



Driving Innovation in Crisis Management for European Resilience

D840.11 - Societal Impact Assessment Framework – Version 1

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Lead Participant	PRIO	Lead Author	Stine Bergersen
Contributors	FHG-INT	Reviewers	Chiara Fonio (JRC)
			Marcel van Berlo (TNO)

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Document Information

List of Contributors	
Name	Partner
Stine Bergersen	PRIO
Mareile Kaufmann	PRIO
Gerald Walther	FHG-INT

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Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	2 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

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Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	3 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Table of Contents

Project Description	8
Executive Summary	9
1 Introduction	11
1.1 Purpose of deliverable.....	11
1.2 Societal Impact in DRIVER	12
1.3 Relation to earlier versions of the deliverable	13
1.4 Structure of the deliverable	14
2 The framework as a method for qualitative assessments of societal impact.....	16
2.1 Moving beyond the cost- benefit analysis	17
2.2 The benefits of a qualitative approach	19
2.3 A need for innovation – Examples of current dilemmas in CM	21
2.3.1 Examples: Communication during crisis.....	22
2.3.2 Example: Societal acceptability of new technologies	23
2.3.3 Example: Accountability & decision- making	24
2.3.4 Conclusion	24
3 Method: Societal Impact Assessment Framework	26
3.1 Introducing the framework’s components	27
3.2 Component 1: CM functions as the object of assessment.....	29
3.2.1 Identifying and categorizing functions	29
3.2.2 Definitions for high-level functions	33
3.3 Component 2: Societal values and principles as assessment criteria	34
3.3.1 Designing a criteria system.....	34
3.3.2 Criteria definitions.....	40
3.4 The framework in practice: relating functions to criteria	51
3.5 The different elements of a societal impact assessment.....	54
3.6 Societal Impact Assessment beyond the state of the art.....	57
4 Conclusions & way ahead: utilizing the SIA approach throughout the project and beyond	61
4.1 SIA in the consortium: SIA training sessions in T840.3 and T840.4.....	62
4.2 SIA in the consortium: SIA via SP2.....	62

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	4 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

4.3 Beyond DRIVER: Tentative suggestions for integrating SIA in the Portfolio of Solutions 63

References..... 65

Annexes 73

Annex 1: The complete SIA Framework (to be filled out) 73

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	5 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

List of Tables

Table 1: Simplified scheme for the SIA framework	27
Table 2: Functions and criteria defined	28
Table 3: The functions of the SIA Framework with related tasks	33
Table 4: Original criteria set from M8	38
Table 5: Criteria after first revision in M15	38
Table 6: Criteria ready for implementation in D840.21	39
Table 7: Abstract of updated SIA Framework	52
Table 8: Overarching: Relating the functions to the criteria	53
Table 9: Example: relating the functions to the criteria	54

List of Figures

Figure 1: The Societal Impact Assessment component in DRIVER	13
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Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	6 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

List of Acronyms

Abbreviation / acronym	Description
CBA	Cost Benefit Analysis
Cf	See reference
CM	Crisis management
D	Deliverable
DoW	Description of Work
DRR	Disaster Risk Reduction
E.g.	For example
EU	European Union
FD	Final Demonstration
i.e.	In effect/that is
Ibid.	As above
JED	Joint Experiment Deliverable
NSA	National Security Authority
PoEs	Portfolio of Emerging Solutions
SIA	Societal Impact Assessment
SotA	State of the Art
SP	Subproject
T	Task
UAV	Unmanned Aerial Vehicles
WP	Work package

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	7 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Project Description

DRIVER evaluates emerging solutions in three key areas: civil society resilience, responder coordination as well as training and learning.

These solutions are evaluated using the DRIVER test-bed. Besides cost-effectiveness, DRIVER also considers societal impact and related regulatory frameworks and procedures. Evaluation results will be summarised in a roadmap for innovation in crisis management and societal resilience.

Finally, looking beyond the lifetime of the project, the benefits of DRIVER will materialise in enhanced crisis management practices, efficiency and through the DRIVER-promoted connection of existing networks.

DRIVER Step #1: Evaluation Framework

- Developing test-bed infrastructure and methodology to test and evaluate novel solutions, during the project and beyond. It provides guidelines on how to plan and perform experiments, as well as a framework for evaluation.
- Analysing regulatory frameworks and procedures relevant for the implementation of DRIVER-tested solutions including standardisation.
- Developing methodology for fostering societal values and avoiding negative side-effects to society as a whole from crisis management and societal resilience solutions.

DRIVER Step #2: Compiling and evaluating solutions

- Strengthening crisis communication and facilitating community engagement and self-organisation.
- Evaluating emerging solutions for professional responders with a focus on improving the coordination of the response effort.
- Benefiting professionals across borders by sharing learning solutions, lessons learnt and competencies.

DRIVER Step #3: Large scale experiments and demonstration

- Execution of large-scale experiments to integrate and evaluate crisis management solutions.
- Demonstrating improvements in enhanced crisis management practices and resilience through the DRIVER experiments.

DRIVER is a 54 month duration project co-funded by the European Commission Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 607798.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	8 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Executive Summary

This deliverable presents the first version of a structured methodology for conducting qualitative societal impact assessments (SIA) of crisis management research and the implementation of CM measures and solutions. This framework is a qualitative methodology designed to assess both the unintended negative and positive impacts, that crisis management (solutions) can have on society. Acknowledging that CM research and the implementation of (innovative) measures and solutions to better CM takes place within a heterogeneous and complex field, the framework presented here takes into account the various key societal issues that have been identified by different research disciplines¹. The fundamental idea is that the societal impacts of CM measures and solutions can be quite powerful, and often, the burden is unevenly distributed across society (e.g. relying on mobile technology that not everyone possesses). Therefore, it is important for the actors and agents in CM research and implementation, to consider the potential societal impacts of their activities, to increase the potential for successful implementation and societal acceptability. Such impacts are difficult to assess via quantification or existing cost-benefit methods therefore the framework presented in this document offers a flexible methodology that aims to increase the understanding and managing of, and response to, potential societal impacts of CM research and CM measures.

The framework is designed for and tailored to assess the societal impacts of DRIVER functions in particular, but it is flexible enough to also assess CM functions in general. The deliverable explains the relevance and innovation potential of societal impact assessments in European CM, and it presents the methodological background and method developed to conduct such assessments. The heart of the deliverable is a detailed description of the qualitative methodology on which the framework is based, as well as an introduction of the framework's two main components, the CM functions, which is the object of the assessments, and the societal impact criteria, which are what these functions are assessed against.

First, it is explained how the CM functions were identified and categorized, and relevant definitions of these functions are provided. Second, the deliverable discusses how societal values and principles serve as criteria to assess the impact of these CM functions on society at large. The identification and selection of the criteria chosen for this framework are explained. Next, the SIA framework is demonstrated in practice, and one full example assessment is conducted. The rest of the societal impact assessments are provided in D840.21.²

¹ Such as the fields of risk assessment, data protection, critical infrastructure protection, resilience, community and civic engagement, decision-making frameworks, communication, critical security studies in general.

² D840.21 is thus a follow-up deliverable to this one and it includes the following: Identification of relevant criteria (usually approximately 6-7) per function and the related impact assessment, examples of how such an impact can take place, a list of concrete recommendations for how to avoid negative impacts and achieve positive impacts, and a strategy for integrating SIA in DRIVER.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	9 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

In the final chapter, an account is given of how the SIA framework will be utilized throughout and beyond the project. This is mainly foreseen via three channels:

- a) Conduction of various SIA training sessions for the consortium, with integrated feedback mechanisms to optimize the revision of the SIA outputs towards the end of the project
- b) The integration of the SIA framework into the overall DRIVER methodology, as part of the trial preparation
- c) The integration of the SIA framework as part of the DRIVER solutions, relevant and usable beyond the project.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	10 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

1 Introduction

1.1 Purpose of deliverable

The assessment of crisis management (CM) solutions traditionally focuses on their efficiency [16]. Such assessments do, for example, determine whether CM solutions are cost-efficient, whether they can save more lives or compensate damage, for example by providing for more time efficient-response [46]. Cost-benefit-analysis is a classic instrument to assess such efficiencies [16] [41]. The purpose of this deliverable is, however, to point to those negative and positive impacts of crisis management that are difficult to assess via counting or quantification. It points to effects and impacts that are also different from externalities, since externalities are those costs that original plans or budgets did not account for, but are regardless quantifiable and calculable [39].

This deliverable draws attention to the way in which CM solutions – with their many different functions - create secondary negative or positive impacts on society beyond economic effects. The deliverable presents a first version of a framework that can be used for conducting “Societal Impact Assessments” (SIA). The framework is designed for DRIVER, encompassing all the solutions and measures within the project, but at the same time, it is flexible enough to be relevant beyond the project, since the assessment objects is not limited to e.g. one particular technology, but rather the functions that this technology has. While the realm of ‘societal’ can arguably include economic, environmental and other kinds of effects and issues, the SIA framework focuses on impacts concerning societal values, principles and in/securities as, for example, anchored in fundamental rights or policies [14] [35]. It draws attention to those effects that cannot be measured or addressed through clear code, checklists or calculation models, but that nonetheless play an important role for successful crisis management [33] [34]. The second chapter will address this importance, and the qualitative and flexible nature of the framework. The aim of the framework is to emphasize that working with CM solutions is not only a matter of efficiency, but requires anchoring critical awareness for societal effects in all phases of crisis management. Acknowledging that societal impacts can be positive and negative at the same time, also speaks in favour of a qualitative approach. The SIA framework presented in this deliverable is exhaustive in the sense that it covers every CM solution and measure included in DRIVER. The assessment categories are broad enough to serve future CM projects, which may develop and tailor the framework further. While the solutions and measures in DRIVER are strong and reasonable reflections of key CM solutions in general, there is a risk that other technologies or approaches (that may not be known or implemented in CM yet) can have functions that are not covered by this framework. For example, it is likely that advancements in drone (UAV) technology will imply that the common drone in the future may have different and more sophisticated functionalities, such as the ability to smell, communicate or have algorithms written into them that allow for a (more) autonomous operation [91]. However, the broader assessment categories in the current framework could still be used, since it already allows for assessment of functions such as data collection (smell would here be a subcategory of “data

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	11 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

collection”) and CM communication (communicating via the drone would here be a subcategory of “CM communication”). This is what is meant by the framework being flexible and adaptable. It is with such potential societal, political and technological ambitions and possibilities taken into account that the present framework has been developed. However, drawing on a wide range of existing research and the broad expertise and input from the DRIVER consortium, the methodological approach to doing societal impact assessments presented in this deliverable, allows for the conduction of qualitative, rich, informative, text-based assessments of all the key impacts that the most prevalent CM solutions can potentially have on society as a whole.

The basic logic behind the framework is to provide a systematization of CM functions and relate them to a set of criteria that enable the assessment of positive and negative societal impacts. In sum, the key purpose of this revised deliverable is to provide a methodology for the practical implementation of SIA in CM, acknowledging that societal impacts can be both positive and negative at the same time (hence a qualitative assessment methodology is required). In this way awareness is created and critical thinking about CM measures incited, giving room to meaningful weighing pros and cons of CM from a societal perspective.

1.2 Societal Impact in DRIVER

This deliverable is the material vantage point for a series of activities and outputs that make up the societal impact component of DRIVER. The first step is the delivery of the societal impact assessment framework. Furthermore, the framework is put to use, and assessments are conducted for all the CM functions in DRIVER. The framework and the assessments are then integrated into SIA training modules, which the consortium receives training based on (D94.11). The basic idea of this three- step approach is not only to raise awareness of potential positive and negative societal impacts of CM activities, but also to provide an actual methodology and practical guidance for how to conduct such assessments (see also Figure 1).

For the training sessions, the training modules are designed to introduce the participants to the framework, and to conduct their own assessments, based on the concrete CM solutions they are working with. By integrating feedback mechanisms into the training material insights gained during the training sessions are systematically collected.

Towards the end of the project, the collected feedback is used to refine and update the framework, the example assessments and the training modules. These final versions (delivered in three separate deliverables) will be designed to ensure their relevance and usability also outside the project. As such, the SIA approach in DRIVER, as described above, serves as a vantage point for innovation in CM: it provides for a systematic methodology for implementing SIA in European CM, it provides for detailed example assessments to demonstrate how the methodology can be used, and it delivers training material that can be used to raise awareness about societal impacts and to train crisis

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	12 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

managers in practically conducting and implementing SIA in their everyday work. As all these components remain open access, they can inspire, and practically be utilized to make SIA a standard component and procedure in future research projects and in European CM at large.

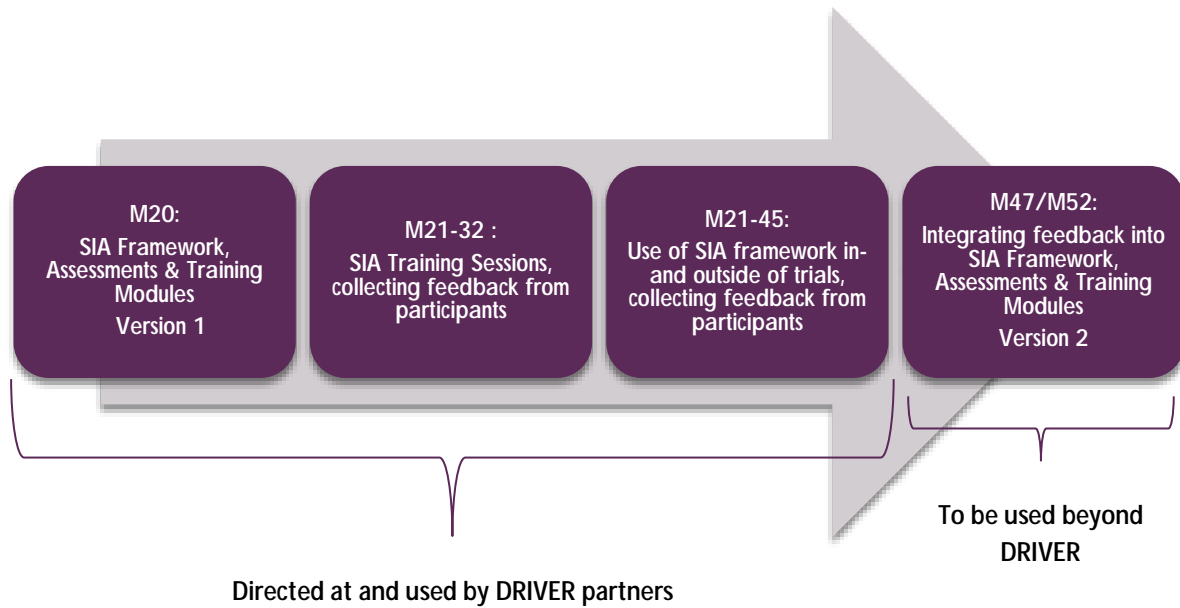


Figure 1: The Societal Impact Assessment component in DRIVER

1.3 Relation to earlier versions of the deliverable

The SIA framework was developed in both year 1 and 2 of the project, and is the combination of several deliverables from the original DoW. To simplify the structure of the SIA component in DRIVER, and to make its implementation more efficient, this current deliverable combines all aspects of original deliverables that have to do with the development of the SIA framework. Separating the framework and the assessments in two different sets of deliverables³ is considered more efficient, , and allows the SIA component to be more effectively implemented in DRIVER. As mentioned, the framework consists mainly of two components: functions and criteria. The framework presented here includes not only re-worked and updated functions, but also re-worked and updated assessment criteria tailored for both negative and positive impacts.

³ As opposed to earlier versions, e.g. in D92.11 and D92.21, which foresaw somewhat varying frameworks for negative and positive assessments, the opportunity was now seized to combine positive and negative assessments into one framework. This new focus on a combined SIA framework for “secondary insecurities” (former task T92.1), “societal costs incl. negative impacts” (former task T92.2) and “positive societal impact (former task T93.2) very much speaks to the general idea of societal impact assessments, in which a separation of insecurities from other negative impacts and from positive impacts would be artificial.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	13 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

The collection of assessment criteria adheres to the original DoW, addressing broadly unease and fear, as well as impacts on key societal values and principles. The criteria selection has also been discussed with SP2, 3, 4, 5 leaders as well as the Ethical and Societal Advisory Board. In addition, this deliverable draws upon a thorough review of the assessment criteria and positive societal impacts inherent to CM policies by the UN, the EU and the Red Cross. This review was conducted in D93.1 (accepted).

