accessible post-disaster guidance and ensuring that all relevant pages are public and focused on disaster risk awareness.

By doing so, communities will be better equipped to prepare for and respond to future disasters.





NATURTEJO CORE LAB



EXAMINING PRE- AND POST-HAZARD COMMUNICATION ON SOCIAL MEDIA: NATURTEJO CASE STUDY

Identified Facebook public pages (by July 2024)

- Bombeiros-Voluntários-de-Nisa
 Firefighters 6 800 followers
- BombeirosCasteloBranco
 Firefighters 4 600 followers
- MunicipiodePenamacor
 Municipality 29 000 followers



Registered disaster:

1 August 2023: Wildfire
1 July 2022: Wildfire
1 October 2017: Wildfire
1 June 2017: Wildfire



Data and awareness analyses

For the analysis related to the awareness, only the

Bombeiros-Voluntários-de-Nisa, **BombeirosCasteloBranco** and the **MunicipiodePenamacor** pages produced useful material that could be analyzed as disaster risk awareness. Other pages were lacking data or produced results that were not useful for those analyses.

After data collection, data was cleaned and preprocessed in order to make it possible to analyze the posts. The analysis focuses on posts made during the **60 days leading up to the disaster as well as the 90 days following it**, examining whether they discuss topics relevant to the event. Additionally, we evaluate the **engagement metrics** of these posts, including the **number of reactions**, **comments** and **shares** they received.



Pre-disaster communication

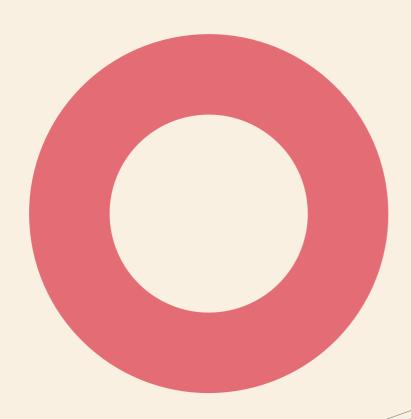
Inconsistent proactive awareness:

- Bombeiros-Voluntários-de-Nisa and MunicipiodePenamacor both demonstrated a lack of pre-disaster communication in 2022, with no posts focused on raising awareness about fire risks. This gap indicates a missed opportunity to prepare the community before the fire incidents.
- In contrast, BombeirosCasteloBranco
 exhibited a proactive approach in 2022,
 providing several posts aimed at educating the
 public about fire risks and preventive
 measures. However, by 2023, this page also
 failed to maintain proactive communication, as
 no pre-disaster awareness posts were
 identified.

Post-disaster communication

Varied approaches and effectiveness:

- Bombeiros-Voluntários-de-Nisa and BombeirosCasteloBranco both showed a commitment to post-disaster communication. After the 2023 fire,
 - Bombeiros-Voluntários-de-Nisa focused on promoting ongoing training and preparedness, indicating a forward-looking approach to fire safety. Meanwhile, BombeirosCasteloBranco emphasized preventive tips and collective responsibility following both the 2022 and 2023 fires, although its 2023 communication was more reactive.
- MunicipiodePenamacor displayed significant gaps, with no post-disaster communication following the 2022 fire and only a single post related to future preparedness after the 2023 fire. This inconsistency suggests a lack of focus on immediate community needs and recovery after disasters.



Insights on communication changes

Improvement and Decline in Proactivity:

- Bombeiros-Voluntários-de-Nisa showed an improvement in proactive disaster communication from 2022 to 2023, shifting towards more sustained and comprehensive messaging that included training and preparedness activities.
- Conversely, BombeirosCasteloBranco exhibited a decline in proactive engagement, as its pre-disaster communication became less prominent by 2023. This shift towards a more reactive approach could reduce community preparedness.
- MunicipiodePenamacor displayed no significant change or improvement between 2022 and 2023, consistently lacking both pre- and post-disaster communication.



Gaps in disaster risk awareness

Persistent Awareness Gaps:

- Across all three pages, there were notable gaps in disaster risk awareness, particularly in the absence of pre-disaster communication.
 MunicipiodePenamacor was the most consistent in its lack of engagement, missing critical opportunities to inform and prepare the community both before and after the fires.
- The inconsistency in proactive communication across the pages highlights a need for a more uniform and sustained approach to disaster risk awareness.

Specific Concerns:

- It is concerning that BombeirosCasteloBranco, representing the capital of the municipality, does not provide any consistent information about disaster risk management, despite the importance of this region in the broader context of municipal safety.
- Although the social media pages of these municipalities have a substantial number of followers, which indicates a high potential for reaching the community, they are not fully capitalizing on this opportunity to run effective awareness campaigns. This presents a critical opportunity for improvement.



