



Ex-post Evaluation of PASR Activities in the field of Security

Interim Evaluation of FP7 Research Activities in the field of Space and Security

Crisis Management - Case Study

January 2011



Centre for
**Strategy & Evaluation
Services**

P O Box 159
Sevenoaks
Kent TN14 5WT
United Kingdom
www.cses.co.uk

Contents

SECTION	PAGE
1. INTRODUCTION – CRISIS MANAGEMENT CASE STUDY	1
1.1 7th RTD Framework Programme 2007-2013	1
1.2 EU Security Research and Crisis Management	1
1.3 Case study methodology and structure	1
2. POLICY CONTEXT AND KEY SECURITY ISSUES	2
2.1 EU policy and legislative context	2
2.2 Key issues – Crisis Management	6
2.3 Sectoral overview – Crisis Management	7
2.4 Key stakeholders – Crisis Management	9
3. PROJECT ASSESSMENT – CRISIS MANAGEMENT	10
3.1 Crisis Management in PASR and FP7 Security – overview	10
3.2 PASR and FP7 project assessment – Crisis Management	11
3.3 Project achievements and research quality	17
3.4 End-user involvement in projects	21
4. CONCLUSIONS - CRISIS MANAGEMENT	23
4.1 Overall conclusions	23
4.2 Recommendations	24
APPENDICES	
A. List of interviews	26
B. Crisis Management in PASR and FP7 Calls	27

Introduction

1

1. Introduction

1.1 7th RTD Framework Programme 2007-2013

The 7th Framework Programme for Research and Technological Development (FP7) will be implemented in the 2007-2013 period and is the European Union's main instrument for funding transnational collaborative research activities.

1.2 EU Security Research and Crisis Management

Following the implementation of the PASR Preparatory Action on Security Research in 2004-2006, an EU Security Research programme was included for the first time in the RTD Framework Programmes in FP7, with a budget of €1.4 bn from the European Commission.

The objectives of FP7 Security Research are to: make Europe more secure for its citizens; strengthen industrial competitiveness; promote research excellence and state-of-the-art; prevent the fragmentation of research efforts and strengthen critical mass in particular areas of security research. The specific objectives include: stimulating the development of a European market for new and emerging security products and systems; ensuring the security of EU citizens from new and emerging threats; delivering mission-oriented research results to reduce security gaps; ensuring the optimal use of available and nascent technologies and stimulating cooperation between providers and users of civil security solutions.

FP7 Security provides support in a number of thematic areas. Crisis Management (CM) was an important area of intervention in both the PASR Preparatory Action and in FP7 SEC. Additionally, support for the development of GMES in the crisis management area has been funded through FP7 Space. GMES projects such as G-MOSAIC and SAFER have helped to provide the initial building block for technology-focused projects in FP7 SEC. These were important in paving the way for the development of downstream applications and services that are being developed through FP7 Security. CM, together with maritime security, are among the areas that provide a useful illustration of the synergies between investment in EU Security and EU Space Research respectively.

1.3 Case study methodology and structure

The methodology for the preparation of this case study involved a combination of desk research of key policy and legislative documentation, sectoral research and a review of the annual work programmes in respect of PASR and FP7 Security. Project-specific materials have also been examined, including periodic project monitoring reports and a sample of deliverables. An interview programme has also been undertaken with PASR and FP7 Security beneficiaries and end-users. The case study is structured as follows:

Section 2 - provides an overview of the policy context, the underlying rationale for intervention, and of the main issues relating to crisis management

Section 3 – examines projects that were supported through PASR and FP7 Security in the area of crisis management

Section 4 – outlines conclusions, recommendations, and reviews progress towards the achievement of objectives.

Policy context and key issues

2

2. Policy Context and key issues

2.1 Policy context

The following section describes key developments in the crisis management field.

Conceptual Overview

Crisis management (CM) is characterised by a diverse range of activities and stakeholders, and is more fragmented in terms of the composition of stakeholders than other thematic areas within FP7 Security.. CM projects supported through FP7 Security have typically addressed a number of areas, including helping first responders to respond to (i) terrorism attacks (including CBRNE incidents), (ii) humanitarian crises, (iii) natural disasters and (iv) major industrial/technical accidents. The ESRIF stakeholder consultation developed a working definition of crisis management: *“A complex discipline incorporating managerial, organizational, and technical facilities to assist in managing the return to normal life in case of major incident as quickly and swiftly as possible”*. A key principle underpinning this definition is ‘prepared to react’ and involves bolstering society’s capacity to manage the response and recovery phases of a crisis. While *“technology substantially influences crisis management, it is nonetheless regarded as a management process with decision-makers at the center of the process, rather than a technical undertaking”*.

The growing number of topics that fall under crisis management and shifting conceptual boundaries mean that the issues that arise continue to be very diverse. This leads to significant overlapping in governance structures. In spite of a consensus that clearer governance structures are needed, the variety of agencies and the roles they play in crisis management continue to make the achievement of this objective extremely challenging.

Development of EU Governance in Crisis Management

The main EU instrument in crisis management is the **Community Civil Protection Mechanism (CCP)**, established by a Council Decision in 2001. However, the CCP has its origins in the early 1980s and is linked to an attempt to manage environmental disasters such as earthquakes, fires, volcanic eruptions, and oil spills (Wendling 2010). The origins of EU-level crisis management are thus found in environmental crisis management.

Further reflection of the environmental origins of crisis management is the joint initiative **Global Monitoring for Environment and Security (GMES)**, led by both the European Commission and European Space Agency, comprising a group of vertical services aimed at monitoring Earth sub-systems (land, ocean, and atmosphere) and horizontal services addressing emergency and security issues. GMES is an EU-led initiative for an autonomous and operational European Earth observation capacity. GMES aims to provide relevant information to policy-makers and other users, particularly in relation to environment and crisis management. The objective is to rationalize the use of multiple-source data to obtain timely information and achieve high quality services and knowledge, in order to provide autonomous and independent access to information in relation to the environment and security. GMES has been conceived to move from R&D to operational services. This transition to operational services follows a phased approach:

- **2008 – 2010:** GMES pre-operational services (FTS and Pilot services)
- **2011 – 2013:** GMES initial operations
- **From 2014:** GMES fully operational services

Policy context and key issues

2

In 2007, the CCP was strengthened through the addition of a **Civil Protection Financial Instrument** (CPFI) and a recast of the original Decision, which added a clear emphasis on natural and man-made disasters, including acts of terrorism. This extended the mandate of the CCP mechanism well beyond its original mandate (House of Lords 2009). In spite of this extension, the operational core of the CPP, the MIC, remains linked to DG ENV. The MIC is available on a 24/7 basis and is staffed by duty officers working on a shift basis. It gives countries access to the community civil protection platform. Any country affected by a major disaster – inside or outside the EU – can request assistance through the MIC. During emergencies the MIC performs three important tasks; (i) communications hub, (ii), information provision and (iii) supports co-ordination.

The Civil Protection Financial Instrument supports and complements the efforts of Member States for the protection, primarily of people, but also of the environment and property, including cultural heritage, in the event of natural and man-made disasters, acts of terrorism and technological, radiological or environmental accidents. The financial envelope allocated to the instrument under the EU's 2007-13 financial framework amounts to €189.8m. Indicative annual amounts of €20 million are available for actions within the EU and €8m for actions in third countries.

In a parallel and potentially rival initiative to strengthen capacity in crisis management, the Council created the **Crisis Coordination Arrangements (CCA)** in 2005. The London bombings provided the political momentum for this increased capacity. The CCA is linked organizationally to the Council and consists of provisions that promote information sharing, mutual support, consistency across Europe, debate on external action and media coordination. A core function linked to CCA is Council oversight of the **Joint Situation Centre (SitCen)**, which allows member states to share information, collect intelligence information, and conduct situation monitoring when crises occur. In fact, the mandate of SitCen is different and broader than of the MIC, and there is little overlap between the two organizations (House of Lords 2009). The CCA acts as *an ad hoc* coordinator of central institutions, including the President, Secretary General, the Commission, and Member States.

Several aspects of the **EU Security Strategy 2003** are relevant to the field of crisis management. The European Security Model commits to, among other things, “enhancing prevention and anticipation, involvement, as far as they are concerned, of all sectors which have a role to play in public protection – political, economic and social; and a greater interdependence between internal and external security.” The updated Commission Communication from November 2010, an **EU Internal Security Strategy in Action: Five steps towards a more secure Europe** ¹ stresses the need for a stronger, more coherent and better integrated European crisis and disaster response capacity. It identifies as one of its five key objectives. It also stresses the need to reinforce links between sector-specific early warning and crisis cooperation functions.

