

RESEARCH/STUDY

Developing a national strategy for disaster risk reduction and resilience in Sweden

Recommendations for the implementation of the Sendai Framework Global Target E



Facts

Developing a national strategy for disaster risk reduction and resilience in Sweden: Recommendations for the implementation of the Sendai Framework Global Target E. Swedish project title: Sveriges möjligheter för tillämpning av Sendairamverkets globala mål E om katastrofriskreduceringsstrategier.

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Lund University Centre for Sustainability Studies LUCSUS, in cooperation with the Department of Risk Management and Societal Safety at Lund University.

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MSB commissioned in 2018 Lund University to explore if, and how, a national (and linked local) strategies for disaster risk reduction and resilience could be developed and implemented in Sweden. It is the global target E of the Sendai Framework for Disaster Risk Reduction 2015-2030. Based on different methods, including document reviews and interviews with international, European, national and local stakeholders, the study provides key recommendations for fulfilling this goal and, ultimately, making Sweden more disaster resilient.

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Sammanfattning

Antalet allvarliga konsekvenser av katastrofer i världen har ökat, vilket lett till ett internationellt initiativ för att främja utvecklingen av nationella strategier för katastrofriskreducering (DRR) och resiliens. Ett av de globala målen i Sendairamverket för katastrofriskreducering 2015-2030, antaget av FN:s medlemsstater, handlar om att länderna ska ta fram strategier kopplat till DRR (mål E).

En ökande förståelse, för behovet av att ta itu med de underliggande orsakerna till risk, har lett till krav på mer samstämmighet mellan strategier som fokuserar på DRR, anpassning av klimatförändringar och hållbar utveckling. Detta stöds av Sendairamverket, Parisavtalet om klimatförändringar och Agenda 2030 för hållbar utveckling. MSB är kontaktpunkt för Sveriges åtaganden inom ramen för Sendairamverket och har därmed uppdraget att samordna arbetet på nationell nivå.

Syftet med denna studie var att stödja MSB vid genomförandet av Sendairamverkets globala mål E. Målet var att ge kunskap och rekommendationer för beslutsfattare, inklusive en analys av relevansen och omfattningen av det arbete som krävs för att utveckla en nationell strategi för DRR. Studien identifierar också framgångsfaktorer och hinder för att skapa en sammanhållande inriktning av olika styrdokument samt vilket stöd som bör ges på lokal nivå. Studien ger också förslag på vad MSB bör tänka på när nationella och lokala strategier ska utvecklas och hur arbetet ska bidra till att skapa ett sammanhang kring gällande lagar och strategier. Dessutom behandlar studien utmaningarna att uppfylla UNDRR's tio kriterier för DRR-strategier och fyra prioriterade områden, samt vikten av att välja relevanta indikatorer. Studien tar även upp lärdomar från sex andra europeiska länders arbete med strategier.

Metoderna för denna studie omfattar granskning av dokument, intervjuer, gruppdiskussioner och observationer under DRR-konferenser, vilka syftade till att systematisera aktuell kunskap och erfarenheter från intressenter på internationell, nationell, regional och lokal nivå.

Resultaten visar att det finns ett tydligt behov och intresse för att utveckla en nationell strategi för DRR i Sverige. Det skulle bidra till att förbättra nuvarande arbetssätt, ta itu med brister och bygga vidare på befintliga styrkor i arbetet med DRR. Införandet av konkreta och politiskt förankrade mål med tillhörande budget behövs för att strategin ska bli användbar och effektiv för det svenska samhället. Det framhålls också att processen att utveckla och genomföra en nationell strategi är minst lika viktig som strategin själv.

Summary

Increasing impacts from hazards worldwide, including Sweden, have prompted international efforts to promote the development of national strategies for disaster risk reduction (DRR) and resilience to reduce associated impacts and support sustainable development. The development of such strategies is global target E of the Sendai Framework for DRR 2015-2030, which was adopted in 2015 by Sweden and other UN member states.

An increasing understanding of the need to address the underlying causes of risk has led to demands for more coherence in strategies that focus on DRR, climate change adaptation, and sustainable development. The Sendai Framework, Paris Agreement on Climate Change, Agenda 2030, and the Sustainable Development Goals (SDGs) promote such strategies. MSB is the Swedish national focal point for the Sendai Framework and thus commissioned to drive its implementation in Sweden.

The overall purpose of this study was to support MSB in the implementation of the global target E of the Sendai Framework for DRR. The specific aim was to provide knowledge and recommendations for decision-making. This includes the analysis of the relevance and scope of developing a national strategy for DRR and resilience. The study also identifies drivers and barriers for creating policy coherence and local-level support. In fact, it addresses what to consider in developing a national and local strategies and provides information about how to achieve coherence with current laws and strategies. Furthermore, the study addresses the challenges of meeting UNDRR's ten criteria for DRR strategies and four priority areas as well as the importance of selecting good indicators. Apart from the local context and conditions, it considers lessons learned from six other European countries.

The methods for this study included document reviews, interviews, group discussions and participatory observation aimed at systematising current knowledge and experiences of key stakeholders at international, national, regional and local level.

The results show that there is a clear need, and vast support, for the development of a national strategy for DRR and resilience in Sweden in order to improve current approaches, address shortfalls, and build on the existing strengths. The inclusion of concrete measures and associated budgeting are needed for the strategy to become useful and effective for the Swedish society. It is also highlighted that the process for developing and implementing a national strategy is equally or even more important than the strategy itself. Specific recommendations for a national strategy are described in this report.

1. Introduction

1.1 Background

Impacts from hazards, such as floods, landslides, drought, heat waves and fires are increasing worldwide, including in Sweden (IPCC 2014, 2018). The results are escalating human and economic losses that pose a serious risk to sustainable development (IPCC 2014, 2018; Wamsler 2014).

This situation has prompted international efforts to promote the development of national strategies for disaster risk reduction (DRR) and resilience aimed at reducing global disaster losses and, ultimately, support sustainable development. The development of such strategies is global target E of the Sendai Framework for Disaster Risk Reduction 2015-2030 (henceforth abbreviated Sendai Framework). The Sendai Framework was adopted by Sweden and other UN Member States at the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR) held in Sendai, Japan 18th of March 2015. It is the successor to the UN Hyogo Framework for Action (HFA) 2005-2015.

The Swedish Civil Contingency Agency (MSB) is the Swedish national contact point for the Sendai Framework and thus commissioned with its implementation. Target E is to substantially increase the number of countries with national and local strategies for DRR and resilience by 2020. The indicators that the Member States must respond to in their national reporting regarding target E are:

- E-1 The number of countries which adopt and implement national strategies for DRR and resilience in line with the Sendai Framework 2015–2030.
- E-2 Percent of municipalities which adopt and implement local strategies for DRR and resilience in line with the national strategies.¹

In Sweden, as of 2018, little advancements have been made towards achieving target E. This was also highlighted by the Swedish Institute of International Affairs (Utrikespolitiska Institutet) that conducted a study for MSB in 2017 about how the Sendai Framework is currently applied in the Swedish context (Haraldsson and Reischl 2017).

1.2 Overall purpose of study

The overall purpose of this study is to give recommendations as to how Sweden can work towards achieving global target E of the Sendai Framework by 2020 through the assessment of key stakeholders' knowledge and perceptions, key

¹ The UN General Assembly has endorsed these two indicators for the measurement of global Target E following a recommendation from the open-ended intergovernmental expert working group on indicators and terminology (OIEWG).

documents (e.g. UNDRR guidelines, national legislation and strategies) and other countries' experiences.

1.3 Specific goals and limitations

In order to achieve target E of the Sendai Framework, countries either need to show how strategic and comprehensive DRR and resilience work already is embedded and reflected in existing national and local strategies or, alternatively, develop DRR and resilience strategies at the national and local level. This study aims to support the relevant authorities in Sweden in this decision process.

The specific goal of this study is thus to provide knowledge and concrete recommendations for decision-making and implementation processes. This includes the analysis of the relevance and scope of developing a national strategy for DRR and resilience and, in this context, identify barriers and drivers for creating policy coherence and local-level support. It also includes the learning from other countries, mainly the Nordic countries but also other EU countries with similar DRR legislation, about how they go about developing DRR strategies.

The focus of the report is on the national work in Sweden. MSB and its partners also conduct extensive international work in the field of DRR, but this is outside the scope of this study. In addition, the scope of the study was limited due to the very restricted time frame in which it was conducted, including a total of 6,5 weeks (between 1,5-3 weeks per person) for data collection, analysis, reporting, revisions and the presentation of the final outcomes at MSB.

1.4 Research questions

Based on the overall purpose and specific goals of this study, the overarching research question is: *How can Sweden best achieve the Sendai Framework global target E in a Swedish context?* To answer this question, the following sub-questions were formulated:

- **Rationale and needs:** Is a national strategy for DRR and resilience needed? What are the pros and cons for the development of a national strategy in Sweden?
- **Strategy coherence:** Which already existing Swedish national strategies are considered to have a close link to DRR? Should a national DRR strategy be linked to the strategies that already exist? If yes, why? How can national and local DRR strategies take into consideration the goals set in Agenda 2030 and the UN climate agreement?
- **National - local synergy creation:** How can the already mandatory DRR work at the municipal level be strengthened by a national strategy and become part of local ones?
- **Indicator development and coherence:** How should DRR indicators be developed? Can the UNDRR's Disaster Resilience Scorecard for Cities

support DRR work at the local level? What is the potential role of the Swedish indicators used for risk and vulnerability analysis?

- **Development and implementation process:** What actors should be engaged in the development of a national strategy? Is a gap analysis required to identify the shortfalls in current DRR work in Sweden as part of the strategy development? If yes, how could MSB best develop such a gap analysis by considering the criteria which should be part of DRR strategies? What actors should be engaged in the development of a gap analysis?
- **Lessons from other countries:** What are good examples from other countries in Europe that could in some way be applied in Sweden?²

1.5 Target group

The results will provide a better knowledge base deciding for how Sweden can best achieve the Sendai Framework global target E, via targeted strategies, the integration of related objectives in existing strategies and work, or a combination of it.

Consequently, the direct target group is MSB and its national contact point for the Sendai Framework, ministries and other authorities with which MSB is (directly and indirectly) cooperating, including county administration boards, regions and municipalities. It also includes external partners, such as the private sector, universities, and civil society organisations who should actively work to implement the Sendai Framework in Sweden. The indirect target group are the Swedish citizens who benefit from effective DRR work. Another target group includes countries that together with their associated stakeholders are in the process of developing national or local DRR and resilience strategies.

² Two additional questions were added later on in the process to highlight certain results (cf. Sections 3.2 and 3.4).

2. Methodology

This study was conducted from May 2018 until February 2019 by three experts from Lund University in Sweden. They have an academic background and professional expertise in DRR, risk assessment, policy mainstreaming, climate change adaptation and sustainable development.

The study was an exploratory analysis aimed at assessing the factors that influence the relevance, scope, and processes of developing a national (and linked local) strategies for DRR and resilience and associated policy coherence (cf. Section 1). While the main focus of the analysis was on Sweden, a country that is often portrayed as a pioneer in DRR, it also includes lessons learned from six other European countries (the Netherlands, Finland, Norway, United Kingdom, Germany and Croatia). These were selected based on information given by key informants from the United Nations Office for Disaster Risk Reduction (UNDRR) and MSB, as well as other interviewees.

Data was collected through interviews, group discussions, participatory observation and document reviews to systematise current approaches, knowledge and experiences of key stakeholders. MSB supported the access to relevant formal and internal documents and information, their cooperation partners and other key stakeholders.

A total of 34 interviews (cf. Annex 1) of 1-3 hours were conducted, summarised and transcribed. Interviewees came from international key organisations, such as UNDRR as well as national, regional and local organisations that actively work with DRR-related issues. Several interviewees explicitly stated that their answers should be seen as representative for their organisation. Some had a preparatory meeting within their organisation before their interview, to ensure the adequateness and representativeness of their answers.

In addition, group discussions and/or participatory observations were conducted during meetings with MSB and two key events, which took place in 2018. These were 1) the annual German Forum for Disaster Risk Reduction (October 22-23 in Berlin, Germany [GFDRR 2018]), and 2) the annual meeting of the European Forum for Disaster Risk Reduction (November 21-23 in Rome, Italy [EFDRR 2018]).

The document reviews included the analysis of academic key literature, international, national and local policy documents and reports, as well as guidelines for developing national and local DRR strategies by UNDRR. The selection of the documents was based on input given by MSB and information provided by the interviewees involved in this study.

Qualitative coding was used for data analysis and the identification of patterns in current approaches, knowledge and experiences and was based on the defined research questions (cf. Section 1.4 and Annex 2). Both the interview summaries/transcripts and the reviewed documents (except for policies and

regulations) were analysed in this way. Depending on the focus and background of the interviewees and documents (e.g., international, national, local), the importance given to certain aspects varied.

In addition, the identified national key policies and regulations were analysed in relation to UNDRR's ten criteria for DRR strategies³ and the associated four priority areas of the Sendai Framework (UNISDR 2018a):

1. **Understanding disaster risk:** Disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be used for risk assessment, prevention, mitigation, preparedness and response.
2. **Strengthening disaster risk governance to manage disaster risk:** Disaster risk governance at the national, regional and global levels is very important for prevention, mitigation, preparedness, response, recovery, and rehabilitation. It fosters collaboration and partnership.
3. **Investing in disaster risk reduction for resilience:** Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment.
4. **Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction:** The growth of disaster risk means there is a need to strengthen disaster preparedness for response, take action in anticipation of events, and ensure capacities are in place for effective response and recovery at all levels. The recovery, rehabilitation and reconstruction phases represent a critical opportunity to build back better, including through integrating disaster risk reduction into development measures.