Potential gaps in social media communication:

The presence of various types of social media accounts, including public pages, people pages (representing organizations like "Bombeiros-Voluntários-de-Idanha-a-Nova"), groups and even "Local Business" pages, raises questions about whether these are the most effective ways for disseminating public safety information. This suggests there may be a knowledge gap in understanding the best approaches to social media communication within these organizations.

The overall analysis reveals both **strengths** and **weaknesses** in the **disaster communication strategies** employed across the three social media pages. While there have been some improvements in proactive engagement, particularly on **Bombeiros-Voluntários-de-Nisa** in 2023, significant gaps remain, especially in **pre-disaster communication**. The **absence** of consistent **awareness campaigns** and the **reactive nature of many posts** suggest that the communities may not be adequately **prepared to face fire risks**.

To enhance disaster risk awareness and community resilience, it is crucial for all pages to adopt a more proactive, consistent and comprehensive communication strategy. This should include regular updates before disaster seasons, continuous community engagement on preventive measures and robust support during and after disasters to ensure that the community is well-informed, prepared and supported at all stages of a disaster.

Given the substantial following of these social media pages, there is significant untapped potential to improve disaster awareness and preparedness campaigns. Moreover, a reassessment of the types of social media accounts used to disseminate public information could help in overcoming the knowledge gaps and optimising communication strategies for better community engagement.



TRONDHEIM NORWAY CORE LAB



EXAMINING PRE- AND POST-HAZARD COMMUNICATION ON SOCIAL MEDIA: TRONDHEIM CASE STUDY

Identified Facebook public pages (by July 2024)

- TrondheimKommune
 Municipality 30 000 followers
- **Brannogredningstjenesten**Local fire department 22 000 followers
- Trondheim Spolitiet
 Local police 34 000 followers
- Adressa.no
 Local newspaper 95 000 followers



Registered disaster:

15 August 2023: Fire

2 September 2022: Landslide

27 August 2022: Fire

28 September 2021: Landslide

22 April 2021: **Landslide** 1 January 2012: **Landslide**



Data and awareness analyses

For the analysis related to the Awareness, only the **Trondheimkommune** page and the **Brannogredningstjenesten** page produced useful material that could be analysed as disaster risk awareness. Other pages lacked data or produced results that were not useful for those analyses.

The content of social media posts is analysed to assess the level of awareness related to the target disaster type. The analysis focuses on posts made during the **60 days leading up to the disaster as well as the 60 days following it**, examining whether they discuss topics relevant to the event. Additionally, we evaluate the engagement metrics of these posts, including the number of reactions, comments, and shares they received.

Information on Social Media Pages

The comparative analysis of social media posts from **Brannogredningstjenesten** and **TrondheimKommune** reveals distinct yet complementary approaches to disaster awareness and communication.



Pre-disaster communication

- Brannogredningstjenesten: The posts
 consistently emphasize fire safety, with a
 strong focus on preventive measures such as
 the use of smoke alarms, fire drills, and
 responsible behavior in vulnerable areas. This
 reflects a longstanding commitment to
 educating the public about fire risks and
 promoting preparedness.
- TrondheimKommune: Before the August 2023 fire, the posts were similarly focused on raising awareness about fire risks, particularly those associated with extreme weather conditions. The use of historical incidents to stress the importance of fire safety highlights a proactive approach to linking past lessons with current preparedness.

Post-disaster communication

- Brannogredningstjenesten: Following recent disasters, particularly the August 2023 fire, there is a noticeable shift towards more community-oriented and targeted outreach. The communication evolved to include organizing events like Fire Prevention Forums and educational visits, specifically targeting vulnerable populations such as children and the elderly. This shift underscores an increasing emphasis on community engagement and tailored messaging.
- TrondheimKommune: After the disaster, the communication broadened to address the impacts of climate change, including the risks of landslides triggered by increased rainfall. This shift from a fire-specific focus to a broader discussion of climate-related hazards indicates a comprehensive approach to disaster preparedness, involving both community and municipal levels.

Both pages exhibit a clear evolution in their communication of disaster awareness. While Brannogredningstjenesten has shifted towards more interactive, community-based efforts post-disaster, TrondheimKommune has expanded its focus to include broader environmental issues such as climate change, demonstrating a more holistic approach to disaster preparedness. In addition, Brannogredningstjenesten has increasingly targeted vulnerable groups and emphasised the importance of tailored outreach. Meanwhile, TrondheimKommune has broadened its focus beyond fire safety to address interconnected hazards, reflecting a growing awareness of the multifaceted nature of disaster risks.