Clearly, the case for the increased importance of community-driven operations has been made, and a need in parallel for greater interoperability across different organisations involved in crisis management has been identified. As the EU level approach becomes increasingly collaborative, roles, structures, and standards need to be developed to facilitate an even closer relationship. The role of FP7 in developing technologies to further these aims is significant.

The various regulatory developments at EU level prior to the adoption of the FP7 Security Programme in the area of crisis management include:

¹ COM(2010) 673 final, Brussels, 22.11.2010

Policy context and key issues

2

Table 2.1: EU regulatory developments in field of crisis management

Issue	EU policy document	The main document aims (contents)
Collaboration and coordination in crisis situations	Community Civil Protection Mechanism (Council decision 2001, updated 2007)	Develop coordination mechanisms for the effective deployment of community and member state resources.
Community cooperation in crisis management	<i>'Community approach to the prevention of natural and man-made disasters'</i>	<ol style="list-style-type: none"> 1) Improve the knowledge base on disasters 2) Link the organizations involved in crisis management 3) Spread and stimulate good practices 4) Improve financial and legislative instruments for the effective use in crisis management situations
Internal Security Strategy	<i>"Towards a European Security Model."</i> 2004	Outline of the internal mechanisms to be developed to improve internal security in Europe. Based on significant role for community approaches.
GMES	"The EU programme for Global Monitoring for Environment and Security (GMES): governance and financing".	Presents GMES and emphasizes its strategic importance for the European Union. Through a comparison with the Galileo Programme it also identifies and analyses a set of potential pitfalls. Several political recommendations are presented in the study to help making GMES sustainable and efficient on the long-run.

Crisis Management and the Lisbon Treaty

It is important to note in planning for FP8 that the legal base has evolved since the FP7 Programme Decision. In particular, a key development was the ratification of the Lisbon Treaty and its entry into force in December 2009. This allows strengthened scope for the EU's role in crisis management in the context of EU external actions. This may in future enable a stronger external dimension to Security Research projects in the CM domain. It also opens up scope for greater potential synergies between GMES and Security Research projects to improve operational picture in crisis and emergency situations (e.g. the Haiti earthquake).

There are various areas of the Treaties relating to external EU security matters. Title V of the Consolidated Treaty on European Union (TEU) sets out General Provisions on the **Union's External Action (Chapter 1)** and Specific Provisions on the **Common Foreign and Security Policy (CFSP) (Chapter 2, Section1)** and the **Common Security and Defence Policy (ESDP) (Chapter 2, Section 2)**. In addition, Part Five of the Treaty of the Functioning of the European Union (TFEU) refers to **External Action by the Union**.

Article 42 TEU states that the main objective of the ESDP is to provide the Union with operational capacity drawing on civil and military assets. The aim is to fulfil the EU's international commitments as a global positive player in areas such as **peace-keeping, conflict prevention and strengthening international security**. **Article 43(1) TEU** is relevant in this regard. According to the findings of the ESRAB report, there is a need for a more coordinated effort in the area of security in response to the need to contribute to the evolving CFSP and ESDP, although FP7 Security Research is of course a civilian research programme. **Article 222 TFEU introduces a Solidarity Clause in the event of a terrorist attack or a natural or man-made disaster**. Article 222(1) states that the Union and its Member States shall act jointly in a spirit of solidarity if a Member State is the object of a terrorist attack or the victim of a natural or man-made disaster. The Union shall mobilise all the instruments at its disposal.

Policy context and key issues

2

Most importantly, **Article 196 TFEU on Civil protection** refers to the importance of improving the effectiveness of systems for preventing and protecting against natural or man-made disasters. In particular, clause 1 (Art. 196(1)) states that ‘the Union shall encourage cooperation between Member States in order to improve the effectiveness of systems for preventing and protecting against natural or man-made disasters’. Union action shall aim to: (a) support and complement Member States’ action at national, regional and local level in risk prevention, in preparing their civil-protection personnel and in responding to natural or man-made disasters within the Union; (b) promote swift, effective operational cooperation within the Union between national civil-protection services; and (c) promote consistency in international civil-protection work.

In the table below, we provide a summary overview of the various areas of competence as set out in the Treaty on European Union (TEU) and the Treaty of the Functioning of the European Union (TFEU). The types of interventions funded through FP7 that are relevant in contributing to these areas are indicated.

Table 1.3: Overview of legislative provisions in Lisbon Treaty of relevance to FP7 Security Research

<i>Title in Lisbon Treaty</i>	<i>Description</i>	<i>Article</i>	<i>Policy areas</i>	<i>Types of interventions that could be funded in FP8 Security Research*</i>
Title III TFEU	Cooperation with Third Countries and Humanitarian Aid	Article 208 – 214 TFEU	Development, Cooperation, Humanitarian Aid	Crisis Management
Title VII TFEU	Solidarity clause	Article 222 TFEU	Solidarity Clause	Joint cooperation projects between Member States’ authorities on the field of terrorism and in respect of strategies and approaches for responding to internal EU natural or man-made disasters. Opportunities for institutional bridge-building and whole-of-society capability development
Title XXII TFEU	Civil protection	Article 196 TFEU	Civil protection - improving the effectiveness of systems for preventing and protecting against natural or man-made disasters.	Crisis management and emergency response projects Situation awareness projects

In conclusion, developments in the field of CM which suggest a number of trends:

- A continued lack of clear direction, despite several attempts to build consensus and to plan strategically, due to the fragmentation of key actors responsible for crisis management.
- A lack of coherent industrial policy related to crisis management, due to the lack of a definable industry.
- A shift from an inter-governmental to a Community-based approach to dealing with crisis situations both within and outside the EU that demand a cross-border or joint response, with the Lisbon Treaty consolidating this development.

Policy context and key issues

2

2.2 Key issues – Crisis Management

National authorities and civil authorities face a number of major challenges in crisis management. These include:

- Impact of new technologies
- Aligning and integrating systems and technology (interoperability)
- Identifying, understanding, and addressing needs of the public (societal issues)
- Promotion of trust from the public and among public agencies
- Identification, delimitation, and dialogue with authorities, stakeholders and end users
- Coordination between and within organizations and authorities
- Leveraging the communication capacity of established and new (social) media
- Role of Ethics

Since the development of crisis management structures, **new technologies** have led to significant improvements in the availability, access, and time-delay in information aggregation relating to crisis situations. For example, near-real time data aggregation is enabling new forms of decision-making that were not possible in the very recent past (ESRIF, 115).

The alignment and integration of systems and technologies is an increasingly pressing issue. As technology is becoming increasingly sophisticated, organizational capacities will need to adjust to more technical requirements. Several interview respondents referred to this issue: *“In crisis management the solution is rarely in the technology itself, the most important task is to improve practice. This can be done with the help of technology, but it takes a lot more than that”*.

A driver of change in crisis management involves an attempt to include individuals into the crisis management process. These **societal issues** start with the assumption that “people are not only the targets and victims of attacks and security threats, but also the rescuers, decision-makers, and those who respond to situations of insecurity”

Promotion of **trust from the public and among public agencies** is an issue that has been generated by rising public expectations in the field combined with the perceived failures of some agencies to plan for worst-case scenarios (Hurricane Katrina, the BSE crisis, heat waves in Europe). As authority moves further from local agencies towards the EU level, this issue is likely to be exacerbated.

Coordination between and within organisations and authorities (also known as **interoperability**) is a fundamental issue in the field. The historical trends of policy development have shown a consistent trend toward joint actions but the technologies and processes used by various agencies do not align. Understanding citizens’ information-seeking behaviour is becoming increasingly important. Attempts at **leveraging the communication capacity of established and new (social) media** have led to new opportunities to organize citizens and responders.

Ethics

Technology is increasingly characterized by integrative approaches that include “security by design” and “safety by design” principles. Under these approaches, security or safety is built into the technology itself, instead of requiring an additional system or process. This integrative approach now includes ‘privacy by design’ or ‘ethics by design’ elements. To shift to this new paradigm, significant reforms need to take place: Ethicists and technology developers need to reduce their institutional and professional distance. Work should move beyond parallel activities and towards

Policy context and key issues

2

integration, as disciplines are not sufficiently interlinked so that they effectively produce the types of information upon which decisions can be made. Technology needs to be accepted by the public at large before it can become an effective tool. However, technological and ethical development is marked by rapid change followed by a shift in entrenched patterns. These rarely occur simultaneously. In some cases, focusing events occur that align ethics and the technology. In the recent past, surveillance activities were viewed with suspicion. Terrorist activities have shifted the ethical perception toward protecting safety and away from strict guards on privacy.