For identifying whether the Swedish legislation and associated principles comprise a holistic framework as set out by the Sendai Framework and its four priority areas (see above; cf. UNISDR 2018a), both the actual policies and regulations as well as the interviewees' knowledge and perceptions regarding these were assessed. Focus was here on those policies and regulations that MSB as well as the interviewees identified as the most relevant for DRR and resilience building in Sweden (cf. Annexes 3-4).

Preliminary findings and associated policy recommendations were discussed regarding their validity and feasibility with some key organisations (mainly MSB) before they were revised and finalised.

³ These criteria are from the "Technical Guidance for Monitoring and Reporting on Progress in Achieving the Global Targets of the Sendai Framework for Disaster Risk Reduction" (pp.115-116) and relate to national and local strategies. They were used together with UNISDR's priority areas for coding the documents. A spreadsheet was applied to indicate whether a particular document met the criteria and, if so, how.

3. Results

This section describes the results of the conducted interviews, group discussions, participatory observations and document reviews (cf. Section 2 and Annex 1). They are organised according to the research questions (Annex 2) and are grouped in relation to the overall purpose and specific goals of this study (cf. Section 1).

3.1 Why develop a national strategy?

Questions answered in this section: Is a national strategy for DRR and resilience needed? In other words, what are the pros and cons for the development of a national strategy in Sweden? In this context, the identified main shortfalls in current DRR in Sweden will be listed.

The vast majority of the interviewees recommend the development of a targeted national strategy for DRR and resilience in Sweden. In fact, all but two interviewees working in Sweden within key organisations at the national, regional and local levels, highlight the importance of developing such a strategy.

This recommendation is supported by the UNDRR guidelines (UNISDR 2018b) developed for the implementation of the Sendai Framework (UNISDR 2017a) as well as related professional and academic key literature (e.g., Haraldsson and Reischl 2017; Henstra and Thistlethwaite 2017).

The most important *arguments and rationales given by both interviewees and key literature* for the need to develop a national strategy in Sweden are:⁴

- *Existing risk, vulnerability and capacities:* Sweden is facing increasing risk and vulnerabilities, together with reduced DRR capacities caused by societal and climatic changes (cf. Andersson et al 2015; SOU 2016:57; SOU 2001:41; Wamsler and Brink 2015), while a false sense of security seems to prevail.
- *International stewardship, commitment and credibility:* How the Sendai Framework is implemented so far is not adequately addressed in Sweden. Long-term, multi-sector and all risk plans and commitments are for instance missing (see below). At the same time, its global targets (including target E) are widely proclaimed in Swedish international development work (cf. Government of Sweden 2016). The Sendai Framework, as well as the Paris Agreement and Agenda 2030, are intended to link DRR, climate change adaptation and sustainable development. However, this integration has so far not been adequately pursued in the Swedish context.

⁴ Note that all arguments listed are based on the analysis of the interviews. In addition, they are all supported by literature. Some relevant examples, but not a full list, of publications was added.

- *Current DRR practice*: An overarching and long-term approach (e.g., for setting priorities, addressing gaps and creating synergies) for DRR and resilience building is missing. Related efforts are limited to the national risk and capability assessment. At the same time, there are important shortfalls in, and fragmentations of, current DRR work that reduce societal resilience, safety and security in Sweden that are described below.



The main shortfalls regarding current DRR practice (identified by the interviewees and supported by academic literature) are:

- *Risk awareness*: There is a lack of awareness, consideration and communication of current risks at all levels, as well as increasing risks linked to contextual societal and climatic changes (cf. King 2002; Weichselgartner and Pigeon 2015; Haraldsson and Reischl 2017; Wamsler and Brink 2015).
- *Limited and fragmented DRR approach*: There is a lack of a coherent and comprehensive approach for DRR and resilience-building, which would address the underlying risk factors. Often crisis response and preparedness are still the focus of DRR and resilience work. Consequently, important aspects (e.g. physical planning) and key actors (including private actors and citizens) are excluded (cf. Wamsler et al. 2014, Brink and Wamsler 2018). In addition, relevant regulations are fragmented and/or do not explicitly address DRR and resilience issues (cf. Henstra and Thistlethwaite 2017).
- *Work in silos*: There is a lack of a comprehensive DRR approach that should be intrinsically linked to the work on climate change mitigation and adaptation, security, and sustainable development planning. “Currently, every single topic lives its own life” instead of mutually supporting each other (cf. Göpfert et al. 2019; Johansson and Wagner 2017; Schipper 2009; Haraldsson and Reischl 2017; Wamsler and Brink 2014a,b; Wamsler and Raggars 2018; Wamsler et al. 2014).

- *Responsibilities, mandates and tasks*: The shared responsibilities of relevant actors at different levels and their collaboration required to support a more coherent and comprehensive approach to DRR and resilience-building, are not adequately defined. Inaction or doubling of efforts are the result (cf. Johansson and Wagner 2017; Haraldsson and Reischl 2017; Wamsler 2014). This relates to different governmental agencies and departments as well as private actors and citizens (Brink and Wamsler 2018).
- *National support*: Most interviewees mentioned that there is a lack of national will and support for DRR and resilience-building. There is also a concern that the national will and support given to the national, regional and in turn local level might diminish due to resources allocated to civil protection and civil defence. Similar concerns exist due to the fact that climate and sustainable development goals dominate the political agenda (cf. Haraldsson and Reischl 2017).

Finally, another important argument and rationale given by the interviewees for the need to develop a national strategy in Sweden was related with the risk of not developing a national strategy:

- *High political costs and other impacts*: There was a vast agreement amongst the interviewees that *not* developing a national strategy would mean not only a missed opportunity for learning and improving current approaches and systems, but also mean high political costs and negative consequences, such as increasing disasters, societal incidents and associated impacts similar to those occurred during summer 2018. There are also added financial losses due to uncoordinated or duplicate efforts.

3.2 How to develop a national strategy: Addressing gaps and shortfalls

Questions answered in this section: How can current gaps and shortfalls be addressed through the goals set by a national strategy?

On the basis of the identified gaps and shortfalls (cf. Section 3.1), the importance of developing a national strategy is said to be conditional for achieving important goals such as to:

- Outline the overall intentions and goals of the government.
 - *Increase the importance of DRR and resilience-building on the political agenda*. Also increase the visibility of DRR work across all governance levels so that DRR and resilience in the country is coherent with Sweden's international commitments, forerunner role and its contextual needs.
 - *Support mainstreaming of DRR and resilience to create synergies and a common understanding of the way forward*: Integrate DRR across all sectors and related mandates, structures, mechanisms, strategies and regulations at national, regional and local levels to create a more coherent and comprehensive approach that is also intrinsically linked to climate change adaptation and sustainable development goals.

- Identify gaps, pinpoint priorities and define concrete measures to achieve the outlined intentions.
 - Mechanisms and regulations: Identify existing mechanisms and regulations that relate to DRR and require changes, demand specific updating and linking of regulations and mechanisms (e.g., between DRR and climate change adaptation indicators and reporting), and improve current approaches and structures for risk, vulnerability and capacity assessments.
 - Responsibilities: Delegate individual and joint responsibilities of actors at all levels and enhance collaboration.
 - Learning: Create a system that allows for better monitoring of risks and learning at all levels.
- Focus on strengthening capacities and resources.
 - Strengthen MSB for the implementation of the Sendai Framework that requires a comprehensive approach that gives adequate priority to sustainable development and climate-related issues.
 - Increase support (knowledge, capacity and financial resources) for translating the intentions and actions into practice at the local level (including changes in local laws, regulations, budgets for creating targeted positions and developing local strategies for DRR and resilience).
 - Strengthen the county level to ensure improved guidance given to the local level. A national-level strategy will only be of relevance if it can provide regional and local support for capacity development and support a broader risk reduction *and* resilience approach. The strategy and its implementation need to result in clear benefits for the local level including adequate support from the regional and national levels.

Finally, it has to be highlighted that the political standing of the national strategy (i.e., its endorsement and the decision regarding its development and implementation), and the process of developing and implementing it are equally or more important than the strategy itself. For related results and recommendations see Section 3.7.

3.3 How to achieve coherence with laws and other strategies

Questions answered in this section: Which already existing Swedish national strategies/regulations have a close link to DRR? Should a national DRR-strategy be linked to the strategies which already exist? If yes, why? How can a national and local DRR strategies take into consideration, the goals set in Agenda 2030 and the UN climate agreement?

The already existing national strategies and regulations for which interviewees saw close linkages to DRR were the following (listed based on perceived relevance):

- Agenda 2030 national action plan – Handlingsplan Agenda 2030, 2018–2020. (Regeringskansliet 2018)

- National Strategy for Climate Change Adaptation – Nationell strategi för klimatanpassning (prop. 2017/18:163) (Government bill 2017).
- Planning and Building Act – Plan- och Bygglagen PBL (SFS 2010:900)
- Environmental Code – Miljöbalk (SFS 1998:808).
- Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert – Lag om kommuners och landstings åtgärder inför och vid extraordinära händelser i fredstid och höjd beredskap (LEH) (SFS 2006:544)
- Climate Change Law – Klimatlag (SFS 2017:720).
- Civil Protection Act – Lag om skydd mot olyckor (LSO) (SFS 2003:778).
- Swedish Civil Contingencies Agency's ordinance on municipal risk and vulnerability assessments – Myndigheten för samhällsskydd och beredskaps föreskrifter om kommuners risk- och sårbarhetsanalyser (MSBFS 2015:5)
- Swedish Civil Contingencies Agency's ordinance on governmental authorities' risk and vulnerability assessments – Myndigheten för samhällsskydd och beredskaps föreskrifter om statliga myndigheters risk- och sårbarhetsanalyser (MSBFS 2016:7)
- National strategy for physical planning (Nationell strategi fysisk planering) that is being developed in 2018-2019.
- Road and railroad code – Järnvägslag (SFS 2004:519).
- Road Act - Vägslag (SFS 1971:948)⁵
- Local Government Act – Kommunallag (SFS 2017: 725)
- National Security Strategy – Sveriges nationella säkerhetsstrategi (Government Offices of Sweden 2017)
- The three principles for crisis management: responsibility, proximity and parity (Government bill 2002)
- Common Guidelines for Command and Control – Gemensamma grunder för samverkan och ledning vid samhällsstörningar (MSB 2018d)
- National Strategy for the Protection of Vital and Social Functions and Critical Infrastructure: A Functioning Society in a Changing World – Ett fungerande samhälle i en föränderlig värld, nationell strategi för skydd av samhällsviktig verksamhet (MSB 2011a)
- Specific plans related to flood risk, for instance of the different county administration boards (*Länsstyrelsen*).

The following national strategies and regulations were also mentioned:

- The Climate Adaptation Ordinance – Förordning om myndigheters klimatanpassningsarbete (SFS 2018:1428)
- Public Water Services Act – Lag om allmänna vattentjänster (SFS 2006:412)
- Action Plan for Protection of Vital and Social Functions and Critical Infrastructure – Handlingsplan för skydd av samhällsviktig verksamhet. MSB (2013a)
- National Energy Agreement 2016 – Energiöverenskommelsen (Energy agreement 2016).
- Swedish Administrative Procedures Act – Förvaltningslagen (SFS 2017:900)
- Ordinance on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert

⁵ www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/jarnvagslag-2004519_sfs-2004-519

- Förordning om kommuners och landstings åtgärder inför och vid extraordinära händelser i fredstid och höjd beredskap (SFS 2006:637)
- Ordinance on Emergency Preparedness and Heightened Alert – Förordning om krisberedskap och bevakningsansvariga myndigheters åtgärder vid höjd beredskap (SFS 2015:1052)
- The National Risk and Capability Assessment – Nationell risk och förmågebedömning (MSB 2017a; MSB 2018a)
- Security in a New Time – Säkerhet i en ny tid (SOU 2001:41)
- Different climate change action plans prepared by a number of authorities. Many of them got in 2016/2017 funding for their development by the Swedish Meteorological and Hydrological Institute SMHI. There are also the regional action plans for climate change adaptation that regional authorities prepare (Boverket 2010).⁶

Furthermore, there was full agreement across the interviewees that a national strategy for DRR and resilience should be linked to the relevant strategies and regulations (see above) and importantly to the following two:

- National Strategy for Climate Adaptation – Nationell strategi för klimatanpassning (prop. 2017/18:163) (Government bill 2017)
- Agenda 2030 national action plan – Handlingsplan Agenda 2030, 2018–2020 (Regeringskansliet 2018)



The reasons given by the interviewees that are also supported by academic and professional literature (e.g., Johansson and Wagner 2017; Council of the European Union 2018a; UNISDR 2018b) were:

- *Aim of national strategy - mainstreaming*: Mainstreaming DRR and resilience into existing strategies and regulations should be one of the main aims of a national strategy (cf. Section 3.2; Wamsler 2014).
- *Improving understanding about linkages*: To explicitly create linkages between DRR, climate change adaptation and sustainable development for increasing understanding about what comprehensive DRR entails (cf. Schipper 2009; UNISDR 2018). As stated by one of the interviewees: “DRR

⁶ www.klimatanpassning.se/roller-och-ansvar/kommande-underlag/pa-gang-fran-lansstyrelserna-2018-1.134148

and resilience is a mindset, it is a way of thinking which goes hand in hand with the SDGs.”

