



Report

Risk identification

City of Stavanger

September 30, 2016

City of Stavanger

Deliverable 1: Risk identification



Funded by
European Union
Civil Protection



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1. Introduction

1.1 Background¹

The City of Stavanger became partner in the EU-project CRISMAS (Community for risk management and risk assessment). The projects started January 1st 2016 and will end December 31st 2017.

The aim of this by the European Commission funded project is to:

- Support regions and cities implementing all hazard risk management and assessment methodologies, including the cross sectorial and cross border dimension
- Build a European wide community for government professionals working on risk management and assessment to encourage cooperation and knowledge exchange within the EU
- Improve links between relevant actors and policies throughout the disaster management cycle (prevention-preparedness-response-recovery)

The project has a project budget of € 782.953,-. The European Commission (DG ECHO) contributes 75%: € 587.215,-.

Partners in this project are the *Safety Region South-Holland South* (VRZHZ) and *ITINERIS Health & safety*, from the Netherlands, the *City of Stavanger* (Norway), *Ungheni District Council* (Moldova), *Prijedor Regional Economic Development Agency* (Bosnia and Herzegovina) and the *Province of Forlì-Cesena* (Italy)



¹ http://ec.europa.eu/echo/funding-evaluations/financing-civil-protection-europe/selected-projects/community-risk-management_en



The last four partners will start with the implementation of risk assessment and the translation of the results in risk management strategies in their own areas with the support of VRZHZ and ITINERIS and in an environment in which the partners can learn from each other. This will be based upon principles and experiences, derived from earlier projects: MiSRaR and PRISMA, the “EU guidelines for risk assessment and risk management capability planning” and the Dutch methodologies for national and regional risk assessment.

CRISMAS is also meant to be the starting point of a structural community within the EU. It is the aim to start a EU community of public experts on the subject of risk assessment and risk management, supporting each other and other public bodies with further developing their risk assessment and risk management capacities (also after the closing of the project).

The City of Stavanger arranged a local kick-off for the local stakeholders on February 29th 2016, giving them information about the project, and what expectations we had for their deliveries into the project.

1.2 Objective

This document will serve as deliverable 1 (Action D.1) in the CRISMAS-project; **Risk identification**. Expected result of this deliverable is to illustrate an overview of risk sources and vulnerabilities, presented as a risk list and a selection of risk maps. Using existent local and national information sources, historical research and expert judgement on potential future risk developments an all hazard overview will be made of all relevant risk situations.

1.3 Scope and limitations

The risk list has been created as part of an overall risk- and vulnerability analysis for the area defined as the City of Stavanger. The scope of this analysis includes all events/incidents that are specific for the City of Stavanger. It also includes incidents that may affect the whole



Stavangerregion simultaneously, as well as incidents that the municipalities in the region have in common. The incidents identified in this risk- and vulnerability analysis are risks that potentially can threaten one/several of our social values/consequence categories, see chapter 3.3. Security policy crisis and war are not included in this analysis.

1.4 Overall risk- and vulnerability analysis for the City of Stavanger

The Civil Protection Act encourages cooperation across municipal borders, and in 2013, the four municipalities (Randaberg, Sandnes, Sola and Stavanger) conducted an overall risk- and vulnerability analysis together as partners. The emergency response functions in the region's municipalities prepared a project proposal, which received endorsement of councilors in each municipality. The proposal from the emergency response functions suggested that the region prepared a project with a clear mandate that intended to establish a common risk understanding, and the need for a joint emergency response in the region.

A large scale of stakeholders was invited to join the project. Over 200 people (from both private and public sector) contributed with information into this project. The purpose of the analysis in 2013 was to get an updated list over risks that could occur in the Stavanger region, that again would form the base of a systematic approach to dealing with risk in the region. The result from this work ended up in two reports; *The overall risk- and vulnerability analysis for the Stavanger region 2013 (ORVAR 2013)* and *The overall risk- and vulnerability analysis for City of Stavanger 2013 (ORVAS 2013)*.

This kind of work had never been carried out in Norway before, and it was an instructive, but still a very demanding project.

The law requires the analysis to be updated every four years, preferably parallel to the updating of the municipal master plan. In 2016 it has soon been four years since the last reports were finished, and the reports were therefore ready for a review/upgrade.



The preparation of the overall risk- and vulnerability analysis for the City of Stavanger in 2016 has been lead by a project group, as part of the CRISMAS- project. In 2013 the analysis had a regional focus. Now, the City of Stavanger has ownership of the analysis, and an improved ability to update and maintain it, and to carry out additional risk analyses in the future.