Threats and challenges

The threats and challenges identified throughout the historical and conceptual development of the field align with those identified by the ESRIF process. After synthesizing various risk scenarios and abstracting the key aspects of crisis management, the ESRIF process identified the core challenges. Based on the identified threats, challenges and trends in crisis management, the ESRIF process identified eleven priorities across each capability area that are required to bring the field up to a state of readiness. The points include:

- | | |
|------------------------------------|---|
| • Enabling the public | • Cooperation |
| • Strengthening response forces | • Communication with the public and media |
| • Strategic planning | • Managing resources |
| • Strategy and tactical simulation | • Operations support (medical and psychosocial) |
| • Innovative concepts | • Recovery logistics |
| • Situational awareness | |

2.3 Sector overview – crisis management industry

The lack of coherence in the term “crisis management” makes it more difficult to delimit the market. The sources of information on the crisis management sector leave an unclear picture at best:

- The EU level budget for crisis management is 26 million Euros.
- The economic impact of crises in Europe is significant. Disasters cost Europe an estimated €15 billion a year.²

Estimating the size and scope of the industry is itself difficult. It is significant, but as the stakeholders in the field form and disband episodically in response to crisis situations, firm figures are elusive. The lack of a clear crisis management domain limits the extent to which the sector can be identified and quantified. However, a number of qualitative observations can be made regarding the sector.

One topic that came up during project-specific interviews was the question of “who owned the need” for crisis management resources. A range of stakeholders who would not consider themselves crisis managers will be thrust into this role depending on the context. This is due to the episodic nature of crises. Engaging with this group is difficult as their main professional functions normally lie elsewhere. By comparing the crisis management field with more traditional ones, an interviewed representative of a national authority made the nature and challenges of the crisis management field very clear:

- Crisis Management has a large number of potential end users but no single customer. This creates a market with no clear and obvious clients. Who then pays for the development of new technologies and new systemic solutions? This is hard to answer when no agency holds the main responsibility of crisis management.

²<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/1811&format=HTML&aged=0&language=EN&guiLanguage=en>

Policy context and key issues

2

- Crisis management has many systemic failures. This, among others, is related to different ICT systems and management structures used in different domains. Even the same kind of actors, such as hospitals, placed within a close distance may have systemic differences that make coordination difficult.

Apart from R&D, the private sector plays a limited role in crisis management at the EU level. At the national level, core functions of crisis management are routinely outsourced to the private sector, such as logistics, heavy lifting equipment, and waste removal. However, this outsourcing is done in an *ad hoc* fashion, based on episodic need for capacities that governments do not regularly maintain in their core functions. The private sector is needed and usually steps in times of crisis, but often in an unorganized way. Because of this lack of sustained procurement of some private sector capacities, there is little capacity or incentives for industries to invest in this function.

Another issue is related to the multi-level nature of public funding. Some countries or national agencies have pursued specialisation in specific fields (e.g. the UK in surveillance and counter terrorism and Germany in public infrastructure protection). The FP7 programme could potentially work against this Member State-led strategy if it is not managed carefully. There is a need for coordination with national funding if this 'excellence' model is pursued, or the programme risks shutting out some of the leading industrial producers.

The loose and variable structure of the demand side of crisis management limits the extent to which the market can aggregate demand and guide industry towards meeting its needs. In this sense, the crisis management organisations that comprise the end users tend to be "technology-takers" rather than organisations that have an ability to influence the field. Programme level comments from FP7 beneficiaries have indicated that there is a significant learning curve in including users in research.

There is an inherent learning curve in involving end-users directly in the product development process. Typically, end-users were approached by sales and marketing representatives from the industry with solutions that were either already developed, or close to being marketed and could be applied immediately. End-users have had little experience in inputting to medium-term development processes (3-5 years).

A commonly heard comment from end users, when approached about research needs, is "yes, we need the tools, but we need them now." End-user organisations do not have a clear image of themselves as crisis managers and thus do not recognise themselves as future customers of crisis management technologies. These same organisations are often constrained in terms of the extent to which they can devote resources to development.

There is strong interest among end-users in finding out about what technological solutions are already on the market. Therefore, the biggest opportunity is in technological transfer rather than basic research. While there is interest in what crisis management research projects will achieve in the medium terms, users want technology that is already available and can be transferred and adapted to their needs. The mismatch between user expectations and the reality of the timeframe involved in undertaking applied research can lead to disappointments. An example identified was an informal counter-terrorism group which withdrew from a project when it became clear that the research was aimed at medium-term deployment (3-5 years).

Policy context and key issues

2

2.4 Key stakeholders – Crisis Management

Key stakeholders at European and national levels include:

<i>European</i>	<i>National</i>
<ul style="list-style-type: none"> • The European Council • The European Commission • DG ENV <ul style="list-style-type: none"> ◦ The MIC • DG Justice, Freedom and Security (DJS) • Major industrial suppliers of crisis management technologies (FP7 beneficiaries) 	<ul style="list-style-type: none"> • National governments • Public sector authorities (transport, health/medical) • Local first responders (depending on Member State and Sector, could be national, regional, or local) • Public institutions that support a high number of users (schools, hospitals) and require continuity planning • Public sector utilities (water, power, roads) • Private sector industries related to mitigation and reconstruction (heavy lifting equipment suppliers, logistics companies) • Media organizations and other key sources of authoritative information (public health)

Interaction between these stakeholders and their involvement in research programmes is complex. Civil security actors, such as police and fire departments and first responders have a major role to play in strengthening the EU's internal crisis preparedness and response capabilities.

Civil society organisations and NGOs are increasingly important actors in CM. The closer involvement of NGOs in CM raises a need for improved coordination among CM stakeholders, given that there is already considerable fragmentation. Horizontal management is becoming a new skill for the organisations that deal regularly with crisis situations. In spite of the difficulty in preparing for future crises, there has been a dramatic evolution from a reactive to a proactive approach to crisis management. Significant resources are being used for strategic planning and there is a shift to systematic capability development ('prepared to react') that includes risk forecasting and assessment, scenario development, capability-based planning, and evaluation.

The role of civil society and NGOs may be further strengthened in future, given the evolution in the legal base since the adopt of the Lisbon Treaty which in the context of EU external actions in the field of crisis management and disaster response opens up new possibilities in FP8.

Project assessment – Crisis Management

3

3. Activities supported under PASR and FP7 Security Annual Work Programmes – crisis management

3.1 Crisis Management in PASR and FP7 Security - overview

In this section, consideration is given to selected projects that have received support under PASR and FP7 Security in the area of crisis management. Interviews have been undertaken to inform the project assessment. In the first table, projects that have been reviewed as part of this research are identified.

Table 3.1: PASR and FP7 Security projects – Crisis Management

Project	Full name	EU Contribution	Budget
Geocrew	Study on Geo-data and crisis early warning situation awareness	532,900	695,573
Project	Full name	EU Contribution	Budget
Security			
BeSeCu	Human Behaviour in Crisis Situations: A cross cultural investigation in order to tailor security-related communication	2,093,808	2,446,144
COPE	Common Operational Picture Exploitation	3,535,049	3,886,574
ESS	Emergency Support System	9,100,000	14,000,000
NMFRDisater	Identifying the Needs of Medical First Responders in Disasters	815,079	815,079
SGL for USaR	Second generation locator for urban search and rescue operations	4,859,026	6,217,478
SICMA	Simulation of Crisis Management Activities	2,566,330	3,902,580
Space (note: while funded through FP7 Space, the development of GMES benefits crisis management projects funded through FP7 SEC)			
G-Mosaic	GMES Services for Management of Operations, Situation Awareness and Intelligence for Regional Crises	9,600,000	15,300,000
SAFER	Services and Applications for Emergency Response	26,912,700	39,312,720

It should also be recalled that other additional crisis management projects have been supported through both PASR and FP7 SEC, as shown in Table 3 below.

Table 1.2: Additional Crisis Management Projects – PASR and FP7 SEC

PASR Project	Full name	Year	Value	Lead coordinator
CRIMSON	Urban crisis simulation systems	2004	€ 1,520,000	FR
ASTRO+	Advanced space technologies support security operations	2004	€ 2,200,000	FR
MARIUS	Monitoring crisis management operation	2005	€ 1,425,402	FR
PROBANT	Crisis management people	2005	€ 1,176,799	FR
CITRINE	Common Intelligence and Traceability for Rescue and Identification Operations	2006	€ 1,412,606	FR

Project assessment – Crisis Management

3

FP7 SEC Projects	Full name	Value	Country of lead coordinator
FORESEC	Europe's evolving security: drivers, trends and scenarios	€ 942,202	FI
SECRICOM	Seamless Communication for Crisis	€ 8,606,791	UK
SGL for USaR	Second Generation Locator for Urban Search and Rescue Operations	€ 4,859,026	GR

It should be noted that the list of projects excludes those supported in the 3rd Security Research call in FP7 since this was outside the scope of the evaluation.