The development of the CM functions followed a similar iteration. SP- leaders working with CM solutions (which have these functions) were consulted throughout the development of the framework, in order to make the framework useful and relevant for the different parts of DRIVER. The framework therefore covers all CM solutions, and the functions that they have. The development and design of the framework is thus crosscutting, since the framework builds upon the different SP’s functions and integrates their feedback over time.

The framework is put to use in D840.21, which includes a first version of the full set of societal impact assessments. The framework and the assessments are translated into SIA training modules, which are taught in consortium-wide teaching sessions. The partners can then not only follow the pre-made assessments and recommendations, but also conduct their own assessments. The feedback from the training sessions will then be used to optimize and refine the final version of the framework, and the final version of the assessments, towards the end of the project.

1.4 Structure of the deliverable

The following chapter introduces the methodological background for the Societal Impact Assessment framework. While the methodology described in chapter 2 clarifies why it is important to conduct societal impact assessments in the first place, the actual framework – the method - is described in detail in chapter 3.

Chapter 3 presents the different components of the SIA framework. First, it explains the categorization of CM functions, on which the assessments are based. The categorization acknowledges that one CM solution can have several CM functions. The chapter iterates how the categories of functions were developed, it provides the definitions of these categories, and it preliminary describes which functions are relevant to which DRIVER task or WP. Chapter 3 furthermore explains the development of assessment criteria and provides the definitions of the criteria. Finally, chapter 3 also gives a step-by-step explanation of how the framework can be put to use, and gives a summary of every element of a societal impact assessment. The annex contains a table that summarizes the SIA framework.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	14 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Chapter 4 explains how the framework will be implemented and utilized throughout the project. It also foresees how version 2 of the framework will serve as a vantage point for future CM research projects. The final recommendations for using the framework beyond DRIVER however, are not provided until the final version of the framework is ready.

Chapter 5 lists the references of this deliverable.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	15 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

2 The framework as a method for qualitative assessments of societal impact

The need for Societal Impact Assessments in crisis management research has not emerged in a vacuum, but as an integrated part of society. Similarly to the state of the art of SIA in security research⁴, the SIA approach developed for DRIVER draws upon a wide range of previously established practices, disciplines and research fields. It draws together academic disciplines and public and private organizations representing various stages of the crisis management cycle. The complexity and heterogeneity of the field of crisis management, and the innovative development and implementation of CM tools, solutions and technologies, makes it necessary to take into account the larger societal impacts, e.g. to increase the acceptability of the tool etc. at stake, and to make its implementation more efficient and effective. This is also important to lessen the risk of uneven distribution of (negative) impact, especially for disadvantaged groups [50].

The societal perspective is relevant in all phases of the CM cycle, whether that refers to solutions aimed at prevention, preparedness, mitigation or recovery. While there are different angles and approaches to capture impact, the inclusion of societal perspectives is becoming prevalent in European security research. A main difference between approaches is the distinction between qualitative and quantitative methods, and in the following, the qualitative nature of the DRIVER approach to SIA is explained.

One of the overall objectives of DRIVER is to facilitate a shared understanding of crisis management across Europe. The Societal Impact Assessment framework designed for DRIVER is the core of a methodology for making qualitative assessments of the impacts that the CM solutions can have on society. The concept behind the framework is to provide solution providers, practitioner organizations/ end-users and researchers, working in crisis management, with a method for conducting societal impact assessments. The flexibility of the framework (as described in detail below), and the qualitative assessments that it produces, makes it implementable in various ways for various stakeholders in crisis management. The overall objective is that the implementation of the framework, or variations of the framework, (i.e. the systematic implementation of societal impact concerns in research projects), can lead to a cultural change, an objective that is at the core of the overall DRIVER objective of facilitating a shared understanding of crisis management across Europe. As only few systematic approaches to assessing the societal impact of crisis management activities

⁴ One example is described in this state of the art on societal impacts of security research. Available at: <file:///grid/Institute/SP/Project%20management/Active%20Projects/DRIVER/Resubmission%20of%20deliverables%202016-2017/Background%20Info/state%20of%20the%20art%20societal%20impact%20assessment%20for%20security%20research%20-%202014.pdf>

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	16 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

are known⁵, this framework has particular relevance. Since it is based upon a qualitative methodology and principles, rather than an assessment of e.g. legal compliance or cost-effectiveness, it has a wider potential applicability.

2.1 Moving beyond the cost- benefit analysis

A prevalent way of assessing CM solutions is via cost-benefit-analysis (CBA), where the costs and benefits of CM solutions are assessed in terms of their economic effects with a focus on their efficiency [16] [40] [46]. Such analytics assess mainly the monetary investments needed for specific solutions and whether they are proportional or profitable in relation to the effects they produce. They can also assess efficiency in terms of lives saved or damage caused. For reasons of calculability, such effects are often translated into monetary or economic values (For critical analyses [2] [41]). Even variables such as ‘lives saved’ are increasingly translated into monetary values [1]. Questions that such analytics address are, for example, whether an investment in new communication technologies would lead to a more rapid communication during crises, thus increasing the efficiency of mitigation measures. The DRIVER of cost-benefit-analyses is thus that decisions on CM solutions can be taken in a rational manner (since they are based on calculable results) and that the most efficient decision is implemented. In addition, it is a method that, due to its calculability, enables a fast assessment of the efficiency of a measure, which is also convenient in the context of high-level decision-making.

Particularly in CM the need to take efficient decisions is very prominent, since there are many pressures that are specific to crisis management, such as time pressures and economic pressures. Rational decision-making based on CBA then provides a solution to such pressures. Exploring the most efficient solution in terms of timing, budget decisions, lines of orders and communication models, is thus largely done through calculations. That means, however, that for the sake of conducting such cost-benefit-analyses, any kind of influence factor or variable often needs to be quantified and rendered into numerical values. Thus, cost-benefit-analyses have a tendency to economize CM-related decision-making. In the broader context of security research this trend has been criticized as a specific “politics of numbers”, which implies that counting and calculating have concrete effects on the issue in question to the extent that they concretely change the practices and policies related to it [74].

While the CBA plays an important role in the assessment of CM solutions, the goal of the SIA methodology developed in DRIVER is, however, to address impacts that are not easily calculable or that exceed calculability, not least because most of these effects are long-term, abstract and often unintended. In this way, the SIA methodology described in the following is a move beyond the

⁵ One example is described in this state of the art on societal impacts of security research. Available at: <file:///grid/Institute/SP/Project%20management/Active%20Projects/DRIVER/Resubmission%20of%20deliverables%202016-2017/Background%20Info/state%20of%20the%20art%20societal%20impact%20assessment%20for%20security%20research%20-%202014.pdf>

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	17 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

traditional CBA, aimed at capturing the more incalculable impacts that CM can have on society. The width of these impacts can be reflected in the research that lies behind the first round of assessments using this first version of the framework. This literature came for example, from the following fields: risk assessment, data protection, critical infrastructure protection, resilience, community and civic engagement, decision-making frameworks, communication, critical security studies in general. Concretely knowledge was gathered from policy papers, research articles, academic literature and media channels⁶.

The onset for the development of the SIA framework is that not every kind of effect of CM can be calculated or expressed by a number. And yet, it is without doubt that these effects may have considerable societal impacts [77] [67]. For example, the increased use of drones for search and rescue missions can be an efficient tool for locating displaced individuals, but it might also inflict suspicion in the population through its pop cultural connotations or lack of proper labels indicating what its mission is [31]. It is these incalculable societal costs and opportunities that the framework addresses and draws attention to. This societal impact assessment framework was designed to raise awareness about unintended negative and positive societal impacts of CM, and to serve as a practical tool to be used for conducting such assessments. While such societal impact assessments, and the decisions based on them, may also be prioritized or ranked using numerical values and implemented in an efficient manner, the societal value itself is not a calculable one. And yet, these societal values are highly important to crisis management, because society’s ability to perform and the functioning of CM are also dependent on them [e.g. 77].

Of course, DRIVER is not the first EU project on CM that has looked into the issue of how to incorporate an SIA into the project. D91.21 already provided an overview of the SOTA of SIA in EU projects. This section will therefore provide a synopsis of the deliverable. Based on an identification of projects using keyword searches in CORDIS, three levels of engagement with societal issues have been found:

1. Projects that do not deal with the societal aspects of their application area at all;
2. Projects that have dedicated tasks or work packages on societal aspects in the area of the project’s activity, i.e. projects that try to add societal knowledge around the areas and solutions addressed;
3. Projects that try to follow a “society-friendly-by-design” approach and try to really integrate societal aspects into their solutions.

While many projects do not engage with societal implications at all, there are a few that have dedicated work packages or tasks for this effort. A very small number of projects actually follow the “society-friendly-by-design”, i.e. where societal impact assessment is paid attention to throughout

⁶ It is important to note here that literature, theory and approaches for negative impacts and opportunity assessments differ. Thus, two different sets of background knowledge was needed for one assessment (e.g. Resilience has generated a body of literature that supports the approach, mainly in the policy field, but it has also generated considerable critical literature).

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	18 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

the entire project, approach. In fact, only four projects were identified that promoted the latter approach. These projects are discussed in detail in D91.21. In addition, in the field of security research, the FP7 PACT project (Public perception of security and privacy: Assessing knowledge, Collecting evidence, Translating research into action) [64] developed a web-based decision support system, which provides a context dependent assessment of privacy, social and ethical impact of security measures to decision makers. This support system involves a six-step process, which uses a qualitative approach. Similarly, most of the projects under review in D91.21 rely on the use on qualitative assessments, which is hardly surprising given the wide variety of societal implications that could arise from the use of a technology, development of a policy or an operational decision. Quantitative approaches generally fail to capture the multifaceted reality in CM or security in general.

2.2 The benefits of a qualitative approach

Qualitative research is a broad umbrella term that covers many different techniques, approaches and philosophies, and this makes the term not easy to define [96: 8]. Hennink et al. describes it as an approach that allows for examining people’s experiences in detail, by using a specific set of research methods, but that it is also more than just an application of methods (ibid). What furthermore is a feature of qualitative research is that the approach allows you to identify issues from the perspectives of the people you study, and understand the meaning or interpretation that they give to certain issues. [96: 8] For example, to understand how individuals experience crisis, and how various meanings and opinions can feed into the experience. This can be referred to as an interpretive approach (ibid). Researchers have turned to qualitative approaches for several reasons, such as the recognition of the limitations of positivist epistemology and quantitative methods [97: 161]. To describe in more detail the methodological foundation of the Societal Impact Assessment Framework designed for DRIVER, the different aspects of qualitative and quantitative research approaches can be discussed in relation to the framework. Concretely, the SIA framework is analysed as a methodology in itself, since the framework is the method allowing for making the Societal Impact Assessments, while the assessments (which are presented in D840.21) are the data that the methodology produces.

When comparing the basic differences between qualitative and quantitative research methods, these differ primarily in the following areas⁷:

- The analytical objectives
 - For qualitative approaches, the objectives can be to describe variation, to describe or explain relationships, individual experiences or group norms. It can also mean to

⁷ The comparison of quantitative and qualitative research approaches is largely based on Module 1, Qualitative Research Methods Overview in Family Health International “Qualitative Research Methods: A Data Collector’s Field Guide”. Available on: <http://www.ccs.neu.edu/course/is4800sp12/resources/qualmethods.pdf>

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	19 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

gain a detailed understanding of underlying reasons or motivations [96: 16] or “multiple realities” [98: 101].

- For quantitative approaches, the objectives can be to quantify variation, to predict causal relationships or to describe the characteristics of a population. It can also be to measure and count issues and then to generalize the findings to the broader population [96: 16].
- The types of questions that are posed
 - For qualitative research approaches, the format of the questions is usually open-ended, meaning that these questions require more than one word answers. Such answers could be given in the form of a list, sentences or even a paragraph or longer written texts such as a dissertation. For example, one can ask “Why? How? What is the process? How does this influence happen?” [96: 16].
 - For quantitative research approaches, the format of the questions is usually close-ended, making this a less flexible approach, as such questions can usually be answered with a simple “yes” or “no”. The data collected are usually numbers or numerical data [96: 16].
- The types of data collection instruments that are used
 - Qualitative research approaches use instruments that are more flexible, have an iterative style of eliciting and categorizing responses to questions. This can happen via interviews, observations or group discussions.
 - Quantitative research approaches use instruments that have a more rigid style of eliciting and categorizing responses to questions. This can happen via population surveys or opinion polls [96: 16].
- The forms of data they produce
 - A qualitative research approach provides data that are textual and interpretative [96: 16]. These data can be obtained in a number of ways, e.g. via interviews, focus groups, or field notes.
 - A quantitative research approach provides data that are numerical or statistical. These data are usually obtained by assessing numerical values to responses. Collecting numerical data requires highly structured methods, such as structured observation or questionnaires.
- The degree of flexibility built into the design
 - In qualitative research, some aspects of the study are flexible (for example, it is possible to add, remove, or change the wording of questions). The responses by the participants can potentially affect how and which questions researchers ask next. The study design of qualitative research is iterative, meaning that the data collection and research questions are adjusted according to what is learned.
 - The study design in quantitative research is usually stable from beginning to end, and the participant’s responses does not influence or determine how and which questions the researchers ask next. The study design is subject to statistical assumptions and conditions.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	20 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Looking at the key differences as they are described above, one of the main differences between quantitative and qualitative methods is their flexibility [89]. While quantitative methods generally are rather rigid, one advantage can be that this inflexibility allows for a comparison of responses across participants. However, to be able to do this, a thorough understanding of the questions, the best way to ask them and the range of possible responses is needed [89]. Furthermore, the participants must be asked the same questions, in the same order, and the response categories should be “close-ended”. Qualitative methods are generally more flexible, meaning that the interaction between the researcher and the participant/ research object is more open:

For example, qualitative methods ask mostly “open-ended” questions that are not necessarily worded in exactly the same way with each participant. With open-ended questions, participants are free to respond in their own words, and these responses tend to be more complex than simply “yes” or “no.” [89]

The flexibility of the qualitative methodology of the framework in DRIVER allows for “open-ended” questions that may be tailored to the different participants or groups of participants. This facilitates for a more dynamic interaction with the framework, since participants are free to respond to the questions and issues in the framework in a free and creative way. The richness and depth in this textual data that the SIA framework is designed to explore, makes it possible to assess various aspects of the phenomena of societal impact of crisis management functions. For example, the framework is not designed to assess concrete CM solutions (such as a particular drone), but to assess the functions of concrete CM solutions (such as what a particular drone does). For example, the framework asks “what is the impact of function y on criterion x? How is that impact positive/negative? Do we know any examples from personal experience or literature to back such an assessment up?”. The outcome of these open-ended questions makes up the societal impact assessments and furthermore allows for discussing follow up questions and issues within the textual data contains. This relates to the analytical object of qualitative research methods, which encompasses the descriptions of variation, relationships, individual experiences or group norms. As mentioned above, the research approach of the SIA framework is more flexible, in the sense that it has an iterative style of eliciting and categorizing responses to questions. In addition, the study design of the qualitative SIA framework is iterative, meaning that the data collection and research questions are adjusted according to what is learned, via the follow-up deliverables where the method is refined, and via the conduction of the training sessions on SIA.

2.3 A need for innovation – Examples of current dilemmas in CM

CM needs solutions that are accepted by society. If CM solutions create societal controversy, their efficiency and effectiveness may actually be undermined. Yet, as discussed previously in section 2.2, EU projects engaged in CM or security research have shown limited interaction with SIA. This is where DRIVER sees innovation potential. A methodology for societal impact assessment is not only an added value for solution providers that can take account of potential societal impacts when addressing gaps and developing CM solutions. Such a methodology is also relevant for practitioners

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	21 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

who implement CM solutions. While solution providers and practitioners often focus on the short-term practical potential of new CM approaches, strategies, concepts and solutions, societal reactions are often long-term and more abstract and complex, which makes it hard to include them. The DRIVER societal impact assessment framework is designed to address this complexity and pave a way for more effective inclusion of societal issues in approaches, strategies, concepts and solutions.

