

The role of the surveyor in Disaster Management

What is disaster management? Understanding risks, from prevention to mitigation and reconstruction

Florian LEBOURDAIS, France

Key words: Cadastre, Capacity building, Cartography, Coastal Zone Laser scanning Management, Digital cadastre, Engineering survey, Land management, Land readjustment, Risk management, Security of tenure, Spatial planning

1. INTRODUCTION:

The UN and Copernicus, the European Earth observation program, announced on Monday June 19 that Europe is warming twice as fast as the rest of the planet.

And the consequences of this warming are already visible. In the summers of 2022 and 2023, heat waves combined with low precipitation led to major forest fires across Europe and the Mediterranean region.

Added to this already alarming climatic picture was the return of war to Europe with Russian aggression in Ukraine, which began on February 24, 2022.

Last but not least, Europe remains a territory with a high seismic risk, as evidenced by the recent earthquakes in Croatia (2021) and Turkey (2022).

All specialists agree that the frequency and scale of these disasters will increase over the coming decades, due to climate change and the expected demographic explosion, particularly in those regions of the world most exposed to natural hazards.

While we cannot entirely avoid some of these disasters, we can prepare for them and cope with them.

Prevention efforts and coordinated responses to disasters save lives and reduce their impact on communities. Disaster management professionals, including surveyors, play a crucial role in preventing suffering, protecting people's livelihoods and helping communities recover.

What is disaster management? How land professionals such as surveyors contribute to disaster management - before, during and after disasters occur?

To answer these questions, the Ordre des géomètres-experts, in collaboration with the Council of European Geodetic Surveyors organised in Paris on November 9, 2023 the IXth European Surveyor's Conference dedicated to this thematic.

Disaster management requires a systemic approach to responsibilities and involves the strategic organization of tools, policies and resources to reduce the damage caused.

The Role of the Surveyor in Disaster Management What Is Disaster Management? Understanding Risks, from Prevention to Mitigation and Reconstruction (12427)
Florian Lebourdais (France)

FIG Working Week 2024

Your World, Our World: Resilient Environment and Sustainable Resource Management for all

Accra, Ghana, 19–24 May 2024

This approach was outlined and illustrated by several examples of know-how and best practice from European surveyors. The conclusions and findings of the conference have been published in the form of the 'Paris Declaration' which is the subject of this communication.

Mitigation and prevention efforts aim to reduce the potential damage and suffering that disasters can cause. While disaster management cannot prevent disasters, it can prevent them from worsening due to neglect of causal factors and manageable risks. Mitigation refers specifically to measures taken to reduce the severity of the impact of a disaster. Investing in measures that limit risk can significantly reduce its burden.



Strategies that disaster management professionals implement to protect vulnerable communities and limit risk include:

- installing and strengthening pre-© Denny Müller - Unsplash diction and warning systems ;
- raising awareness and educating decision-makers and the public about potential hazards and how to prepare properly for different types of disasters.

This may involve:

- encouraging the purchase of appropriate insurance to protect property and assets ;
- raising awareness of the need to create effective emergency plans;
- promoting the use of appropriate materials (fireproof, earthquake-proof, etc.) in buildings;
- advocate capital works initiatives, such as the construction and maintenance of dykes;
- create partnerships between sectors and agencies at federal, state and local levels to collaborate on mitigation projects.

2. DISASTER PREPAREDNESS

A well-coordinated response to disasters requires advance planning. This ensures rapid and effective interventions and limits duplication of effort.

Disaster preparedness plans must therefore:

- Identify organisational resources;
- Designate roles and responsibilities;

- Create procedures and public policies for disaster preparedness.

Anticipating the needs of communities affected by disasters improves the quality of response efforts. Building the capacity of volunteers, staff and disaster management teams to respond to disasters also makes response efforts more effective.

Plans may include emergency accommodation sites, evacuation routes or emergency energy and water sources.

They may also cover chains of command, training programmes, communications procedures, distribution of emergency supplies, stock requirements and contingency planning.

Emergency plans answer three fundamental questions: What is going to happen? What will be the response? What will be done in advance to prepare?