However, the analysis also suggests that information regarding **landslide disaster awareness is not frequently emphasised** in the posts, indicating a **potential gap in communication** that could leave the public less informed about this specific risk.

Numerical analysis

A quantitative analysis of social media engagement across the targeted social media pages before and after the registered disasters was explored. The focus is on understanding the volume of posts, user interactions (comments, reactions, shares), and engagement trends for each page and disaster event.

From the numerical data, it is possible to observe that the **TrondheimKommune** page (Municipality page) seems to have started posting disaster awareness information around the time of the last disaster. It might indicate a **proactive** communication that aims to prepare the audience for disaster awareness.

Although they have around 30 000 followers, it seems that they don't have much interaction from the users regarding these disaster awareness posts.

On the other hand, **Brannogredningstjenesten** page (Fire department page) seems to be more active on disaster awareness information over the years. Although with fewer followers than the Trondheimkommune page (22 000 followers), it seems they managed to have more engagement with the public. From the identified awareness posts, the average number of reactions per post was most of the time higher after a disaster had occurred than before the disaster. It might indicate an increased level of public concern and engagement with disaster-related content in the aftermath, reflecting heightened awareness and a greater sense of urgency among the audience. On the other hand, the number of posts shared have decreased, which could suggest that while the content resonates on a personal level, users may feel less compelled to distribute the information further, possibly due to saturation of similar content or a belief that the immediate need for widespread dissemination has passed.







KARSIYAKA CORE LAB



EXAMINING PRE- AND POST-HAZARD COMMUNICATION ON SOCIAL MEDIA: KARSIYAKA CASE STUDY

Identified Facebook public pages (by July 2024)

- Karşiyaka-Haber-Gazetesi News - 11 000 followers
- KarsiyakaBelediyesi
 Municipality 75 000 followers
- **Izmirltfaiyesi**Fire Department 4 100 followers



Registered disaster:

11 February 2021: **Flood** 30 May 2019: **Wildfire** 22 October 2018: **Flood**



Data and awareness analyses

For the analysis related to awareness, only the **IzmirItfaiyesi** page produced material that could be analyzed for disaster risk awareness. Other pages were lacking data or produced results that were not useful for those analyses.

The content of social media posts is analysed to assess the level of awareness related to the target disaster type. The analysis focuses on posts made during the **60 days leading up to the disaster and the 90 days following it**, examining whether they discuss topics relevant to the event. Engagement metrics of these posts, including the number of reactions, comments and shares, are also evaluated.



Given the limited number of pages available for this analysis, the results of this study are not fully conclusive and further investigation may be necessary to provide a more comprehensive understanding. The **challenges** encountered during this analysis, including the **high posting** frequency on news-oriented pages and limitations on collecting posts from earlier disasters, further constrained the scope of the evaluation.

The high volume of posts on news-oriented pages made it difficult to isolate relevant content related to the disasters, complicating the assessment of their disaster communication. Additionally, the inability to access posts from earlier disasters hindered the ability to draw comparisons and evaluate changes in communication strategies over time. These factors underscore the need for a more extensive and detailed examination to accurately assess the effectiveness of social media in disaster risk communication.

Considering the **Izmirltfaiyesi** page, the analysis of social media posts related to the flood disaster on 11 February 2021, provides some insights into the disaster risk communication efforts by the Izmir Fire Department. **Before the disaster**, the posts focused on **showcasing the department's readiness and preparedness**, highlighting their equipped organisation and trained personnel.

This proactive communication **emphasised the department's ability to respond effectively** to flood emergencies and underscored their commitment to emergency rescue interventions and continuous training.

After the disaster, the communication appeared to shift towards educational content, with posts focusing on training programmes for firefighters, community awareness through disaster training sessions and specific initiatives aimed at preparing village heads for future disasters, including floods. These post-disaster posts indicate a sustained effort to enhance community preparedness and resilience, reinforcing the importance of training and education in disaster response.

Although the posts before and after the flood disaster demonstrate a consistent focus on preparedness and training, the **analysis cannot compare these efforts to previous disasters due to the lack of available data for earlier events**.

This limitation prevents a thorough evaluation of whether the communication evolved in response to lessons learned from past disasters. Nonetheless, the Izmir Fire Department's approach, as observed in this analysis, suggests a **strong commitment to maintaining and improving disaster readiness through both proactive and reactive communication**.

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