Such long-term effects are already known from the context of security policy. For example, the introduction of the “body scanner” raised considerable public debate [2]. Some people were quite hopeful that this technology would improve their personal security. The arguments for the introduction of the body scanner were largely based around its perceived effect and efficiency. It was e.g. seen as a reliable instrument to detect explosives, or as more of a symbolic measure to show that action is taken to prevent and counter terrorist attacks. This was further enforced in the wake of occurred attack, as people claim that they are not worried about the screening after there has been an attack [38]. Others commented that the technology might also reduce the time spent at airports security checks, in the sense that the solution reduces waiting lines at the airport [49], or further, that it actually reduces prejudices: by being an instrument that can make profiling more neutral than ethnic profiling or a pat-down-searches [34]. Yet, at the same time, others commented on the negative consequences of the scanner. For example, people have worried about the physical side effects of the technology, such as the safety of an unborn baby being carried through the scanner [87]. Others express concern about their privacy, asking e.g. if the security personnel are able to see that they have a prosthetic limb [82], to which degree they are able to see the contours of the body [77], or if the technology allows the operator of the technology to see through religious attire such as a burqa. Furthermore, people expressed scepticism about the utility and efficiency of the technology, asking if the machines are really reliable for detecting all potential weapons [67] [69]. In sum, these examples of societal resistance and unease may reduce the utility of the technology (active resistance) as well as undermine the feeling of being secure that body scanners are supposed to achieve, and thus be of an unintended negative societal impact.

A solution thus never produces only positive or negative effects. It shows that developing new CM solutions is always a balancing act. The societal impact of CM solutions has only recently become part of the political and the research agenda. However, three examples of such balancing acts already exist, which are relevant to the core activities in DRIVER. They are illustrated below.

2.3.1 Examples: Communication during crisis

DRIVER is particularly concerned with communication and its role in CM, mitigation and recovery. The following two examples demonstrate how difficult communication in a crisis can be and how the way it is conducted has important ramifications for successfully managing the crisis.

One of the key phrases that have recently emerged in CM is the concept of resilience[48], which describes the ability to not only weather a crisis but also emerge stronger at the end of it. While it thus has a positive connotation, the example of its emergence after Hurricane Katrina in the US shows that its use by policymakers can have negative consequences as well. During the crisis,

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	22 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

resilience became a symbol for a successful recovery. However, while some parts of the population in New Orleans accepted this positive understanding of resilience and used it to deal with the aftermath of Katrina [52], others became fed up with the concept, since they felt overburdened by the responsibility to deal with the crisis themselves, and one could say that resilience became a nuisance of the population [45].

If implemented well, resilience is considered to save livelihoods. However, if resilient behaviour is taken for granted, some parts of the crisis population can feel overburdened by the idea that bouncing back after crises is their own responsibility.

The need to better understand the societal implications of crisis communication by officials can also be seen in two recent events in Germany, which are linked in terms of official uses of media. The first event took place during New Year’s Eve in Cologne. Despite about 1000 young men engaging in robbery and sexually harassing, including several cases of rape, women at the Cologne Cathedral, the Cologne police press release in the morning of the 1st of January read “Festive Atmosphere – Celebrations Largely Peaceful”. This misinformation about the events that took place during the previous night had a profound impact on the perception of the police and its credibility throughout the year. In addition, the limited information sharing by the police had of course also been witnessed by other police units within Germany, which became apparent in the Munich Mall shootings that took place on the 22nd of July, where a young man opened fire in a shopping mall in Munich. In this case, the police was very quick to provide information to the public, however, some of these bits of information turned out false, which could have contributed to a public panic [81]. For example: “There has been gunfire – the Situation is unclear,”; “The suspects are still on the run,”; “Please avoid public places.” [81] While both events are completely different in nature and not related to one another, the communication strategy employed by state authorities in one scenario impacted on the subsequent communication strategy. This lack of proper procedures that incorporate a thorough societal impact assessment can be detrimental to perception of the state thus undermining its authority as in the first case, or contribute to public insecurity such as in the second case.

2.3.2 Example: Societal acceptability of new technologies

An example of how technologies can create societal impact concerns the use of unmanned aerial vehicles for CM, which is a recent phenomenon as for example seen during the Nepal earthquakes [46b]. Many good reasons exist as to how they can be of great help during crises and disasters. In DRIVER, the use of UAVs is explored as a solution for crisis management.

At first glance, the advantages of using UAVs are quite apparent. For example, they can be used by traffic controllers to identify bottlenecks. They can assist the police in several ways from speeding up the localization of missing people to allowing the identification (smell) of dangerous substances. For crisis managers, they can be an efficient tool for providing a situational overview. More specifically, they can help to find routes and ways to inaccessible areas, spot safe havens and places as well as deliver vital goods such as medication. All of these examples are excellent arguments for the use of UAVs. However, there are also downsides. With limited knowledge, people may be overly concerned

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	23 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

if they see the deployment of a drone and wonder if they are safe. Or they may worry that criminals may use the drone to take picture of them and their home for nefarious purposes. Even if it is made clear that there are legitimate reasons for the deployment of the drone, people may be concerned about the storage of data (where and for how long) and who is given access. Even though most UAVs do not yet collect data or have sophisticated technological appliances that enable visual and audio data collection, the general population may not yet know this and the implementation of UAVs for crisis management may cause unforeseen reactions as discussed above.

2.3.3 Example: Accountability & decision- making⁸

A final example for an unintended societal effect speaks to risk communication and decision-making practices during CM. The risk communication and the decision-making, as well as the responsibility of scientists as decision-makers, during the L’Aquila earthquake in Italy became a topic of societal discussion [88]. While methods for the measurement of seismic activity and risk communication procedures existed, the actual decision-making framework and accountability questions were not clear before the crisis situation. The scientists who conducted the analyses about seismic activity were held accountable for issuing a statement that reassured people to stay within the city, which again caused major negative impacts once the earthquake struck harder than expected [65]. If communication procedures had been in place and responsibilities had been clarified in the context of existing decision-making frameworks, such negative impacts could potentially have been avoided. The scientists, however, were at first held accountable for manslaughter by law, which caused a major debate in society questioning whether science and scientists have a responsibility vis-à-vis society. After 2 years the scientists got acquitted. This goes to show that risk assessment and communication methods need to be aligned with questions of decision-making responsibility all of which need to be an integral part of CM decision-making frameworks – otherwise they can create larger societal problems than expected. In addition, the absolute reliance on technical tools, as evidenced in this case, can be detrimental to the ability of a society to prepare for disasters as well as to understand how to react within a disaster. In this case, communicating to the public that science and technology can be fallible could have improved their preparedness by increasing the willingness to organize communally, sharing best practices and foster closer cooperation with first responders.

2.3.4 Conclusion

While the above examples demonstrate the relevance of taking societal dimensions of CM into account, they furthermore show how the effectiveness and societal acceptability of a CM solution cannot necessarily be quantified and calculated. As an innovative parallel to assessing economic benefits and testing efficiency via cost-benefit analyses, the focus on societal impacts and opportunities, are the focus of the SIA framework. To avoid that unintended societal impacts are side-lined with those values that can be calculated and assessed more easily, the aim of SIA component in DRIVER is thus to strengthen awareness about societal impacts assessments in CM research, but also to practically offer a methodology, a dedicated SIA framework, that can be

⁸ Version 2 of this deliverable will include a more concrete example for illustration that will be based on the insights and feedback that WP840 members will get through the training and experiment activities.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	24 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

implemented and used by crisis managers to assess the more incalculable side-effects of CM. It aims to support a form of crisis management that regards the creation of positive societal effects as equal to calculated efficiency.

The design of this framework has a normative element since it seeks to implement SIA in CM through a set of criteria and principles that unavoidably and intentionally reflect shared societal values. The values that sit at the core of society, however, may not only differ from context to context (e.g. depending on culture or traditions), but may also be redefined through societal controversy (such as technology development or historic events). This is why a main challenge in designing the framework is the balancing act of keeping it broad enough to allow for different societal perspectives, but also concise enough to give concrete and useful advice. The first version of the framework, as presented in this document, already provides a method that enables a wide range of stakeholders (i.e. everyone working with a CM solution) to conduct their own assessments and implement their findings within the respective organizations or institutions. The method also includes feedback mechanisms, to enable improvement of the framework and its components. This makes the development of a method for societal impact assessment in DRIVER de facto a dynamic process: the improvement and refinement of the next version of the framework are dependent on feedback from CM stakeholders. This is gathered mainly via the SIA training sessions, with the aim e.g. to refine the categorization of the CM solution’s functionalities.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	25 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

3 Method: Societal Impact Assessment Framework

Having presented the background and rationale behind the methodology that is the SIA framework, this chapter will go into more detail on what the framework actually is, and how it is designed. The framework for societal impact assessments (SIA) was developed in the first years of DRIVER throughout different deliverables, which has been revised and consolidated in one single framework. This final first version of the full framework relates different functions that CM solutions fulfil to a set of criteria that are used to assess the secondary insecurities, societal costs and societal opportunities that can be generated by different functions. The framework presented here, has already been put to use, both via the first SIA training sessions for the consortium, and in writing the first versions of the full set of actual assessments. Throughout the rest of the project, the consortium participates in training sessions where the use and implementation of the methodology is key, and furthermore, the framework is integrated into future DRIVER trials. Finally, a refined version is delivered towards the end of the project. The practical and theoretical development of the framework was a highly cross-cutting exercise. It builds upon the integration of feedback from leaders and key individuals from all relevant sub projects from bilateral consultations, meetings and workshops.

While it is crucial to point to unintended negative impacts of CM, it is equally important to ensure that users of the framework also understand where opportunities lie to foster societal resilience, which they might not have seen before. When it comes to formulating such positive impacts, the biggest challenge is not to state the obvious. Most CM solutions with their diverse functions exist because they are believed to create a positive impact and foster societal resilience. This is why it is important to reflect about the kind of positive impacts that the use of the SIA framework addresses. There are different kinds of opportunities and positive impacts that CM solutions are thought to create. This includes, for example economic opportunities, positive environmental impacts or opportunities to save 'bare lives' as is often the case with triage approaches [12]. The SIA framework is not designed to address these kinds of opportunities; environmental impacts are, for example, covered in D840.5. Rather, this framework assesses opportunities to create societal resilience by strengthening and respecting societal values and creating a positive sense of feeling secure.

The framework does not assess whether, for example, community training would make response activities more time-efficient, but how community training can be used to foster a culture of trust in society so that communities feel safe when they are in a crisis situation. The framework should then be a practical tool for those who work with solutions for community training, to assess the potential societal impacts of this solution. Similarly, the function 'information exchange' is not assessed in terms of its capacity to foster efficient information exchange, but rather, whether it is done in a transparent manner and whether it contributes to communities feeling well-informed rather than feeling uninformed and uneasy in a crisis situation. Crisis managers should thus be better equipped

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	26 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

to plan communication solutions in a way that creates opportunities to foster, e.g. values of trust and transparency in society, thus creating societal resilience.

3.1 Introducing the framework's components

A framework for assessing societal impacts has to facilitate two things: an assessment of how unintended negative impacts of CM can be avoided and how opportunities to foster societal values can be created. The framework developed for DRIVER consists of two key components. It includes a set of CM functions, which is assessed through a set of criteria in order to define positive and negative impacts. Below is an excerpt of the framework. In a simplified manner, the framework could be represented in a chart format in which the y-axis presents the different CM functions and the x-axis presents the assessment criteria.

Subcategory	SECONDARY IN/ SECURITIES				POLITICAL & ADMINISTRATIVE PRINCIPLES				LEGITIMACY	CORE SOCIETAL & ETHICAL PRINCIPLES				LEGAL VALUES	FUNDAMENTAL RIGHTS				WP/Tasks								
	Unease - Calmness	Suspicion - Trust	Misuse - Protection	New Vulnerabilities - Progress	Technology Dependency - Flexible Solutions	Function Deep - Specialized and Controlled Use	Sustainability	Accountability	Transparency	Integrity	Negative - Positive Standardization	International Relations	International Cooperation	State - Citizenship - Relationship	Political Reputation	Social Cohesion & Solidarity	Participation	Diversity		Open - Closed Society	Cultural & Gender Sensitivity	Suitability, Necessity & Proportionality	In/justice & In/equality	Dignity & Non-Disc	Privacy & Da	Freedom	
Criteria																											
Functions concerning Civil Society Resilience																											
Category: Community Engagement																											
Training Communities for Psychosocial Support		X	X												X	X	X										
Building & Measuring Community Resilience	X	X						X																			
Volunteer Management (Incl. Crowd Tasking)	X	X	X				X						X		X	X	X			X					X		
Category: Crisis Communication																											
From Crisis Managers to Citizens (public)	X	X	X											X	X	X	X					X		X			
Low-level: Media & Policy communication	X	X												X	X					X				X			
From the Citizens to Crisis Managers			X	X				X	X							X	X			X		X	X	X			
High-level functions																											
Mid-level functions																											

Table 1: Simplified scheme for the SIA framework

The table above is an excerpt of the framework, and not the full framework. However, it illustrates how the two key components of the framework are linked together. The full table is presented in the annex of this deliverable. To briefly explain the components highlighted in the table above, we can define them in the following way:

HIGH- LEVEL FUNCTIONS	The high-level functions are the broad clustering of the overarching functions, i.e. the highest analytical level. The framework is based on functions instead of solutions or tools, since one CM solution can fulfil several functions. Using functions as a vantage point thus allows for a fine-grained and varied analysis, since different assessments based on functions can be combined for assessing the impact of one solution.
MID-LEVEL FUNCTIONS	The mid-level functions are the object of the assessments by the framework. While the high-level functions categorize the mid-level functions, the latter more concretely described a CM function as something that a CM solution does.
CRITERIA	To assess how the functions can influence society, positively or negatively, a set of criteria was developed. The assessment criteria are chosen and formulated in a way that allows for assessing and balancing both, positive and negative societal impacts.

Table 2: Functions and criteria defined

Functions and criteria will be further introduced in detail below.

The definition of the functions have been developed in consultation with the different partners working with solutions, in particular the leaders of SPs 3, 4, 5, to ensure the best possible representation in the framework of the actual solutions (included in the former DRIVER experiments and in the future DRIVER trials) and to provide at the same time for a set of functions that speaks to CM in general. In addition, all functions have been verified and adapted to match the CM functions contained in the former SP8, which assesses context factors and gives legal advice. Basing the assessment on functions thus ensures the integration and usefulness of the approach across all relevant DRIVER SPs, but it also means that the scope and level of detail of the functions can be adapted and tailored to other uses (e.g. in other research projects). While the high-level functions would then likely stay the same, the mid-level functions can be adapted and lower-level functions can be added as a sub-level, to allow for even more detailed and fine-grained assessments. The assessment criteria have also been presented to and endorsed by the SP leaders, as well as by the Ethical and Societal Advisory Board.

The complete framework can be found in Annex 1. As such it can be accessed, re-used, adapted and developed further by future CM projects.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	28 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

3.2 Component 1: CM functions as the object of assessment

As described above, the objects of assessment within the DRIVER SIA framework are the functions that the CM solutions have. This chapter describes how the functions were identified and categorized at first, and lists the definitions of all high-level functions. More concrete definitions and descriptions of each mid-level function are given in D840.21, which presents the actual assessments. The functions were developed to be concrete enough for DRIVER and the gaps that DRIVER seeks to address and broad enough to be relevant for CM in general and remain relevant in the future, even when CM develops beyond the state of the art.

3.2.1 Identifying and categorizing functions

CM measures and solutions fulfil a vast variety of functions. These functions can range from gap analysis to volunteer management, from information exchange between crisis managers to simulations. Almost all CM solutions involve, for example, functions of collecting, storing and exchanging information. In short, diverse functions are the building blocks of any CM solution. Societal impact assessment starts with these building blocks: if functions are designed without keeping their societal effects in mind, they can undermine CM objectives. Or, when designed carefully, they can create additional opportunities to foster societal resilience. Functions are thus the object of assessment in this framework.