- *Increasing synergies and cost-effectiveness*: To increase synergies and avoid the creation of separate structures and the resource inefficient doubling of efforts (cf. Johansson and Wagner 2017; Wamsler et al. 2014).
- *International commitments*: To fulfill the international agreements and associated commitments of the Sendai Framework, Agenda 2030 and Paris Agreement, which require the creation of linkages across all levels.

The same aspects were also mentioned as key objectives that a national strategy for DRR and resilience should pursue (cf. Section 3.2). One interviewee remarked “It is not enough to say there are laws, ... it is not about creating something separate, parallel, ... it is about connecting things.... risk analysis, crisis planning, Agenda 2030.”

In order to link a national strategy and local DRR strategies to the goals in Agenda 2030 and the UN climate agreement, a participatory and interdisciplinary process is needed (cf. Section 3.5). Key challenges for its realisation were said to be the current funding streams, capacities, structures and processes and associated legislation at all levels, which need to be improved for creating more comprehensive approaches (cf. Section 3.4).

3.4 Challenges of meeting UNDRR’s criteria

Questions answered in this section: How do identified national key policies and regulations relate to UNDRR’s criteria for DRR strategies and the associated four priority areas of the Sendai Framework?

The following results on how key policies and strategies meet the ten UNDRR criteria and the associated four priority areas of the Sendai Framework are based on both the interviews and document analyses:

Priority 1 – Understanding Disaster Risk:

- Crisis management-related legislation (e.g., LSO and LEH) generally does not reflect a comprehensive understanding of risk. They mostly deal with preparing for and responding to certain rapid-onset and large-scale disasters and associated risks, rather than preventing or mitigating existing risks and dealing with a wider spectrum of hazards as prescribed by the Sendai Framework, including climate variability, slow onset, smaller-scale and frequent hazards. For example, LSO covers mainly fire and rescue service-related activities and LEH focuses on extraordinary events, which is defined as an event which means a serious disturbance, or high probability for a serious disturbance in important societal functions (SFS 2003:778; SFS 2006:544). A reference to legislation that addresses other risk factors and crises is missing. Legislation such as LEH and LSO focus on big events, and crises. However, there are many other things that municipalities have to consider in DRR such as increasing temperatures and rainfall. In this context, an interviewee stated, “There is nothing in the legislation to support us in our endeavors.”

- Accordingly, the promoted DRR measures are very limited. Crisis management-related legislations (e.g., LSO and LEH) do not cover development-oriented measures that address underlying risk factors (including hazard reduction and avoidance and vulnerability reduction). These aspects are central to the Sendai Framework. As expressed by Margareta Wahlström, former UN Special Representative for the Secretary General: “Many countries feel that they have DRR plans, but very often they are preparedness plans.” This becomes particularly a problem as different sectoral actors mainly work with specific legislation related to their own sector.
- Development-oriented laws do not reflect a comprehensive understanding of risk and how hazard exposure and vulnerability are related to development. They hardly acknowledge the close linkages between hazards, vulnerabilities, disasters and sustainable development and, consequently, their role in creating and reducing associated risk. There are many specific examples. The “polluter pays principle” is outlining the responsibility of the polluter to pay the impact the pollution is causing in the environment and is well established through the Environmental Code (SFS 1998:808). A similar principle linked to natural hazards is so far not adequately included in current legislation.
- Development-oriented legislations also lack a comprehensive inclusion of potential DRR measures (which would require the inclusion of measures to reduce or avoid hazards, reduce vulnerabilities, prepare for response and prepare for recovery). For instance, the Environmental Code is relevant for DRR as it “shall be applied in such a way as to ensure that human health and the environment are protected against damage and detriment, whether caused by pollutants or other impacts” (SFS 1998:808: 1 ch, 1§). However, it does not mention hazards, such as flooding, extreme heat and cold, drought, forest fires, or windstorms, nor their linkages with developmental and environmental work (e.g., as an important cause). In addition, while the Planning and Building Act PBL (SFS 2010:900) does mention hazards such as flooding, erosion and landslides, it is predominantly focusing on certain measures. It lacks a comprehensive risk approach, which requires the consideration of all risk factors and associated measures (see above) and a comprehensive approach, including green, soft and grey solutions. Furthermore, some aspects such as drought and the need for protection of drinking water sources in river basins are not adequately covered by any legislation. This was also concluded in a workshop with all Swedish water authorities, which was conducted in August 2018. It was organised to discuss the results from governmental assignments on water scarcity in south-east Sweden during 2016-2017, and included reflections on the hot and dry summer of 2018 (Vattenmyndigheterna 2018).
- Overall, the importance of understanding risks in terms of prevention and mitigation as well as the term DRR are barely mentioned in existing national strategies. The linkages between DRR, security, climate change adaptation and associated sustainable development issues are hardly established. For

example, the National Security Strategy has no reference to understanding risks. The plan for protection of vital and social functions and critical infrastructure includes nothing about climate change. In the national risk assessments from 2017 and 2018 a few prioritized areas of work are mentioned, which relate to DRR: Energy and food production, for example, but it is not described in enough detail to clarify whether this relates to comprehensive DRR or only crisis response within these fields. Not being explicit about the integration of DRR in existing strategies, opens up for dangerous assumptions, where important risks and the different possible measures to address them comprehensively may be omitted.

- The current legislative system is not able to convey a comprehensive understanding of risk. This lack of clarity is then transferred to the local level in the form of separate processes and one-sided DRR practice. For example, risk and civil protection actors only working with local risk and vulnerability assessments, LSO and LEH; urban planners with PBL; environmental actors with the Environmental Code. Due to this, municipalities do not have adequate influence on DRR in general, and particularly on non-public, private land. This is especially apparent in the context of heat wave mitigation and storm water management (cf. SFS 2006:412; SOU 2018:34).
- The basic conditions needed to adequately understand disaster risk through systematic data collection and monitoring are currently not given. Most documents include requirements or measures that enable follow-up, but few relate to the possibility of monitoring achievements in relation to specific goals or indicators. In comparison, the Swedish action plan for Agenda 2030 includes as part of its activities to monitor progress and the government agency Statistics Sweden has been assigned this responsibility.



Priority 2 – Strengthening Disaster Risk Governance to Manage Disaster Risk:

- The lack of a comprehensive understanding of risk and an associated system for data collection (cf. priority 1) has clearly negative effects on current risk governance to manage disaster risk and increase resilience in Sweden (cf. Cedergren et al. 2018; Wamsler and Brink 2014a). Looking for a description of disaster risk governance in Sweden, the available information is limited to crisis management. “All sectors need to get involved, not just a few actors, the emergency agencies”. Involving different sectors through systematic mainstreaming of a more comprehensive understanding of risk and DRR into existing legislations is thus key (cf. Section 3.1).
- Instead of strengthening risk governance, the current policy landscape rather leads to a low political mobilization around DRR in Sweden (cf. Eriksson 2016), which is also a phenomenon in other countries (cf. Olu et al. 2016; Thepot et al. 2016). This relates to different aspects, including the lack of targeted DRR indicators and the lack of amendments to legislation which is considerate of DRR (e.g., recent changes to the PBL are clearly biased to climate hazards and not hazards in general). If DRR is portrayed and perceived as mainly being linked to LSO and LEH, it remains a crisis management issue, with which many mainstream development sectors and processes naturally do not identify with.
- The decentralisation of power to the municipalities has been an ongoing trend in Sweden, which can hamper comprehensive risk governance if not combined with adequate support from national and local levels (in the form of financial support, capacity development, legislation and guidance). This decentralisation was further strengthened through the amendments to the Planning and Building Act in 1996 (Government bill prop.1994/95: 230) where risks needed to be identified in comprehensive planning. The current decentralisation often leads municipalities to interpret their responsibilities handling DRR quite differently since associated legislation and support are ambiguous. “What can be expected from the municipality and their rescue service, whether they will help or not is unclear. Some decline and some don’t.” In addition, the decentralisation is also hampering risk governance that requires the consideration of larger scales, such as flood risk governance since the municipal planning level does not include the river basin scale (Johannessen and Granit 2015). The current water legislation (Environmental Code) also provides barriers for such larger scale risk governance where private landowners have for instance the right to decide over land use in e.g. joint property societies. This makes it cumbersome to decide on adequate measures, requiring all involved landowners to agree on issues that also affect downstream areas. At the same time, there is also a lack of power given to the municipal level in relation to private land, both for enforcing and implementing joint DRR measures.
- Recent changes in legislation have strengthened risk governance but not in a systematic way. The recent climate change adaptation strategy has for

instance led to an important revision of the PBL⁷. However, further improvements are urgently needed. The creation of increasing hazards, vulnerabilities and associated risk through inadequate development processes has to be considered more systematically and explicitly. For instance, PBL states that society has to be built in a “safe way”, but without clear linkages to and guidance for DRR and resilience building. In contrast, the legislation and instruments linked to the Environmental Code prescribe an exact value for e.g., accepted noise in residential areas, or environmental quality in surface water specified by the environmental quality guidelines, whilst similar details are missing when it comes to DRR and resilience.

- The processes and mechanisms that are linked to the existing regulations and strategies relevant for DRR are not adequately coordinated, such as the assessments of risk-related issues (e.g., conducted independently in relation to the national risk and capability assessments and the assessments regarding the Climate Change Adaptation Strategy).
- While the preventive/mitigative nature of many DRR measures requires important synergies between crisis management, sustainable development and environmental quality goals, current governance structures tend to keep these aspects separate, even in the context of new policy developments. For example, the current government investigation (SOU) on water governance and associated legislation, organisation and financing (to be finalised around October 2019) is predominantly about water quality and does not mention/ relate to extreme hazard events (e.g., extreme rainfall). Overall, in official documents ideas on sustainable development and climate change have become more prominent only in recent times (as a case in point the notion of “climate change” is not mentioned once in the 110 pages long Swedish Environmental Code from 1998, albeit environmental protection and development is at the heart of the document). Consequently, related aspects are not sufficiently included in existing policies, nor linked to DRR.
- Current legislation does not sufficiently define different actors’ responsibilities and falls short of convening all relevant sectors around a common objective regarding DRR and resilience building. This relates to the role of, and cooperation between, the coordinating body and other actors. “You need to have a coordinating body. For it to have any impact it needs to have an authority that the other development sectors respond to. The Sendai Framework is a global milestone, but it is not as mandatory as the other international frameworks. If there is no authority that can impose this on other sectors, it will be little forceful.”

⁷ The amendments to the PBL were the following: a) The municipalities must make a mandatory risk and vulnerability assessment (focus is mainly flood risks and erosion) in relation to the comprehensive planning (CP) to point out risk areas; b) in the detailed development plan, the municipality has the possibility to demand a special permit for measures/developments which impair the infiltration capacity of the ground. In other words, this gives the municipalities a possibility to deny building permits in risk areas.

Priority 3 – Investing in Disaster Risk Reduction for Resilience:

- Due to the lack of a comprehensive understanding of DRR in current policies and legislations, the financing is only thought through for crisis management, while there is a clear lack of financing and incentives for preventive and mitigation measures in a development context. This is related to the general lack of clarity regarding DRR at and between all levels.
- Databases for monitoring and evaluating the financial impacts and the cost effectiveness of measures are lacking. “We have no clue how often a road is closed off because of floods and how much it costs us. We don’t know why it happens and how we can avoid it next time. When you work with traffic safety, you focus on the questions: Why does the accident occur? How do we prevent the next one? This thinking is not at all present when it comes to natural hazards.”
- There is a risk of increasing financial expenses, especially if no national strategy is developed. “Essentially the costs keep increasing at the local level, and regional and national levels. The political risk is very high (...). There is a cost for not having a proper plan and the capacity and resources behind it, so that you can act appropriately. Also the lack of integration between the sectors, between the sectors that are responsible for DRR (...), the environment and infrastructure, agricultural, fishery (...) if they are not working together and identify the risk elements together, it increases costs.”

Priority 4 – Enhancing Disaster Preparedness for Effective Response, and to Build Back Better In Recovery, Rehabilitation and Reconstruction:

- The aspect of recovery, including reconstruction and rehabilitation, has so far given little attention in current policies and regulations. The Civil Protection Act (LSO; SFS 2003:778) prescribes aspects for effective response, e.g., that the municipalities should be responsible for the rescue service and should have a plan for action decided by the political decision makers for each mandated period. It also prescribes the role of the municipality for follow up after a disaster, e.g., for replacing costs incurred during the response. The strategy on critical infrastructure also mentions reconstruction. However, recovery planning is clearly weaker than response (and associated preparedness) planning (cf. Wamsler and Brink 2014). The UK’s nationally operated recovery process might be an interesting source of inspiration to look at in this respect.
- Especially the linkages between recovery and development are hardly looked at, less so in development-related legislation. This translates also into clear weaknesses in current DRR practice at the local level. “We are not very good at building back better. We have no preparation plans for that. We are good at acting on events. The work done after a disaster is done without plans.”
- The lack of preparedness for major catastrophic events, where the regional and/or national level needs to take over local responsibilities (e.g., when larger systems fail), was also mentioned to be an aspect that requires improvement in the current system.

