Driving Innovation in Crisis Management for European Resilience

SUMMARY OF TRIAL 4, THE HAGUE, NETHERLANDS

21-23 MAY 2019

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The DRIVER+ project

Current and future challenges, due to increasingly severe consequences of natural disasters and terrorist threats, require the development and uptake of innovative solutions that are addressing the operational needs of practitioners dealing with Crisis Management. DRIVER+ (Driving Innovation in Crisis Management for European Resilience) is a FP7 Crisis Management demonstration project aiming at improving the way capability development and innovation management is tackled. DRIVER+ has three main objectives:

1. Develop a pan-European Test-bed for Crisis Management capability development:
    a. Develop a common guidance methodology and tool, supporting Trials and the gathering of lessons learnt.
    b. Develop an infrastructure to create relevant environments, for enabling the trialling of new solutions and to explore and share Crisis Management capabilities.
    c. Run Trials in order to assess the value of solutions addressing specific needs using guidance and infrastructure.
    d. Ensure the sustainability of the pan-European Test-bed.
2. Develop a well-balanced comprehensive Portfolio of Crisis Management Solutions:
    e. Facilitate the usage of the Portfolio of Solutions.
    f. Ensure the sustainability of the Portfolio of Solutions.
3. Facilitate a shared understanding of Crisis Management across Europe:
    a. Establish a common background.
    b. Cooperate with external partners in joint Trials.
    c. Disseminate project results.

In order to achieve these objectives, five Subprojects (SPs) have been established. **SP91 *Project Management*** is devoted to consortium level project management, and it is also in charge of the alignment of DRIVER+ with external initiatives on Crisis Management for the benefit of DRIVER+ and its stakeholders. In DRIVER+, all activities related to Societal Impact Assessment are part of **SP91** as well. **SP92 *Test-bed*** will deliver a guidance methodology and guidance tool supporting the design, conduct and analysis of Trials and will develop a reference implementation of the Test-bed. It will also create the scenario simulation capability to support execution of the Trials. **SP93 *Solutions*** will deliver the Portfolio of Solutions which is a database driven web site that documents all the available DRIVER+ solutions, as well as solutions from external organisations. Adapting solutions to fit the needs addressed in Trials will be done in **SP93**. **SP94 *Trials*** will organize four series of Trials as well as the Final Demo (FD). **SP95 *Impact, Engagement and Sustainability***, is in charge of communication and dissemination, and also addresses issues related to improving sustainability, market aspects of solutions, and standardisation.

The DRIVER+ Trials and the Final Demonstration will benefit from the DRIVER+ Test-bed, providing the technological infrastructure, the necessary supporting methodology and adequate support tools to prepare, conduct and evaluate the Trials. All results from the Trials will be stored and made available in the Portfolio of Solutions, being a central platform to present innovative solutions from consortium partners and third parties, and to share experiences and best practices with respect to their application. In order to enhance the current European cooperation framework within the Crisis Management domain and to facilitate a shared understanding of Crisis Management across Europe, DRIVER+ will carry out a wide range of activities. Most important will be to build and structure a dedicated Community of Practice in Crisis Management, thereby connecting and fostering the exchange of lessons learnt and best practices between Crisis Management practitioners as well as technological solution providers.

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1. Background

A Trial is an organised and systematic process of searching for innovation in Crisis Management. This process is to be prepared, executed and evaluated in line with the **Trial Guidance Methodology (TGM)** with support of the **Test-bed Technical Infrastructure (TTI)** and the **Trial Guidance Tool (TGT).** These three elements are designed in order to assist a Trial Owner to realize this challenge in a way which provides a realistic environment for testing innovative solutions.

A Trial should be tailored for finding innovations that show potential to limit or cover identified Crisis Management Gaps related to Crisis Management Functions. However, to achieve this ambitious goal in a manner which enables relevant and representative results, it is important to organise a Trial in conditions as realistic as possible in order to minimise research biases. The TGM, as a systematic and research-based method, assists Trial Owners in this challenge. Further, the TTI facilitates creating a realistic set-up for that purpose. A Trial Owner is also actively supported by a Trial Committee including the Trial Host who is, in case of all the Trials, a crisis management institution. The Trial Committee is a Trial organisational body which consists of experts supporting the TGM and Test-bed infrastructure implementation, coordination of solution providers and practitioners. The Trial Committee is permanently working with the Trial Owner through the entire process of the Trial organisation.