The framework's functions are categorized to allow for an assessment of crisis management in general and DRIVER functions in particular, with regards to the creation of secondary insecurities (originally covered in D92.1), other societal costs (originally covered in D92.2), and positive societal impacts (originally covered in D93.2). The original idea was to develop an assessment framework that can be used throughout the whole project, to create a systematic overview and streamline the process. In order to reach that, the current set of functions was also compared to the functions defined by the original SP8. Both sets of functions, which serve as a starting point for different kinds of assessments, are now aligned in one set of functions that defines the starting point for the assessment of any DRIVER solutions, but they are also broad enough to speak to CM in general.

In order to conduct societal impact assessments in a meaningful way, the determination and categorization of functions followed an inductive approach. Within former SP9 all DRIVER tasks that involve CM functions were listed. This was done based on the DoW as well as in cooperation with SP 3, 4 and 5 leaders. From that list, general categories of high-level functions and subcategories of mid-level functions were deducted. The assessments are conducted at the level of mid-level functions.

Since each of the planned DRIVER tasks can incorporate several functions, all DRIVER tasks were assigned to the matching functions. This means that some DRIVER tasks are listed under several different mid-level functions, as these tasks work with many different CM functions in one task. The fact that one task or one solution can fulfil several DRIVER functions and that assessments are thus

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	29 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

conducted for CM functions instead of solutions increases the versatility of the framework, since the assessment per solution is composed of the different functions assessments. The functions were also defined in a systematic manner to ensure that they would relate to each other, but don't overlap not too much in order to avoid double assessments.

The different mid-level functions were defined narrow enough to match DRIVER tasks, but also broad enough to allow for an assessment of general CM functions at the same time. For example, "Building and Measuring Community Resilience" is a concrete mid-level function that reappears in different work packages of SP3. It is a specific DRIVER function addressing a gap in CM at the same time as "Building and Measuring Community Resilience" will continue to be a relevant function in future CM at a more general level. Through this approach of defining and categorizing functions, the framework is also more effective and versatile than, for example, developing an assessment for DRIVER solutions on a singular basis.

In order to ensure the best possible integration across the project and a high relevance of the framework for every sub project, the categorization of functions was iterated and updated four times: it was sent to sub project leaders for their approval at an early stage in the project and was then updated and iterated in year 2 of the project through workshop meetings, when the different tasks for each sub project were more clearly defined. The list of functions was updated when they were consolidated with the functions identified and defined by former SP8. In this final step, it was also identified in which DRIVER experiment (onwards: "trials") each function will be tested in action. This match was identified by the new SP8 lead. For example, the first deductions from the DoW led to a high-level function called "Other forms of training" which included a subcategory "Psychosocial". In 2014 such a suggestion was at first confirmed by SP3. However, while the SP3 solution development continued throughout year 1, a revision of the function system in 2015 led to a more concrete high-level function called "Community Engagement" which included a mid-level function called "Training on Psychosocial Support". Three preliminary mid-level functions were added: "Measuring resilience", "Knowledge Transfer" and "Volunteer Management". After merging the function descriptions with the former SP8, the high-level function "Community Engagement" was kept, but the actual mid-level function was renamed to "Training Communities for Psychosocial Support". While "Knowledge Transfer" was integrated and further into a new high-level function called "Crisis communication" and further elaborated upon there as "From Crisis Managers to Citizens (public)" and "From the Citizens to Crisis Managers", two mid-level functions were refined within "Community Engagement": "Building & Measuring Community Resilience" as well as "Volunteer Management incl. Crowd Tasking". This was done to ensure that the most relevant functions are covered, relate to each other, but don't overlap too much.

The latest setup of functions for the SIA framework is presented below. The table structures all CM functions according to the thematic foci of SP3 (Civil Society Resilience), SP4 (Strengthened Responders) and SP5 (Learning Across Borders). It presents high-level functions that mainly serve as an overarching category to collect various mid-level functions. Most assessments are provided on

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	30 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

that level. An introduction text to these mid-level functions can be found in D840.21. The table also opens up for functions that are even more specific than mid-level functions, which are here called low-level functions.

As of now, the high- mid- and low-level functions should speak to all DRIVER tasks in SP 3, 4 and 5, but also cover some of the basic functions that re-appear in CM all over Europe. Example assessments concerning the societal impact of all mid-level functions are available in D840.21. Some functions on this list were added as late as November 2015. For that reason, assessments for the mid-level functions “Tasking and resource management” and “Strategic transportation & Supply Chains” will be combined. They may be revised throughout the process. Another exception is here “Learning Across Borders”, where only general assessments are conducted concerning the design of decision-making and competence frameworks, since SP5 leaders specifically asked for that instead of assessments on mid-level functions. However, additional assessments for the low-level function “Media & Policy communication” are given. All assessments in D840.21 are given with the intent to exemplify assessment processes, inspire thinking and give concrete advice for solution provides already at this stage. The intent of the work flow is, however, that DRIVER consortium members learn to make their own assessments and through that contribute to a revision of all assessments in M47.

There is a possibility that task contents and operational aspects may still change during the DRIVER project, so that the assignment of DRIVER tasks to functions will look different in version 2 of this framework, when it is updated and finalized in M47. It is also possible that by M47 the assignment of DRIVER tasks to each function will in fact be replaced by a list of CM solutions that fulfil the respective functions. Even though the discussion about key DRIVER functions will continue over the next few years and some terms may be replaced (referring to the flexibility of the qualitative framework), this set of functions already covers all the key solutions and functions in DRIVER as well as CM in general, and it can serve as a solid starting point for example assessments and further discussions about CM functions and their societal impacts.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	31 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

The current set of functions for DRIVER looks as follows:

CM Function	DRIVER tasks/WPs ⁹	DRIVER trial	A ¹⁰
Functions concerning Civil Society Resilience			
Community Engagement			
Training Communities for Psychosocial Support	WP32, WP33, WP55	E32.1-3, E33.3, T55.1, T55.2	X
Building & Measuring Community Resilience	WP33, WP34, WP36	E33.1-3, E34.1-2, E36.1-3	X
Volunteer Management incl. Crowd Tasking	WP36, T43.4, T44.3	E36.1-3, E42	X
Crisis Communication			
From Crisis Managers to Citizens (public)	WP35, T36.2, T43.4, T44.3	E35.1-4, E36.1-3, E42	X
Low-level: Media & Policy communication	WP35	E35.2	X
From the Citizens to Crisis Managers	(WP35), T36.3, T43.4		X
Functions concerning Strengthened Responders			
Identification & Awareness			
Gap analysis of community resilience	WP34, WP44	E34.1-2	X
Situational Analysis & Impact Assessment	T43.1, T43.2, T43.4, T43.5, T44.4, WP34	E40, E45	X
Early warning, Risk Analysis, Forecasting	T43.1, T43.3, T43.4, T44.1, WP34, (WP54)	E40, E45, E43	X
Identification of Critical Infrastructures	WP34	E34.1-2	X
CM Coordination, Command & Control			
Tasking and resource management	T44.1, T44.2, T44.4, T44.5	E43	X
CM Logistics			
Strategic transportation & Supply Chains	T44.4, T44.5	E43, E44	(X)
Information Management			
Collection & Storage of data	WP34, T35.2, T36.2, T36.3, T43.1, T43.2, T43.4, T43.5, WP53, WP54	E34.1-2, E35.1, E36.2, E41, E42, E45	X
Low-level: Crowd sourcing	T36.2, T43.3, T44.3	E42	
Facilitating Data Processing (Incl. Operational data lift)	T36.2, T43.5, WP53	E36.2, E41, E42, E44, E45	X
Analysis & Evaluation	T33.1, WP34, WP35, T36.2, T43.1, T43.2, T43.3, T43.4, T43.5, T44.4, WP53	E33.1, E34.1-2, E35.1, E35.3, E35.4, E36.1-2, E40, E42, E44, E45, T53.3+4	X
Communication between first responders	WP35, T43.3, T44.2,	E41, E43, E44, E45	X

⁹ This table was devised in December 2015, and it reflects the status after all SP's have submitted their suggested restructuring, as per 18 December 2015. Once the new structure of the project is finalized in early 2017, the table will be updated again.

¹⁰ "A" means: "Example assessments are given in D840.21, because these functions are expected to have an impact on society at large"

CM Function	DRIVER tasks/WPs ⁹	DRIVER trial	A ¹⁰
	T44.3		
Functions concerning Learning Across Borders			X
Education & Training	WP35, WP52, WP54	E35.2, T54.2-4	
Evaluation & Lessons learnt	WP53	T53.3+4	
Organisational adaptiveness	WP44	E43	

Table 3: The functions of the SIA Framework with related tasks

3.2.2 Definitions for high-level functions

The following definitions of high-level functions are the result of collaboration between former SP8 and SP9 in course of the merge into a new SP8, and were finalized in late 2015.

Civil Society resilience - **with the aim to build resilience in communities**

Community Engagement includes functions that are dedicated to training with a focus on psychosocial support; to measuring of community resilience and to managing volunteers through registration databases, ad hoc in the field and/or through crowd-tasking.

Crisis Communication refers to functions aimed at improving communication procedures and mechanisms mainly with a focus on the content of messages. Such communication can refer to communication from the CM professionals to the public where, for example, the impact of messages is measured. It can also refer to communication processes from the public to crisis managers (e.g. through social media). More specific lower-level functions include media and policy communication.

Strengthened Responders – **aims at professional preparedness, response & interoperability**

Identification & Awareness covers any technology, system or measure that has as its key functions to conduct situational analysis or impact assessment, to conduct early warning, risk analysis or forecasting. It can refer to solutions of raising alerts, risk mapping, situation assessment via airborne sensors as well as modelling bottlenecks in, for example, traffic.

CM Coordination, Command & Control relates to the improvement of planning, tasking and resource management and interoperability with special focus on cross-border cooperation.

CM Logistics refers to strategic transportation and improvement of traffic management. This covers contingency and logistics plans that target resources, supply chains including their safeguarding, and having as their key function to make those more resilient and efficient. Optimization of the cooperation with civil society logistics stakeholders is another important function here.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	33 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Information Management describes functions that mainly focus on improving technical functions such as to collect, store, process, exchange, or analyses information or data, for example for the sake of situational assessments. It includes, for example, operational data-lift, for a common operational picture and interoperability.

Learning Across Borders - **harmonized Competence-Building for Decision-Makers and Organizations**

Learning across borders mainly refers to the design of decision-making and competence frameworks. In addition, it also includes functions of training and education, lessons learnt activities and organizational adaptiveness, always taking into account cross-border aspects.

Vis-à-vis earlier versions of this categorization, and taking into account that different tasks have evolved throughout the past two years, the main change was to exclude methodological aspects, such as strategy design or experimentation, as a whole category, because the current categories were supposed to speak more clearly to the DRIVER Portfolio of Emerging Solutions as well as to standard functions of crisis management. A category on communication was added and broadened as well as one on community engagement. The former categories “harmonization” as well as “cross-border interaction” was integrated into other categories.

3.3 Component 2: Societal values and principles as assessment criteria

As described above, the object of the assessment within the DRIVER SIA framework are CM functions, which are assessed according to a set of societal impact assessment criteria. This chapter describes how the criteria system was designed and how the criteria were identified. It also provides the definitions of all the criteria.

3.3.1 Designing a criteria system

The different DRIVER functions introduced in Chapter 3.2 are assessed according to a specific set of societal impact criteria. In order to be able to do so PRIO developed different sets of criteria that corresponded to the different tasks in the original WP92 for the original deliverables 92.11 and 92.21 (submitted in M8). For D92.11, criteria describing secondary insecurities of crisis management measures were developed, and for D92.21, criteria describing other societal costs of CM. Now, these two sets are merged, and criteria describing positive impacts have been added to the list. This process is described below.

How were the criteria selected and validated?

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	34 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

A number of factors informed the selection of the assessment criteria. The different actions leading to the development of the particular set of criteria presented in this deliverable are described in the following.

1. The DoW

The very onset for choosing the criteria was the indications in the original DRIVER DoW. The DoW concretely asked for assessment criteria to organize a general evaluation of the unease, fear, insecurity or secondary risks that CM activities can produce (T92.1). It furthermore asked to use these criteria to assess side-effects to societal values (DoW mentions solidarity, cohesion, community, trust, etc.) (T92.2). Based on these suggestions, PRIO came up with a first list of criteria, relating to the main fields of core societal values, political values, administrative values, human rights and general unease.

2. Experience & Expertise

In addition, PRIO has extensive experience in similar projects that included a component to conduct societal impact assessments, e.g. from the ValueSec project [92], the DESSI project [90] and the PACT project [93]. Even though these projects concern the domain of societal security and crisis management per se, these experiences made in other FP7 projects were drawn upon in the first phases of developing the SIA framework, for example when it comes to determination of the number of assessment criteria.

3. Significance & Balance

The list of assessment criteria could be practically endless. Any culture, any societal context or group may be organized around different key principles and criteria. One could for example ask: How are the criteria relevant to different European Societies? How do they relate to different concepts of societal security? How do the criteria function in different societal, historical and cultural contexts? As a consequence, it was crucial to strike the right balance between having enough criteria to cover a wide range of impacts, and at the same time not too many criteria, that means a concise amount of criteria to make SIA graspable and constructive. It was also very important that the selected criteria allowed for meaningful assessments both of the DRIVER functions in particular, but also for CM in Europe in general. It should also be noted that some of the criteria indeed overlap, and that they in fact influence each other in the actual assessments (cf. D840.21). This is not only unavoidable when focusing on societal values, but can even be seen as a mutual strengthening of the importance and relevance of the particular criteria in the concrete assessment (e.g. transparency often leads to a reduction of suspicion and the fostering of trust). As detailed in chapter 2, the methodological approach of the framework is qualitative, and while it facilitates a systematic categorization of the societal impact assessments, it does not count impacts, and the actual exercise of performing the assessments is designed to reflect reality in the sense that the system acknowledges that two criteria can overlap. As mentioned above, the two criteria transparency and suspicion could both be relevant to use in the same assessment of a concrete function, e.g. because a function, such as data collection, can lead to suspicion if the governing of the process of data collection is not transparent.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	35 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Also, the criteria unease and privacy could be relevant in the same assessment, since a function such as data exchange could have an influence on them both: e.g. because exchange of personal data (which could furthermore happen in a non-transparent manner), can create unease in the affected population if their privacy is not respected. Another example is the way the function training for psychosocial support can be assessed via its impact on the criteria gender sensitivity and participation, in the sense that making sure CM efforts are diverse in terms of different gender, both for the trainers and the trainees, can increase participation in such training programs, and make them more reflecting of the general society. A final example is the way the criteria unease, distrust and political reputation can both be impacted by the function early warning. E.g. if early warning messages are spread too early and too often, they may cause unease and potentially distrust in society and undermine the reputation of the warning organizations. These examples show that criteria overlapping should not be seen as a distortion of the results of the assessments, but rather a mutual validation of the importance of both of the criteria for the assessments. Furthermore, this approach also aligns the framework more with a realistic representation of the world, since it is not easy or even possible to strictly separate such impacts from each other.

4. Focus on society

As described in Chapter 2 and 3, although many different kinds of impact can be assessed in relation to CM activities, the criteria developed here are focusing on societal principles and core values in particular. This means that after the first round of criteria development, criteria assessing the impact on such fields as employment, insurance, applicability etc. were taken out of the criteria set, since they either concern assessments that are conducted elsewhere in DRIVER or purely methodological questions. Although CM can, especially in the larger societal picture, indeed have an impact on such criteria, they are not considered as part of the core societal values and principles that this assessment focuses on.

5. Consultancies with SP-leaders

For both the initial set-up of the first version of the criteria system through D92.11 (submitted in M8) and for its refinement throughout 2015, the leaders from other SP's were consulted. In the first 8 months of the project all SP leaders received the criteria system and they were asked to provide input. In the refinement period throughout 2015 SP leaders were consulted again. This time they were consulted in dedicated workshops with the leaders of SP's 3, 4 and 5, where the applicability and relevance of the criteria were discussed. This led to the refinements reflected in the rest of Chapter 3.3.