Annex 3 provides a more detailed account of how the identified key regulations and strategies relate to the four priority areas of the Sendai Framework and the ten criteria by UNDRR that national and local strategies for DRR and resilience should seek to meet (UNISDR, 2017d).

In essence, both the interview and the document analyses stress the need and value of a national strategy to explain the interlinkages and connections between existing national and local mechanisms, legislation and strategies and how they help to achieve the goals and priorities expressed in the Sendai Framework.

Developing a strategy that helps in understanding the “bigger picture” of how individual legislations and strategies are interlinked and also connected to global objectives may increase the motivation for achieving aims in line with specific DRR initiatives (by installing a sense of being an important part of/contributor to a common puzzle), prompt inter-agency communication and collaborations and, thus, accelerate the fulfilment of both national and global objectives. Moreover, it is expected that the mapping of interlinkages and connections will generate more comprehensive knowledge and create synergies.



3.5 Creating national-local synergy

Questions answered in this section: What is (considered as) mandatory local DRR work. What are the main shortfalls? How can the already mandatory DRR work at the municipal level be strengthened by a national strategy and become part of local ones?

Regarding municipalities' DRR work, the interviewees stated that:

- **Mandatory DRR work:** Only the local risk and vulnerability assessments are mandatory, requiring explicit DRR work at municipal level. They focus mainly on disaster/ crisis management and require municipalities to report to the regional county administrative board (Länsstyrelse) every fourth year (cf. SFS 2006:544).

- *Limited DRR approach:* Accordingly, local DRR work is so far mainly framed around disaster/ crisis management (response and preparedness), which is in stark contrast to the broader and comprehensive approach required for local resilience building promoted by the Sendai Framework. “I don’t know any municipality that is working to prevent a major downpour that has not yet experienced it yet. The current framing comes from the national level, where DRR is framed as a crisis management problem, because it comes from civil protection work, which in turn stems from the military.”
- *Development-related work lacks support for tapping into its potential role for DRR:* Sustainable development and planning regulations and mechanisms, such as comprehensive and detailed development plans, were acknowledged to be key for local DRR work. However, related mechanisms and processes limit their usefulness for improving DRR and resilience.
- *Staff:* The current DRR approach translates into the fact that the professionals who work at the municipal level on risk and vulnerability assessments, and who are also MSB’s contact points, come almost exclusively from a disaster/ crisis and fire management background, with hardly any linkages to staff with other competencies and/or sectors.
- *Work in silos:* Accordingly, the issues of DRR, climate change adaptation and sustainable development are mostly dealt with in isolation, while local DRR work needs to be closely linked to the sustainable development agenda and related regulations promoted at national levels, e.g., for spatial planning – PBL (cf. Section 3.3). Creating better synergies at local level requires ‘acting by example’ by national and regional level authorities.
- *Lack of local-level involvement:* Representatives from the regional and local levels agree that municipalities are not always included in DRR-related work in Sweden. “At the best they talk to the Swedish Association of Local Authorities and Regions (SALAR/SKL), but they are representing the median municipalities. There needs to be a kind of clustering to address this better.”
- *Policies and regulations:* National-local synergy creation requires improved policies and regulations at the national level. Of special importance are the Planning and Building Act (PBL) (SFS 2010:900), The Environmental Code (SFS 1998:808) and the Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (SFS 2006:544) that steers the Risk and Vulnerability Assessments (cf., Section 3.3).

There was agreement across all interviewees that the risk and vulnerability assessments are an important tool with great potential to help mainstream DRR across all sector work, but this potential has not been tapped into. The interviews, literature review and associated policy assessments in relation to the 10 UNDRR criteria and the four priority areas of the Sendai Framework agree that current risk and vulnerability assessments require profound revisions due to the following shortfalls (cf. Annex 3 and 4):

- **Priority 1 – i.e., Understanding Disaster Risk:** A comprehensive representation of disaster risk is missing. The risk and vulnerability assessments are for instance not based on a comprehensive risk approach and understanding (cf. Cedergren et al. 2018). This becomes particularly obvious when looking at the included indicators (cf. Section 3.6) as well as the selected foci of analysis. For example, “many municipalities [affected by forest fire in 2018] had not forest fires as part of their local risk analyses.”
- **Priority 2 – Strengthening Disaster Risk Governance to Manage Disaster Risk:** There are several aspects that determine whether or not the assessments have influence on local disaster risk governance: i) They are mostly seen as an administrative obligation and, consequently, do not lead to improved DRR practice; ii) they often focus on few, mostly traditional, hazards, while new or potential future hazards are hardly considered (cf. Eriksson 2016; Wamsler and Brink 2014a,b), and iii) the assessments are often conducted by few people with a crisis, emergency or civil protection background, with little further stakeholder involvement (cf., Eriksson 2016; Wamsler and Brink 2015). (See also Section 3.4).
- **Priority 3 – Investing in Disaster Risk Reduction for Resilience:** The Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (SFS 2006:544) makes provisions for (so called 2:4) funding of crisis preparedness activities based on local plans, which are often based on local risk and vulnerability assessments (SKL and MSB 2018). Given the challenges of producing these assessments (see above), financing for DRR is likely to focus on a too narrow spectrum of risks, lack mainstreaming and thus synergy creation with other sectors and associated stakeholders.
- **Priority 4 – Enhancing Disaster Preparedness for Effective Response, and to Build Back Better in Recovery, Rehabilitation and Reconstruction:** The indicators for preparedness for recovery are comparably weak and do not adequately link to development-related issues. Furthermore, the lack of a consideration of civil society actors (citizens, citizen groups and NGOs) was identified by some interviews as an additional barrier, negatively affecting the capacity of the affected population groups and supporting institutions (cf. Asp 2015).

In accordance to the identified shortfalls, the interviewees highlight that a national strategy for DRR and resilience could be important for strengthening local risk and vulnerability assessments, for instance by demanding the following revisions:

- **Indicators:** Revision of the current indicators for risk and vulnerability assessment in order to better reflect a comprehensive understanding of risk and increase the usefulness of the assessments for improving current DRR (cf. Section 3.6).
- **Hazard focus:** Predefine the potential hazards that must be considered by the municipalities, with clear guidance by the national and regional levels for prioritising, rating and following action plan development (cf. Section 3.6).

- *Actor involvement*: Demand for an all-sector involvement and participatory process that allows for ownership development. Creating a process for ownership creation is crucial in order to enable the different sector actors to take on their role in identifying and addressing local risks in coordination with the other local actors (Section 3.6).
- *Capacities and resources*: Increase resources for fostering municipal capacities/ staff and conducting local risk and vulnerability assessments through an inclusive process that is based on a more comprehensive understanding of risk and is explicitly linked to local climate change adaptation and sustainable development work.

3.6 Selecting the best indicators

Questions answered in this section: How should DRR indicators be developed and existing ones improved? Can the UNDRR's indicators in the Disaster Resilience Scorecard for Cities be a support in this context?

Both the literature review and the interviews highlight the important role of indicators for DRR and resilience building as part of a national strategy. Their development would require the consideration of the following aspects:

- *Multi-level system*: There are three levels of indicators that according to UNDRR (UNISDR 2018a) and the interviewees should support and complement each other:
 - i) The global indicators are an integrated part of the Sendai Framework, are obligatory. These global indicators relate to the seven global targets of the Sendai Framework, which have to be reported on every year by all member countries. MSB is responsible for this reporting.
 - ii) The national indicators are voluntary. Each country can develop their own customized indicators. In contrast to the global indicators, they should be more specific in relation to the countries' actual needs and weaknesses.
 - iii) The local indicators should translate the national goals and associated indicators to the local level. UNDRR provides in this context support in form of the Disaster Resilience Scorecard for Cities indicators that are based on the Ten Essentials for Making Cities Resilient. There are two scorecards: one with a set of indicators for the preliminary assessment and more indicators for the detailed assessment. These indicators can help municipalities to see their strengths and weaknesses and, ultimately, enable them to better decide on the measures to be taken and included in their local strategies and plans. The Scorecard with its indicators is not obligatory and should be seen as a potential starting point for developing context-specific local indicators. However, in Sweden and the other countries included in this study, the indicators in UNDRR's Disaster Resilience Scorecard for Cities are hardly known. Only those actors who have been directly or indirectly involved in their development (e.g., municipalities of Arvika and Jönköping in Sweden) were aware of their existence.

- *Aims of national indicators:* The lack of national-level indicators for DRR and resilience and consequently the lack of associated financing, control and follow up of DRR work was seen by many stakeholders as weaknesses of the current system. It prevails systematic support, monitoring, evaluation and learning. Accordingly, there was vast agreement that indicators for DRR and resilience should not become an administrative burden, something that needs to be fulfilled for political reasons, but be developed to become a useful tool for improving the current DRR system and work. The development of the indicators along the Sendai Framework's four priority areas was considered to be a useful approach in this context.
- *Stakeholder involvement:* Indicator development should be based on a participatory process, including governmental actors from all levels, including policy-makers and technical staff/practitioners, together with academia, private sector and civil society groups that allow for mutual learning, motivation and ownership development. For related lessons learnt from other countries, see Section 3.8.
- *Existing indicators and synergy creation:* New indicators need to be based on existing indicators included in the existing policies and regulations relevant for DRR (cf. Section 3.3) and be aligned to related policy cycles and mechanisms (e.g., for reporting). For related lessons learnt from other countries see Section 3.8.



Regarding the development and improvement of local-level indicators for risk and vulnerability assessments, which should be promoted by the national strategy, as well as the development of local strategies for DRR and resilience, the interviewees highlighted the following aspects:

- *Existing indicators:* The current indicators included in the risk and vulnerability assessments are seen as very weak regarding both their usefulness and their comprehensiveness. There was full agreement across the stakeholders from the national, regional and local levels that the existing

indicators for the risk and vulnerability assessments need to be revised so that they can serve to improve current DRR approaches. “They do not provide any information regarding how well the DRR system works. It is not about performance. They are measuring the wrong things, focusing on how they use money. It’s a fiscal approach. It is not about the effects in terms of addressing the problem. The indicators do not link to sustainable development.” In addition, they do not adequately consider the DRR capacities and efforts of other actors, including citizens. For more details as to how a national strategy could strengthen the local risk and vulnerability assessments, see Section 3.5.

- *Aims:* Accordingly, the revised indicators should serve to improve current DRR mechanism and approaches and, thus, be more linked to whether or not the local authorities can address DRR in an adequate way, have the right type of knowledge and approaches to make decisions. The Scorecard indicators could be a voluntary starting point to improve the indicators included in the risk and vulnerability assessments, also since it links to the 10 UNDRR criteria and the 4 priority areas of the Sendai Framework. However, the Scorecard is hardly known and also the international country experiences have not shown that it is of particular relevance.
- *Process:* Revised indicators could be easily implemented when the agreements between MSB and SKL get renewed (cf. MSB and SKL 2018). The next time will be in 2022. The actual revision (i.e., the process of revising the indicators) and the following inclusion into existing mechanisms should be a measure that should be included in the national strategy and associated budgeting.
- *Actors:* The revision process requires the active involvement of all sectors, which is important to look and address the root causes of risk and, thus, should be required. So far, MSB’s staff who work on DRR and resilience do not have sufficient contact with development-related actors across all levels. “This is a blank spot ... to find people at the local level... who are not from the fire department ... who can see the connections between DRR and their own sectoral work.“
- *Local level:* Certain cities, such as the Swedish cities in the UNDRR Making Cities Resilient Campaign (Arvika, Gothenburg, Jokkmokk, Jönköping, Karlstad, Kristianstad, Malmö, Stockholm, Vansbro, Vellinge, Värnamo and Ängelholm) and city associations could assist in driving the development and improvement of local-level indicators. They could create blueprints for and collaborations with other municipalities in developing local strategies for DRR and resilience.
- *Regional level:* Improved national and regional support and guidance is required in the processes of improving local work and capacities for DRR and resilience, the development of associated strategies and the creation of policy coherence across the existing local plans and legislations. Strengthening the regional level is crucial and has shown to be beneficial also in other contexts. For related lessons learnt from other countries see Section 3.8. In Sweden, the regional support through non-governmental

associations, such as the Resilient Regions Association⁸ were also considered to be of high value and benefit for DRR at the local level.

3.7 Development and implementation process

Questions answered in this section: What aspects should be considered in the development and implementation process of a national strategy? E.g., Which actors should be engaged? Is a gap analysis a good way to identify the shortfalls in current DRR work and develop a national strategy?

The development and implementation process for developing a national strategy for DRR and resilience should explicitly consider potential barriers such as:

- *Decentralisation*: Since municipalities have autonomy in all planning matters, top-down regulations from the national government to improve DRR are not easy to implement.
- *Contextual setting*: Swedish municipalities are very diverse in relation to size, geography, size, population, risk and their capacities for addressing DRR that should be taken into account.
- *Policy environment*: Creating more strategies runs the risk of making things rather more complex than effective if the aims are not phrased adequately (cf. Section 3.1), and the development and implementation is not conducted adequately.
- *Intersectoral work and interdisciplinarity*: DRR spans different communities of practice with different educational backgrounds, institutional setups, norms and little coordination between them, and thus comes with all kinds of challenges that inter-sectoral and interdisciplinary work involves.
- *Traditional DRR governance structures*: DRR is an important development issue, whilst current DRR work is generally dominated by disaster operations thinking. The traditional DRR governance structures also limit the involvement of multiple stakeholders, including citizens. Breaking up old structures and creating a cultural shift based on positive connotation and motivation (e.g., “together for resilience”) is needed but challenging.