Case study 1: *Data production and sharing in times of crisis (anticipate, respond and analyse)*, by Elisabeth Leblanc & Jacques Désir, Partnership managers, National Institute of Geographic and Forest Information (France)

Case study 2: *Environmental assessment by the surveyor: a relevant tool for risk prevention and management*, by Michel Greuzat, OGE (France)

Case study 3: *The surveyor and forest fire risk prevention*, by Jean-Yves Mas, OGE (France)

Case study 4: *Earthquake and tsunami potential of Turkey and its vicinity: from historical records to the present*, by Prof. Dr, Haluk Özener, Director of the Kandilli Observatory and Earthquake Research Institute - Bogaziçi University (Turkey)

Case study 5: *Construction and urban development in flood-prone areas*, by Mr Etienne Saint-Aubin, OGE (France)

Case study 6: *3D scanning for heritage preservation and reconstruction: the example of the spire of Notre-Dame-de-Paris cathedral*, by Mr Denis Lachaud, OGE (France)

3. DISASTER RESPONSE

During and immediately after an emergency, disaster management focuses on immediate and short-term needs with the provision of aid and interventions that can save lives, preserve health (evacuations, search and rescue missions and emergency medical assistance) and protect buildings, animals and community property.

After an initial response, efforts shift to supporting communities as they rebuild emotionally, economically and physically after trauma. This involves longer-term efforts to restore housing, economies, infrastructure systems and the health of individuals and communities.

Case study 7: *Project #saveukrainianheritage: challenges, solutions and vision of preservation of monuments during the war*, by Mr Andriy Hryvnyak, Skeiron (Ukraine)

Case study 8: *Launching a unified Ukrainian immovable heritage database*, by Mr Yevhen Tonkopiadov, Director of the Department of Support and Coordination of Information Technologies, Ministry of Culture and Information Policy (Ukraine)

The Role of the Surveyor in Disaster Management What Is Disaster Management? Understanding Risks, from Prevention to Mitigation and Reconstruction (12427)
Florian Lebourdais (France)

FIG Working Week 2024

Your World, Our World: Resilient Environment and Sustainable Resource Management for all
Accra, Ghana, 19–24 May 2024

Case study 9: *Enabling applications in disaster management: the EU Space Programme*, by Ms Teresa Martinez Reche, European Union Agency for the Space Programme (EUSPA)

Case study 10: *The critical role of authoritative geospatial data in resilience*, by Mr Duncan Moss, Ordnance Survey (United Kingdom)

4. DISASTER RECOVERY

When a disaster strikes, the road to recovery can seem overwhelming. In the midst of chaos, geodetic surveyors emerge as invaluable assets, playing a crucial role in the process of disaster recovery. With their specialised knowledge and skills, these professionals contribute significantly to assessing damage, ensuring safe rebuilding, and fostering long-term resilience in affected areas.

Assessing Damage and Safety:

Geodetic surveyors are instrumental in assessing the extent of damage caused by disasters. They conduct detailed surveys to determine the condition of land, structures, and infrastructure, identifying potential risks and hazards. By thoroughly examining the aftermath, surveyors provide vital information that helps authorities prioritise resources and make informed decisions regarding the safety of rebuilding efforts.

Reconstruction Planning and Compliance:

After a disaster, land surveyors assist in the planning and execution of reconstruction projects. They analyse the topography, soil stability, and drainage patterns to develop efficient and safe rebuilding strategies. By ensuring compliance with building codes and regulations, surveyors help prevent future disasters and promote resilience in the face of potential hazards.

Property Boundary Identification:

In disaster-affected areas, property boundaries can become obscured or destroyed, leading to disputes during recovery and rebuilding efforts. Land surveyors play a critical role in identifying and re-establishing accurate property boundaries. Their expertise in boundary surveying ensures that property ownership is correctly determined, resolving conflicts and facilitating a smooth recovery process.