6. Validation through D93.1

The policy- relevance of the criteria was confirmed through D93.1 (accepted, submitted also in M8), where the criteria were validated through a systematic screening of different UN, EU, and RCRC CM policy documents. It was verified what the core principles and values are that UN, EU and RCRC CM policies invoke to foster resilience. Based on that, an even more revised set of criteria was presented

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	36 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

in the deliverable 93.1. The output of D93.1 is still reflected in the final criteria selection presented here, in D840.11.

7. Endorsement by the DRIVER Ethical and Societal Advisory Board

At the second meeting of the DRIVER Ethical and Societal Advisory Board in October 2015, the already revised set of criteria (as well as the complete conceptualization and application of the Societal Impact Assessment Framework) were presented to the board. The criteria were discussed during the meeting and in follow-up communication. After additional refinement and revisions (i.e. sorting out criteria that were too similar), the criteria were finally endorsed by the Ethical and Societal Advisory Board.

It is the version of the criteria set deriving from these seven actions described above that are presented in this deliverable. In addition to the abovementioned stages it should also be mentioned that following the restructuring of the DRIVER project (and the subsequent restructuring of the tasks within the original SP9), the criteria (both for positive and negative impact) are now merged, to overcome the artificial divide between conducting negative and positive societal impact assessments in two different deliverables, when they in fact, very much relate to each other.

Three stages of the criteria set development

Below is a visualization of the different criteria set(s) that were iterated over the past 2 years as described in the previous pages. It presents the specific criteria, and how they have been modified.

1. Original criteria set from M8, mainly focusing on the assessment of negative effects.

92.11 Insecurities and Secondary Risks	92.21 Side-effects to Societal Values
Unease Suspicion Function creep vs. Limitations Applicability Misuse New Vulnerabilities Technology Dependency Legality Truthfulness Efficiency & Effectiveness Impacts on market Economic Stability Employment	Trust Social Cohesion Solidarity Participation Diversity Open society vs. Control Cultural & Gender Sensitivity Accountability Transparency, Openness & Visibility Integrity State-Citizen Relationship Political Reputation Negative Standardization International Cooperation & Treaties

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	37 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

92.11 Insecurities and Secondary Risks	92.21 Side-effects to Societal Values
	Suitability, Necessity & Proportionality Dignity & Non- Discrimination Privacy & Data Protection Freedoms & Protest

Table 4: Original criteria set from M8

2. After first revision from M15 when the original set of criteria was compared against criteria from UN, EU and RCRC CM policies and re-iterated with SP leaders

After the workshops PRIO had with SP3, 4 and 5 in July 2015, the revised and complete set of criteria looks as indicated below. This included merging “Secondary Insecurities and Secondary Risks” and “Side-effects to Societal Costs” to allow for a more coherent approach. The revisions also took account of D93.1, which verified the relevance of the criteria in EU, UN and Red Cross Red Crescent CM policies. As opposed to earlier versions of original WP92 and WP93 deliverables, some criteria have been removed in this new merged version (truthfulness, effectivity/ efficiency, impact on market, economic stability, employment) and some new criteria were discovered through the screening of crisis management-relevant policy documents (sustainability and in/equality & in/justice).

Originally for implementation into the merged D92.12/D92.22	
Unease Suspicion Function creep vs. Limitations Applicability Sustainability Misuse New Vulnerabilities Technology Dependency In/justice & In/equality Legality Trust Social Cohesion & Solidarity Participation Diversity	Open vs. Control Society Cultural & Gender Sensitivity Accountability Transparency Integrity State-Citizen-Relationship Political Reputation Negative Standardization Int. Cooperation & Treaties Suitability, Necessity, Proportionality Dignity & Non-Discrimination Privacy & Data Protection Freedoms & Protest

Table 5: Criteria after first revision in M15

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	38 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

3. After second revisions from M19 including positive and negative impact assessment criteria and feedback from the ESAB

Based on the feedback from the DRIVER Ethical and Societal Advisory Board, the criteria are now categorized according to sub headlines, and are being further revised. Because the framework combines the negative with positive assessments, the criteria lists from M8 were merged, and thus, some of the criteria had to be further developed to allow for assessing both the positive and the negative impacts that a certain CM functions can have. For example, unease is clearly meant to say something about the negative impact, while on the other side, calmness is its opposite, saying something about positive impact to society.

Implemented in D840.21	
<p>Secondary in/securities</p> <p>Unease - Calmness</p> <p>Suspicion - Trust</p> <p>Misuse - Protection</p> <p>New Vulnerabilities - Progress</p> <p>Technology Dependency - Flexible Solutions</p> <p>Function Creep - Specialized and Controlled Use</p> <p>Sustainability</p> <p>Sustainability</p> <p>Political & administrative principles</p> <p>Accountability</p> <p>Transparency</p> <p>Integrity</p> <p>Negative - Positive Standardization</p> <p>International Cooperation</p> <p>Legitimacy</p> <p>State-Citizen-Relationship</p> <p>3.3.1.1.1 Political Reputation</p>	<p>Core societal & ethical principles</p> <p>Social Cohesion & Solidarity</p> <p>Participation</p> <p>Diversity</p> <p>Open - Control Society</p> <p>Cultural & Gender Sensitivity</p> <p>Legal values</p> <p>Suitability, Necessity & Proportionality</p> <p>In/justice & In/equality</p> <p>Fundamental Rights</p> <p>Dignity /Autonomy</p> <p>Non-Discrimination</p> <p>Privacy & Data Protection</p> <p>Freedoms & Protest</p>

Table 6: Criteria ready for implementation in D840.21

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	39 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

3.3.2 Criteria definitions

The purpose of the Societal Impact Assessment Framework is to facilitate the assessment of the DRIVER activities in particular and CM activities in general. This happens by using the criteria to assess categories of DRIVER CM activities, i.e. functions. The following criteria are used as something that will trigger the CM solution provider’s thinking about positive and negative societal impacts. The different criteria can structure the thinking in regards to the most commonly discussed societal impacts. For the follow- up deliverable in M47, where this framework is finalized, there is a possibility that criteria will be revised again, depending on feedback and progress in DRIVER (especially the application of the SIA framework in the DRIVER trials). In order to facilitate a structured thinking about societal impacts, the different criteria are organized according to impacts of secondary in/securities (such as unease and calmness, misuse and protection) core societal and ethical principles (i.e. participation, diversity), sustainability, political and administrative principles (i.e. accountability, transparency), legitimacy, legal values (i.e. in/justice) and particularly relevant fundamental rights (i.e. non-discrimination, privacy).

SECONDARY IN/SECURITIES

Unease - Calmness

Crisis management activities may create unease, but may also make the population calm, if they are planned and deployed in a specific way. Calmness refers to the state or quality of being free from agitation or strong emotion, in particular disturbance or violent activity [53]. A certain level of unease can be valuable in a crisis situation, in order to make people alert and responsive [73], but in general terms, a crisis management function that calms and reassures the population represents more explicitly exercising care for the individual citizen. In addition, a society which is generally free of significant disturbance and agitation, can also be said to be better suited to react to a crisis, since reflected and informed decisions may be easier to take under calm conditions. To create calmness, research indicates that it is important that the distributed information is real and trustworthy (cf. trust), and that it doesn’t feed rumours and misconceptions during the crisis [83].

Example: The preparation of the information to be given to the public during a crisis, can easily be done in a way that creates more unease than calmness (or constructive alertness), but the information can also be helpful and make the population feel more at ease, if it strikes the right balance between truthfulness and necessity. Over-communicating detailed information without any real operational value to the general public may create more unease than it allows the public to constructively contribute to bettering the situation.

Suspicion - Trust

Suspicion refers to the feeling of suspecting something or being suspected of something dangerous or malicious [20]. Trust is more specifically tied to the belief that someone or something is reliable, good, and honest. It also refers to the reliance on the integrity, strength, and ability of a person or a state, an institution, a system, or an organization [60]. Trust is a key element of relationships

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	40 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

between and within social groups and individuals, and the general trust in the population can influence the trust in both old and new CM measures. Trust is important and valuable for CM, e.g. because it can enable cooperation that people would not be willing to engage in if relations were of mutual suspicion. Furthermore, trust makes it easier for people to put their security in the hands of others. A culture of suspicion can be exemplified with the US' distrust in the pharmaceutical industry and medical profession, which leads to parents rejecting vaccination for their children, ultimately putting public health at risk [33]. The emergence of new crisis management technologies, especially information technology, has a great impact on how societies define and experience trust. In the CM context, trust in infrastructure and organizational/ administrative systems is important, but also having a trustful relationship between crisis managers and the public. Trust can make it easier for crisis managers to plan CM efforts, as they know that the public will relate to instructions and advice given in the different phases of the CM cycle. Trust can also be enforced by communicating transparently (cf. transparency).

Example: The information shared during a crisis is more trustworthy if it derives from reliable sources. Trust in new technologies can influence operational crisis management. Studies show that during the earthquake in Tohoku and the tsunami in Japan in 2011, the unreliable nature of "ReTweets" was problematic because the ReTweets contained information about people that were no longer in danger [23].

Misuse - Protection

An important part of crisis management is to ensure the protection of the population (or the relevant referent object). This fundamentally means to preserve or protect the population or infrastructure among others from harm; protection can also mean protecting non-material assets, such as central societal values, important to uphold in a community. Misuse as such, refers to the wrong or inappropriate use, a misapplication of something [54] (cf. function creep). Protection of non-material objects can both be especially important and especially challenging in a crisis situation that takes a toll on the crisis management operations, where the easiest solutions may not always be the most societally friendly. Furthermore, misuse can in fact undermine protection, e.g. if a CM technology is misused, it can undermine the protection value that such a technology can have. In Japan earlier this year, there was a call for urgently taking steps to prevent the misuse of UAVs, after a UAV was discovered on the roof of the prime minister's office building in April 2015 [75].

Example: Although the technology can also be misused for other purposes, using an UAV (drone) during a crisis to map where the people in need are located, can protect the population from (additional) harm, and allow them to be evacuated in a more effective way¹¹. The protection of the crisis population can in the longer term foster trust (cf. trust) and other societal values in the population (as they are aware of the existence of technology that can assist them during a crisis) and thus have a positive societal impact.

¹¹ In the US, unmanned, remotely controlled UAV's has demonstrated their ability to evacuate wounded people. See for example : <http://www.gizmag.com/lockhead-martin-k-max-air-ground-casualty-evacuation/37242/>

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	41 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

New Vulnerabilities - Progress

A new crisis management function is a procedure, method, concept or tool that is either newly introduced or re-introduced in a different manner. This implies that the CM field is developing or progressing, by making more solutions and functions available for CM purposes. However, when CM tools are developed and implemented, they can create additional (new) vulnerabilities for the affected individuals or groups, e.g. when a new technology fills a gap in crisis management and creates a certain amount of technology dependency (cf. technology dependency). Although the tool is effective and efficient, should it fall out, affected individuals may be worse off than before because they are more dependent on the new technology¹². In general, vulnerability refers to the risk of being exposed to the possibility of being attacked or harmed, either physically or mentally [61]. However, progressing on the development of better CM technologies can reduce bureaucratic complexity or financial costs, bringing such benefits as usability and efficiency. In general, although they risk carrying the potential for new vulnerabilities, progress in such a way as described here is closely related to, and often a precondition for, innovation in CM.

Example: Although the introduction of a new CM tool (such as an early warning system) relying on new technology can create new vulnerabilities (e.g. creating technology dependency), a progressive CM industry that develops and makes progress in finding more effective and suitable (cf. suitability) CM solutions can create positive societal impact by being able to issue more precise warnings.

Technology Dependency - Flexible Solutions

Flexibility is important when responding to the needs of a country struck by crisis. When a society becomes dependent on a certain technology, making the society vulnerable in case that technology falls out or becomes temporarily unavailable, we talk about technology dependency. This is as opposed to versatile and flexible crisis management solutions that are adaptable for many different uses or functions, and that are even meant to be applicable in several areas.

Example: Ensuring flexible crisis management capability in an organization can make it easier to maintain effective lines of communication, e.g. because several solutions to communicating exist at the same time. This can create a crisis management operation that is able to not only better communicate relevant and true information to the public, but further, have positive spill over- effects on such factors as transparency (cf. transparency) and calmness (cf. calmness) in the population.

Function Creep - Specialized and Controlled Use

When developing, implementing and refining technological solutions for crisis management, the risk of function creep can be defined as the gradual widening of the use of a technology or system beyond the purpose for which it was originally intended, especially when this leads to the potential invasion of privacy [19]. A specialized crisis management solution however, tailored to special

¹² In addition, such vulnerability may be exploited. See [78] for an example of software vulnerabilities that can have serious security implications.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	42 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

conditions or restricted to special functions, is less easy to misuse. Specialized solutions, tailored to a specific problem cannot only be more applicable and useful, but can also minimize the risk of function creep, i.e. negatively impacting privacy.

Example: By searching for alternative and more specific solutions to e.g. automatically using Big Data for doing research or solving a challenge in the crisis management context, the crisis managers has the opportunity to foster innovation and progress in the field.

SUSTAINABILITY

Sustainability

Sustainability normally has an economic and ecological dimension. However, here, in the context of CM, it refers to the sustainability of an organization or even a community (e.g. in terms of fostering and balancing resilience) and the endurance of certain values. This includes that something is able to be maintained at a certain level or rate, or that it is able to be upheld or defended [59]. For a sustainable society, DRR is described as a good practice, and essential to strengthening resilience as it enables communities to anticipate, absorb and bounce back from shocks. As sustaining the status quo over a longer period of time is not always wanted (because change may be necessary), current practices and methods can be challenged and constantly improved in order to see if new approaches are more suitable (cf. suitability) and sustainable.

Example: Investing in resilience and focusing on risk reduction can increase sustainability in other areas as well. Resilience measures could thus have a positive spill-over effect into other societal domains, such as strengthening social cohesion (cf. social cohesion) by promoting shared values among the (crisis) population. The sustainability of social systems can be strengthened e.g. by increasing public participation (cf. participation) and the access to public goods.

POLITICAL & ADMINISTRATIVE PRINCIPLES

Accountability

Accountability is the obligation of an individual or organization to account for its activities, accept responsibility for them, and to disclose the results in a transparent manner [9]. As a core value of good governance, public accountability ensures that actions and decisions taken by public officials are subject to oversight in order to guarantee that these initiatives meet their stated objectives and respond to the needs of the community they are meant to be benefiting [86]. Responsible and open communication is a central part of accountability for CM (cf. transparency).

Example: Typically during CM situations, many different organizations and actors implement a variety of measures. If the accountability for conducting these measures or using CM tools is not clearly set out, potential negative side-effects and damages cannot be regulated effectively in the aftermath. It is thus crucial to determine accountability beforehand as a part of planning measures and tools, in order to reach the most positive societal effects.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	43 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Transparency

Transparency means information disclosure, clarity and accuracy to enhance "the perceived quality of intentionally shared information from a sender" [70]. Transparency is then also to communicate about and make those kinds of actions visible that cannot be perceived by the crisis population directly, but that may nonetheless have consequences for their rights, actions and reactions. An open society (cf. open society) is often characterized by a high level of transparency, meaning e.g. public discussions and debates are conducted in a way that allows for the public to follow them.

Example: If a CM measure foresees the implementation of technologies that may collect personal data, transparent communication explains publicly and in an accessible manner what kind of data that would include, what it does not include, which purpose it serves and how it is going to be stored, processed, shared, and deleted. If these aspects are clearly and transparently communicated before, during or even after emergencies, the societal acceptance of such measures may be higher (cf. trust), because they are more predictable to relate to for the population.

Integrity

Within the DRIVER project, integrity refers to two aspects that are particularly relevant for the political dimension of crisis management. Integrity means to adhere to ethical principles [48] when planning and implementing crisis management measures and tools, but it also means "standing for something" [72] and showing this through truthful, accurate and consistent actions, values and principles [44] [64]. This means also to be predictable and following a certain set of rules. Here, integrity is the opposite of hypocrisy [43].

Example: A crisis management measure/organization has a high level of integrity when it respects widely accepted ethical codes and rights, such as the European Charter for Fundamental Rights. Integrity is also an important aspect of network security and resilience, *which means that the operators' obligation to meet risks in an appropriate way and to report security breaches has to be strong* [24].