Therefore, a Trial aims to actively involve Crisis Management practitioners in the search for innovation which meets their expectations. Gaps are revealed and defined by them on the basis of their experiences and problems they face in the realisation of their missions. These expectations and gaps are to be met and covered (partially or completely) by solution providers who address them with their solutions. By the inclusive approach of the DRIVER+ Trial organization it is possible to reach out to external organisations (solution providers and CM practitioners) to enhance external cooperation and shared understanding. Broad involvement of these two groups at a relatively early stage of a Trial organization facilitates building a common platform. Furthermore, it enhances the understanding between those groups, which provides positive prospects for fulfilling their expectations, as well as achieving the main aim, to find and adopt innovation in Crisis Management.

It is important to underline that the briefly described process of the Trial implementation during the project period is being done in order to test, verify and improve the project outputs, i.e. the TGM, the TTI and the TGT. This will assist to make it ready for an effective and sustainable utilization after the project's end. Building, testing and maintaining this concept beyond the project will create a universal solution for assessing innovative solutions for Crisis Management that is both practitioner driven and research-based.

From **21 to 23 May 2019**, the fourth Trial organized as part of the DRIVER+ project (Trial 4) took place in The Hague, the Netherlands, at the Safety Region Haaglanden (SRH). The organisation of the Trial was a shared responsibility between the Trial Owner (DLR) and the Trial Host (SRH). This event involved 140 persons from 13 countries. The majority of the organisational staff naturally represented the hosting country – the Netherlands. Since the scenario was performed on all three levels of the Dutch national emergency response system, including a request for international assistance, there was a broad representation of Dutch practitioners who represented 10 different emergency action centres/crisis teams of the Netherlands. However, there was significant contribution from other states like Germany and Poland reflecting the trans-European network and cooperation within the DRIVER+ project.

The **general purpose** of Trial 4 was to improve cooperation and coordination among agencies and organisations during severe flooding, using innovative solutions providing support in handling large scale and long-term crises.

Figure 1.1: Multi-disciplinary participants of Trial "The Netherlands"

2. Context

This section presents the practitioners' needs (gaps) which the selected solutions aimed to address, the research questions guiding the Trial overall process, as well as the scenario on which the Trial realisation is based.

2.1 Crisis Management Gaps

In DRIVER+, a capability gap is understood to be "the difference between a current capability and the capability considered necessary for the adequate performance of one or more disaster management tasks."[1] The three 'high priority' Crisis Management capability gaps proposed by Trial 4 practitioners is presented below:

- Gap 1: Limitations in the planning of resources (qualified personnel and equipment) for response during large scale and long-term crisis.
- Gap 2: Shortcomings in the ability to exchange crisis-related information among [emergency management] agencies and [consulted] organisations (also related to as interoperability).
- Gap 3: Shortcomings in planning and managing the side effects of large-scale evacuation of population in urban areas.

All these gaps have been discussed and validated during the DRIVER+ gaps assessment workshop[2] in January 2018 and subsequently prioritized by the Trial 4 Committee.

2.2 Main Research Questions

The main research questions driving the Trial 4 process are the following:

I. How can simulation tools improve resource planning activities in large scale and long-term disaster operations?
II. How can net-centric data exchange improve information sharing between relevant parties and thus improve the shared understanding of the current situation?
III. How can simulation tools support the planning and management of a large-scale evacuation under consideration of real-time traffic information?

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[1] ECORYS and TNO for European Commission DG HOME. First Responders - Identifying capability gaps and corresponding technology requirements in the EU. January 2016.

[2] DRIVER+ Project. D922.11 List of CM gaps. March 2018 (https://www.driver-project.eu/wp-content/uploads/2018/08/DRIVERPLUS_D922.11_List-of-CM-gaps.pdf)

2.3 Scenario outline

The scenario of Trial 4 dealt with an extreme high tide at the coast, coinciding with an expected storm. On top of that a moderate probability of technical failure of the shipping lock at Scheveningen was given. The initial scenario reads as follows: A potential breach of the coastal defences at Scheveningen may result in the flooding of large areas of The Hague (with water depths up to 2 meters). Especially the area of The Hague city centre is threatened (Figure 2.1). In case the event occurs, thousands of people are at risk of being trapped, including expected loss of life. Thus, the predicted flood requires decisions on evacuation needs for inhabitants of the threatened area. The water inflow will further affect the vital infrastructure and result in loss of power, drinking water and heating (the event occurs in the winter) in the area. Traffic, whether it be cars, buses or trains, struggles with difficulties due to flooded roads, debris and disappeared manhole covers. In order to keep the number of casualties at a minimum, one should pay attention to the emergency supply for an efficient evacuation process of the population before, during and after the disaster.