3.2 Project assessment – crisis management

The sample of projects selected in the area of crisis management includes one PASR and six FP7 projects, including two space projects.

Examples of projects in the **prevention and preparation phase** are first examined, beginning with the **GEOGREW** project, which is concerned with enhancing prevention capabilities through the early detection of (man-made) crises with relevance to the security of European citizens. The study was composed of two parts which concentrate on different aspects and complement one another. The first part (CREW) comprises an overall architecture for integrating different information sources identified through user requirements of security related services. The second part (GEODATA) concentrates on the specific utilization of geospatial data for improving situation awareness, using a more detailed technical approach.

Project(s):	GEOCREW
Project timeframe:	13 months
Lead Partner:	ESG Elektroniksystem - und Logistik GmbH, Germany
Total Cost:	€ 695,573
EU Contribution:	€ 532,900
Start Date:	Jan 1st, 2005
<p>A main objective of the study was to integrate end users into the requirement establishment process. PASR and FP7 thematically concentrate on political objectives mainly followed by US and NATO security policies, namely counterfeiting “terroristic” threat and action prevention. Taking into account the consideration that “terroristic” activities, i. e. high public effect heavy criminal or asymmetric military (guerrilla-like) acts especially on soft targets, usually result from political, social, economical instability, like ethnic, ideological or religious suppression, disinformation and agitation, uneven distribution of resources (like food, water, energy, clean environment) in weak justice and enforcement structures, more focus should be given to objectives as matched by GEOCREW, in order to identify, understand, and counteract the causes for “terrorism”, in addition to its resulting threats.</p> <p>The main result of GEOCREW was the elaboration of an architecture concept for a collaborative secure virtual platform. This could allow organizations like intelligence services, crisis and situation awareness centres, institutes within the EU and its Member States to integrate different and comprehensive data sources like geospatial data, open sources, reports.</p> <p>As a result of the study a pilot project was defined and prepared for realisation within FP7. After very encouraging high level political support by the envisaged initiating EU member states, the project idea had to be abandoned for the time being because of higher priority tasks within organisations necessary for cooperation and because of still unclear national organisational responsibility for early warning of crises.</p>	

Project assessment – Crisis Management

3

Although the abandoning of the project, after an encouraging start, is clearly to be regretted in terms of the failure to achieve concrete outcomes, the project has been important in illustrating the difficulties of engaging stakeholders with insufficient commitment to longer terms solutions.

Another key aspect of Crisis Management is the issue of interaction between the public and first responders. The following two projects tackle this issue in different ways; **BeSeCu** aims to develop better safety and evacuation procedures especially with regards to cross-cultural and ethnic differences in crisis situations. The second, **CrisComScore** deals with the communication of crises to the public to help develop a situation where the public is encouraged to help themselves and others without harming the efforts of first responders.

Project(s):	BeSeCu
Project timeframe:	36 months
Lead Partner:	Ernst-Moritz-Arndt-Universität Greifswald, Lehrstuhl Gesundheit und Prävention-Institut für Psychologie, Germany
Total Cost:	€ 2,446,144
EU Contribution:	€ 2,093,808
Start Date:	01/05/2008
Project type*:	Capability
<p>The project aims to develop better safety and evacuation procedures. One under-investigated issue is related to cross-cultural and ethnic differences in human behaviour in crisis situations. Lack of cultural awareness in crisis situations generates potential for an unnecessary injury or loss of life. An example of relevance is for German fire-responders, as there is an increased incidence of fire in Turkish-inhabited areas of Germany. The crisis management sector and building designers are ill-equipped to deal with these increasingly relevant questions. Also significant was the lack of an empirical evidence base upon which decisions could be based and facilities designed.</p> <p>The project is aims to build an evidence base of inter-cultural differences in crisis behaviour. The goal was to fill the gaps in knowledge, but also to develop tools to help first responders and security designers. The intended outcomes of the project include a range of tools that are at various stages of development. Results are preliminary, but there is some evidence of inter-cultural differences in evacuation behaviour (e.g. Turkish people are more likely to remove personal items than are people from the Czech Republic; Turkish emergencies display a higher level of anxiety). Data such as these will be converted into usable tools and resources for first responders and building designers. One immediate input is into software used by architects and urban planners.</p> <p>There will be significant opportunities for future research, either by the investigators or by sharing data with other researchers. The project will also yield publications after the project is completed and eventually contributions to the further development of standards and building regulations in this area. The publication plan is part of the dissemination strategy and is a driving force behind the academic participation, alongside an interest in seeing improvements to services. The publications are supplemented by academic and professional conferences. Data will also be made freely available for end users. The project is supported by a well-developed website (http://www.besecu.de/index.html)</p> <p>There has been significant liaising with project partners and other potential end users. Interest in the project (and media coverage) is high. Once results are converted into a usable format, there will be ongoing dissemination and training activities. Interested organizations include national fire organizations and international advisory groups. To continue working on the project, the team has applied for an extension. The main purpose for this was to integrate a new partner from Italy who had had direct experience with evacuation situations (Aquila earthquake) and could contribute significantly to the project.</p>	

One of the problems in the crisis management area is that there is a clear gap in expectations between what authorities can do and what people believe can be done. Authorities are generally not

12

Project assessment – Crisis Management

3

able to ensure everyone's safety all of the time during a crisis. People need to be empowered to help themselves and others. Cooperation is necessary, but there is a huge gap in the capacity to work together in a crisis situation. The key is to be able to communicate while a crisis is happening. Communication is itself an intervention and a tool to support other interventions.

Project(s):	CrisComScore
Project timeframe:	39 months
Lead Partner:	University of Jyväskylä Yliopisto, Department of Communication, Finland
Total Cost:	€ 1,013,207
EU Contribution:	€ 799,174
Start Date:	01/02/2008
Project type*:	Capability
<p>The goal of this project is to develop an audit instrument and relevant guides for crisis communication strategies, with which public authorities are better prepared to communicate in crisis situations. To meet this goal the project has four key objectives :</p> <ul style="list-style-type: none"> • identify critical factors for communication strategies in <i>media relations</i> before, during, and after crisis situations. • identify critical factors for communication strategies in relations with <i>civilians and miscellaneous public groups</i> (survivors, casualties, deceased victims, family workers, first responders, and affected communities) before, during, and after crisis situations. • construct a <i>Balanced Scorecard</i> for public authorities to measure and improve their readiness to communicate in crisis situations. • stimulate implementation by <i>facilitating</i> the use of the Balanced Scorecard and the Strategy Guides for spokespeople and crisis communication with other public groups. <p>A significant piece of the work involves developing something generic enough that it can be used in many situations and by different end users. Best practices can be copied, but only under certain contexts and even then, only at the level of general principles.</p> <p>The final products are intended to empower others at several levels, including individuals and authorities. For individuals, the tools are aimed at helping people help themselves. Authorities will be empowered to self-evaluate, as the score card will demonstrate their progress over time. There are a number of products that will be produced, some to meet the required deliverables but some that will transcend the project and will be realized in the longer term. The partners in the project have committed to extending their research relationship beyond the scope of the FP7 funding. Partners and the momentum to pursue more research.</p>	

The cross-border aspect of crisis management and crisis response within the EU is an emerging challenge. In order to ensure an adequately coordinated response, there is a need for systems between different types of first responders and responders from different member states to communicate with each other. Interoperability was one of the key findings of ESRIF.

SGL for USaR is a mission-oriented project aiming to address critical problems faced by rescue teams following massive destruction and large scale structural collapses in urban locations. The project focuses on rapid location of entrapped or buried victims and the continuous monitoring of the air conditions in the voids of damaged and partially collapsed structures. It directly involves rescue teams from different Member States as end users to improve the interoperability of rescue practices across Europe in such cases of emergency.