Negative - Positive Standardization

Standardization generally describes the process of developing a specific level of quality or attainment [58] for materials, products and services in order to ensure that they are "safe, reliable and of good quality" [36]. Standardization usually refers to technical standards, but in DRIVER, in order to support the SIA's, it refers to a qualitative and social process. Negative standardization then refers to the overarching social process of establishing a procedure as normal when in fact it has detrimental effects. Positive standardization refers to the process of implementing standards that have positive societal effects.

Example: Crisis management tools and principles that are ethically acceptable, suitable, necessary and proportional (cf. acceptability, suitability, necessity & proportionality) can be considered for standardization, as they are likely to have positive societal impact. This could

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	44 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

e.g. be to promote the standardization of a common international terminology to ease international cooperation in CM [81], or to base a CM solution on the highest level of privacy, or by setting requirements for a higher level of transparency, which could, in turn impact society positively by enforcing trust (cf. trust) in the population or the users of the CM solution.

International Relations

International relation describes the relations across border, which may also include collaboration, i.e. to find responses for international challenges [11]. Such collaboration is often organized and officially regulated in international treaties. Since emergencies can easily become a matter of international concern, as exercised in the DRIVER trials, crisis management necessitates international cooperation, but it can also potentially cause (unwanted) spill-over effects in other domains of international relation when not properly managed. However, the strengthening of positive international relations is important, especially when it comes to legal and structural developments for improving the security and safety of international supply chains and movement of goods across EU borders [25]. In crises that take international dimensions, because they concern a large part of Europe or because they take place across borders, it is important to reflect on the way in which CM efforts and manoeuvres can strengthen or weaken political international relations.

Example: Working together in global and local partnerships (e.g. through research cooperation) is central to strengthen resilience. Promoting resilience in international forums such as the G8 will also underscore its importance. For countries facing recurrent crises, working with regional and international organizations to create platforms at country level for facilitating the exchange of information can be important to strengthen resilience [27].

LEGITIMACY

State-Citizen-Relationship

The state derives its legitimacy from its interaction with citizens [32]. States are legitimate when elites and the public accept the rules regulating the exercise of power as proper and binding [63]. The state-citizen relationship is thus a relationship marked by the legitimate exercise of power. In the crisis management context, attention needs to be paid as to how measures and tools may change this legitimate power-relationship.

Example: Expecting citizens to take on self-managerial roles during crises that are more demanding than they can manage, challenges the legitimacy of the power-relationship between the state and the citizens. Citizens may easily feel overburdened and feel exploited or left alone rather than helped. This happened, for example, after Hurricane Katrina, when resilience programs overburdened locals. It is important to plan such programs in a realistic and participatory manner [22].

Political Reputation

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	45 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Political reputation refers to the social opinion [57] and evaluation of a political entity. The reputation of a political entity is influenced by public discourses [7]. Bad political reputation is often accompanied with a low acceptance of policy measures. Resilience should be country-led and country-owned. National strategies will require firm political commitments and accountability (cf. accountability), and may involve institutional change and technical support, including in-country coordination mechanisms. A lack of dedication towards this kind of progress could influence the political reputation for the state at stake [26]. If the crisis population does not trust (cf. trust) the administrative- or governmental actors that are implementing the crisis effort, the implementation of the efforts is less likely to be successful. The general trust in the population will influence the trust in new measures that are suggested (cf. trust).

Example: A crisis management measure or tool that includes potentially controversial methods, such as excessive public warning or insufficient planned infrastructure protection, can influence the reputation of the political entity that implements it. At the same time the reputation of a political entity can influence the measure to be implemented. In crisis situations, it is important to follow principles of transparency and integrity in order to foster political and societal acceptability of measures (cf. integrity; transparency).

SOCIETAL & ETHICAL PRINCIPLES

Social Cohesion & Solidarity

The Council of Europe defines social cohesion as the capacity of a society to ensure the well-being of all its members, minimising disparities and avoiding marginalisation [14]. Cohesive societies have the capacity to manage differences and divisions, and to ensure the means of achieving welfare for all members [14]. Social cohesion thus refers to the reduction of disparities, inequalities (cf. in/equality) and social exclusion within or between societal groups, as well as the strengthening of social relations, interactions and trust (cf. trust) [80]. Solidarity refers to the feeling or action that produces a community of interests, objectives and standards. It is a common way to show mutual support within a group [60]. The fundamental principle of solidarity of the EU is based on sharing both the advantages, i.e. prosperity, and the burdens equally and justly among all group members. The Internal Security Strategy in Action requires solidarity in response and responsibility in prevention and preparedness of crisis within the EU [25]. Also, the solidarity clause in the Treaty on the Functioning of the EU introduces a legal obligation on the EU and its member States to assist each other when an EU State is the object of a terrorist attack or a natural or man-made disaster [30].

Example: Crisis management measures have the potential to positively affect social cohesion if they are applied equally and not in a discriminatory or unequal manner against a specific social group. Creating a societally cohesive community of volunteers and responders can positively influence the resilience and flexibility of the CM organization. An equal and non-discriminatory (cf. non-discrimination) distribution of emergency help, taking the needs of different societal groups into account, can also foster trust (cf. trust).

Participation

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	46 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Participation is the action of taking part in something, but also the state of being (actively) related to a community, region, or nation [56]. As a core societal value, participation is understood as public participation -the belief that those who are affected by a decision have a right to and an interest in being involved in the decision making-process. Participation also entails that all participants involved in decision-making processes need to be provided with the information they need to contribute in a meaningful way [35].

Example: Public participation during the development of a crisis management tool or measure will increase its effectiveness and acceptance among the affected population once it is implemented. On the contrary, preventing the participation of potentially affected populations could lead to an eventual distrust, suspicion and even misuse (cf. trust; suspicion; misuse) of the CM measure or tool during its implementation, e.g. because the tool does not reflect the actual needs.

Diversity

Diversity refers to the condition of having or being composed of differing elements, especially, the inclusion of different types of people in a group, organization or country [47]. Specific actions must be taken into consideration and ensure that their views are incorporated into any analysis activities taking place in the community. As a core societal and democratic value, diversity describes the wide range of racial, cultural, ethnic, linguistic, and religious variation that exists within and across societies. Cultural, religious and linguistic diversity is recognized and protected by the European Charter of Fundamental Rights (art. 22) [5] (Cf. dignity; non-discrimination; cultural & gender sensitivity).

Example: Crisis management tools and measures have to take the diversity of the crisis population into consideration to avoid cultural, linguistic, religious and gender discrimination of the general population. Crisis management tools furthermore have to be publicized in all languages spoken by the crisis population. Another example is if health programs during a crisis do not plan for the specific needs of elderly or children. In this case they will not succeed in building resilience. (cf. societal cohesion).

Open - Control Society

An open society is characterized by a flexible structure, freedom of belief, a wide dissemination of information [55] and a respect for core societal values, which creates a feeling of trust and security in society (cf. trust). In an open society, the authorities are expected to be tolerant, transparent and flexible and respond to demands in the society. Societies of control, however, use mainly control technologies to establish security, which may also apply to crisis management tools. Societies of control thus create a feeling of security that is also based on distrust (cf. trust). Furthermore, transparency (cf. transparency) in communication is one trait of an open society, but not all societies with transparent communication are necessarily open societies.

Example: The use of technologies to single out potential troublemakers during a large event may contribute to the preparedness and responsiveness of crisis management, but they are also based on the idea of establishing or achieving security through control. To ensure that

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	47 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

this kind of control is perceived as proportional is important to ensure the acceptability of the use of such technologies, which can streamline and improve crisis management.

Cultural & Gender Sensitivity

This refers to socio-cultural and gender-based particularities that need to be respected in the development of CM tools and measures, and decisions should take into account and be responsive to (e.g. show sensitivity to) gender or cultural background. This stems from the general recognition of the fact that CM decisions, tools and measures can have different effects on men and women, boys and girls and groups of different cultural backgrounds. It is important to mainstream gender and cultural sensitivity across all phases of a crisis situation and specifically when developing new tools and measures. As marginalized groups can potentially suffer disproportionately during and after crises, resilience enhancements could be mainstreamed with other interrelated sector goals, such as gender. Enhancement can only be reached by empowering vulnerable individuals [8] [27].

Example: Men and women experience stress and traumatic events in very different ways due to biological and socio-cultural factors. Psychosocial support measures should therefore be adjusted to the different gender, age and cultural circumstances of the crisis populations to ensure an effective and inclusive delivery of emergency aid and support. This means for *example that women’s role as breastfeeding mothers needs to be taken particular care of in a crisis [29]. However, at the same time, a single father with need of feeding a newborn need equal care. In addition to that, it is important to pay attention to gender diversity (cf. diversity) in CM to allow for the availability of female crisis managers to female aid recipients and male managers for male aid recipients.*

LEGAL VALUES

Suitability, Necessity & Proportionality

The so-called «proportionality test» is an instrument in EU law [15] to determine fairness and justice. It examines the suitability of a measure/tool in terms of its suitability, asking whether the appropriate means are being used to pursue the given objective. In a second step, the test examines the necessity of a measure/tool, asking whether there is an alternative measure that is less restrictive than the measure in question and that is equally effective in achieving the pursued objective [21]. Finally, the «proportionality test» examines the proportionality in strict sense, namely whether the effects of the measure “are disproportionate or excessive in relation to the interests affected. At this stage the true weighing and balancing takes place.” [21]

Example: Airborne sensors in unmanned aerial vehicles (UAVs) can be a suitable means to get an overview of an emergency situation. Alternative measures, for example manned helicopters (for non-automated data collection), do exist to fulfil this task as well. Helicopters may, however, be more expensive, so there is potentially a financial necessity to use airborne sensors; or sensors might have an added value as compared to human surveillance. The key question is then whether an airborne sensor, by collecting vast amounts of data that is not relevant for the situational analysis, is proportional to the objective in the narrow sense. This

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	48 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

has to be balanced vis-à-vis the benefits of the airborne sensor. If CM measures are not proportional, they will cause several secondary effects, for example a low level of acceptability of negative standardization (cf. negative standardization), which could contradict the effect/ aim of CM.

In/justice & In/equality

Just and equal crisis management means that the CM activity is exercised according to certain principles (e.g. human rights) and that it is equitable, fair, non-partial and proper. It can also mean that it is rightful and lawful, and facilitates the treatment of all individuals in the same way. While it is a standard to provide support for the most affected and the most vulnerable first, the fair, just and equal distribution of help and resources during crises needs to be assured. Equal treatment cannot always be a given, since time and resources are often limited and sometimes seemingly unfair decisions have to be taken and priorities set. The idea is to avoid unfair, unequal or disproportionate treatment of two social groups or between two individuals wherever possible (cf. non-discrimination; gender- and culture sensitivity).

Example: Women are generally underrepresented when it comes to political participation in crisis management [42] (cf. participation). Thus, by taking efforts to promote the inclusion of and influence by, women in CM and decision-making about CM in all levels of the crisis management organization (locally, regionally and internationally) the result would be a more equal CM organization.

FUNDAMENTAL RIGHTS

Dignity /Autonomy

Dignity is considered to be a universal value of the European Union. It means that a human being has an innate value and the right to be treated with respect. This right is inviolable and must be protected in accordance with Article 1 of the European Charter of Fundamental Rights [51]. Dignity is very closely related to autonomy, which can either mean independence of freedom (as of the will or one's actions) or the condition of being autonomous (as of self-government or the right to self-government) [17].

Example: After hurricane Katrina in New Orleans, some of the residents in New Orleans did not actually want to be rescued or evacuated, but preferred to stay in their homes [4]. The choice to evacuate regardless can be said to affect the autonomy of the residents. Leaving the choice to inhabitants to act against authorities' advice while clarifying the consequences of staying and leaving their homes, including all related responsibilities, will respect the autonomy of the individuals. However, such a guideline of informing aid recipients about consequences of taking their own choice is highly contextual. In some situations there is little time to inform aid recipients. These considerations thus need to be weighed against the responsibilities that a state has towards their citizens to evacuate effectively in case of an acute emergency situation. Keeping the autonomy of the citizen in mind is, however, crucial for the implementation of any CM solution.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	49 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Non-Discrimination

Dignity (cf. dignity) is closely related to Article 21 of the European Charter of Fundamental Rights [51], the right to non-discrimination, which forbids any discrimination “based on any ground such as sex, race, colour, ethnic or social origin, genetic features, language, religion or belief, political or any other opinion, membership of a national minority, property, birth, disability, age or sexual orientation” [51] (cf. diversity; cultural & gender sensitivity). Non-discrimination further endeavours to relieve the suffering of individuals, being guided solely by their needs, and to give priority to the most urgent cases of distress [76].

Example: Non-discrimination is practiced if response measures providing access to first aid, e.g. do not neglect homeless people in favour of others, but treats every individual equally. For example during the rescue operations during and after hurricane Katrina in New Orleans in 2005, disaster planners were criticized for not properly taking the needs of disabled individuals into consideration (e.g. in transportation, communication and shelter facilitation)[50]. If this results in wheelchair users being left behind, this is clearly a discriminatory practice.

Privacy & Data Protection

The content of privacy is contested. It mainly refers to the right to seclusion and to create an intimate sphere. Article 7 of the European Charter for Fundamental Rights [51] protects the right to privacy as the right for private and family life. But privacy is no longer “the right to be let alone” [84]. It has become a concept, a regime, a set of policy instruments and a way to frame civil society activism [6]. A working definition is “the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others” [85]. As such, it is closely related to the protection of personal data (Article 8). Protection also means that data has to be processed fairly, with the consent of the concerned person, who also has the right to access this data. This was framed as the right to “informational self-determination” [10]. Both, privacy and data protection no longer relate to individuals only but express a conflict that affects society as a whole [71]. The implementation of privacy friendly CM measures would mean to implement measures that respect the right of the individual to have a private life.

Example: A breach of privacy happens if informed consent is not obtained before the collection of personal data from individuals included in e.g. focus groups or interviews, thus guidelines and regulations for respecting privacy should be in place before the start of the activity. CM measures that respects, and even advances best practice solutions in the area, have the opportunity to foster trust in the population and improve the (political) reputation of the CM actor(s). This opportunity is closely linked also to the notion of transparency and legality (cf. transparency; legality).

Freedoms & Protest

The European Charter for Fundamental Rights addresses a range of freedoms. The most relevant for the crisis management context are the freedom of thought, conscience and religion (Article 10),

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	50 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

which means that it is possible to “change religion or belief and freedom, either alone or in community with others and in public or in private, to manifest religion or belief, in worship, teaching, practice and observance” [51]. Another freedom is that of expression and information (Article 11), which states that everyone can hold and express their opinion and has the right “to receive and impart information and ideas without interference by public authority” [51]. A third important article is the freedom of assembly and of association (12) [51], this includes the freedom to form peaceful associations, for example, on political, trade union and civic matters. According to the “Hyogo framework for action 2005-2015”, in order to foster positive societal impact, the media should be engaged in stimulating a culture and climate of resilience and community engagement [81]. This includes allowing for protest, and people having the freedom to voice their opinion. In general, protecting societal values like freedom can make the population more resilient against shocks.

Example: The so-called “chilling effect” [13] (that people change their behaviour because of the awareness of surveillance measures) can be seen as a negative consequence of a lack of freedom and the right to protest, because the surveillance happens covertly and thus doesn’t allow for protest. Data collection can also positively influence the right to freedom and protest, e.g. by allowing participants in focus groups or interviews to speak their mind about something that they care about relating to CM, to someone that actually has the possibility of making it better.

3.4 The framework in practice: relating functions to criteria

Below is an abstract of the first version of the Societal Impact Assessment Framework. As described in Chapter 3.2 and 3.3, the framework developed for DRIVER consists of two major components. It includes a set of CM functions (the tables y-axis), which is assessed using a set of criteria in order to determine positive and negative impacts (the tables x—axis; cf. Table 1 Simplified scheme for the SIA framework).

