Science Advice for Policy by European Academies

European Commission's Scientific Advice Mechanism

Scientific advice on the topic

'The role and use of artificial intelligence for emergency and crisis management'

Call for nominations for an expert workshop

29 July 2025

Dear Euro-CASE member academies,

SAPEA invites nominations for experts to participate in an **online workshop** on the topic of "**The role and use of artificial intelligence for crisis management", on the 6th of October 2025 from 10:00 to 13:00 CET.** The results will feed into a rapid evidence-synthesis report requested by the European Commission's Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO).

The aim of the workshop is to inform the development of an evidence-synthesis report on the use of artificial intelligence for crisis management, forming part of a short-term science advice process led by SAPEA. The outcomes of the workshop will inform the work of a small Working Group of independent experts who are drafting the report to be submitted to DG ECHO by the end of October 2025. The report will be published by the end of November 2025. The experts invited to the workshop will provide feedback on an initial draft report and contribute with further evidence. The report will inform policy developments in the European Commission, and inform DG ECHO's position at the next meeting of the UN Global Initiative on Resilience to Natural Hazards through AI Solutions, to be hosted by DG ECHO in Brussels.

SAPEA offers your Academy the opportunity to highlight its expertise and play an active role in shaping evidence-based policymaking at the European level. We therefore warmly welcome and rely on your support through the nomination of experts for this workshop.

For detailed information about the scope of the topic and the relevant expertise, please see Annexes 1 and 2 below.

Nominations are welcomed from across all relevant fields and sectors. We encourage the inclusion of female researchers, early- and mid-career researchers as well as experts from widening countries.

You can nominate Fellows and Members of your academy, as well as experts who are not Fellows or Members of your academy.

Please send your nominations to nominations@sapea.info by **15 August 2025**. Nominations should please include the following:

- A CV of the nominee and/or a link to their online profile
- A short statement of expertise relevant to the topic
- If possible, whether the nominee is available to participate in a 3-hour online workshop on 6 October 2025, from 10:00 to 13:00 CET.

Invited experts will receive a draft report at least a week before the meeting.

Participation in the workshop is on a voluntary basis. Experts will be required to complete a self-declaration of interests form. If you have questions or would like further information, please email nominations@sapea.info.

Thank you very much in advance for your support, and we look forward to hearing from you,

Professor Stefan Constantinescu

Chair of the SAPEA Board

Annex 1. Expertise sought and selection process

Non-exhaustive areas of expertise that are of relevance are provided below. Given that this assignment sits at the intersection of crisis management and AI, all nominees are expected to engage in interdisciplinary discussions.

Applied knowledge in crisis contexts will be key.

Crisis management and the Use of AI

Expertise in disaster and crisis management, detection, and response, including the use, governance or regulation of AI technologies (generative AI, machine learning, etc.). This can include specific hazards (floods, earthquakes etc) or technologies (early warning systems, anticipatory action, damage detection, chatbots)

Example of relevant disciplines: Crisis management, Disaster risk reduction, Disaster Studies, Geography

Remote Sensing for Crisis and Disaster Contexts

Expertise in analysis of satellite or aerial imagery for crisis and disasters, especially with a focus on using Copernicus data. This can include early warning systems or damage detection and anticipatory action for different hazards

Example of relevant disciplines: remote sensing, computer vision

AI Technologies and data sciences in crisis contexts
Expertise in artificial intelligence technologies, including machine learning, generative AI, Agentic AI, and other artificial intelligence technologies, with a focus on their application to crisis preparedness, detection, response, and recovery.

Example of relevant disciplines: Computer Science, Data Science, Artificial Intelligence, Engineering

Governance and Policy of AI in Crisis Management
Knowledge of institutional frameworks, ethical considerations, risk management, and EU/national governance mechanisms for the responsible design and use of AI during crises. Understanding the implications of AI in crises, ranging from social to environmental impacts. Familiarity with AI Act, GDPR, and broader digital governance frameworks in Europe.