Thus, the outcomes of this study clearly highlight that the process of developing and implementing a national strategy for DRR and resilience is equally important as the strategy itself (cf. Section 3.2). This relates to the following recommendations, which were highlighted by the interviewees and are supported by literature:

- *Political standing and will*: The political decision and actor constellation for the development and endorsement of the national strategy should possibly

⁸ www.resilientregions.org

come from the highest governmental level and be supported by all ministries (governmental assignment) (cf. EFDRR 2018; GFDRR 2018). The increasing national priority given to civil defence issues (as opposed to capacity development for resilience development) is seen as a threat in this context.

- *Leadership*: An inter-ministerial coordination group with one coordinating body (e.g., Ministry of Justice/MSB) with clear mandates is seen as important in this context and is supported by the lessons learnt from other countries (cf., Section 3.8; EFDRR 2018; GFDRR 2018). A national strategy will not be adequately implemented if it does not promote ownership throughout its development and implementation process. This requires additional resources and possibly staff for the respective organisations to take on this leadership role. “You need to have a coordinating body, but for it to have any impact they need to have an authority that the other development sectors respond to.” “Sendai is a global milestone, but it is not as mandatory as the other international frameworks. If there is no authority that can impose this on other sectors, then this is a threat to implementation.”
- *Organisational and internal mainstreaming*: The coordinating body for implementation of the Sendai Framework (at MSB) needs to ensure that both external and internal actors are adequately involved. This requires internal reform and opening up for a more comprehensive understanding of risk and resilience that is needed for leading DRR work. This involves for instance a revision of internal working groups and the identification of a strategic approach to mainstreaming DRR, so that DRR is moved forward by all departmental and sector work.
- *External actor involvement and collaboration*: Complex issues such as disasters and climate change require the inclusion of many actors with different roles in society. The key actors (as identified by the interviewees and key literature) include: national, regional and municipal authorities (both policy makers and practitioners at all levels), universities/ expert groups, the private sector, non-governmental and civil society organisations. “Not only the usual suspects”. “New perspectives, and thus new actors, need to be involved.” At the agency level the following actors were highlighted as crucial: The National Board of Housing, Building and Planning, National Food Agency, Ministry of Environment and Energy, Environmental Protection Agency, Swedish Transport Administration, Swedish Agency for Marine and Water Management and the Water Authorities, Ministry of Finance, Swedish Meteorological and Hydrological Institute, Swedish Geotechnical Institute, Swedish National Institute of Public Health, Swedish Forest Agency and Swedish Board of Agriculture.
- *National platform*: Swedish and international stakeholders recommended building up a new national platform that can possibly be more effective than the national platform that existed for the implementation of the Hyogo Framework for Action.

- *Demonstrating cost effectiveness and relevance to national/local economy:* “Money talks”. Demonstrating that the development and implementation of a national strategy for DRR and resilience is cost effective and relevant for the national and local economy, might be important both for the process and as an inherent component of the strategy. However, this needs to be based on data for slow and rapid onset, frequent and less frequent, large and small-scale events. This data is currently not collected or monitored in Sweden (EFDRR 2018).
- *Trust, responsibility and ownership creation:* The establishment of a process that fosters trust, ownership, common understanding, joint responsibility, motivation and agreement is crucial for the successful development and implementation of a national strategy, but requires time and resources. Consequently, adequate time and resources should be allocated for learning from previous experiences for developing and implementing new strategies and associated processes. Some example are the Climate Change Adaptation Strategy and the strategy on Drug Prevention of the so called Three Cities Project, funded by the Public Health Agency, where the responsibility of developing the strategy was delegated to three large cities. Another example is the Security Commission and its initiative Insurance Sweden, chaired by Fredrik Reinfeldt, former Prime Minister of Sweden⁹. The importance of creating ownership is also a clear lesson from other strategy development processes. “We found out how important it was to have these meetings and get input from different views, with people who normally don’t talk with each other”.
- *Aim of national strategy:* The risk that a new strategy will make current governance more complex rather than effective will not realize if the main aim of the strategy is the mainstreaming of DRR and synergy creation to improve DRR and resilience across all sectors (cf. Section 3.1).
- *Budgeting:* Proposed actions need to be financed. For example, if the goal is to increase capacities and improve risk and vulnerability assessments at local levels then there needs to be a budget for that.
- *Role of regional level:* The regional level needs considerable strengthening. Improved support and guidance by national and regional level stakeholders is required to foster DRR capacities at the local level and has shown to be beneficial also in other contexts (cf. Section 3.5). This requires strengthening the role of the regional level (including related governmental and non-governmental authorities/platforms).

⁹ Security Commission (Swe: Trygghetskommissionen) website: <https://trygghetskommissionen.se/>

- *Local-level involvement and adjustments:* Local officials and practitioners need to be included in the process of developing the national strategy. At the same time, its translation to the local context needs to allow for context-specific adjustments and flexibility.



- *Gap analysis:* Generally, the analysis of existing strengths and weaknesses is seen as an important tool and process for creating the necessary ownership and social learning needed to ensure that the strategy will be based on context-specific perspectives and needs and transform current DRR governance. A systematic way of doing the analysis would be to first conduct a desktop analysis followed by more in-depth discussions with relevant stakeholders. The analyses and discussions could be conducted in relation to the four priority areas of the Sendai Framework to identify both the weaknesses that need to be addressed as well as the capacities and strengths one can build on (cf. the case of Germany, Section 3.8).

A gap analysis could either take the form of an integral component of the process for developing the national strategy, which means that the stakeholders would be the same or it could be conducted as a kind of pre-study for planning the development process and thus involve a smaller group. However, the involved actors, related power constellations and their current DRR approach require thorough consideration in this context (see also above under actor involvement). In line with international best practice (e.g., Netherlands; cf. Section 3.8) it would be advisable to follow a consistent methodology in this process. Guidelines and methodologies for stakeholder engagement and associated problem identification processes are available from different scholars (e.g., Patton 2015) and international organizations (e.g., Krick et al. /UNEP 2005).

3.8 Lessons from other countries

Questions that are answered in this section: What are the lessons learnt from other countries that could be of relevance for the Swedish context?

While the focus of this study was on Sweden, it also included the analysis of six other European countries, namely the Netherlands, Finland, Norway, the United Kingdom, Germany and Croatia (cf. Section 2). While these countries can all be seen as progressive in DRR, the development of national strategies for DRR and resilience is highly context-specific, making it difficult to translate or even learn from other countries' experiences. Nevertheless, it was possible to identify some lessons in relation to the six focus areas of this study (cf. Sections 3.1-3.6), which are described below.

Rationale and needs for developing a national strategy (cf. Section 3.1): The rationales and needs for (not) developing a national strategy and the umbrella term used for addressing DRR and resilience are highly context-specific and relate mainly to the political and institutional landscape and related power relations between different stakeholders and governance levels (local, regional and national):

- Germany plans to finalise its national strategy in 2020, which is the target date for Sendai Framework's national and local strategies. Here, contextual factors are addressed by developing a targeted national strategy that is of voluntary character, while strong emphasis is put on creating ownership across all ministries to ensure its implementation. In addition, emphasis is given to the resilience term (as opposed to disaster and DRR terminology) since it does not come with predefined legal implications.
- The approach taken by The Netherlands is to develop a national strategy for security *and* safety, with the later covering DRR-related aspects. The focus is on governing through cooperation, which aligns with the country's governance mechanisms and structures and linked financial resources. The Netherlands plans to complete their national strategy in 2019.
- In the other countries that are involved in this study, existing policies are expected to also cover DRR issues. In Finland and Norway this relates to the countries' security policies (targeted strategy or white paper, respectively) and in the UK to the country's integrated emergency management doctrine. DRR mainstreaming work is here seen as a rather integral part of the day-to-day deliberation in civil service.
- All countries who have not (yet) developed a separate strategy to support DRR and resilience, confirm that there are challenges associated with this approach. These include: i) the lack of a clear mandate and public spending for DRR and resilience; ii) weak indicators and thus control for DRR and its mainstreaming at all levels; iii) the associated challenge of working across all relevant sectors and cross-cutting fields, which is especially apparent in the missing linkages between DRR, climate change adaptation and

sustainable development; and iv) the often prevailing focus on reactive versus development-oriented DRR.

- Also, the approach of focusing on combining safety with security (The Netherlands) was seen as having shortfalls regarding: i) its operationalisation that has a particularly broad focus, and ii) linking DRR closely with sustainable development and climate change adaptation, which comes at the expense of the ‘preferred’, ‘too close’ link to security. The risk of hijacking safety for security issues is acknowledged in all studied countries.
- Finally, the different countries’ representatives also concur that a strategy that explicitly targets DRR is important to strengthen political will and decision-making for DRR, which in some countries (like in Sweden) is more important than in others.

Strategy coherence: There is vast agreement that the creation of strategy coherence and national-local synergy (cf. Section 3.3 and following paragraph) should be supported, while similar barriers exist across all countries:

- Strategy coherence was shown to be supported through the following measures: i) the integration of DRR across all ministries and sectors as well as into existing national regulations and policies; ii) the development of closer linkages between DRR, climate change adaptation, civil protection and sustainable development, including spatial planning, building and critical infrastructure development; and iii) improving support for regional and local levels, which in turn requires the integration of DRR in different budget lines. The support of these aspects is also seen as the main objectives of a targeted strategy, if developed.
- At the same time, all of the analysed countries face similar difficulties in creating strategy coherence (due to regulations/strategies’ different lifecycles, priorities and standing that also lead to conflicts of interests and budgeting).
- A key barrier for strategy coherence relates to separation of two political areas, DRR and climate change adaptation, where long-term DRR experiences and activities are often ‘reallocated’ to climate change adaptation. Fortunately, both political areas are moving closer together within the international sphere as seen for instance in the Warsaw International Mechanism for Loss and Damage [COP19, 2013]) that is linked to the Paris agreement (UNFCCC 2015).

National-local synergy creation (cf. Section 3.5): Similar challenges exist in all countries, including the existing power constellations, mandates as well as the risk and vulnerability assessments at local level.

- All of the interviewees from other European countries stated that there are challenges regarding the country’s local risk and vulnerability assessments regarding: i) their usefulness for improving DRR, ii) their comparability, and iii) their comprehensiveness. Regarding the latter, the usual one-sided

stakeholder involvement at the local and/or regional levels (often fire and rescue staff) is one of the challenges.

- In addition, due to changing societal and climatic conditions and understandings of DRR, the (re-)distribution of responsibilities and power relations between the local, regional and national levels has become an issue in all countries. Increasing the influence of higher-level stakeholders to support local-level capacities is in this context discussed in different forms, and some countries have already taken related actions. Finland is for instance going through an extensive reform aimed at giving more power to the regional level in order to better support local authorities. This is a process that several Swedish interviewees would also like to see in Sweden. Starting from 2021 onwards, in Finland the regional governments will have more power including the role of coordinating DRR-related work. In the Netherlands, a similar approach is already established through so-called ‘safety regions’.
- Overall, all countries face similar difficulties in creating national-local synergies, also due to the current mandates (or lack of defined responsibilities) of different stakeholders and governance levels. To address this, improved ownership development at all levels is seen as key in this context. In the case of Germany, this aspect is addressed at the national level by developing a strategy of only 15-20 pages, to which the different ministries will add sector-specific aspects and measures. In the UK, the national risk and vulnerability assessment is used as a tool for ownership creation. The methodology is called “the national risk register”. It includes around 100 different risk types that get prioritised and are then addressed by specific departments; for “red” risks national plans are established and a “comprehensive challenge process” ensures the involvement of all relevant stakeholders, followed by a political process to specify mandates and budgets.

Indicator development and coherence (cf. Section 3.6): Relevant lessons for the development of DRR indicators could be identified:

- All country representatives highlight that the development of national DRR indicators should be based on already existing ones that require reporting at international, EU and national levels. For the interdisciplinary development of the national strategy and related indicator development, Germany created in 2017 an inter-ministerial working group and conducted a participatory workshop in 2018 during their annual national DRR conference (and at the same time their national DRR platform). For the creation of indicator coherence, the German Sendai Framework Focal Point has started linking the 38 global indicators of the Sendai Framework with the European Union Civil Protection Mechanism and will add their own custom indicators. The workshop in 2018 was also developed and designed to provide input regarding the national indicator development. Apart from participatory-based methods, there are also expert-driven approaches for indicator development, from which Sweden could learn from. In the Netherlands the national risk analysis is carried out by a consortium of research centres that

have developed indicators. They are using one methodology for related data collection and analyses.