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	51 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Subcategory	SECONDARY IN/ SECURITIES				POLITICAL & ADMINISTRATIVE PRINCIPLES				LEGITIMACY		CORE SOCIETAL & ETHICAL PRINCIPLES				LEGAL VALUES		FUNDAMENTAL RIGHTS			Measures as of WP/Tasks							
	Unease - Calmness	Suspicion - Trust	Misuse - Protection	New Vulnerabilities - Progress	Technology Dependency - Flexible Solutions	Function Creep - Specialized and Controlled Use	Sustainability	Accountability	Transparency	Integrity	Negative - Positive Standardization	International Relations	International Cooperation	State - Citizenship - Relationship	Political Reputation	Social Cohesion & Solidarity	Participation	Diversity	Open - Control Society		Cultural & Gender Sensitivity	Suitability, Necessity & Proportionality	Ir/justice & Ir/equality	Dignity & Autonomy	Non-Discrimination	Privacy & Data Protection	Freedom & Protest
Functions concerning Civil Society Resilience																											
Category: Community Engagement																											
Training Communities for Psychosocial Support		X	X												X	X	X			X		X		X	X		
Building & Measuring Community Resilience	X	X	X					X															X	X	X		
Volunteer Management (Incl. Crowd Tasking)	X	X	X			X							X		X	X	X			X					X		
Category: Crisis Communication																											
From Crisis Managers to Citizens (public)	X	X	X					X						X		X	X	X	X				X		X		
Low-level: Media & Policy communication	X	X											X	X	X	X			X						X		
From the Citizens to Crisis Managers			X	X				X	X								X	X			X		X	X	X		

Table 7: Abstract of updated SIA Framework

Having presented an abstract of the full framework, the next pages illustrate how the different components of the framework work together, and what concrete method they translate into. The next table illustrates how each DRIVER solution can perform different functions, and how several criteria can be applied to assess these functions. The three levels are explained in the scheme below.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	52 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

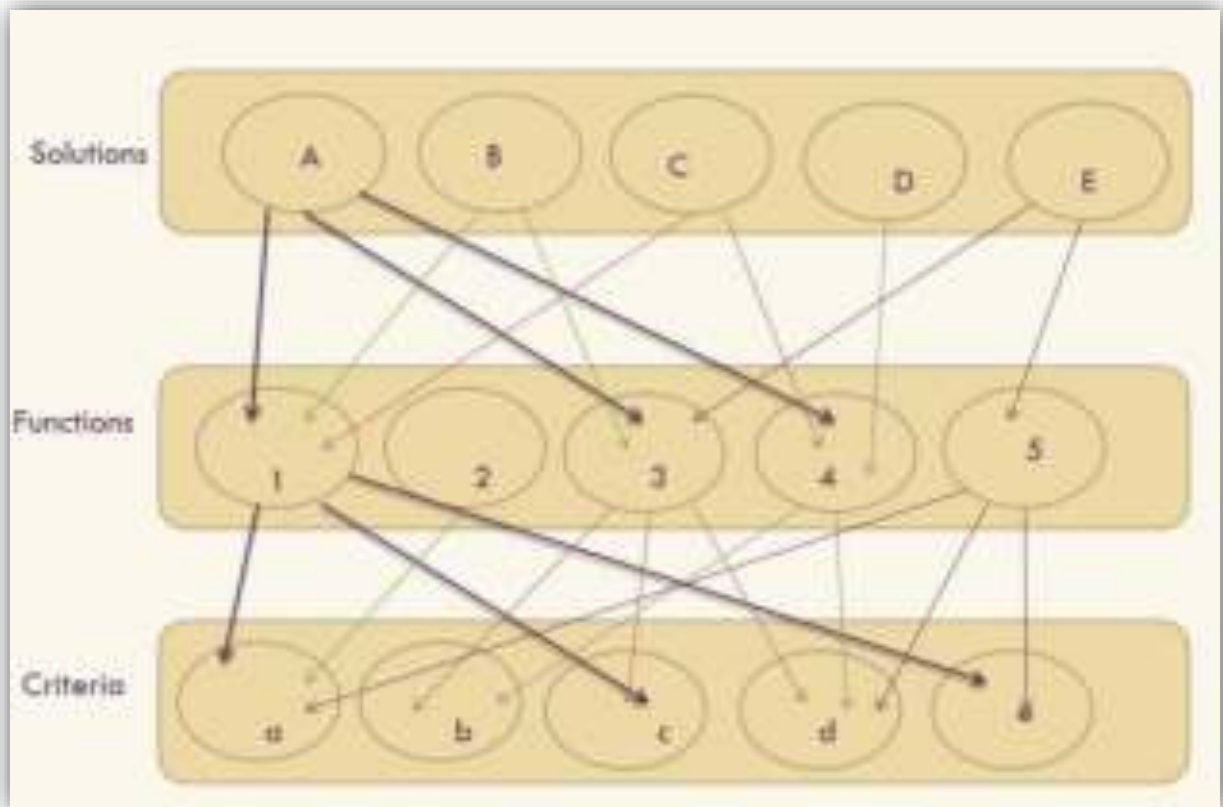


Table 8: Overarching: Relating the functions to the criteria

1. Solutions: the crisis management solutions that make up DRIVER.
2. Functions: the functions that these solutions have. This is the level on which the societal impact assessments are made.
3. Criteria: the societal impact criteria that can be used to assess the functions' impacts on society at large.

On a simplified level one can say that one particular solution (e.g. a UAV) can perform several functions and address specific gaps in CM (a UAV can perform both data collection and situational analysis). One function, again, affects several criteria positively and negatively (the functions "data collection" and "situational analysis" can, for example, impact criteria such as "misuse-protection" and "technology dependency-flexible solutions"). This is the level at which actual assessment work takes place and where the concrete functions are thought in relation to the given assessment criteria. It answers questions such as:

- What is the impact of function y on criterion x? (e.g. what is the impact of data collection on suspicion-trust?)
- How is that impact positive/negative?
- Do we know any examples from personal experience or literature to back such an assessment up?

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	53 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

- What concrete recommendations can be given to crisis managers, to avoid negative and foster positive societal impacts?

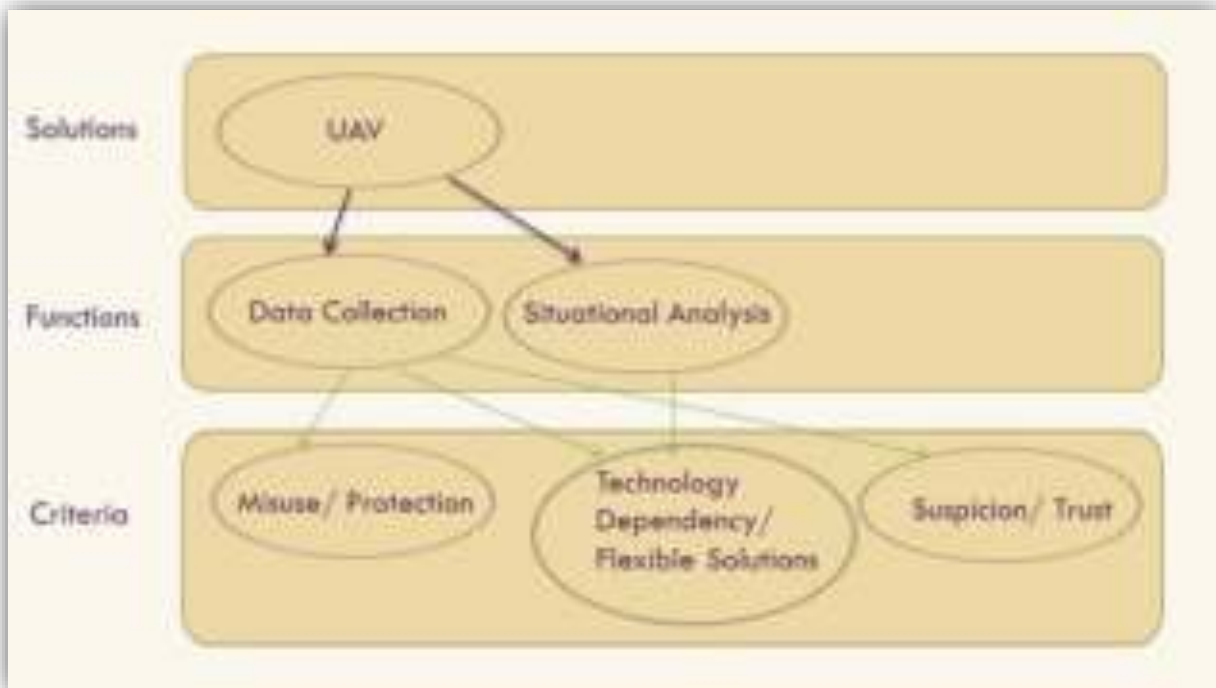


Table 9: Example: relating the functions to the criteria

Versatility of the framework

The SIA framework focuses on functions, because it allows for a more versatile impact assessment than an assessment based on a specific solution. The framework is the methodology that gives guidance on how to do the assessments. Yet, how the assessments actually look like in the end is partly dependent on the actor or groups of actors that perform them. This means that the concrete outcome of the SIA framework will rely on different interest groups and the crisis management actors that perform them. Another way of utilizing the framework (also beyond the scope of DRIVER) is to apply it through “world café” style assessment sessions on the different criteria with different experts. Chapter 4.5 below will give an example of what a societal impact assessment looks like and what its different elements are.

3.5 The different elements of a societal impact assessment

Conducting a societal impact assessment takes expertise, preferably concerning knowledge about the design of the function itself, and the effects of its implementation. The detailed descriptions of criteria and functions provided here should, however, help the assessor to start the assessment process.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	54 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

A societal impact assessment would typically include the following components:

- The high-level function describes the major category under which the assessment can be filed, for example “Community Engagement”. It is an umbrella term for different functions that are grouped together.
- The mid-level function is the object of the assessments by the framework. While the high-level functions categorize the mid-level functions, the latter more concretely describes a CM function as something that a CM solution does.
- The point “related WP and Tasks” lists all the different DRIVER tasks that deal with solutions which include exactly this function¹³.
- A short description of or introduction to the function, what it refers to, mainly with regards to its relevance and use within DRIVER, but also to CM in general. This intro also includes an example, which is practically an entryway into the assessment. It could be a situation or a development that describes how the implementation of a CM function has already impacted or could impact society. It should be simple and illustrative, showing that the assessment has relevance and the function has concrete effects. Already here, critical thinking about the respective function could be incited.
- The actual assessment is the core of the procedure, which is basically a systematic analytic exercise structured by the different criteria. It assesses the function vis-à-vis each given criterion, following the questions described above:
 - What is the impact of function y on criterion x? (e.g. what is the impact of the function “data collection” on the criterion “suspicion-trust”?)
 - How is that impact positive/negative?
 - Do we know any examples from personal experience or academic and policy literature to back such an assessment up?
 - What are concrete recommendations for solution providers and implementers to avoid negative and foster positive societal impacts?
 - Making an assessment can include a scenario-thinking exercise (describing likely future scenarios of societal impact), research on concrete examples of impacts that happened in the past, background literature on the given functions and their assessments, as well as their underlying logics and assumptions or it can draw even on personal experience from the field. The assessment should be concise and critical, and present a comprehensive view of the key issues that are relevant for describing the societal impacts of a function, which means that the assessment of opportunities makes most sense when related to the negative assessments. The aim is not only to avoid negative impacts, but to create an added value.
- The assessment is finalized with a recommendation in order to reach solution providers and operators and investors with concrete advice. It includes concrete tips and guidance on how to plan CM functions in a way that negative impacts are avoided and opportunities seized.

¹³ This assignment was done during the restructuring of DRIVER, and it reflects the status after all SP’s have submitted their suggested restructuring, as per 18 December 2015. Since the project is undergoing another restructuring at the time this deliverable is submitted, this assignment will only be updated once the structure is finalized.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	55 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

The recommendation is on the one hand a conclusion drawn from the assessment, and will naturally be formulated closely to the identified opportunity to foster societal resilience, but it can also include creative solutions for how to steer societal impacts.

Making an assessment can include a scenario-thinking exercise (describing likely future scenarios of societal impact), research on concrete examples of impacts that happened in the past, background literature on the given functions and their assessments, as well as their underlying logics and assumptions or it can draw even on personal experience from the field. The assessment should be concise and critical, and at the same time draw attention to the effects that the planned CM function may have on society, but also be followed by recommendations for concretely how to avoid unintended negative impact, and foster positive impact. It also present a comprehensive view of the key issues that are relevant for describing the societal impacts of a function, which means that the assessment of opportunities makes most sense when related to the negative assessments. The aim is not only to avoid negative impacts, but to create a value-added. As explained in the deliverable presenting the SIA framework, the SIA framework presented in this deliverable is exhaustive in the sense that it covers every CM solution and measure included in DRIVER. However, while the solutions and measures in DRIVER are strong and reasonable reflections of key CM solutions in general, there is a risk that other technologies or approaches (that may not be known or implemented in CM yet) can have functions that are not covered by this framework.

For example, it is likely that advancements in drone (UAV) technology will imply that the common drone in the future may have different and more sophisticated functionalities, such as the ability to smell, communicate or have algorithms written into them that allow for a (more) autonomous operation [19]. However, the broader assessment categories in the current framework could still be used, since it already allows for assessment of functions such as data collection (smell would here be a subcategory of “data collection”) and CM communication (communicating via the drone would here be a subcategory of “CM communication”). This is what is meant by the framework being flexible and adaptable. It is with such potential societal, political and technological ambitions and possibilities taken into account that the present framework exists. However, drawing on a wide range of existing research and the broad expertise and input from the DRIVER consortium, the methodological approach to doing societal impact assessments presented in this deliverable, allows for the conduction of qualitative, rich, informative, text-based assessments of all the key impacts that the most prevalent CM solutions can potentially have on society as a whole.

Conducting societal impact assessments is not a standard in security or crisis management domains yet, which is why this framework and the actual assessments follow the idea of both being an awareness-raising tool, as well as a practical and applicable tool for doing societal impact assessments. Most existent impact assessment methodologies, such as the one developed as part of the ValueSEC project [<http://www.valuesec.eu/>], stop at the point where assessment criteria have been developed and pedagogic methods for conducting the assessment have been formulated. The assessments, presented in D840.2, can be consulted for learning on how to write one’s own

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	56 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

assessments and for taking the recommendations into account when planning CM solutions and functions. This also takes the DRIVER approach beyond the state of the art for societal impact assessments on CM functions. Furthermore, through a concrete integration of the framework into DRIVER, the example assessments will be revised and refined over time to include only the most relevant and concrete guidance from those who know solutions and functions well.

What is the output of the framework so far? The SIA framework itself is a major output of the societal impact assessment work within DRIVER. The process involved many steps, each of which had their respective outputs, such as:

- A systematization of DRIVER functions that also speaks to CM functions in general - developed with the feedback of SPs 3, 4, 5;
- A list of DRIVER- tasks relevant for each function - developed across SPs 3, 4, 5;
- A short introduction explaining the categorization of all functions including concrete definitions;
- An assessment criteria system and a definition of each criterion including an example - developed across SPs 3, 4 and 5; checked, updated and endorsed by the DRIVER Ethical and Societal Advisory Board.

In D840.21, where the framework is put to use, we can find:

- Identification of relevant criteria (usually approximately 6-7) per function and the related impact assessment;
- Examples of how such an impact can take place;
- A list of concrete recommendations for how to avoid negative impacts and achieve positive impacts.

3.6 Societal Impact Assessment beyond the state of the art

Even though societal impact assessment is a novel element of security and especially crisis management projects, DRIVER’s societal impact assessment framework is not the only approach to assess the societal effects of security or CM measures. Within the FP7 security projects, some have pointed to the necessity of societal impact analysis. Such analyses fall into two categories; they either contain a work package that is supposed to deal with any societal implications or they actually try to embed a societal impact assessment method into its core activity. Examples of the former are as follows:

The FP7 SLANDAIL (Empowering Emergency Response Systems Using Social Media) project contained an analysis of the ethical concerns surrounding the use of social media information for improving

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	57 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

communication and coordination during a crisis [91]. Some of the project’s findings elaborate on how to build a relationship of trust with the public using three principles: simplicity, relevance and goal-focus. Trust vis-à-vis social media solutions are thus the main focus. DRIVER expands this focus to develop a framework to assess a multitude of functions using a set of 25 assessment criteria.