Example of relevant disciplines: Public Policy, Political Science, Science and Technology Studies (STS), AI Ethics

Legal and Regulatory Aspects of AI in Crises
Expertise in data protection, liability, human rights, and legal frameworks regulating the development and use of AI in crises and disasters.
Example of relevant disciplines: Law, International Law, Technology Law, Human Rights Law

Social and Behavioural Dimensions of AI in Crisis Situations
Social scientists with expertise in how AI influences human behaviour, decision-making, trust, and societal dynamics during crises (e.g., risk perception, public compliance, misinformation, human-AI interaction).

Example of relevant disciplines: Sociology, Psychology, Anthropology, Human Geography

AI-Driven Information and Communication in Crises

Expertise in how different types of AI, especially agentic AI and (chat)bots as well as generative AI, shape crisis and risk communication, public messaging, early warning systems, and information flows before, during, and across different phases of crisis management.

Example of relevant disciplines: Communication Studies, Media Studies, Information Science, Computational Social Science

SAPEA staff, along with the Chair of the small Working Group, will be responsible for proposing the composition of the expert workshop participants to the SAPEA Board based on the nominations. Criteria for the selection of members include the following:

- Demonstrated excellence in one or more of the fields listed above
- Interdisciplinarity, all relevant disciplines should be included (see indicative list of expertise)
- Wide geographical coverage of Europe including Widening Countries[1]
- Participation of underrepresented gender in SAPEA Working Groups of at least 40%
- Inclusion of early- and mid-career researchers

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[1] According to the Horizon Europe regulation the Widening Countries are: Bulgaria, Croatia, Cyprus, Czech republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, Slovenia and all associated countries with equivalent characteristics in terms of R&I performance and the Outermost Regions.

Annex 2. Specifications of work

This document is internal and confidential, please do not share it widely and in the public domain.

Specifications of work: Scientific Input Paper on

'The role and use of artificial intelligence for emergency and crisis management'

This document explains the rationale behind the request, specifies the evidence needed, defines the type of scientific product required, and frames the questions for the Scientific Advice Mechanism (SAM) to address. It is the outcome of the discussion between DG ECHO and the SAM. It is based on a Background Note drafted by DG ECHO and on the outcomes of a 3-day workshop organised by DG ECHO and held in Brussels on 16-18 June 2025.

1. **Background to the request**

There are many ongoing discussions on how to use AI in emergency and crisis management at both national and European levels. AI is rapidly changing the way that data is collected, analysed and processed. This rapid development of AI has led to a sprawling number of applications and scientific publications in the area of emergency and crisis management. However, literature reviews and evidence-synthesis on the application of AI in crisis management field are limited and fragmented for different hazards or AI technologies.

Currently, the use of AI technologies for analytical purposes and for early warning services in the Emergency Response Coordination Centre (ERCC) is limited. There are discussions to include AI technologies to assist visualisation efforts and facilitate and compile reports in the Global Situation System (GSS). The use of AI within Copernicus Emergency Management Services (CEMS) for drought assessment, and for decision support for wildfires emergency is also being explored. Developments of ongoing initiatives and projects exploring the use of AI for weather forecast models, impact assessments, response operations etc, are also being closely followed. First results from the development of these technologies are expected to be available soon.

Given the recent developments and the plethora of tools, there is a need to **synthesise the evidence on AI performance across different crisis management tasks**; to survey current frameworks for assessing AI capabilities based on different applications; **and outline lessons learned about the current reliability and maturity of such applications** in view of experience from real-world implementation.

The rapid evolution of AI coincides with the major EU regulations on AI and data, such as the AI Act and the General Data Protection Regulation (GDPR), creating both opportunities and constraints for crisis management applications. This regulatory context, combined with the high-stakes nature of emergency and crisis management response, require a careful, evidence-based approach to AI adoption.

The ERCC is therefore requesting the SAM to deliver an evidence-synthesis report that consolidates current knowledge on AI applications in crisis management and provides frameworks for understanding their capabilities and limitations based on existing literature. This can inform how to advance the integration and use of AI in emergency and crisis management, both for the ERCC and, more generally, for crises centres in Europe.