Trial 4 was prepared and executed as a table-top (in-door) event based on a scenario run in a simulated environment created in the TTI. Actions were taken by the participants in a realistic information environment, based on currently available legacy tools and means, crisis management plans, rescue procedures and good practices of the Trial practitioners. In Trial 4 the focus was on coordinating the flood (threat) by SRH only.

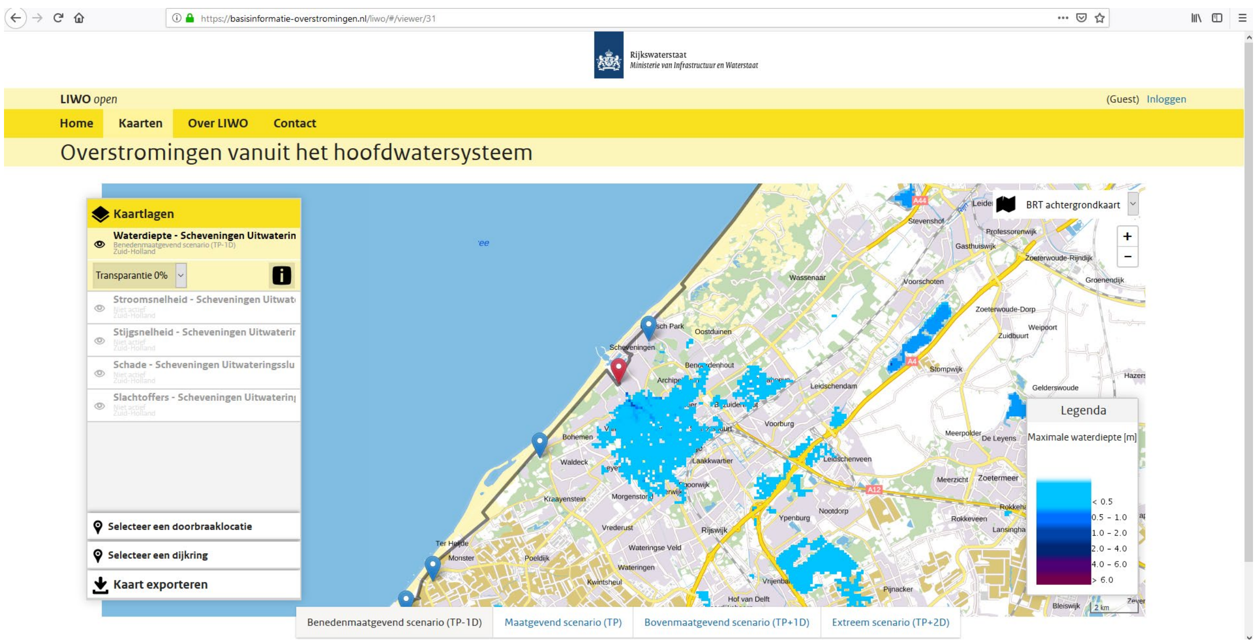

Figure 2.1: Visualisation of the flood in baseline scenario[3]

The Trial 4 scenario was divided in two phases:

- Threat phase: there is a serious threat of flooding due to the severe meteorological circumstances;
- Impact phase: the flooding occurs and an appeal is made for additional (international) emergency response.

Each of the phases consisted of two blocks (see Table 1).

[3] https://basisinformatie-overstromingen.nl

Table 1: Trial setup

Day	Phase	Block	Trial time at start of the block	Focus	Objective
1	Threat	1	31 hours before the expected dike breach	Situational awareness and determining the cascading effects of possible flooding	Assessment of The Hague city centre
		2	28 hours before the expected dike breach	Formulate mitigating measures, with focus on evacuation	Formulate two evacuation strategies, define actions/measures to mitigate effects of possible flooding
2	Impact	3	16 hours after the dike has breached	Damage assessment	Assessment of damage in the flooded area (The Hague city centre) and mitigation measures
		4	16 hours after the dike breach	Damage control and recovery	Answering questions of International Organisations, planning police personnel, mitigating measures

3. Solutions

After passing the Call for Application and the selection process, the Dry Run 1 and Dry Run 2, the following five solutions were implemented in Trial 4. Three of them (CrisisSuite, 3Di and SIM-CI) were provided by non-DRIVER+ partner companies while the other two (Airborne and Terrestrial Situational Awareness and HumLogSim) were from project partners.