FP7 Sec-InCoRe (Secure Dynamic Cloud for Information, Communication and Resource Interoperability based on Pan-European Disaster Inventory) project discusses how IT supported emergency responses need to balance security and privacy [94]. It is noteworthy that the project frames ethics not as just a challenge to the project, but that addressing ethical issues can have a beneficial impact. In this case, how societal resilience can be strengthened by the use of IT-enabled communication with the public and dissemination of response strategies. The framework suggested in DRIVER in fact assesses both, potential challenges and negative impact of CM measures and opportunities to foster societal resilience. It does so, however, for a multitude of CM functions in three main fields: civil society resilience, strengthened responders and learning across borders.

While it is laudable that more and more project proposals and work packages include ethics and societal impact as a specific work package, the approach of having them as separate entities bears risks. For example, in the field of teaching ethics to business students, stand-alone modules used to be customary. Unfortunately, this model proved rather unsuccessful. Educators noticed that their students are quite capable in dealing with ethical concerns during the ethics course, e.g. pertaining to corporate social responsibility, but then do not apply these lessons and skills to problems encountered in other courses of the curriculum [68]. As a result, any ethical training is not put to use when students enter the business world. One solution to this problem has been to ‘mainstream’ ethics education, i.e. to discuss any ethical issues whenever they appear in a course. Ethics has to be directly linked with business. Of course, there is a difference between teaching ethics to students and having ethics and societal impact assessment modules as part of a research project. However, if an individual student can dissociate ethics or societal impact assessments from the ‘normal’ business curriculum, it may be even easier for project partners to develop the attitude that the people of the ethics or societal impact assessment module will just deal with all the related problems. Yet, societal impact analysis is not just a box that needs to be ticked to show that the project has thought about them. It can actually be useful in helping solution providers with identifying weaknesses in their solutions. Thus, directly incorporating societal impact assessments across the project will strengthen the project and its success. DRIVER is following such an approach by developing an SIA framework that works cross-SP and involves training for the full consortium.

This type of pervasive societal impact assessments in projects has been done before as well. For example, the ‘Bridging resources and agencies in large-scale emergency management’ (BRIDGE) project discusses the pros and cons of the use of ICT in emergency management [89]. While in appearance similar to DRIVER’s proposed method, there are important differences in the user-friendliness and applicability to other technologies and solutions. The BRIDGE assessment starts with a list of positive and negative aspects of using ICT and then identifies which relevant principle is

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	58 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

involved as well as what specific technology of BRIDGE is in use. Finally, it briefly outlines an ‘augmentation opportunity’ to strengthen or weaken the identified positive or negative effects of the technology. While the BRIDGE approach is useful in directly describing negative and positive effects, it is less useful as a tool for helping solution providers in identifying them. Similarly, DESSI (Decision Support on Security Investment) [90] has developed a method for assisting decision-makers in societal impact assessment. The approach defines a universal set of criteria for seven domains that can be applied to any security decision-making problem as well as a method to conduct such assessments. While this method and criteria are useful and progressive, DESSI neither provides targeted feedback or assessments for CM-specific problems, nor does it provide example assessments beyond three case studies. As such, it is a broader method that can be used in many contexts, but it does not (yet) provides CM relevant guidance or recommendations. In a similar fashion the project ValueSec (Mastering the Value Function of Security Measures) [92] provides for an impressive set of societal impact assessment criteria that can be applied in a ranking-style procedure for security measures. However, neither does the project provide for in-depth criteria definitions or analyses, nor concrete recommendations for the problem at stake. As such, the method is good for decision-makers to conduct a ranking of societal impacts, but it does not provide for in-depth assessments or recommendations.

The DRIVER SIA approach of assessing functions via a set of well-defined criteria has four advantages: First, it allows users to critically assess what sort of functions their specific solution will employ, which already might reveal inherent strengths and weaknesses.

Second, by providing guidance rather than instructions concerning a user’s solution, it gives the ownership of the process to the users. Societal impact assessment is frequently considered as adversarial to projects and solutions. By giving ownership over the process to the users the DRIVER approach fosters cooperation between users and those that can provide guidance when encountering societal challenges in implementing solutions.

Third, the DRIVER approach can be used by other projects as it provides example assessments and concrete recommendations based on functionality. These functions are frequently found in projects that are not just related to crisis management.

Finally, some solution providers will consider societal impact assessment quite challenging. Specifically in teaching ethics to scientists, a divide between the methodologies of science – getting the right answer, and humanities – justifying an answer, is observable [37]. Science students, and many sub projects in DRIVER pertaining to technologies, have a hard time identifying what their societal impact assessment teachers want from them. The DRIVER SIA will take users by their hand in not only giving them a method to analyse their solutions, but also providing quite fine-grained recommendations. While these may not always be one hundred percent applicable to a specific project, they nevertheless allow users to see what sorts of problems a societal impact assessment identifies and how to find solutions. In addition, solution providers learn to conduct their own

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	59 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

assessments and give their own recommendations to future solution providers and operators and investors, which are again integrated in a refined version of the framework itself, assessments, recommendations and even the training modules.

Progress beyond the state of the art in sum

DRIVER's SIA assessment framework:

- Allows for a more finely-grained analysis than most societal impact assessment methods as it is based on functions instead of more complex end results or solutions;
- Is a practical and applicable tool for doing SIAs;
- Fosters an attitude of awareness about societal impacts;
- Is developed specifically for CM;
- Provides for assessments, where most other projects only develop a framework or a methodology;
- Is based on a set of functions that will remain relevant in the CM of the future, as well as concretely defined assessment criteria that can be understood by anyone;
- Enables solution providers and operators and investors to run their own assessments and contribute to the process.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	60 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

4 Conclusions & way ahead: utilizing the SIA approach throughout the project and beyond

Relating all DRIVER solutions and tasks to the DRIVER functions has been a common effort performed by former SP9 and SP8 with the help of the SP leaders of SP3, 4 and 5. Conducting the actual assessments, i.e. to assess the functions against the criteria, has already been done by a WP840-team, for a complete set of example assessments. Such example assessments for each mid-level function are presented in D840.21. The next step of WP840 is now that over time members of the DRIVER consortium familiarize themselves with the framework, especially the criteria, described above, for example in SP-specific training sessions, to eventually conduct an assessment themselves.

A challenge remains that in order to create, develop and revise the SIA framework and to conduct more advanced assessments; there is a need to have concrete knowledge about the different solutions in DRIVER and the technical specifications and particularities of the different functions that these solutions have. Consequently, the abovementioned revisions of the framework based on interaction with the SP leaders, were also aimed at aligning both the actual functions and solutions (in terms also of their more technical functionalities) and the terminology used to describe them. It is crucial that the consortium understands the functions and the criteria in the same way as the other partners. A common understanding of this is fostered in the WP840 training sessions with the consortium, as well as in the future integration of the SIA framework in the PoS.

Together with the assessments given in D840.21, the framework guides crisis management practitioners in planning CM in a way that avoids negative societal impacts and utilizes opportunities to foster societal security. The current version of the framework includes categorizations of the DRIVER functions, and a list of the relevant criteria used to describe the societal impact that these CM functions can have. Both have been presented, updated and thus revised several times.

As mentioned in the introduction, the next step is to enhance the usage of the framework and to distribute the related assessments throughout the project. Several steps are foreseen to achieve this:

- The training of the SIA framework and assessments to the consortium
- The integration of simplified templates into SP2, which serves as a basis to ensure that SIA is a part of the trial methodology,
- The integration of the SIA framework – and updated assessments – into the PoS if possible.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	61 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

The feedback collected from the usage of the SIA framework in the training sessions and throughout the future DRIVER trials will show if the framework or the assessments need updating. For both forms of implementation a feedback mechanism is planned, which ensures that the consortium's input, criticisms and comments about the framework or the assessments can be taken into account. The feedback will serve as a basis for the revisions and final versions of the framework and the assessments foreseen in M47.

4.1 SIA in the consortium: SIA training sessions in T840.3 and T840.4

Task T840.3 will draw upon the framework (D840.11) and the actual assessments (D840.21) to develop specific training modules including concrete examples, work sheets and pedagogical material to teach the SIA framework itself and its deployment to the DRIVER consortium. The main aim of T840.3 and T840.4 is to ensure that the consortium members know how to relate to the example assessments and utilize the framework's method for their own purposes. The training sessions will take place throughout 2017 and different training modules will be given, depending on which concrete solutions the relevant participants are working with. The training modules will include various feedback mechanisms and a report to ensure that insights from the training sessions can be taken into account for the versions 2 of the framework and the assessments in M47. Versions 2 of the framework and the assessments will be presented in a way that facilitates and prepares the integration of these findings into the DRIVER Portfolio of Emerging Solutions. There are additional ways in which the framework can be used in and feed into various parts of DRIVER. Some of these are described in the following.

4.2 SIA in the consortium: SIA via SP2¹⁴

As described above, the development of the societal impact component and its foreseen implementation is a result of increased cross- SP cooperation, which started in year one of the project and was deepened during summer and fall 2015. A meeting between SP2 and WP840 was initiated by PRIO, and held via Skype on 4th September 2015. The aim of the meeting was to present the past and on-going work of WP840, and to investigate potential interaction between the SP2 and WP840. During the meeting, SP2 representatives described closer how SP2 develops the DRIVER test-bed, consisting of the resources to be used for performing experimentation activities (now replaced by the concept of trials), within DRIVER and beyond the project. Thus, it became clear that a societal impact assessment component would fit very well - and in fact is necessary – as part of the methodology for conducting such testing. In simple terms, this would mean that nearly all the

¹⁴ Due to the restructuring process not being completed at the time of the submission of this deliverable, it still remains to plan the details of the integration of SIA into the SP2 methodology. However, contact has been established with WP23, and a telco is scheduled for early January 2016 to clarify this integration. This chapter explains the two ways WP840 currently foresees interaction with SP2, and in particular with the experimentation methodology.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	62 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

DRIVER partners will be bound to relate to societal impact, by making it a compulsory component or step in the structured approach to conducting trials, i.e. as part of the definition of needs.

Assisting SP2 in a pilot case of the methodology

The second discussed form of collaboration between SP2 and WP840 is the idea of having a common pilot case of the SP2 assessment methodology for the DRIVER partners. This would happen by applying the SP2 methodology to one of the DRIVER trials, while a representative of WP840 would be present to guide participants through a “best practice”- run of the application of the SIA framework. From a WP840 perspective, this exercise could be a T840.4 task, i.e. the carrying out of “training and educational events”. An assessment of this pilot case could also be added as an annex to the deliverables on DRIVER trial methodology. When it comes to finding the most relevant trial to be used as a ‘pilot-case’, the most obvious type of trial was suggested to be one from the original SP3, as they often contain both people, methods and tools, and thus have the potential of creating more obvious societal impact than e.g. trial using only computer simulation or similar.

4.3 Beyond DRIVER: Tentative suggestions for integrating SIA in the Portfolio of Solutions

In addition to the abovementioned intersections, WP840 strengthens the contact with the work package tasked with defining the DRIVER Portfolio of Solutions. As the PoS is yet to be finally defined, these suggestions are only tentative and will be revised. As of now, the PoS will be based on an overall assessment of all trials in DRIVER. The portfolio will consist of emerging solutions that address critical gaps and are available in the short term, as additions or modifications to existing crisis management arrangements. It is useful to start planning the future development of the SIA component of the PoS at an early stage and to start brainstorming about how it will eventually feed into the DRIVER final outputs. As the PoS’s basic structure still needs to be finalized, the suggestions below can only be preliminary. The suggestions are based on the idea that the PoS exists as a computer-supported catalogue of CM solutions.

Step 1: If a user consults the PoS for planning their CM solutions, a first step could be that the operator or investor selects the functions that his or her planned solutions are supposed to fulfil. Here, the WP840 categorization of functions could serve as a given list of key functions of CM in which the relevant functions are simply ‘ticked off’.

The PoS would then show the list of functions, and the PoS user would, for example, tick off “I plan solutions that involve... volunteer management”. The PoS user can choose as many functions as are relevant to his or her planned solutions. The point of selecting the functions is to limit the amount of functions and related assessments to those that are relevant to the planned individual portfolio. This step would thus make the operator or investor reflect about the functions his or her CM plan is

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	63 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

supposed to include. If the operator or investor needs help in choosing these functions, the SIA framework's definitions can be consulted for help. This could, for example, be included in the list of functions via a mouse-over.

Step 2: After choosing the relevant functions, the PoS user sees now which criteria are relevant to the functions that were selected. This relevance was established in the work conducted in task T840.2 and is summarized in the respective matrix (cf. D840.21). When clicking on a criterion, the user will be able to:

- a) see a definition of the criterion,
- b) see the negative and positive impact assessments that match the particular function,
- c) read examples,
- d) find recommendations for how to avoid negative and foster positive impacts through the planned solutions.

The PoS user now has guidelines (which have been revised and tested throughout DRIVER) on how to put his or her planned solutions to work with the best possible societal outcomes. How such already existing information is prepared, integrated and visualized in the final system will be dependent on the PoS's initial design.

A computer-supported PoS would thus allow for a simple way of organizing the already existing WP840 outputs and guide the user through the assessments and recommendations that are relevant to his or her individualized portfolio of CM solutions. The relevant inputs from the societal impact work in DRIVER to the PoS can be organized in a manner that allows for an easy translation of the SIA framework and its methodology into a PoS component. Such an organization of outputs would have to happen in preparation of the final deliverable(s) in M47. It should be clear that all of these suggestions are preliminary and need to be discussed in relation to the overall development of the PoS. However, the suggestions recognize the SIA framework both as an already applicable and usable tool for SIAs, as well as a part of the DRIVER methodology on a more systematic level.

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	64 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

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Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	65 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

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Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	66 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

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Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	67 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

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Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	68 of 75	
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Document name:	D840.11 - Societal Impact Assessment Framework – Version 1				Page:	72 of 75	
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Annexes

Annex 1: The complete SIA Framework (to be filled out)

Subcategory	SECONDARY IMPACTS				POLITICAL & ADMINISTRATIVE PRINCIPLES				LEGITIMACY		CORE SOCIAL & ETHICAL PRINCIPLES				LEGAL VALUES		FUNDAMENTAL RIGHTS			Measurement as per WFP/Track								
	Urges - Culture	Suspicion - Trust	Misuse - Protection	New Vulnerabilities - Progress	Technology Dependency - Flexible Solutions	Reaction Group - Specialized and Controlled Use	Sustainability	Accountability	Transparency	Integrity	Regulation - Positive Discrimination	International Relations	International Cooperation	State - Citizenship - Relationship	Political Participation	Social Cohesion & Solidarity	Participation	Diversity	Open Control Society		Cultural & Gender Sensitivity	Sustainability, Necessity & Proportionality	Inclusion & Inequality	Dignity & Autonomy	Non-Discrimination	Privacy & Data Protection	Freedom & Protest	
Functions concerning Civil Society Resilience																												
Category: Community Engagement																												
Training Communities for Psychosocial Support																												
Building & Measuring Community Resilience																												
Volunteer Management (incl. Crowd Tasking)																												
Category: Crisis Communications																												
From Crisis Managers to Citizens (public)																												
Low-level Media & Polling communication																												
From the Citizens to Crisis Managers																												

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1					Page:	73 of 75
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Category: Identification & Awareness																			
Gap analysis for community resilience																			
Situational Analysis & Impact Assessment																			
Early warning, Risk Analysis, Forecasting																			
Identification of Critical Infrastructures																			
Category: CM Coordination, Command & Control																			
Tasking and resource management																			
Category: CM Logistics																			
Strategic Transportation & Supply Chains																			
Category: Information Management																			
Collection & Storage of data																			
Low-level Crowd Sourcing																			
Facilitating Data Processing (incl.)																			
Analysis & Evaluation																			
Communication between First Responders																			

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1					Page:	74 of 75
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final

Functions concerning Learning Across Borders																							
Category: Competence-Building for Decision-Makers and Organizations																							
Competence-Building for Decision-Makers and Organizations																							

Document name:	D840.11 - Societal Impact Assessment Framework – Version 1					Page:	75 of 75
Reference:	D840.11	Dissemination:	PU	Version:	3.0	Status:	Final