As part of the updating of the overall risk- and vulnerability analysis it has been chosen to simplify the content of the two previous reports (*ORVAR 2013* and *ORVAS 2013*) in order to improve readability for both stakeholders and decisionmakers. The City of Stavanger decided therefore during the updating process, to merge these two documents into one; *Overall risk- and vulnerability analysis for the City of Stavanger 2016*. The risk list presented in this report is a result of the updating of the overall risk- and vulnerability analysis for the City of Stavanger.



1.5 Presentation of Stavanger²

The total graphical area, which constitutes the City of Stavanger is displayed in figure 1. Stavanger municipality consists of the mainland and the inhabited islands Hundvåg/Buøy, Austre Åmøy, Langøy, Bjørnøy, Roaldsøy, Omrøy, Steinsøy, Engøy, Sølyst, Grasholmen, Vasy, Lindøy, Hellesøy and Kalvøy.

The City of Stavanger is divided into the districts:

- Hundvåg
- Tasta
- Eiganes/Våland
- Madla
- Storhaug
- Hillevåg
- Hinna



Figure 1: The City of Stavanger

The administration in the City of Stavanger consists of City Manager and the following departments and municipal enterprises (KF):

- Urban Environment and Development
- Communication
- Culture and Urban Development
- Political Secretariat
- Industry
- Sølvberget KF

² www.stavanger.kommune.no



- Education, health and welfare
- Human Recourses
- Economy
- Municipal Attorneys
- Stavanger Parking KF
- Nature and Sport Services KF
- Stavanger Building Operations KF



2. Our approach to risk management

Norway has a long-standing tradition of protecting its citizens from a range of threats from natural disasters, infectious diseases, industrial accidents, critical infrastructure failure, to terrorist attacks.

The Norwegian civil protection system is based on the principles³:

Responsibility: The entity that is responsible for a discipline or service in a normal situation is also responsible for necessary emergency preparations and the handling of extraordinary events. The responsibility also applies to information within your own discipline.

Subsidiarity: A crisis shall be handled at the lowest possible level.

Equivalency: The organisation established during crises must be as equivalent as possible to the organisation with which you normally operate, cf. principle of responsibility.

Cooperation: All entities have an independent responsibility to ensure the best possible cooperation with relevant parties in the work on prevention, preparedness and crisis management.

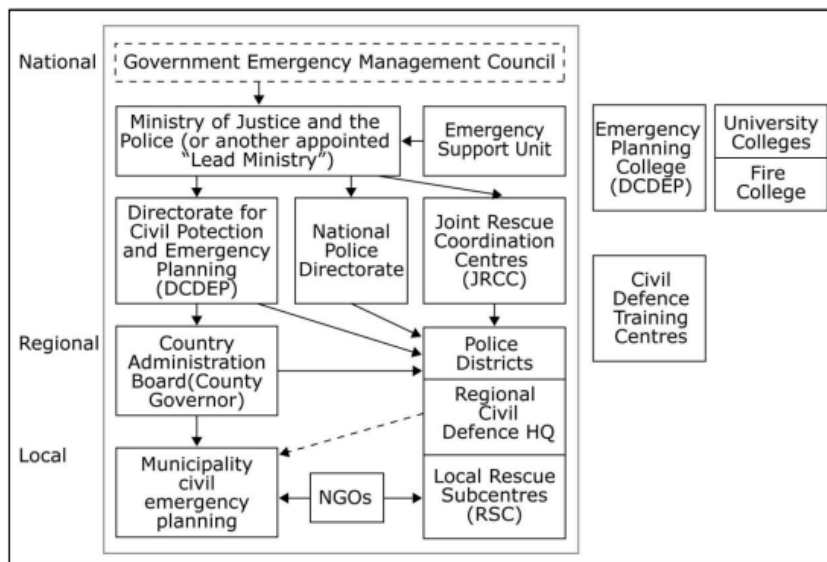


Figure 2: Illustration of the Norwegian civil protection system

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https://www.regjeringen.no/contentassets/261879a38c3e438d82ab4729e0661cf1/hod_national_health_preparedness_plan_eng.pdf



The major reforms of the Norwegian civil security system occurred in the 1990s when it gradually widened its focus from preparing for war – based on the ‘Total Defence’ doctrine – to also include societal security and safety (“samfunnssikkerhet”). The Civil Protection Act was established in 2010, and section 14 refers to statutory requirements for (all) the municipalities in Norway to conduct an all risk (assessment, probability and vulnerability) analysis. The results from this work shall found the basis for a systematic approach to civil protection and emergency preparedness in the municipality.