CrisisSuite (provided by Merlin Software B.V., the Netherlands), performing the following main functions:

- Establish information exchange to provide a Common Operational Picture to supporting crisis teams without access to the legacy system of crisis management professionals.
- Log sitreps, decision and actions.

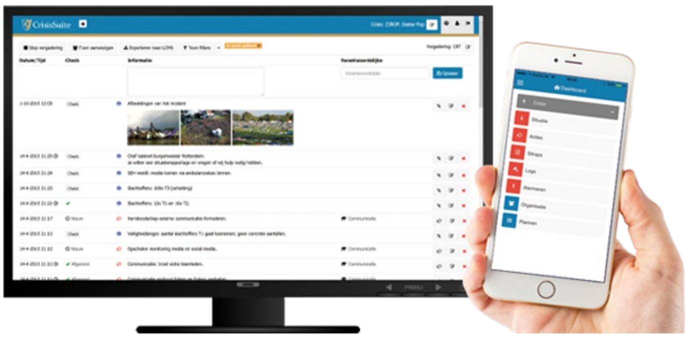

Figure 3.1: CrisisSuite

3Di (provided by Nelen & Schuurmans, the Netherlands), performing the following main functions:

- Provision of a flood prediction in the threat phase and update of this prediction based on actual water level in the impact phase.
- Calculate effects of mitigation measures (pumps, barriers).

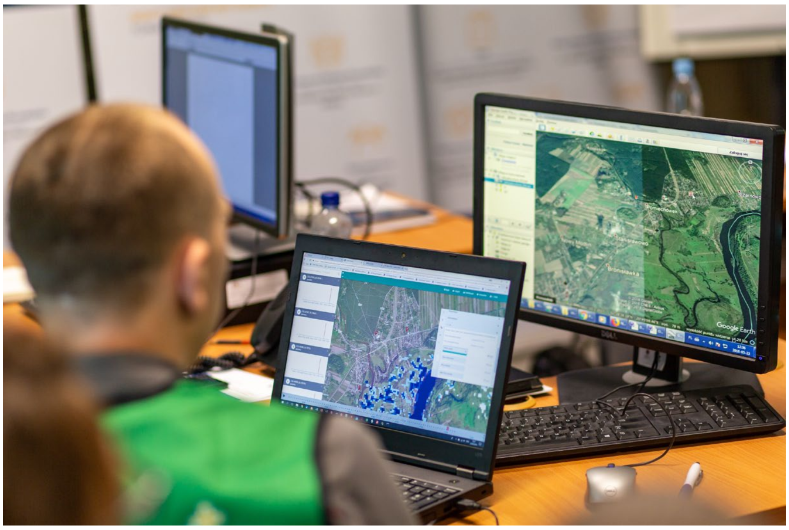

Figure 3.2: 3Di

SIM-CI (provided by SIM-CI, the Netherlands), performing the following main function:

- Prediction of cascading effects on critical infrastructure (power, telecommunication and public transport).

Figure 3.3: SIM-CI

Airborne and Terrestrial Situational Awareness (ATSA; components *KeepOperational* and *ZKI*, provided by DLR, Germany), performing the following main functions:

- Overview of actual flood state based on aerial images.
- Route calculations that avoid the flooded area.
- Provision of damage assessment maps in 2D and 3D based on the derived inundated area.