Project assessment – Crisis Management

3

Project(s):	SGL for USaR Second generation locator for urban search and rescue operations
Project timeframe:	01/10/2008 – 01/10/2012 (48 months)
Lead Partner:	National Technical University of Athens
Total Cost:	€ 6,217,478
EU Contribution:	€ 4,859,026
Start Date:	01/10/2008
Project type*:	Capability
<p>SGL for USaR is mission oriented towards solving critical problems following large scale structural collapses in urban locations. The devotion, courage and expertise of rescuers need to be matched by procedures and technology that will enable safe and effective responses. This project will combine chemical and physical sensors integration with the development of an open ICT platform for addressing mobility and time-critical requirements of USaR Operations. The project will also focus on medical issues and on the relevant ethical dilemmas.</p> <p>The project is formed by eight sub-projects (work packages) running in parallel. These WPs address the development of simulation environments; the development and validation of portable devices for location operations; the development and validation of smart sensors environment for monitoring the situation under the ruins; the management of medical information, including privacy and bioethics; and finally the development of an ICT platform that will integrate all the previous data, ensure interoperability and control the flow of the information from the field to the operational centre.</p>	

Furthermore, in the project described above, ethical issues concerning the operation of rescue teams following massive destruction and large scale structural collapses in urban locations are explicitly addressed through a separate module focusing on the development of protocols concerning the prioritisation to different points/structures and categories of victims during rescue operation. In addition, a separate module of the project will examine the potential for additional uses of the developed analytical devices and prototypes in the areas of safety and security, health inspection and manufacturing processes.

In the same vein, **COPE** applies a range of human factor methods from functional task modeling to end user simulations to better understand the processes of individual agencies and to ensure that new systems both match requirements and can be integrated with legacy processes and technologies. The project involves mapping and then harnessing legacy technologies, including military and civilian. The goal of the technology mapping work package was to align the user requirements with technology solutions through brokering and technology mapping; to define the system architecture for technology solutions, and to develop user driven scenarios as well as define the key performance indicators. In the technology solutions work package, a systems integration task brings together the outputs of the other tasks addressing the areas of command and control, sensors, communication, decision support and first responder solutions. The final solutions will be trialled and evaluated in realistic scenarios with end users.

Project(s):	COPE (Common Operational Picture Exploitation)
Project timeframe:	36 months
Lead Partner:	Jari Hamalainen VTT Technical Research Centre of Finland
Total Cost:	€ 3,886,574

Project assessment – Crisis Management

3

EU Contribution:	€ 2,535,049
Start Date:	01/02/2008
Project type*:	Capability
<p>The objective is to achieve a significant improvement in emergency response management command and control performance, reliability, and cost. New solutions will be created by combining a user oriented human factors approach with the technology development. The aim is a step improvement in information flow both from and to the first responder in order to increase situational awareness across agencies and at all levels of the command chain in emergency management situations. The technologies should enable improved effectiveness of emergency response operations in crisis situations.</p> <p>The experimental nature of the research means that the success of research outcomes cannot be guaranteed. However, if the technology works end-users are likely to take-up the technologies. While the extent of take-up is difficult to predict, there are various drivers likely to encourage take-up of the technology developed through COPE. These include the increasing need among emergency services' to harmonise crisis management and incident management processes and to have interoperable IT systems and other technologies. Large-scale disasters and crisis situations such as the Haiti earthquake increasingly require a pan-EU, or global response with emergency services from different countries working together.</p> <p>Once the research aspect of the project has concluded, commercialization will drive post-project dissemination and related activities. The project should 'definitely lead to the development of new products and services, although new technologies are unlikely to be developed' (rather existing technologies will be adapted to serve new purposes). The Spanish partner has developed add-on commercial applications using software (IPSCI) from the COPE project. In addition, arrangements have been put in place so that all partners in the consortium will benefit through licensing arrangements.</p>	

During the response phase of the crisis management cycle, as underlined by ESRIF, and explained above, one of the most important challenges in responding to crises is not linked to technology but to the preparedness of the first responder to set up the necessary infrastructure. SICMA is an example of a project aimed at improving decision-making capabilities through an integrated suite of modelling. In this project, a variety of emergency services operate during crisis situations (police, medical care, rescue forces, fire fighting, etc).

This co-management of crisis situations involves interacting vertically (with components of the same organization) and horizontally (with components of other organizations) in a complex environment characterized by both 'predictable' factors (e.g. the crisis responders' standard behaviour) and 'unpredictable' behaviour (e.g crowds). This level of uncertainty limits the extent to which the effects of various decisions can be estimated.

Project(s):	SICMA
Project timeframe:	30 months
Lead Partner:	Giuseppe La Posta Elsag Datamat SPA Italy
Total Cost:	3,902,580
EU Contribution:	2,566,330
Start Date:	01/03/2008
Project type*:	Capability
<p>The SICMA project is a 30 months capability project focused on computer assisted decision-making for Health Service crisis managers. It aims to improve decision-making capabilities through an integrated suite of modelling and analysis tools providing insights into the collective behaviour of the whole organization in response to crisis scenarios. Within this context, decision making support will be provided addressing the key aspects "bottom-up" modelling approach, unpredictable factors modelling, procedure support to</p>	

Project assessment – Crisis Management

3

provide the user with the correct procedures to solve the problem and computation of the “distribution” of the effectiveness of a certain “decision”.

The outcome of the project is a prototype comprising the modelling and analysis tool. The prototype will be used to prove, on a case-by-case basis, the needs, feasibility, relevance, and efficiency of the proposed approach. It will gather data to provide insights into the collective behaviour of organizations in response to crisis scenarios, creating an integrated decision-support system.

The project has a work package dedicated to dissemination. A scholarly paper on the subject has also been written, improving the project’s recognition across the academic community.

Another project example aimed at improving the preparedness of first responders as well as their communication with crisis managers is the Emergency Support System (ESS). The idea guiding the development of ESS is a portable, modular and autonomous system which fuse in real-time various forms of field-derived data including video, audio, weather measurements, location tracking, radioactivity, biochemical, telecom derived data, affected population reports and other information.

Project(s):	ESS
Project timeframe:	01/06/2009 – 01/06/2013 (48 months)
Lead Partner:	Verint Systems Ltd
Total Cost:	€14 million
EU Contribution:	€9.1 million
Start Date:	01/06/2009
Project type*:	Demonstration

The Emergency Support System (ESS) is a suite of real-time data-centric technologies which will provide actionable information to crisis managers during abnormal events. ESS offers technology aimed at improved control and management of major crisis events such as natural disasters, industrial accidents, terror attacks etc. The ESS concept offers real time synchronization and information sharing between forces on the ground and out-of-theatre command and control centres (C&C). It also enables the commanders to communicate with the affected on-site personnel by sending text (SMS) or recorded voice messages.

The project will provide a demonstration of a highly technologically advanced portable command and control system with plug and play capabilities. The ESS system should provide real-time information sharing, real-time multimedia information gathered from multiple sources. The data is collected and communicated via both portable and fixed platforms including wireless communication devices, Unmanned Aerial Vehicle (UAV), Unmanned Ground System (UGS), air-balloon and field vehicles. The fusion of the data is handled within a central system which performs information analysis and provides decision support applications for web-based command and control systems. This provides flexible coverage of the affected area and will be vital in real crisis situations, for example, when communications infrastructure may be down. 3 out of the total of 19 partners are potential users of ESS technologies and solutions. Their role is to provide feedback on real user needs.

The project provides an excellent example of how in future increased use will be made of both GPS positioning and GMES data to develop downstream services that enable first responders to improve common operational picture and to better coordinate their activities. Examples of the practical usage include, for example, identifying the coordinates of collapsed buildings more rapidly and obtaining more accurate data on weather conditions. The project has strong potential to attract interest from users, such as civil protection agencies and first responders, provided that the technology can be deployed at reasonable cost.

In addition to the projects funded through PASR and FP7 Security, reference should be made to two projects funded by FP7 Theme 9 Space, SAFER and G-MOSAIC. Funding to support GMES in the area

Project assessment – Crisis Management

3

of crisis management provides an important building block on which projects supported by Security Research can develop downstream applications. Since these projects were not funded directly by FP7 SEC, further information is provided on them in Appendix B.

3.3 Achievements at project level and research quality

Below, progress is reviewed in relation to each of the main challenges in Crisis Management. However, it should be noted that due to the relatively early stages of FP7 security research, the Programme cannot be expected to fully address all aspect of these challenges. Therefore, the findings focus mainly on the outcomes and research potential of projects in the prevention, preparedness and response phases of crisis management and disaster response.

Among the main research results include: improved Common Operational Picture Exploitation with potential to make command and control performance more effective and the development of a prototype for a standalone first responder device, which once deployed, has the potential to save lives by improving response times to identifying trapped victims. Several projects have also promoted improvements in crisis communication systems, both methodological and technological.

Progress in each of these areas are summarised below:

3.3.1 Preparedness

In order to respond adequately to a crisis, the first challenge for national authorities, civil protection agencies and first responders is to ensure adequate preparation.

Through ESRP projects, while progress has been made in strengthening preparedness, there have been difficulties in some areas, such as setting up an early warning system. The GEOCREW project made some progress in strengthening preparedness for crisis management, with high level political support from a number of EU Member States, but there has not yet been any follow-up. The lack of clear organisational responsibility at national level was identified as a key problem in terms of the sustainability of project results.