- The different country representatives also highlight that the interpretation of key terms, such as disasters and hazards, is vital for indicator development. This differs across countries and is often political. In this context, the inclusion of small-scale as well as slow-onset hazards and disasters (and their cumulative effects) and the consideration of all phases of the disaster management cycle were seen as crucial for strategy and indicator developments at the national and local levels. That is, if increased societal resilience, as opposed to political self-assertion, is the objective. However, related data is generally lacking.
- The lack of a single system for collecting the DRR-related data, which relates to the established indicators, is in fact also a common challenge that the countries hope to address in the future. Some interesting new approaches emerge. For instance, in Norway. After experiencing an increase in water-related damage, insurance companies in Norway started sharing disaster loss data with municipalities for use in planning and initiated a related private -public partnership project. The interesting thing about using insurance data in this way is that it provides information on smaller, more frequent hazards that are often not considered. However, it does not include information on uninsured or non-insurable properties.
- Regarding the local-level indicator development for risk and vulnerability assessments and local strategies for DRR and resilience, the interviewees could not provide information on the usefulness of the UNDRR Scorecard indicators as most did not know about it. They did not know of no municipalities that use the Scorecard. In Norway the local risk and vulnerability assessments do not include indicators, only minimum requirements. The risk assessments are supplemented by data on disaster loss and damage incurred by different hazards that are collected and shared by insurance companies. Giving the municipalities access to such information, has proven to provide them with a better basis for planning (EFDRR 2018). A wider sector involvement is recommended to complement such data, especially at regional and national levels e.g., with the involvement of transport and health-related agencies.

Development and implementation process (cf. Section 3.7): Several lessons regarding the process of developing and implementing a national strategy that could be relevant for Sweden, were identified:

- All country representatives mentioned the importance of releasing cross-sectoral policies from the highest political level and the active involvement of all ministries, while being pragmatic to make the process not overly time and resource consuming.
- A kind of SWOT or gap analysis is generally considered to be helpful for creating ownership, although it can be accomplished in very different ways. For the development of the national strategy in Germany, a gap analysis was conducted in the context of the annual DRR conference in 2018. The

workshop focused on the comparison between the current DRR work and UNDRR's four priority areas (and related measures). The plan is also to structure the national strategy in accordance to these four priority areas. For the national gap analyses and following indicator-development the CADRI¹⁰ and the Risk Management Capability Assessment Guidelines¹¹ were mentioned as helpful tools. The questions included in the former were seen as particularly relevant for the initial meetings with ministries and identifying their sector-related roles.

- In the Netherlands, a general gap analysis was developed at national level in 2007, which led to the decision for, and ongoing development of, their national strategy for security and safety. For the safety aspect, an analytical consortium of research centres is currently doing a more focused analysis (with input from the risk analyses of the safety regions), before a round-table consultation process will be conducted, which will include all ministries, other level authorities, universities, private sector organisations and civil society groups.
- The Dutch example highlights a scientific, expert-driven approach that Sweden could learn from. The process will start next year, followed by more political and budget-focused discussions between all ministries. An external expert council also supports the process. The process is more expert-driven, which allows for a rather short process; the strategy is expected to be finalised in 2019.
- Finally, other countries' experiences (e.g., Croatia) show that stakeholder engagement, motivation and ownership can be increased through the prospect of having access to funding if their measures get included in the DRR strategy, the demonstration of the cost effectiveness of DRR to decision makers, and the involvement of the highest political level (EFDRR 2018).

The study of lessons learnt from other countries show great potential for mutual learning and knowledge development, if the Swedish government will decide to develop a targeted strategy for DRR and resilience, as recommended by this study. The cases of The Netherlands and Germany are especially relevant as they are both currently in the process of developing new national strategies to be finalised in 2019 and 2020 respectively.

Finally, it is important to mention that the other countries' representatives confirmed that Sweden has often been portrayed as a pioneer in DRR. Striving for remaining to be a role model and inspiration for other countries to increase resilience should certainly be an important driving force for the development of a national strategy in Sweden.

¹⁰ www.cadri.net/en/cadri-tool

¹¹ [eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEC:52015XC0808\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEC:52015XC0808(01)&from=EN)

4. Conclusions and recommendations

Increasing impacts from hazards worldwide, including Sweden, have prompted international efforts to promote the development of national strategies for DRR and resilience to reduce associated impacts and, ultimately, support sustainable development. The development of such strategies is priority goal E of the Sendai Framework for DRR 2015-2030, which was adopted in 2015 by Sweden and other UN member states. An increasing understanding of the need to address the underlying causes of risk has further led to demands for more coherence across strategies that focus on DRR, climate change adaptation, and sustainable development, as promoted by the Sendai Framework, the Paris Agreement on Climate Change, Agenda 2030 and its Sustainable Development Goals (SDGs). MSB is the Swedish national contact point for the Sendai Framework and thus commissioned with its implementation in Sweden.

Against this background, the overall purpose of this study was to support MSB in the implementation of global target E of the Sendai Framework for DRR. The overarching research question was: How can Sweden best achieve the Sendai Framework global target E in a Swedish context? The specific aim was to provide knowledge and recommendations for related decision-making and implementation processes. This included an analysis of the relevance and scope of developing a national strategy for DRR and resilience and, identifying drivers and barriers for creating policy coherence and local-level support.

Based on the analysis of key documents and interviews with key stakeholders at international, national, regional and local levels, our results and main recommendations are:

- First, there is a clear need, and vast support, for the development of a national strategy for DRR and resilience in Sweden in order to improve current approaches, address shortfalls, and build on the existing strengths. Accordingly, it is recommended that a national strategy for DRR and resilience will be developed with the aim to:
 - i) Outline the overall intentions, goals and priorities of the government in relation to DRR and resilience-building and give these issues the political standing that is needed in a context of increasing social and climate changes;
 - ii) Support mainstreaming of DRR and resilience in all ministerial work and sectors at national, regional and local levels (including the development of associated sectoral plans) to create synergies and a common understanding of the way forward;
 - iii) Allow systematic work and follow-up based on a broad understanding of DRR that includes a comprehensive understanding of risk (with

substantial focus on preventing and mitigating hazards and disaster occurrence in a developmental context);

- iv) Better define individual and joint responsibilities of actors at all levels to improve collaboration, strengthen the county level and provide better support to the local levels;
- v) Link DRR to climate change adaptation and sustainable development in accordance with Sweden's international commitments;
- vi) Engage in these topics nationally and internationally in a more coherent way;
- vii) Maintain Sweden's role model status and a becoming forerunner in DRR and resilience-building with resources to internally develop and internationally transfer knowledge, methods and technology.

The listed aims are not possible to be achieved within the current policy landscape. What is missing is a generic (multi-hazard) document collating related information which is now scattered in different legislation, mechanisms, processes, guidelines, fact sheets and checklists or is, so far, not at all addressed.

- Second, this study shows that the integration of concrete measures and associated budgets in the strategy are needed in order to achieve the outlined intentions and become useful and effective for the Swedish society. In this context, the following measures are recommended and seen as key aspects to be included in the strategy:

- i) The inclusion of concrete DRR considerations in existing sectoral policies and regulations and associated processes, particularly in those related to spatial and land use planning, environment and water, building and critical infrastructure development;
- ii) The inclusion of explicit linkages between relevant national strategies and associated regulations and plans related to DRR, climate change adaptation and sustainable development. These strategies include the following: National Strategy for Climate Adaptation (prop. 2017/18:163) (Government bill 2017); Agenda 2030 national action plan – 2018–2020 (Regeringskansliet 2018); MSB's mandatory provisions and general advice about municipalities RVAs; state authorities' RVAs and related regulations, i.e. the Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (LEH) (2006:544) and the Ordinance on Emergency Preparedness and Heightened Alert (2015:1052).
- iii) The revision of the current, fragmented system for risk assessments across all levels, including:
 - a. improving the process for national risk and capability assessments in order to give adequate ownership to different sectors as an incentive to actively pursue the mainstreaming of DRR, and

- b. improving the local risk and vulnerability assessments to make them more comprehensive and relevant;
 - iv) The provision of resources, incentives and guidance for increasing motivation and strengthening initiatives and capacities for DRR and resilience-building at regional and local levels. The strategy needs to provide clear benefits for the local level including adequate support from the national and regional levels;
 - v) Internal capacity development and reforms within the coordinating body that allow them to adequately manage the strategy's development and implementation;
 - vi) The establishment of a better system for adequately understanding disaster risk (for slow and rapid onset, frequent and less frequent, large and small-scale events) through systematic data collection, monitoring, evaluation and learning for DRR and resilience-building.
- Third, this study shows that the process for developing and implementing a national strategy is equally or even more important than the strategy itself. In this context, the following aspects need to be considered to create a supportive process for developing and implementing a national strategy:
 - i) A governmental decision and mandate given for its development and implementation, which should possibly come from the highest national level and be supported by all ministries;
 - ii) The process's alignment to related policies' cycles and mechanisms for reporting and negotiating changes, which is especially relevant in relation to the Agenda 2030 national action plan 2018–2020, the National Strategy for Climate Change Adaptation and agreements between MSB and SKL (for instance regarding local risk assessments);
 - iii) The process for identifying strengths and weaknesses of current approaches that should be conducted as part of the strategy and related indicator development, and which are recommended to be conducted in relation to the Sendai Framework's four priority areas; and
 - iv) The development of a systematic participatory process, including governmental actors from all levels, academia, private sector and civil society groups, required to allow mutual learning, motivation and ownership.

In summary, the analyses conducted stress the need for, and value of, developing a national strategy to improve the interlinkages between existing mechanisms, legislations, strategies and stakeholders at different levels and how they help in realizing local, national and international goals and priorities. Concrete measures and aspects that need to be considered in this context were highlighted.

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Annex 1: List of interviews

	Function/ Role	Organisation
International	Program Officer	UNDRR – European Office
	President of the Swedish Red Cross (Former Head UNISDR)	Swedish Red Cross (previously UNISDR)
	Head of the CCAC Secretariat	Climate and Clean Air Coalition (previously UNISDR)
National¹²	Senior Advisor and National Focal Point for the Sendai Framework	Norwegian Directorate for Civil Protection, Norway
	Strategic advisor - National Coordinator for Security and Counterterrorism	Ministry of Justice and Security, The Netherlands
	Senior government official, Senior specialist	Ministry of the Interior, Department for Rescue Services, Helsinki, Finland
	National Focal Point for the Sendai Framework	Federal Office of Civil Protection and Disaster Assistance (BBK) Germany
	Assistant Director for International Resilience and Cabinet Office Head of Science and Engineering	Civil Contingencies Secretariat, Cabinet Office, UK
	Emergency Planning and Resilience Manager*	Newcastle City Council, UK
	Reader in industrial ecology, climate expert	Royal Institute of Technology (KTH)
	Associate Professor and the Director of the Centre for Societal Security	Swedish Defence University (FHS)
	Assistant Professor, Sociology, member of UNDRR E-STAG group	Mitt University, Risk and Crisis Research Centre
	Desk officer	Ministry of Enterprise and Innovation, Division for spatial planning
	Desk Officer	Climate unity, Ministry of Environment and Energy
	Head of Resilience Development and Analysis Department	Resilience Development and Analysis Department, Swedish Civil Contingency Agency (MSB)
	Analyst and National Focal Point for the Sendai Framework	Swedish Civil Contingency Agency (MSB)
	Analyst for the implementation of the Sendai Framework	Swedish Civil Contingency Agency (MSB)
	Analyst - National risk and capability assessment	Swedish Civil Contingency Agency (MSB)

¹² Where the country is not indicated, the organization is Swedish

	Senior advisor	International Affairs Section, Swedish Civil Contingency Agency (MSB)
	Program manager, Function leader, protection of vital societal functions	Swedish Civil Contingency Agency (MSB)
	Water and Climate Expert and Adjunct Professor	Knowledge Centre for Climate Adaptation, Swedish Meteorological and Hydrological Institute (SMHI) and Linköping University
	Focal Point Alternate, Coordinator for IPCC member of the national working group for the management of natural hazards.	Swedish Meteorological and Hydrological Institute (SMHI)
	Research Director	The Swedish Geotechnical Institute (SGI)
	Administrator and member of the national working group for the management of natural hazards.	Swedish Association of Local Authorities and Regions (SKL)
	National climate adaptation coordinator	The Swedish Transport Administration
	National societal planner	The Swedish Transport Administration
Regional	Director, Crisis management	County Administrative Board in Jönköping
	Crisis management officer	Country Administrative Board in Norrbotten
	Societal planner	The Swedish Transport Administration
	CEO and General Secretary	Resilient Regions Association (public-private collaborative organization for resilient cities and regions)
Local	Flood Risk Coordinator, Making Cities Resilient Campaign	Karlstad Municipality
	Director, Safety and Security	City of Malmö
	Civil Contingencies Planner	City of Malmö
	Landscape Architect*	City of Malmö

*Informal interview/ email communication, not included in the quantitative analyses.