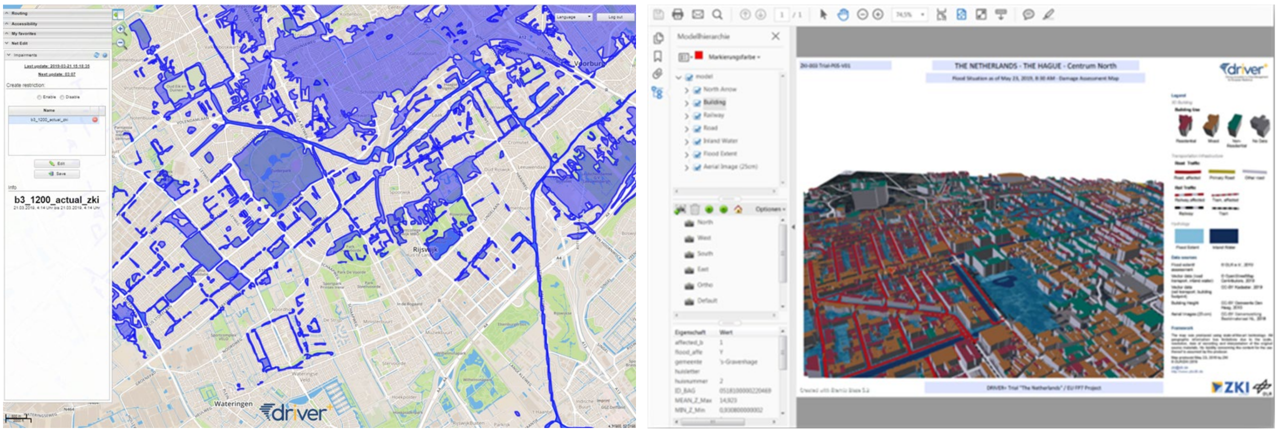

Figure 3.4: Airborne and Terrestrial Situational Awareness comprised of modules KeepOperational (left) and ZKI (right)

HumLog (provided by WWU, Germany), performing the following main functions:

- Create an evacuation plan for neighbourhoods, hospitals, etc.
- Calculate organisational logistics (esp. planning of personnel).

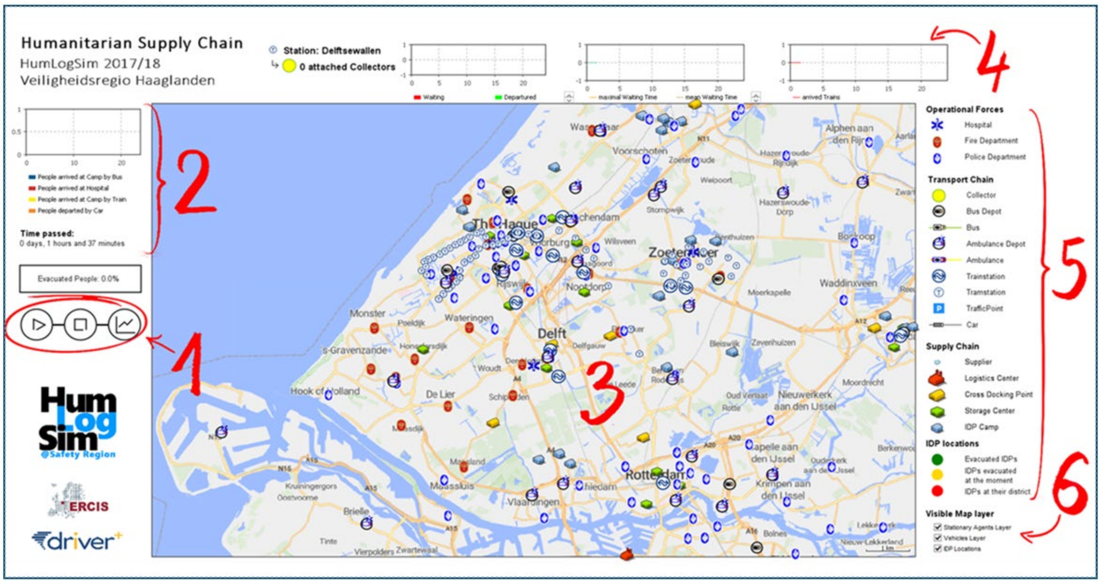

Figure 3.5: HumLog
(1: control buttons; 2: general overview; 3: map; 4: key values of an agent; 5: legend; 6: map options)

4. Results

The results are structured along three dimensions: the Trial dimension, the solution dimension and the Crisis Management dimension. The **Trial dimension** relates to the Trial organisation: everything that has to do with the Trial run in very "hands-on" manner is part of this dimension. The **solution dimension** tackles all functionalities as well as the usability of each solution that is trialled. The most important dimension is the **Crisis Management dimension**, because this is looking at the potential impact a solution has on the selected CM gaps.