The programme has however had a significant impact in ‘softer’ aspects of crisis management; such as promoting closer cooperation between relevant actors, promoting greater interaction between first responders and EU citizens on how to respond in a crisis situation. The need to understand the public’s reaction in times of crisis is very important to first responders. This can potentially save lives and help to ensure that decision-making and actions taken by the emergency services are appropriate to the situation.

BeSeCu addressed an under-investigated issue in developing better safety and evacuation procedures. Substantial progress has been made with this project in identifying where cultural and ethnic differences in human behaviour in crisis situations are significant, given that most models previously used by architects and planners were based on a narrow range of cultures. Lack of cultural awareness in crisis situations leads to a higher risk of unnecessary injury or loss of life and although there are expected to be further results from this project and follow-up work, including an eventual adjustment of the relevant standards, results are already feeding into current practice, for instance through the incorporation of data from the project into wisely-used design software.

Some CBRN projects supported through the ESRP have strengthened knowledge and preparedness about how to respond to CBRN incidents among first responders. They have therefore contributed to some of the aims in the CM field. For example, the project BIO3R developed considerable cross-border technical expertise through common training activities for bio scientists. This knowledge

Project assessment – Crisis Management

3

could be transferred to first responders to help prepare for the possibility of a biological attack. Newly established cooperation structures could help accelerate the production of antidotes and vaccines to prepare for the aftermath of a bio incident.

3.3.2 Response and Recovery

Response and recovery are the most important phases of the crisis management cycle. This phase is linked to foresight and strategic planning.

Overall, there was a strong emphasis in FP7 Security on the response and recovery phase of crisis management. Promoting more effective cooperation between the security services and first responders is an issue that is not specific to crisis management but has been addressed across a number of FP7 Security projects.

Progress has been made in promoting technological innovation in the field of crisis management. This has strong potential to improve situation awareness among first responders. For example, through the COPE project (Common Operational Picture Exploitation), a number of legacy processes and technologies are being integrated into an IT platform. New sensors and systems meant that more accurate information can be designed for use in command and control centres. The aim is to improve information flows to and from first responders to increase situational awareness across agencies and different levels in the command chain. COPE has applied a wide range of human factors methods from functional task modelling to end user simulations to better understand the processes of individual agencies and to ensure that new systems both match requirements and can be integrated with legacy technologies.

Another area in which achievements have been made includes the development of common processes and procedures with the potential to improve interoperability and to facilitate cross-border cooperation. However, there remains further work to be done to strengthen the interoperability of technologies, communications and procedures for first responders.

The ESRP has supported research which is contributing to a better understanding of how first responders can interact with the public in the immediate aftermath of a crisis. This is important in promoting resilience. The uncertainty that immediately follows a crisis can lead to a series of issues. While the public is generally on the scene before first responders and their help in the immediate aftermath of a crisis is often crucial, they can afterwards either continue to help or frequently hinder the professionals in the crisis area, depending on how well structured their involvement is. Linked to this is the issue of communication to the public on the crisis itself. **CrisComScore** is developing an audit instrument and relevant guides for crisis communication strategies, with which public authorities are better prepared to communicate in crisis situations.

The ESRP has improved Personal Protective Equipment for first responders that could potentially be involved in responding to CBRN incidents to protect them against exposure. The FRESF project is developing an advanced technology for the respiratory protection of first responders. This will fill an important gap in the response capability of emergency services to CBRN events.

Through Security Research projects, a more integrated approach to the management of crisis response services has been promoted. Presently, due to a lack of coordination between different services on the scene, there is a risk of incomplete operational picture with different snippets of information among different first responders on the scene. A crisis management centre to collect information and to dispatch it to the different organisations involved needs to be set up. **SICMA** focused on computer assisted decision-making for Health Service crisis managers. It aims to improve

Project assessment – Crisis Management

3

decision-making capabilities through an integrated suite of modelling and analysis tools providing insights into the collective behaviour of the whole organisation in response to crisis scenarios.

GMES services such as the G-MOSAIC and SAFER projects³ funded through FP7 Space are highly relevant to crisis management. They provide maps of the situation on the ground within 6 hours of a request from crisis management agencies. The data and information they are able to provide has strong potential to improve situation awareness among first responders on the ground. There is also crucially strong potential for future FP7 Security projects to explore the possibilities of developing downstream services using the data.

The ESRP has potential to promote the integration of different sources of information and to leverage new and emerging technologies so as to markedly improve situation awareness on the ground. For example, through the Emergency Support System (ESS) project, a large-scale demonstrator is being developed to improve Emergency Management through Service-Oriented Architecture. These will be deployed in mobile environments using both sensor networks and information from UAVs to improve common operational picture on the ground. The plug and play facility being developed represents state of the art. ESS should provide real-time information sharing, real-time multimedia information gathered from multiple sources.

3.3.3 Interoperability

Ensuring the interoperability of different technologies, systems and equipment (especially communications), and processes and procedures between different public agencies responsible for crisis management and first responders is the most pressing challenge for industry. Ensuring interoperability is important at all governance levels – local, regional, national, European and international since strong cooperation is needed between actors and different Member States in sharing information and in carrying out joint operations. As such, interoperability is the potential lynchpin for effective security and is the object of potential reform that would lead to a clear case of European added value in the area of crisis management.

The **COPE** project involves mapping and harnessing legacy technologies, both military and civilian. A large bundle of technologies will be amalgamated into the Common Operational Picture Exploitation. The goal is to align user requirements with technology solutions through technology mapping and brokering; the aim was to define the system architecture. The technology mapping process is an iterative process that considers both human and technological factors. The project is based on consultation between users and technology developers as potential solutions are tested.

The **SICMA** project will create a common platform to gather data to provide insights into the collective behaviour of organizations in response to crisis scenarios, creating an integrated decision-support system. This decision-making system will allow a range of stakeholders and first responders to coordinate efforts and organise both the communication and the assessment of a scenario.

The need to strengthen the interoperability of communications equipment was a central concern of national authorities, first responders and law enforcement alike. Support was therefore provided under FP7 SEC to aid in the design of new interoperable communication technologies which can be integrated across a wide range of emergency services and deliver secure means of access for individual first responders.

³ Further details about both projects – since they have such relevance to FP7 Security projects in the CM field, are provided in Appendix C.

Project assessment – Crisis Management

3

The **EULER** and **SECRICOM** projects are particularly relevant in this regard, although the evaluation research did not specifically target these projects, they serve to illustrate the Commissions support for integrated and secure communication infrastructure.

The **EULER** project unites end-users and major players in the field of wireless systems communication integration and software defined radio (SDR). The aim is to enhance interoperability in jointly managed crisis situations. At the project level, this means developing high-data-rate waveform radio technology, combined with supporting standardisation to help implement software defined radio platforms. A key failing in the emergency services response to the 2005 London bombings was the lack of interoperability among radio and communication software. The results will be used to deliver interoperable solutions in similar post crisis situations where it is vital that synergy exists during joint operations to restore safety.

Several interviewees highlighted the need for the ESRP to do more to promote the interoperability of communications equipment between user organisations and different agencies. In previous terrorist incidents, such as the London and Madrid bombings, there were a number of examples of both communications failures and of the lack of ability for inter-organisational communications, such as metro staff and ambulance services. However, the need to ensure that interoperability in communications technologies is improved is already being addressed through some FP7 projects.

For example, the **SECRICOM project** aims to develop a reference security platform for EU crisis management operations. The new system will (A) address shortcomings in the interoperability of contemporary crisis communication infrastructures (Tetra, GSM, Citizen Band, IP) and (B) add new smart functions to existing services which will increase the effectiveness of communications for users. There is scope for SECRICOM results to impact on promoting greater interoperability in radios to meet the needs of 'next generation' crisis management operations. The practical deployment of SECRICOM could reduced the likelihood of communications failures, for example those effecting VIP and Royal protection.

Another area in which there have been achievements through FP7 SEC includes the development of common processes and procedures with the potential to improve interoperability and facilitate cross-border cooperation. The NMFR Disaster project played an important role in this regard, by providing a mechanism for sharing experiences and strengthening cooperation between European and international partners, including first responders. The project included a series of work modules that promoted the development of common approaches on different aspects of disaster response in areas such as: training methodology and technology, the human impact of disasters, legal and ethical aspects, Personal Protective Equipment and legal and ethical aspects.