3. Method and process

3.1 Risk management process

The figure below illustrates the risk management process followed by the City of Stavanger. To ensure a good result, it is necessary to plan the whole process ahead (**establishing the context**) before conducting the risk identification (**risk identification**) and the risk- and vulnerability analysis (**risk analysis**).

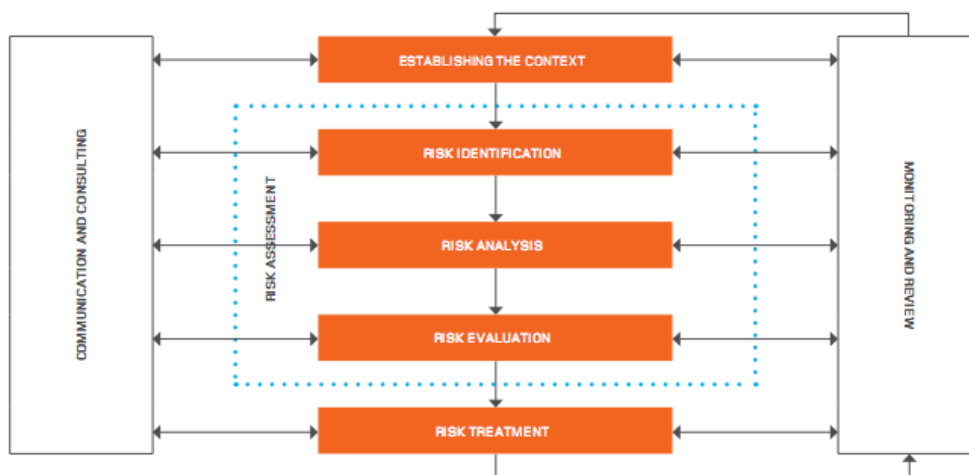


Figure 3: The risk management process

It is important to do a risk evaluation (**risk evaluation**), before planning for risk management/follow-up actions (**risk treatment**). During the whole process, communicating and consulting (**communcatiun and consulting**) with local stakeholders is essential. Monitoring and reviewing, in order to identify significant changes that could affect our analysis, must be conducted regularly (**monitoring and review**).



3.2 Risk assessment

The approach selected for this overall risk- and vulnerability analysis is stated and illustrated in figure below. The figure illustrates the bow-tie diagram, displaying the link between potential causes, preventative and mitigative controls and consequences of undesirable events.

In the middle of the illustrated figure, there is an undesirable event.

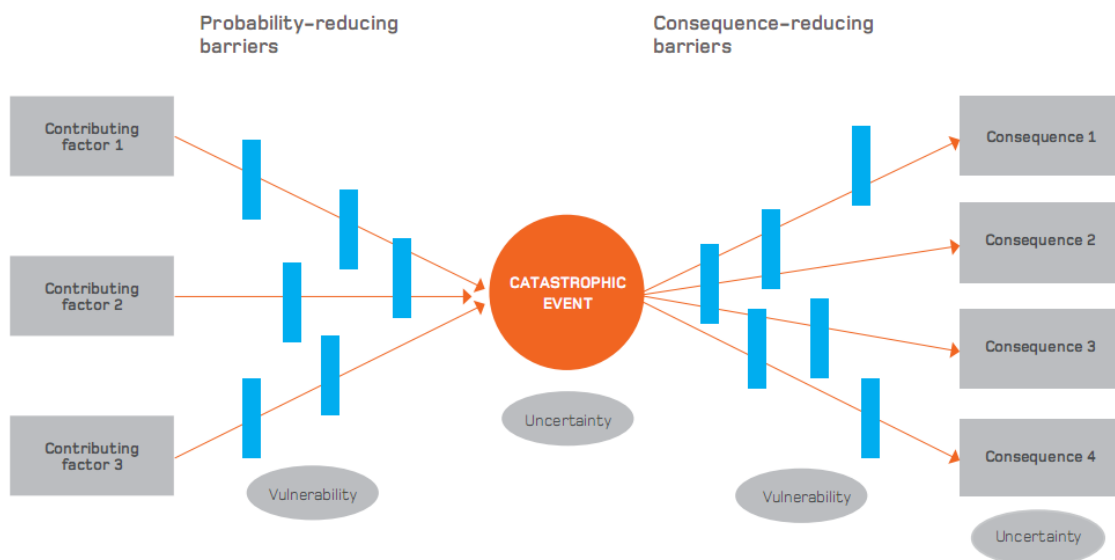


Figure 4: Approach to the overall risk- and vulnerability analysis

The risk analysis method used for the overall risk- and vulnerability analysis for the City of Stavanger, is based on hazard identification (hazid) analysis with an extended uncertainty analysis. A HAZID-analysis is often used as the term for qualitative (non-numerical) or, as in this case, semi-quantitative (partly quantified) risk analysis method that can be conducted with relatively modest effort. The hazard identification based on a set of defined societal values in order to identify adverse events that may threaten these societal values. This is described further in section 3.3.