4.1 Trial Dimension

The major outcomes related to the Trial dimension confirm that the participants' number, background and commitment supported the Trial adequately. The scenario and the simulated environment were deemed realistic enough for the practitioners' immersion. Attendees of Trial 4 agreed that they were satisfied with its organisation and would recommend participating in DRIVER+ Trials to others. However the results also show room for improvement with respect to the technical set-up, the training and the scenario building. The complete Test-bed Technical Infrastructure was running without any problems throughout the complete Trial run.

4.2Solution dimension

The objective of this evaluation in the solution dimension is, for each innovative solution, to provide a detailed answer to the question "Does the selected solution fulfil the expected functions during the Trial?" In order to focus strictly on the gaps selected for Trial 4, not all of the solutions' functionalities were evaluated.

3Di was primary used in the threat phase and significantly facilitated the situational awareness of the practitioners. The flood prediction gave detailed information on the extent and depth of the flooding. 3Di provided quick simulations of the possible flood extent, based on the actual information available. It supported decision making especially through the calculated effects of proposed mitigating measures.

ATSA, module KeepOperational was useful to substantiate traffic circulations plans made by the action centre of Police and was able to cope with blockages. It provided useful input to HumLog. **ATSA, module ZKI** is only for the impact phase, but provided an objective and accepted (by the practitioners) flood extent for dealing with the flood. The practitioners lacked however, information on the water depth. The interactive damage assessment maps provided in the last scenario block were hardly used, mainly because handling of the PDF's was considered difficult by the practitioners in order to complete given task.

CrisisSuite fully covered the gap associated with information exchange between action centres and supporting organizations. Practitioners considered the solution as a valuable support in multi-agency communication.

HumLog has provided objective quantification of the effects of an evacuation strategy, improving decision making, closing to a large extent the gap in planning and management of large scale evacuation. The solution was helpful for resource management, regarding evacuation, herewith partly closing the gap on long-term resource management.

SIM-CI added to the situational awareness of the practitioners, especially since it objectively quantified possible cascade-effects of flooding. Effective handling of SIM-CI takes more training, but is a valuable addition to assessing the flood threat.

Overall, the innovative solutions provided the expected functions. All five trialled solutions significantly improved situational awareness of the practitioners, supported decision making, information exchange and the resource management processes. Additionally, the Trial provided useful and practical feedback to solution providers to further improve their solutions, especially to enhance maturity levels for being fully implemented operationally.

4.3 Crisis Management dimension

The main outcomes in the Crisis Management dimension are that the trialled solutions contributed to closing Gap 1 '*Limitations in the planning of resources for response during large scale and long-term crisis*' and partially closing Gap 2 '*Shortcomings in the ability to exchange crisis-related information among agencies and organisations*' and Gap 3 '*Shortcomings in planning and managing the side effects of large-scale evacuation of population in urban areas*'. These observations are limited to the Trial specific conditions.

In a crisis situation where the Safety Region involves external organisations, **information sharing** is an important aspect. Internally, the Safety Region uses the legacy system LCMS which is fine for their needs, but is – for non-technical reasons – a closed and restricted information system. Closing the Gap 2 on (net-centric) information sharing proved to be feasible with usage of CrisisSuite during Trial 4. The experiences in the Trial even led to initiatives to formally connect both solutions (LCMS and CrisisSuite).

The other solutions added significantly to the **situational awareness**, providing the practitioners with a more accurate and more detailed insight in the (potential) consequences of flooding. 3Di provided accurate predictions on flooding for the threat phase, while ATSA, module ZKI provided objective flood information in the impact phase. ATSA, module KeepOperational facilitated the traffic circulation plan, and HumLog provided insights into the feasibility of proposed evacuation strategies. Particularly SIM-CI provided new **insights in the cascade-effects of flooding** enabling the Safety Region to quantify these effects.

The gap concerning **long-term resources planning** (Gap 1) was only partly closed in Trial 4: the focus on overall resource management was redirected to resource planning in respect to support evacuation execution, using HumLog.

The gap regarding **evacuation planning** (Gap 3) was closed using ATSA, module KeepOperational to determine effective evacuation routes together with HumLog, substantiating the proposed evacuation strategies.