2. **Scope**

This evidence-synthesis report aims to provide a broad overview of current knowledge regarding AI applications for crisis management, **with a focus on preparedness and response**, that are relevant for the ERCC's operations.

The report will examine documented applications of AI, develop conceptual frameworks for categorising and analysing the impact of AI based on the available evidence, and identify lessons learned in reported experiences across different applications. The report will consolidate findings from academic and grey literature to provide an overview of the current state of the art.

The context of this work is **focused on Europe**, both in terms of hazard as well as for the regulatory context (e.g., AI Act, GDPR), but **will integrate evidence from international applications where relevant.**

The hazard scope includes natural hazards and may extend to Chemical, Biological, Radiological, and Nuclear (CBRN) risks where evidence exists.

3. **Questions to be addressed**

Main questions

> *Based on the evidence, what are the characteristics, opportunities and risks associated with the use of artificial intelligence in crisis preparedness and response? According to the literature, how can these risks be mitigated?*

This question will require a combination **of crisis management and computational / AI expertise, with behavioural, governance, environmental, ethics and legal research**.

The report should particularly address the following points:

1) **Definition and framing of the emerging topic of AI for emergency & crisis management**

   - Establish conceptual boundaries and develop a taxonomy for AI in crisis management practice

   - Define different AI tools and families of tools in a way that is short and accessible to non-expert audiences; list basic requirements for AI use in crisis management contexts. This should cover, for example:

     o Rule-based systems vs. machine learning approaches

     o Predictive models vs. pattern recognition

     o Decision support tools vs. autonomous systems

     o Large language models and generative AI

   - Map out requirements for AI tools to be used in the preparedness and response phases of crisis management, broken down by tasks (e.g., collection, sharing, analysis, reporting, decision-making);

   - Highlight evidence and knowledge gaps in the current use of AI in the different crisis management phases.

2) **Using AI for crisis management: challenges and potential ways forward**

- Legal requirements, with particular attention to the AI Act as a comprehensive legal framework.

- Governance challenges, especially those relevant to public–private partnerships in the EU context.

- User uptake challenges, including trust dilemmas, explainability and human-AI teaming

- Data-preparedness related challenges, including access (before and during crises), quality standards, availability, and interoperability issues.

- AI safety

- Environmental impacts (incl. emissions) of the use and deployment of AI as a trade-off

3) P**erformance of AI in different tasks related to crisis preparedness and response**, especially for: **(a) Monitoring, predicting and anticipating; (b) Assessing and reporting; (c) Decision-making**

- Compare AI capacity and capability to human-driven processes across dimensions such as accuracy, reliability, speed, and adaptability (using HABA/MABA frameworks); include coverage of hybrid intelligence (human–AI interaction) for the different phases of crisis management, especially preparedness and response.

- Based on the requirements for AI in crisis management and the capabilities, identify tasks where AI is not currently used or is not (yet) applicable.

- Provide examples from other sectors to illustrate potential applications that could be mapped across disaster risk management.

4) **Case studies**

- Illustrate the potential use of AI (and its limitations) through case studies (to be defined in discussions with ECHO) in specific crisis management tasks or types of disasters (e.g. wildfires, floods, storms, droughts).

- Compile a (non-exhaustive) list of types of tools that have shown their applicability and/or that are promising for future use (incl. stage of development/TRL and examples of past use cases).

5) **Evidence-based conclusions**

- Summarise key findings from the synthesis in the form of clear, actionable, and evidence-based conclusions.

This list of areas to be covered serves as guidance for the Working Group, which may choose to address these topics through alternative approaches.

4. **Process**

The SAM will set up a small interdisciplinary Working Group – composed of independent experts - who will develop a synthetic evidence-based report to answer DG ECHO's request. The Working Group will draft the report based on their knowledge in the field, literature reviews, and an expert's workshop to be held tentatively in September. The paper will not be peer-reviewed, and the experts' workshop will also act as a review step in the process, for wider expert validation.

A first draft report is expected in September 2025, with a reviewed and final version ready by end November 2025, in time for the next meeting of the UN Global Initiative on Resilience to Natural Hazards through AI Solutions, to be hosted by DG ECHO (B3) in Brussels.