© Scott Blake - Unsplash

Insurance Claims and Documentation:

The Role of the Surveyor in Disaster Management What Is Disaster Management? Understanding Risks, from Prevention to Mitigation and Reconstruction (12427)
Florian Lebourdais (France)

FIG Working Week 2024

Your World, Our World: Resilient Environment and Sustainable Resource Management for all
Accra, Ghana, 19–24 May 2024

Land surveyors are also instrumental in the insurance claims process. By conducting pre-disaster surveys and documenting the condition of properties, surveyors provide crucial evidence for insurance companies. Their accurate assessments of damage enable affected individuals and businesses to receive fair compensation, aiding in the recovery and rebuilding process.

In the aftermath of a disaster, land surveyors serve as indispensable professionals, contributing their expertise to various aspects of disaster recovery. Their role encompasses assessing damage, ensuring safe rebuilding, resolving property boundary issues, and supporting insurance claims. By leveraging their knowledge and skills, land surveyors play a pivotal role in fostering resilient communities, helping affected areas recover, and paving the way for a brighter future. Their commitment to accuracy and safety is a testament to their vital contribution in times of crisis.

Case study 11: *Technical and Humanitarian Studies of Surveyors after the 6 February Earthquakes in Turkey*, by Mr Ali Ipek, President of the Turkish Chamber of Survey and Cadastre Engineers (Turkey)

Case study 12: *Data centre disaster recovery following the earthquake and new products for the prevention of natural disasters*, by Mr Ilija Grgic, Croatian State Geodetic Administration (Croatia)

Case study 13: *How surveyors prepare for reconstruction during an ongoing conflict – the necessity of Utility Cadastre*, by Mr Martin Hrdlička and Mr Ondřej Hrdlička, Czech Association of Entrepreneurs in Geomatics (Czech Republic)

5. CONCLUSION:

Catastrophic events and disasters worldwide in 2022 resulted in the loss of 30,704 lives and affected 185 million individuals with economic losses totalled around US\$ 223.8 billion.

As a result, developing the data, tools, processes, frameworks, and best practice to manage natural disasters more effectively is becoming an increasingly urgent global priority. The geodetic profession provides knowledge and skills that can certainly contribute disaster prevention and remediation.

To be useful and effective, we need to adapt our knowledge and skills to the requirements of the disaster management process and to prepare ‘disaster management ready’ solutions and ways of working.

The Conference that was held in Paris on 9th November 2023 brought together surveyors, geospatial experts, and subject matter experts from across the public, private, and academic sectors to share experience and best practice and to consider the increasingly important role that geodetic surveyors should play both now and in the future in the field of disaster management.

The Conference concluded and acknowledged that:

- Disasters, whether natural or man-made, have become more frequent, more severe, and more widespread in recent years, affecting more people than ever before.
- The reasons can vary, and include climate change, population pressure, and direct or indirect human action.
- The range of threats and disasters is constantly evolving and increasing for example the increasing range of technological risks.
- That we are now experiencing a permacrisis.
- Disaster management is a multi-disciplinary activity involving a variety of actors and professions from the public, private, voluntary, and academic sectors.
- Geodetic surveying, geospatial data, and applications are increasingly critical to disaster preparedness, response, recovery, and reconstruction.
- What our profession can offer in this field needs to be more widely understood.

European Geodetic Surveyors proclaimed a ‘Paris Declaration’ and the commitment of our profession to make a positive difference to disaster management across Europe.

We commit ourselves to:

- Continue to support our members in disaster response and reconstruction across Europe.
- Showcase how our profession can help to solve real-world problems.
- Promote the role of surveyors in the acquisition and management of high-resolution spatial data relating to cultural heritage to support preservation and reconstruction.
- Support continuing professional development relating to the application of our profession to disaster management.
- Encourage all European surveyors, especially young surveyors, to develop skills, domain expertise, and tradecraft to support effective disaster management.
- Embrace innovation and technological developments to improve disaster management.
- Invite law and decision makers to enact legislation that promotes and enforces the use of geospatial data, products, and services for disaster prevention and disaster management.
- Cooperate with kindred surveying bodies such as FIG and the Forum of Regional Bodies.
- Monitor the actions of intergovernmental bodies to understand how we can contribute to and align with their initiatives.
- Act in the public interest, to promote resilience for all European citizens and continue to support the UN-Sustainable Development Goals.