4.4 Answers to the research questions

I. How can simulation tools improve resource planning activities in large scale and long-term disaster operations?

By monitoring available resources and in parallel illustrating how the threat (e.g. a flood) evolves, solutions in the Trial could report the need for specialized equipment better than without solution support. Solutions also facilitated the organisation of action logistics, e.g. the commander of action knows his assets and resources, proved potential to provide detailed information on the flood forecast and substantiation of the effects of mitigating measures (like emergency dikes or pumps), and proved the possibility to support in decision making about the deployment of human resources and equipment.

Furthermore, solutions proved potential of providing a traffic management plan on best routes available in case of a crisis, optimizing these routes with respect to the protective measures, and demonstrated possibilities such as determining the roads to reach the destination as quickly as possible, or information on closed roads.

Deriving the flood extent from aerial imagery of the flooded area demonstrated the support potential of remote sensing in decision making on the deployment of human resources and equipment.

II. How can net-centric data exchange improve information sharing between relevant parties and thus improve the shared understanding of the current situation?

The use of solutions resulted in more detailed information, based on the best (actual) data available in an objective manner. Netcentric information exchange provides a shared situational assessment, due to use of more detailed data, e.g. flood maps, cascade-effects and quantified traffic routes. The advantages of netcentric information exchange in the Innovation Line during the Trial were the following:

- Information is shared instantaneous and continuous; all organisations use the same information.
- Faster information exchange between Safety Region (using solely the legacy system) and external organisations (using solution): Information is digitally available, including maps (in contrast to phone or mail communications, followed by importing this information into the systems).
- No errors are made in distribution of information and all information is up-to-date because all organisations use the same data.
- Unambiguous information, since the organisations share their information. There is no person in between that may distort the information.

- Higher efficiency for the external organisations, since their information was available for all action centres and crisis teams, in contrast to every action centre to individually contact the organisation by mail/phone (or relaying information request via the information manager).

III. How can simulation tools support the planning and management of a large-scale evacuation under consideration of real-time traffic information?

The solutions trialled during Trial 4 were useful for indicating collection points for the evacuees, locating evacuation assembly points, avoiding evacuation assembly points in areas flooded or areas threatened by cascade-effects (areas without power), designating routes for transport of evacuees, informing about the current state (who is evacuated, who still needs evacuation), or assessment of necessary resources. As demonstrated during Trial 4, practitioners using solutions made decisions based on available simulations. Advantages of the Innovation line were detailed information on the forecast flood and substantiation of the effects of protective measures (like emergency dikes or pumps), the provision of a traffic management plan on best routes available in case of a crisis, and optimization of these routes with respect to the protective measures. Furthermore, dynamic information on cascade-effects (power failure) in case of flooding and effects of protective measures were made available.

5. Conclusions and policy recommendations

Trial 4 has met its objectives by active involvement of Crisis Management practitioners in the searching for the innovation that meets their expectations. Trialling five promising solutions in the context of a flood forecast and an actual flood response allowed the practitioners to test the solutions in the close to real environment of a table-top Trial. The Test-bed proved a useful environment to plan and execute the Trial in line with the TGM. The Trial has led to collecting data which enabled answering a set of research questions and through that proved the solutions' innovative functionalities which revealed to cover the identified gaps to certain extent. Answering the research questions was the key challenge of the Trial 4. The answers for three main research questions were formulated on basis of the collected and analysed data and observations during Trial 4. They are valid for the context of Trial 4 and in respect to the tasks given to the practitioners in this simulated Test-bed environment during the Trial.

The following set of EU policies and regulations are relevant to the findings of Trial 4. The answers to the research questions asked show that there is potential for the trialled technological solutions to contribute to the crisis management processes. Recommendations were formulated accordingly.

POLICY: *CIVIL PROTECTION*

- **REGULATION:** Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism

RECOMMENDATION:
The forest fires in Sweden in 2018 revealed a need for continuous up-date on the roads patency in order to shorten time for reconnaissance activities and deployment of resources. The same problem concerns also other major disasters like flood which impacts broad geographical areas and transport infrastructure making them not operational any longer (e.g. roads or railways). Having software (ATSA - KeepOperational) which provides a close to real time update on the possibility of roads could have an impact on civil protection modules management. Such solution could facilitate the work of national coordinating cells as well as Union Civil Protection Teams (UCPT) and civil protection team leaders.

Secondly, 3Di and ATSA - ZKI could contribute to the European Flood Awareness System (EFAS) by providing new software which potentially provides added value (e.g. new algorithm for flood spread calculations) to the system utilized on the EU level.