3.3 Categories for describing risk

The analysis has in the same ways as the Norwegian national risk scenarios been based on a set of societal values and corresponding consequence types.

The City of Stavanger has taken six societal values into account when conducting the overall risk- and vulnerability analysis.

1. Life and health
2. Nature and the environment
3. Economy
4. Social stability
5. Controllability and territorial control (Considered in the national risk scenarios, but not in this analysis).
6. Cultural values (Not considered in the national risk scenarios, but included in this analysis).

The impact assessments is based on the national risk scenarios where each societal value is defined with a set of consequence type and their observable sizes.

Table 1: Societal values, associate consequence types, and observable sizes.

Social Values	Consequence type	Observable sizes
1.Life and health	1.1 Deaths	<ul style="list-style-type: none"> • Number of deaths • Time of death
	1.2 Injuries and illness	<ul style="list-style-type: none"> • Number of injured • Number of sick
	1.3 Physical strains	<ul style="list-style-type: none"> • The number of affected people • Duration
	1.4 Psychological damage	<ul style="list-style-type: none"> • Number of persons in need of supervision
2.Nature and environment	2.1 Long-term damage to the nature and environment	<ul style="list-style-type: none"> • Geographical expansion • Duration
3: Economy	3.1 Financial and material damage	<ul style="list-style-type: none"> • Property damage, financial loss, as well



Social Values	Consequence type	Observable sizes
		as combating, handling and restoring
4.Social stability	4.1 Social instability	<ul style="list-style-type: none"> • Number of people with behavioral reactions • Duration
	4.2 Disturbance in daily life	<ul style="list-style-type: none"> • Number of people affected • Duration
5.Management capacity and territorial control*	5.1 Weakened national governance capability*	<ul style="list-style-type: none"> • Number of relevant indicators • Duration
	5.2 Weakened control over the territory*	<ul style="list-style-type: none"> • Area of the geographical affected area • Duration
6.Cultural values	6.1 Loss over cultural value	<ul style="list-style-type: none"> • Qualitative criteria

*Not assessed in the overall risk- and vulnerability analysis for the City of Stavanger.



4. Identified risks

The risks that have been identified as part of the overall risk assessment for the City of Stavanger are presented below.

Table 2: Identified risks

Number	Event
1	Failure in food supply
2	Distribution of health hazardous food
3	Failure/interruption of the drinking water supplies (prolonged)
4	Distribution of contaminated drinking water
5	Contamination of drinking water due to radioactive downfall
6	Power supply failure (prolonged)
7	Failure in gas distribution (prolonged)
8	Failure in district heating (prolonged)
9	Failure of the ability to provide necessary temporary shelter and public warning and evacuation
10	Failure of regional emergency preparedness and/or crisis management
11	Failure of local emergency preparedness and/or crisis management
12	Failure in communication regarding risk, emergency preparedness and/or crisis management
13	Failure of governing bodies (political and administrative)
14	Failure in health care
15	Epidemic/pandemic
16	Hospital fire/ explosion
17	Hospital - sabotage/terror
18	Nursing home/institution – fire
19	Failure of emergency services (in general)
20	Failure of emergency services – Health
21	Failure of emergency services – Fire and rescue
22	Failure of emergency services – Police
23	Major incident- industry
24	Major incident- aviation
25	Major incident- sea
26	Major Incident- road



Number	Event
27	Major incident- railroad
28	Major accident - offshore
29	Incident in large buildings (fire / explosion / collapse)
30	Violence/terror attacks in city
31	Violence/terror at schools
32	Violence/riots in connection with random accumulation of large crowd demonstrations
33	Criminal acts/ other events
34	Failure of information safety/security
35	Damage to cultural heritage
36	Fire in Old town Stavanger
37	Discharge of dangerous goods
38	Discharge of diesel etc. from tank installations or pipelines
39	Acute air pollution
40	Nuclear accident
41	Threats to animal health
42	Dramatic fall in oil prices / phasing out of fossil fuels
43	Loss of social safety
44	Collapse of the money market
45	Failure of critical infrastructure
46	Undesired event that requires evacuation of the Forus area
47	Failure in ICT
48	Failure of drains/ sewerage services
49	Failure in general waste management
50	Failure in the goods and passenger transport
51	Extreme weather condition / climate change
52	Migration



5. Selection of maps ⁴

See appendix