3.3.4 Conclusions - research quality

The research identified a number of projects examples that appear to suggest that projects in the CM domain are leading to high-quality research outcomes. A good example in this regard was the **SGL for USAR project (Second Generation Locator for Urban Search and Rescue operations)** has developed a prototype for a portable first responder device that integrates sensors, images, sound and chemical analysis for the early location of entrapped people and dead bodies. This has strong potential to improve the speed and accuracy of the response provided by first responders, which should save lives if deployed.

Another example of a project that has promoted state of the art was the **BeSeCu** project through which research was undertaken to explore different cultural reactions to emergency situations and disasters in different EU and associated countries. The research results have been incorporated into

Project assessment – Crisis Management

3

software that is being used in the design of buildings and in the development of appropriate operating procedures for buildings.

It is too early to assess the quality of research in some projects, such as those relating to strengthening the interoperability of communications equipment used by police, fire services and first responders, however, the initial research results appear promising.

3.4 End User involvement in projects

A number of issues were identified related to end-user involvement and their intent to use the research results from projects. The examples identified tend to highlight issues relating to the need of users for immediate technology improvements and their consequent inability to participate in long-term research projects.

While it is too early to evaluate the take up of the research, success in overcoming this problem will constitute the paramount impact indicator. The fuzzy concept of crisis management has led to issues related to identification, delimitation, and dialogue with authorities, stakeholders and end users. However, ultimately, in spite of the significant barriers to end user participation, the close involvement of end users has contributed significantly to improving the utility of projects.

Some of the projects analysed focused exclusively on understanding the needs of end users. **CrisComScore**, for example, was premised on incorporating data from users more systematically and then using this data to inform the development of technological solutions. The final products are intended to empower users at several levels, including public authorities and individual citizens. For individuals, the tools aim to help people to help themselves. Authorities will be empowered to self-evaluate and the scorecard will demonstrate their progress over time.

SICMA addresses a variety of end-users that operate during crisis situations (police, medical care, rescue forces, fire fighting, etc). This co-management of a crisis situation involves interacting vertically (with components of the same organization) and horizontally (with components of other organizations) in a complex environment characterized by both ‘predictable’ factors (e.g. the crisis responders’ standard behaviour) and ‘unpredictable’ behaviour (e.g. crowds). This level of uncertainty limits the extent to which the effects of various decisions can be estimated. The project begins by building user needs systematically and then basing technological solutions on the identified needs. It is thus directly tailored to the needs of end users and requires significant end user involvement.

The systematic application of user needs underpinned the **GEOCREW** project dedicated to the early detection of (man-made) crises. The study is composed of two parts which have different points of focus and complement one another. The first part (CREW) comprises an overall architecture for integrating different information sources identified through user requirements of security related services. The second part (GEODATA) concentrates on the specific utilization of geospatial data for improving situation awareness, using a more detailed technical approach.

This process of defining user needs and then building technical protocols is meant to enable collaboration schemes for continuous cooperation and work share of organizations cooperating in the field of crisis early warning within EU and its Member States. An essential part of the GEOCREW study was the collection of operational and functional requirements on geospatial and non-geospatial information from/together with the relevant users. However, some problems were identified in engaging effectively with users and the developments envisaged in the project have been postponed. The ultimate aim, however, is still to build greater capacity for interoperability.

Project assessment – Crisis Management

3

Under the **COPE** project, following interviews with emergency agencies and workshops covering three different emergency scenarios a series of ‘use cases’ has been created. In parallel, a generic concept of a ‘Common operational picture’ has been defined. The requirements of end-users have been collated together with end-user input on scenario descriptions which will be used to evaluate the technologies⁴.

In the **SGL for USaR** project, potential end-users of project outcomes (i.e. first responders involved in search and rescue) have been directly involved in the project and are expected to test and provide feedback on the prototype devices developed. The involvement of rescue teams from different countries around Europe is intended to ensure the interoperability of the developed devices irrespective of the approach to rescue procedures in each country.

The direct involvement of rescue teams from 12 countries was the main tool to disseminate the project results to users. An online technology forum was also created to promote broader discussion and the exchange of experience on different issues related to the project. In parallel, a number of workshops will be organised by the project partners that will also participate in relevant conferences/seminars. The project has a comprehensive dissemination strategy targeting experts in the field and the general public. Bringing together expertise available among rescue teams across a range of countries has significantly increased the exploitation potential of the devices developed and added important value to the project.

One user provided detailed feedback on the most useful areas that FP7 SEC could support in the CM area. This is worth summarising since it illustrates how useful feedback directly from users can be in defining user requirements at the project level, and also in defining programme level priorities.

SAMUR civil protection, Madrid. Project: NMFR Disaster (How can FP7 SEC assist civil protection agencies and first responders in the crisis management field?)

- Improving the interoperability of communications equipment (internally and between organisations) and in ensuring greater versatility in communication systems
- Establishment of standards – a common language between EU countries in respect of operational procedures to improve incident response
- The creation of a network of experts to ensure that good practices on incident response can be exchanged between and among different EU countries, and with international partners
- The development of scenario modelling on some of the main risks identified.
- The establishment of an efficient and secure cross-border information sharing system between national civil protection agencies with common criteria to identify and ensure better preparation for significant-risk events.
- Technical Guidelines with requirements for all EU Member States, including the use of compatible communication technologies. Guidelines for specific threats: CRBN, fire, etc. Important to have procedures on how to respond to different situations, to develop procedures for working together with other emergency services
- Application of geographic information system as standard for first responders
- Wider dissemination of experiences and project results. Sharing experiences is not only necessary but will help to increase knowledge about effective practices in crisis management and emergency support.

⁴ Research EU focus — No 7 — August 2010

Project assessment – Crisis Management

3

In conclusion, while achieving inputs from users is particularly difficult in the CM field, FP7 Security has facilitated this process. The interviews identified good practices among some project consortia that had relied strongly on end-users to identify operational needs at the project outset. This is a significant advantage compared with the typical product development process in the CM domain in which there are often difficulties in establishing sustained contact with users while developing a product.

Conclusions – Crisis Management

4

4. Conclusions

Below, the overall conclusions are now outlined. It should be noted that the more detailed thematic conclusions relating to project achievements and research quality are provided in Section 3.3.

4.1 Overall conclusions

The main challenges in the area of crisis management are being addressed through research topics supported in PASR and FP7 SEC. Many projects are still underway, and while the discussions suggest that research outcomes are likely to be positive, it is not possible at this stage to assess the longer-term impacts.

The ESRP has promoted stronger partnership working and cooperation between stakeholders in the crisis management field, which has helped in structuring this field at EU level. A wide range of participants have been involved in the programme. These include industry, academia, national authorities, first responders and NGOs. A more cohesive ‘community of interest’ in the crisis management field has been created through the Programme, which was necessary given the differing roles of and fragmented nature of the CM stakeholder community.

Technology can act as a key enabler in facilitating cooperation between the many types of actors and stakeholders working in CM. A number of projects have sought to strengthen the response phase to crises. Progress has been made in improving common operational picture in command and control centres, in managing CM resources, operational support and recovery logistics.

User requirements are shifting towards ‘softer’ elements such as ensuring effective and interoperable communications, and improving crisis response capabilities (e.g. the provision of secure housing for people affected by crises and disasters, health services).

There is potential for failures in crisis situations, because of the lack of interoperability of critical systems. ESRP projects have strong potential to improve cooperation and to promote interoperability of processes and procedures, as well as technologies and communications.

Areas that appear to have received only limited support include those related to managing resources and supporting operations with ‘soft’ services. Strategic planning has been strengthened significantly, although information needs to be converted into plans, a key function of resource management. There is a risk of possible diminishing returns on data collection systems in the absence of strong decision-making processes.

There is considerable scope for a European dimension in crisis management. Crisis management is a multilevel, multi-stakeholder activity that has not yet developed into a mature and cohesive field. Because of the fragmented nature of crisis management, there is not a single authority that can claim or enforce accountability for crisis management.

Crisis management security projects, especially during earlier PASR projects, helped to define the field and to ensure that activities supported at EU level add value, and complement national activities. However, because planning and procurement tends to remain the responsibility of local government, the risk of duplication of effort is significant.

Crisis management is undergoing a maturing process, but remains highly fragmented. This is also true of procurement mechanisms. Depending on the Member State and the particular application, procurement can be undertaken at national, regional, or local levels. To date, little has been done to promote common procurement in this area.

The following table summarises the way in which various security research projects have addressed the main challenges in the field of crisis management identified through the ESRIF process but also more broadly to European strategic planning linked to the Internal Security Strategy.