CrisisSuite adds to efficient information sharing among different stakeholders in the response phase. Since UCPM missions by definition include many stakeholders, CrisisSuite has the potential to facilitate vertical and horizontal communication between the ERCC, UCPT and civil protection modules working under the UCPM umbrella. The shared communication environment of CrisisSuite could also be extended to other partners from outside the UCPM (e.g. UN agencies). It would facilitate the work of all these actors in different phases of CP missions (pre-mission, on-mission and mission-end[4]). Since CrisisSuite has the technical ability to be connected to other COP legacy solutions (like in Trial 4 to LCMS), it is worth to consider whether CrisisSuite could also be a module of the Common Emergency Communication and Information System (CECIS).

POLICY: *ENVIRONMENT*

- **REGULATION:** Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks

RECOMMENDATION:

The Regulation primarily is in place to:

- increase public awareness,
- support the process of prioritising, justifying and targeting investments and developing sustainable policies and strategies,
- support flood risk management plans, spatial planning and emergency plans.

Solutions 3Di, SIM-CI, ATSA are crucial for flood development prognoses and adequate information sharing on the flood risk, and as such, could positively influence the quality of flood risk planning processes. They could facilitate the work of water authorities from local up to national level.

- **REGULATION:** Directive 2007/2/EC establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) Improves the provision of information and good quality data across EU Member States

RECOMMENDATION:

Since the set of the trialled solutions provides records on the interagency communication as well as the decisions taken during the disaster response, spatial data recorded in the solutions could be used for post-disaster analyses. These records could facilitate the process of lesson-identification from the past emergencies in order to share it among the EU Member States.

POLICY: *SOLIDARITY FUND*

- **REGULATION:** COM(2013) 522 Proposal to amend Council Regulation (EC) 2012/2002 establishing the European Union Solidarity Fund

RECOMMENDATION:

CrisisSuite has a potential to facilitate Integrated Political Crisis Response (IPCR) arrangements, especially before and during informal roundtable meetings as well as in drafting Integrated Situational Awareness and Analyses (ISAA) reports. It is worth to consider the added value the solution could bring into communication process among the Member States in case of IPCR activation.

POLICY: *INDUSTRY AND INFRASTRUCTURE*

- **REGULATION:** SWD(2013) 318 New approach to the European Programme for Critical Infrastructure Protection Making European Critical Infrastructures more secure

RECOMMENDATION:

Cascading effects are one of the key phenomena which are recognized in the late 20th century. Increasing significance of networks forces deeper understanding of these phenomena in order to mitigate its negative consequences. *SIM-CI* should be considered as a valuable asset in this respect. Therefore solutions as *SIM-CI* should be used for simulation exercises to facilitate critical infrastructure contingency planning.

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[4] United Nations Disaster Assessment and Coordination (UNDAC) Field Handbook, Office for the Coordination of Humanitarian Affairs, 7th Edition (2018), p. 48

- **REGULATION:**
  - SWD(2013) 318 New approach to the European Programme for Critical Infrastructure Protection Making European Critical Infrastructures more secure
  - Regulation 347/2013/EU of the European Parliament and of the Council on guidelines for trans-European energy infrastructure; COM (2011)0650 Proposal for a Regulation on Union guidelines for the development of the trans-European transport network

RECOMMENDATION:

Planning localization of critical infrastructure (1) as well as trans-European energy and transport (2) objects requires simulation exercises on potential flood impact on investment areas. This could be supported by *3Di* and *ATSA-ZKI* solutions in order to minimalize the risk of building the objects in current flood prone areas as well as the areas which could be flood prone in longer time perspective (taking into consideration the climate change effect).

POLICY: *INSURANCE*

- **REGULATION:** COM (2013) 213 Green paper on the insurance of natural and man-made disasters

RECOMMENDATION:

Since flood is the highest risk natural disaster in Europe, involvement of the insurance sector is critical in order to decrease its impact. *3Di* and *ATSA-ZKI* solutions could be valuable in facilitating the consultations among stakeholders on the flood risk calculations. The solutions could support identification and prediction of the (potential) flood impact, also cross-border, for different scenarios. These measures could support the consultation processes between the stakeholders such as policy makers, insurance companies and potential clients of these companies. Such type of discussions, supported with the results of the analysis and simulations, could also broadly promote insurance as a way to decrease flood risks.