Annex 2: Interview guide

Focus areas	Interview questions
<p>1. Overall approach How can Sweden best achieve the Sendai Framework global goal E in a Swedish context? (overarching question)</p>	<ul style="list-style-type: none"> - Would you recommend the development of a targeted DRR strategy in Sweden? If yes/no, why? (Reasons) - Or would you rather recommend not to develop a DRR strategy in Sweden? (i.e., recommend instead only the integration of DRR goals in existing strategies/ work in Sweden) If yes/no, why? (Reasons) - Do you think that there could be any negative consequences of not developing a national strategy? If yes, which ones? - What contextual factors have to be considered for deciding which approach to take and for implementing it? (Note: contextual aspects refers to any aspects that are specific to the Swedish context, such as existing policy structures, existing DRR approaches, etc.) - How can they best be taken into consideration? - Are there positive experiences within MSB, or other Swedish organisations, regarding the development of a national strategy (that is related to another topic) and related processes for its integration/ mainstreaming in different sector work? What are the lessons learned?
<p>2. Relevant national strategies Which already existing Swedish national strategies have a link to DRR?</p>	<ul style="list-style-type: none"> - Which already existing national strategies and other governing documents do you consider relevant for/ linked to DRR work in Sweden? - In relation to your own work, what are the most relevant national strategies? Why? (Give examples of practical implications.) - How do they support or hamper DRR work in Sweden? Please provide concrete examples. - Could you please elaborate on the existing synergies/contradictions between the existing national strategies and the Sendai framework? - Note: For the document analysis this translates also into an analysis of the linkages in relation to the 10 criteria by UNDRR; table form.
<p>3. Strategy coherence/ mainstreaming Should a national DRR strategy be linked to the strategies which already exist? If yes, why?</p>	<ul style="list-style-type: none"> - In your opinion, should a national DRR strategy be linked to the national strategies that already exist? If yes, why and how? - What are the existing challenges to integrate them? - How can these be overcome? (links to processes) - What actors do you think should be engaged in the development of a national strategy? How? (Key indicators for successful and long-term engagement processes?) - What are the key actors? Why?
<p>4. Local DRR strategy & local DRR work How can the already mandatory DRR at municipal level become part of a local strategy?</p>	<ul style="list-style-type: none"> - What type of mandatory DRR work is conducted at municipal level in Sweden? - Do you think this work could or should become part of a local DRR strategy? - Is the mandatory work in the municipalities reflecting the need for a holistic risk approach? (i.e. addressing underlying risk factors, linking DRR, climate adaptation & sustainable development?)

	<ul style="list-style-type: none"> - If not, how do you think it could or should be changed/strengthened? - Could this be supported by a local and/or national DRR strategy? If yes, how? - Note that the literature review will consider the linkages between the mandatory DRR work at municipal level in relation to the 10 criteria set by UNDRR.
<p>5. DRR indicators for national & local strategies</p> <p>How should DRR indicators be developed?</p>	<ul style="list-style-type: none"> - Do you have experiences with developing (or using) national or local DRR indicators? If yes, please describe related work & lessons. - What do you consider to be a good approach/ process to develop indicators at national and/or local level to guide DRR work? - On what basis should the indicators best be developed? (e.g., existing indicators?) - Who should be involved in their development? - What do you think should be the main aims/ objectives for these indicators? (e.g. comparison between different locations, effectiveness) - Are there any contextual factors that need to get special consideration? / Is there any key indicator that is missing in existing (general DRR) frameworks or approaches?
<p>6.UNDRR indicators – Local strategies</p> <p>How can the indicators in the UNDRR’s Disaster Resilience Scorecard for Cities be a support for municipalities in the development of local strategies?</p>	<ul style="list-style-type: none"> - Do you know about the UNDRR Scorecard for City indicators? - If yes, why? Have you used them? Do you have other related experiences? What are the weaknesses and strengths? - Do you think that they could support municipalities in the development of local strategies? If yes, why and how? - Are there any contextual factors that need to get special consideration (for adapting general DRR indicators for the local level in Sweden)?
<p>7.Risk and vulnerability INDICATORS – local strategies</p> <p>How can the Swedish indicators for risk and vulnerability analysis be a support for municipalities in the development of local strategies?</p>	<ul style="list-style-type: none"> - Are you familiar with the Swedish indicators for risk and vulnerability analysis? (If not, provide input) - If yes, why? Used them? Related experiences? Weaknesses and strengths? - Do you think that they could be a support for municipalities in the development of local strategies? If yes, why and how?
<p>8.Links to Agenda 2030 & UN Climate Agreements</p> <p>How can a national and local DRR strategies take into consideration the goals set in Agenda</p>	<ul style="list-style-type: none"> - Do you believe that a national and/or local DRR strategies should take into consideration the goals set in Agenda 2030 and the UN climate agreement? If yes, why? And how? (Note: depending on your expertise/field of work, this question can focus on the local level, or on the national level, or on both) - In your opinion what are the main linkages between DRR work and the Sustainable Development Goals (SDGs, Agenda 2030)? What are the main synergies and/or trade-offs? (Note: depending on your

2030 and the UN climate agreement?	<p>expertise/field of work, this question can focus on the local level, or on the national level, or on both)</p> <ul style="list-style-type: none"> - What are the linkages between local/national DRR work (or the Sendai framework) and the UN climate agreement etc. Are there trade-offs and synergies? (Note: depending on your expertise/field of work, this question can focus on the local level, or on the national level, or on both)
<p>9. Best practices Describe several good examples in relation to DRR strategy development from other countries in Europe that could partly be applied in Sweden.</p>	<ul style="list-style-type: none"> - Do you know of any good examples/ practices from other Nordic or European countries for establishing a national and linked local DRR strategies? If yes, please elaborate on the process! (end product vs. process) - What is good about the example(s)? (Key aspects for a successful process?) - Could this also be done in Sweden? If yes, how? If not, what has to be adjusted/changed? - Do you know an example of a gap/SWOT analysis in the context of the described example/best practice? Why? How?
<p>10. GAP (or SWOT) analysis for national strategy Is a gap or SWOT analysis required to identify the strengths and shortfalls of DRR work in Sweden that should be considered in a national strategy? If yes, how could MSB best develop such an analysis?</p>	<ul style="list-style-type: none"> - What do you consider to be the main shortfalls in current DRR work in Sweden? (This question can relate to issues such as focus areas, governance structure, processes, legislation, lacking knowledge, etc.) - How could these shortfalls be addressed in the developing of a national strategy on DRR? - [Provide background: MSB is thinking about conducting a systematic analysis of the strengths and shortfalls in current DRR approaches in Sweden in order to create a thorough basis for the development of a national DRR strategy] How could MSB best develop such a gap/SWOT analysis? (relates to the basis of the analyses [e.g. 10 criteria by UNDRR] and related processes) - Are there positive examples from within MSB or from other stakeholders regarding the development of a gap/SWOT analysis (in relation to another topic)? - What actors do you think should be engaged in the development of a gap/SWOT analysis? How? (Key indicators for successful engagement processes?) - What are the key actors? Why?

Annex 3: Analysis of DRR coherence across existing regulation and policies

This section includes additional information regarding the document analyses conducted for assessing DRR coherence across existing regulations and policies (cf. Section 3.3). It includes a description of how regulations and policies are aligned with the Sendai Framework's four priority areas. It also shows alignment with the ten criteria for national and local strategies. The DRR coherence across existing regulation and policies was conducted based on the interviews.

Priority 1: Understanding disaster risk

Sendai Framework: "Policies and practices for disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment" (UNISDR 2015:14).

Sweden's approach is officially multi-hazard, which can be understood as an approach that considers the multiple hazards that the country faces which can occur simultaneously, cascadingly or cumulative over time, and taking into account the potential interrelated effects (UNISDR 2017e). Hazards is only one component of disaster risk where vulnerability and exposure are the two other elements. Here, the legislation and strategies will be scrutinized particularly in relation to the hazards.

In addition, the Sendai Framework for Disaster Risk Reduction covers the following aspect of hazards: "the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters, caused by natural or manmade hazards as well as related environmental, technological and biological hazards and risks" (UNISDR 2015).

Here follows an overview of how the relevant Swedish regulations and strategies include/make reference to different hazards

Key legislation and strategies related to Priority 1

The Civil Protection Act (2003:778) (LSO) and The Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (2006:544) (LEH)

The Civil Protection Act (2003:778) (LSO) (SFS 2003:778) focuses on events such as fire, and rescue service (see box 1 for an overview). The Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (2006:544) (LEH) (SFS 2006:544) focus on extraordinary events, which seriously disturb critical societal functions. The events mentioned in the LSO and the LEH, are thus relating to crises response and preparedness, and thus leaves out much of the

more preventive and mitigation ¹³ aspects of DRR which are emphasised in SFDRR.

LSO mentions the following hazards/accidents:

Fire and fire prevention (e.g. clearing soot from chimneys)
 Mountain rescue (incl. mountain search)
 Air rescue
 Sea rescue
 Search of missing persons
 Clean up missions at sea (oil spills or other hazardous substances)
 Rescue in case of radioactive substances emissions

LEH focuses on extraordinary events, which is defined as an event which means a serious disturbance or high probability for a serious disturbance in critical societal functions and needs urgent measures.

One of the aims of LSO is to strengthen the preventive and mitigation work and help shift the focus on fire and rescue to include more risk reduction. However, an evaluation confirmed that after ten years the prevention and mitigation work has only been strengthened in some municipalities. There have been increased actions to prevent and mitigate suicides and fall-accidents. There are, however, many municipalities that prevent and mitigate only fires (MSB 2015b). One interviewee linked this development of the LSO to the problem of a lack of change in the existing working structures and professional foci. Other actors need to get involved to fulfil the broader goal of the law today, but this is not a reality yet. In fact, in practice people have not worked with the new content (i.e. DRR) of the law (cf. MSB 2015b).

In conclusion, SFDRR very much puts emphasis on anticipation, prevention and mitigation that legislation such as LSO and LEH do not handle. This is obvious in relation to fire, which is included in the LSO in relation to crisis preparedness and response, but not in terms of more prevention and mitigation work to reduce the risk of forest fires. Individual risk and vulnerability analyses at the municipal level do take into account a wider set of risks, such as traffic accidents, that are not mentioned in the LSO. The approach to these risks is to prepare the response to them. The Swedish term present in the LSO legislation – “olycka” is directly translated as “accident” (see table 2) which strengthens the focus on crisis preparedness.

The National Strategy and Action Plan for the Protection of Vital Societal Functions and Critical Infrastructure (MSB 2011b; 2013a)

This strategy takes officially an “all hazards approach” in that it encompasses all risks. However, it does not outline what those are, but says: “Vital societal functions and critical infrastructure can be affected by various threats and risks, when many risks are difficult to predict. It is therefore crucial that work on societal functionality is based on a wide threat and risk profile.” However, not mentioning if these threats are slow onset or rapid onset, makes it more difficult to identify prevention and mitigation measures. In the MSB ordinance

¹³ With prevention/mitigation we mean here avoidance and reduction of hazards and reduction of vulnerabilities in a development context.

on risk and vulnerability assessments, linked to the LEH for municipalities as well as for state authorities, the following hazards are mentioned: natural hazards, other hazards, technical infrastructure and social support systems, antagonistic threats, social unrest and diseases (MSB 2015a; 2016a). However, the assumption is that the assessment focuses on preparedness for these hazards, and not prevention or mitigation.

Development-oriented legislations

While the LEH, and LSO predominantly focus on hazards in context of crisis response and preparedness, understanding other risks is a component of other laws and strategies. Some are long established, others are more recent. These include the Environmental Code (SFS 1998:808), the Planning and Building Act (SFS 2010:900), the Climate Change Adaptation Strategy (Government bill 2017; a proposition presented in March 2018), which included amendments to the Planning and Building Act, coming into effect in August 2018, and the Climate Law (SFS 2017:720), coming into effect on the 1st of January, 2018), Climate Change Adaptation Ordinance (SFS 2018:1428, 1st of January 2019). Another relevant strategy is the “National Strategy for Spatial Planning” that is under development.

The Environmental Code (SFS 1998:808) - Damage to human health and the environment, e.g. pollution (preventive/mitigation)

The Environmental Code covers risk reduction especially in terms of a broad spectrum of hazards: “The Environmental Code shall be applied in such a way as to ensure that human health and the environment are protected against damage and detriment, whether caused by pollutants or other impacts”; that also relates to the use of land, water and the physical environment in general, is very much linked to the Agenda 2030 and the SDGs (Sustainable Development Goals) (Regeringskansliet 2018) in its effort to “secure a long term good management in ecological, social, cultural and economic terms”. This includes reuse and recycling, as well as other management of materials and energy to establish and maintain natural cycles (Section 1 page 9). The Environmental Code also points out that, those who are responsible for the damage shall also remedy it (section 8 page 14). However, this “polluter pays” principle is well established in terms of pollution and impact on water and environmental quality but is not clear if the impact refers to water quantity due to, for example, flooding.

The Environmental Code also includes legislation related to the draining of water from e.g. agricultural land. This legislation puts the emphasis on regulating water flows from the perspective of individual landowners, in contrast to larger scale planning of water flows in river basins. This makes it possible for individual landowners to have a disproportionate influence on initiatives, which influence the downstream areas. Often, such joint property societies are not in use anymore, but are still legally binding, creating many difficulties for developing land.

The Planning and Building Act (PBL) - Fire, climate related floods (prevention/mitigation) urban floods, erosion (avoiding existing risk)

PBL mentions the following hazards:

Threats to health and security
 Preventing water, air and noise pollution
 Accidents, flooding and erosion
 Preventing fire and the spreading of fire, traffic accidents, other accidents
 Acts of war/fighting
 Climate related landslides
 Prevention in terms of management of waste, energy, water
 Chemical accidents
 Ground pollution
 Vibrations, light pollution

The Planning and Building Act (2010:900) regulates planning for land use, water and building. Prevention and mitigation of fire and the accessibility of rescue service are mentioned (SFS 2010:900). Although PBL covers prevention of fire, this is more from an urban area perspective, and clearly not forest fires. The PBL also prescribes the controls in relation to these rules, which is to be made by the local government in the building process. However, the PBL has also undergone deregulation the last ten years (Dir 1992:104). One interviewee highlights this deregulation and thinks it has caused bigger risk factors to emerge. This is linked to the strong

emphasis on relatively short-term economic benefits (10-20 years) of single detailed/zoning plans, house complexes and individuals, but not for society at large. Because of this situation, many interviewees believe that Sweden needs to go back to a more centralised way of ensuring that standards relevant for risk reduction are maintained and strengthened. This can only be made by a national regulatory framework in each sector, e.g. transport, and infrastructure.