Conclusions – Crisis Management

4

Table 2: Project contributions through PASR and FP7 SEC to different areas of crisis management

Challenge	Relevant Project(s)
Improving public awareness and resilience	CrisComScore
Strengthening response forces	CrisComScore, GEOCREW, SAFER (G-MOSAIC)
Strategic planning	SICMA, NMFRDisaster, BeSeCu, FROESEC, SAFER (G-MOSAIC)
Innovative concepts	BeSeCu, FROESEC, SGL for UsaR, SICMA
Situational awareness	COPE, CrisComScore, SECRICOM, GEOCREW, SAFER, G-MOSAIC
Cooperation	COPE, SICMA, G-MOSAIC
Communication with the public and media	SECRICOM, CrisComScore
Managing resources	SICMA
Operations support	SICMA
Recovery logistics	SGL for USaR, ASTRO+, and through FP7 SPACE G-MOSAIC, SAFER

4.2 Recommendations

The Commission should encourage national authorities to give greater priority at national and regional level to promoting interoperability in communications equipment. Interoperability should remain a major research theme in future ESRP Calls.

The EU should play a stronger role in promoting harmonisation in procurement policies among end-user organisations in the CM field using a variety of tools, including certification, best practice research, and network development. Indeed, the widest scope for European action is in the standardisation of requirements, which would allow the industry to align itself with a much larger market (given that this is presently characterised by its fragmentation).

Demand-side initiatives should be supported to encourage end-users to research and define requirements in a way that takes full account of currently available technologies and the need for interoperability. A demand-side approach could help to complement more conventional supply-side developments by providing a clearer route to market. As in other areas of security research, the development of standards is an important theme requiring further action.

A system should be developed that is capable of providing comprehensive early warning and situational awareness to decision-makers both inside and outside Europe. There should in future be a full demonstration programme of an integrated and scalable crisis management solution to ensure greater interoperability and to demonstrate the potential value added of EU security research projects to end-users of CM solutions.

There is a need for a greater emphasis in FP7 SEC research activities and in FP8 on improving risk assessment and risk management at EU level. This would enable prevention and preparedness for different types of crisis situations (e.g. terrorist attacks, natural disasters) to be strengthened.

Closer cooperation should be promoted between established organisations in the crisis management field and new actors through the setting up a network of first responders and users.

Conclusions – Crisis Management

4

The aim of such a network would be to provide a platform for users and suppliers to come together to exchange experiences, share best practices and operational requirements.

Practical activities should be bolstered by conceptual and theoretical development of the field by the research community. This will require the development of frames of reference and typologies to guide future research efforts and the development of long-range planning tools.

Realistic simulation events based on different scenarios for first responders are already an effective means of preparing for CBRN events - the scope of such activities could be expanded. For example, simulation events could include a combination of both real-time 3D virtual reality and physical (i.e. first aid and remediation procedures) simulations.

First responders require greater knowledge and awareness concerning the specification of personal protective equipment. This needs to be incorporated into future training programmes and modelling scenarios more systematically.

Looking ahead to FP8, the external dimension of crisis management should be strengthened. The Lisbon Treaty allows scope to support CM in the context of EU external actions. Research projects could in future help to support the strengthening of the EU's role in the CM domain.

Improved cooperation and the exchange of good practices and experiences could be fostered between European first responders and NGOs and their counterparts in third countries to promote improved preparedness and response capabilities to respond to events such as the Haiti earthquake, which require a coordinated, joint EU response and advance planning.

List of interviews

A

No.	Name/Position	Organisation	Organisation type	Project (where applicable)
1.	Nana Wiedemann	Danish Red Cross	End User	NMFR Disaster
2.	Jana Paskajova	DG Enterprise (crisis management)	European Commission	NA
3.	Silke Schmidt	Ernst-Moritz-Arndt-Universität Greifswald	University	BeSeCu
4.	Jari Hamalainen	VTT Technical Research Centre of Finland	University	COPE
5.	Marita Vos	University of Jyväskylä	University	CrisComScore
6.	Hannu Rantanen	Emergency Services College Finland	End User / Technical College	CrisComScore
7.	Hakan Enquist	SAAB/ IMG-S (Crisis Management)	Company / Expert Advisory body	IMG-S
8.	Yrjö Gustaf Sucksdorff	Finnish Environment Institute (SYKE)	National Authority	NA (GMES activities in crisis management and surveillance)

NA – Not Applicable

FP7 Space Projects – GMES/ CM

B

FP7 Space projects – relevant in facilitating FP7 Security Research in the area of CM

The **SAFER** project is developing a series of products based both on demonstration projects and real crisis events. It is developing a flood risk management mapping system and a past flooding map in Bulgaria which serves a demonstration of what is possible with this service and helps develop end-users needs. SAFER products however have already been used in real crisis situations such as the earthquake in Haiti, floods in the south of France and so on. The maps developed can focus on different themes such as assets maps, population maps, critical infrastructure maps. SAFER aims to provide relevant maps in the event of a crisis within a timeframe of 6 hours, analysing both the current operational picture as a reference point, with follow-up maps post-crisis to keep track of evolving situations on the ground.

This allows for the identification of changes in landscape, destruction of infrastructure and so on, which can help emergency services reach the populations in a more timely and efficient manner. The project is especially interesting in its development of the end user dimension. In many respects, the services developed by SAFER sit closer to the end-user than some of the other GMES projects. DG RELEX and MIC of the European Commission has already used SAFER projects and see value in the project. One RELEX member of staff described the DG's experience of the project as "quick and efficient". The Italian Civil Protection Agency, which is in charge of the user dimension, described how end-users needed services which were timely, useful and reliable. The input of users in the project has helped develop pre-operational services that are already in use in different crisis areas.

SAFER has developed a number of services and has – to date been activated over 50 times since November 2009 (including including over 25 activations for 2010 alone). Those activations included such events as the initial early-assessment of building damage in the aftermath of the earthquake that hit Haiti on 12th January 2010, the eruption of the Eyjafjallajökull volcano, floods in Pakistan in the summer of 2010 and the Ajka alumina plant accident in Hungary. The products to be provided are still being developed with an important role played by the user community in the project.

G-MOSAIC's aim is to identify and develop new products, methodologies and pilot services for the provision of geo-spatial information in support to EU external relations policies and to demonstrate the sustainability of the GMES global security perspective. The end result of the G-MOSAIC project is the provision of intelligence data to the end-users that can be applied to early warning and crisis prevention as well as to crisis management and rapid interventions in hot spots around the world.

Core activities include: investigating the operational exploitation of GMES services as assets to support security activities in crisis situations; defining end-user needs regarding geo-spatial services in the intelligence and security sectors; and raising awareness of the potential impact of and options for GMES on the security community. G-MOSAIC aims to serve public sector end-users (both civilian and military) with security mapping and automatic change-detection services. The G-MOSAIC mapping products are able to monitor and detect changes in conflict and post-conflict zones as well as natural resource exploitation. Automatic change-detection services, as well as the (limited) use of hyper-spectral data to identify objects such as natural resource mines, are of particular value for end-users in the conflict and natural resource monitoring fields.

G-MOSAIC is developed in a series of 17 service chains in the fields of Non-Proliferation & treaties, Crisis indicators, Critical assets monitoring, Illegal activities, Routes & borders, Crisis Preparedness and Planning, Crisis management and Damage Assessment and Reconstruction. The chains have already been activated in a number of occasions. The most high profile of such occurrence was the help of **G-MOSAIC** following the Haiti earthquake. The involvement of the G-MOSAIC project attracted praise from the United Nations who sent an official letter in which talks about "the

FP7 Space Projects – GMES/ CM

B

suitability of the project's state-of-the-art technology to provide the necessary information for the required rapid relief operations”.

Project(s):	G-MOSAIC
Project timeframe:	36 months
Lead Partner:	Telespazio S.p.A (Italy)
Total Cost:	15.300.000
EU Contribution:	9.600.000
Start Date:	01.01.2009
Type:	Funded through FP7 Space (as part of GMES)
<p>The G-MOSAIC (GMES services for Management of Operations, Situation Awareness and Intelligence for regional Crises) Collaborative Project will provide the European Union with intelligence data that can be applied to early warning and crisis prevention as well as to crisis management and rapid interventions in hot spots around the world. It aims at identifying and developing products, methodologies and pilot services for the provision of geo-spatial information in support to EU external relations policies and at contributing to define and demonstrate the sustainability of GMES global security services.</p> <p>agenda designed to support its operations and to help support the operations of others. Regarding end users, G-MOSAIC products and services will be of use both to European and national organisations and entities: the European Commission (External Relations, but also Development, Environment, and Humanitarian aid), European Council entities such as the EU Military Staff, the Situation Centre; and, finally, national institutions such as Ministries of Foreign Affairs, Police Organisations, Intelligence Centres, and other organisations.</p>	