In accordance with the climate change adaptation strategy, the PBL was recently amended; two minor changes mainly focusing on floods, which come into force in August 2018:

a) The municipalities now must make a vulnerability assessment in relation to the comprehensive planning (CP) that will be mandatory. One interviewee from SMHI says: "As such comprehensive planning has to come up with suggestions how to deal with those risks and this also makes the risks more linked to the built environment and more disaster related events like flooding, not only slow changes due to the climate." The requirement that the development of the comprehensive plan needs to include an assessment of risks, mainly flood risks and erosion as well as risk areas. This is an important step forward although the comprehensive planning is not legally binding.

b) In the detailed development plan the municipality has the possibility to demand a special permit for measures or developments that impair the infiltration capacity of the ground. In other words, the CCA strategy and the associated changes in PBL now give the municipalities the possibility to deny building permits in risk areas.

In terms of existing risks, the PBL (5 §) prescribes that development cannot be allowed in an area that is unsuitable for development due to the risk of e.g. floods and erosion. In terms of the PBL mentioning the creation or reduction of

risks (i.e. prevention or mitigation), only hazards such as prevention of fire (ignition and spreading) and traffic accidents and other accidents are mentioned. Increased risk for floods and droughts caused by development of an area, is not included here (only in chapter 2, paragraph 9, it is mentioned that developments, which might cause danger for human health and security, are not allowed). In the latest amendment of the PBL climate related events such as flooding and drought are referred to, however, it does not address flooding comprehensively since these hazards are not caused exclusively by climate change. This is a sign that while climate change adaptation considerations are included in the amendments of the regulations, the risk aspects have not. One interviewee supports this conclusion, and he adds: “This relates to why a national DRR strategy is needed, to address risks that are not exclusively related to climate change”. Having DRR and climate change adaptation more coordinated in e.g. when revising relevant legislation, should be a minimum requirement for coordinated processes.

Other criticism about the PBL is that it focuses predominantly on urban measures for building structures. The PBL lacks many aspects of prevention and mitigation of urban floods by considering green and grey approaches (e.g. width of streets) or the implementation of one water absorbing measure upstream in another area to alleviate an area downstream. Such a lack of provisions is detrimental to DRR. One interviewee says: “DRR work in city planning is missing. We have no support in the legislation or strategies”. The PBL also does not provide for spatial planning in a river basin for floods, which is the natural unit of analysis for water, i.e. not coordinating management of flows outside administrative municipal boundaries can provide unpleasant surprises to the municipality downstream (cf. Johannessen and Granit 2015).

A national strategy for spatial planning

The current confusion in spatial planning is addressed through the development of a national strategy for spatial planning to be finalised in 2019. The aim of the strategy is to clarify the main national goals in terms of spatial planning and explain how to prioritise them. The question remains about how prominent risk reduction will be in this document.

Agenda 2030, SDGs – mentioning of climate-related hazards, natural disasters and industrial accidents

Agenda 2030 with 17 Sustainable Development Goals (SDGs) have been adopted by the Swedish Government and an action plan has been developed (Regeringskansliet 2018). The SDGs are tightly linked to DRR (e.g. by UNECE 2018). The main links to DRR are:

- Climate action: “Strengthening resilience to climate-related hazards and natural disasters by promoting adequate siting, land-use policies and emergency plans.”
- Sustainable cities and communities: “Encouraging integrated policies to achieve resilience to disasters, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030”.
- Human health and wellbeing: “Avoiding deaths and illnesses from hazardous chemicals by reducing the risk of technological disasters releasing chemical substances.”
- Clean water and sanitation: “Preventing accidental water pollution from industrial accidents”.

- Industry innovation and infrastructure: “Promoting safe management of industrial installations to make them sustainable”².
- Peace justice and strong institutions: “Ensuring participatory decision-making by involving the public in discussions related to the prevention of, preparedness for and response to industrial accidents”.
- Responsible consumption: “Providing a framework to prevent accidental release of chemicals, thus contributing to their environmentally sound management”.

The Climate Law - Mitigation of carbon dioxide and other greenhouse gases (preventive/mitigation)

The Climate Law covers mitigation, i.e. reduction of carbon dioxide and other climate impacting greenhouse gases that ultimately leads to a reduction of climate change related hazards (SFS 2017:720). This can be considered to be a relevant legislation in terms of prevention and mitigation DRR. Hazards related to climate variability, such as increases in temperature, smaller, more frequent floods and sea level rise are referred to in the Climate Change Adaptation Strategy. As important as they may be, the development aspect of these hazards is omitted. The National Security Strategy mentions climate threat as one of the six prioritised areas.

The National Security Strategy also mentions the threat from the effects of climate change. It stresses the need for prevention and mitigation. Climate change can increase the risk of war, conflict and poverty. It can exacerbate the lack of water and food in regions that are already vulnerable. The combination of a lack of resources and population growth destabilises societies and breeds or exacerbates conflict. This often results in people being forced to flee. Higher sea levels and severe storms threaten lives, property and infrastructure in coastal regions throughout the world. A change in climate has implications for many key services in society. These include physical planning, buildings, communications and transport infrastructure, technical supply systems and, of course, agriculture, hunting and fishing. Sweden’s climate has already become warmer, with more precipitation. Deluges and heavy rain are expected to increase in intensity, raising the risk of flooding and high river levels. Flooding and saltwater intrusion could also increase as a result of rising sea levels, particularly in low-lying coastal areas in southern Sweden. Scania is particularly vulnerable to erosion and a rise in sea level, but these factors would also have implications for Mälardalen and Gothenburg. Over a span of 100 years, saltwater intrusion will threaten the drinking water supply from Lake Mälaren.

The Climate Change Adaptation Strategy

The Climate Change Adaptation strategy set out a number of actions (Government bill 2017), and the recent Climate Adaptation Ordinance states that many authorities now need an action plan for climate change adaptation, that should be based on a climate and vulnerability analysis (SFS 2018:1428). SMHI has an important role in this context to follow up and give instructions how these plans should look like. However, a large critique against the climate change adaptation strategy is that it only covers new developments, and not the already built environment. Another critique was that it did not take adequate

consideration to cross-sectoral synergies at the river basin scale (i.e. floods are reduced to volumes of water, instead of the complex resource it is), and for example, not making more provisions in planning and development for delaying and storing water in (Aspegren et al. 2018; Swedish Water and Wastewater Association 2018). Delaying and storing water is for example an important measure to mitigate both floods and drought. It is considered an important policy for water governance of the Netherlands.

Another disappointment with the climate change adaptation strategy is that it had set out to investigate the responsibilities, but still, no laws were proposed to support enforcement and compliance with the best practice in climate change adaptation. For example, PBL already says that there should be no building in risk filled areas (SFS 2010:900), but this is not always followed. Private land is also an issue. If a private developer does not want to do certain measures to reduce a risk e.g. of landslide, this is not an obligation, and this was not covered by the strategy. An interviewee says: “It is hard for a municipality or anyone to go into private land and prevent a landslide if the owners don’t want that. We should have those opportunities to protect a city against such issues. And most land is private.” She also takes another example of the sewage system. “Who will fix the new sewage system? Who will pay for it? Sweden does not take responsibility [regarding Climate Change and adaptation]”.

Local flood risk plans - Flooding, pluvial (skyfall) and riverine

Local flood risk plans are supported by the Flood Risk Ordinance which is tasking MSB to identify flood risks from a river basin perspective, as part of the five water districts, managed by five County Administration Boards. For each district there should be a preliminary assessment of risks. MSB should also identify areas including e.g. economic activities that can be at risk. Areas of high flood risk should also be identified by MSB. Furthermore, the ordinance specifies that the county administration boards should make plans for managing flood risks at the river basin level that include prevention/mitigation actions. Even though this ordinance is well in line with the EU Flood Directive, the actual implementation is not done in river basins (cf. Johannessen and Granit 2015). According to Swedish monitoring reports on the European Commission’s website pluvial floods (from rain) or climate change were not included in the risk maps. Instead, the Swedish Water and Wastewater Association recommends that municipalities to conduct their own cloudburst modelling to identify vulnerable hot spots. MSB has written guidelines for how this can be done (MSB 2017). In 2017 about 50% of the Swedish municipalities had carried out such an assessment. As a response to a lack of guidance about how to plan urban development taking cloudbursts into consideration, some County Administration Boards have therefore decided to produce support for planning of new developments with regards to pluvial floods (County Administration Boards in Stockholm and Västra Götaland 2018). In some cases, County Administration Boards have stopped the development plans of municipalities that are at risk of flooding (e.g. Kristianstad; Nordell 2017) where municipalities refer to their planning monopoly.

Pluvial floods can be part of the municipal storm water policy and the water and sanitation plan of the municipality. In terms of urban flood risk, urban planners believe that regulation of storm water drainage is complex. Urban development is also slowly contributing to increased urban flooding and it is difficult to know how much water is created by urban developments, and even with oversight, other issues such as housing) are often prioritised over prevention/mitigation flood resilience (interviews with planners in Gothenburg and Malmö).

In a recent government investigation (SOU 2018:34), it is suggested that climate change adaptation regarding floods caused by precipitation should be managed by the entity responsible for water and wastewater management. This perspective reflects a lack of understanding about how flood risk is created and reduced in urban areas, where city and environmental planning are central to risk reduction, while water services can only to some degree help alleviate floods through drainage. This aspect is also highlighted by the Swedish Water and Wastewater Association.¹⁴

In the prevention and mitigation phases, managing flood risk has many synergies with water quality that could also be considered a risk for the well-being of the ecosystems. To provide such linkages, a better coherence is needed between PBL, the Environmental Code where the environmental quality norms set by the water authorities could be a link. Legislation is, however, seen as divided according to authorities and not according to the actual issues.

Another governing document where the municipal strategy for flood management is formulated, is the climate change adaptation plan. All county administration boards have developed action plans for climate change adaptation. It is suggested that municipalities should create or further develop a cross sector organisation to work systematically with the climate change adaptation issue and push for the climate change adaptation perspective is mainstreamed in the municipal activities (SOU 2018:34). However, these climate change adaptation plans are not particularly common, and only a few municipalities have adopted them.

The Environmental Protection Agency has identified issues in legislation concerning storm water to clarify and collect and develop it. They also identified issues to related societal planning, where the issues of water need to come in earlier in planning to be a structural element in the spatial planning.

The Public Water Services Act - Securing Drinking water, (prevention/mitigation)

To implement green storm water solutions, access and rights over land use is necessary (swe: Rådighet); however, in the Public Water Services Act (2006:412) there are no provisions to get the access that is needed for measures (as opposed to rights to put in pipes for drinking water and sewage). This means it is particularly difficult to implement open storm water solutions on private land since the municipality has no right to use (SOU 2018:34).

¹⁴ See <http://www.svensktvatten.se/om-oss/nyheter-lista/nyheter-svenskt-vatten/svenskt-vattens-kommentar-till-utredningen-om-hallbara-vattentjanster/>

Water related risks such as disease transmission caused by inadequate sanitary infrastructure is covered by The Public Water Services Act (Lagen om allmänna vattentjänster SFS 2006:412). The water quality norms for surface and ground water are prescribed in the Environmental Code (SFS 1998:808). Water scarcity and protection of drinking water sources in the river basin is not covered by any legislation according to this analysis. This was also concluded in a workshop of all water authorities, which was conducted in August 2018. It was organised to present the results from governmental assignments in relation to water scarcity in south-eastern Sweden in 2016 and 2017, and to reflect on the events that occurred during the hot and dry summer of 2018 (Vattenmyndigheterna 2018).¹⁵ Water scarcity is also an issue that should not be separated from flooding. Often land use is planned in such a way as to increase the flow in the river basin (causing flooding) and this also contributes to a lack of water retention in the landscape, and ultimately contributes to water scarcity.

The National Security Strategy

This strategy mentions threats to international order and globalisation that can be caused by threats related to climate change, the environment and resource shortages, or armed conflict, violent extremism, terrorism, threats to health, uncontrolled migration, cyber threats, economic crises and organised crime. The National Security Strategy also mentions health threats, infectious diseases and other types of biological, chemical and also radio-nuclear threats. Threats may be in the form of bacteria, viruses and other microorganisms, as well as radioactive, chemical and biological weapons. These may be used intentionally or unintentionally through deficient handling. Threats that affect people's health may also have an environmental origin, such as pollution of watercourses in the event of flooding and similar events. The cross-border aspect and the constantly changing microbiological world are central to health threats. The nature of the threats is consequently unpredictable. Global travel and international transport result in the spread of an increased number of diseases. These diseases can adapt to local conditions and new, previously unknown infections can emerge. Increasing antibiotic resistance poses a threat to modern health care. Outbreaks of infectious diseases in Sweden, including flu epidemics, will lead to an increased burden on health care (Government Offices of Sweden 2017).

The governmental investigation "Security in a new age" (SOU 2001:41) also considers that the issue of biological hazards should be considered in the societal security and contingency work. The biotechnical development means both natural mutation in viruses and other microorganisms and advanced possibilities in changing the genetic setup of plants, animals and human characteristics. The development in this area can also get geopolitical consequences and contribute to the risk for serious and extensive epidemics.

¹⁵ Conclusions from the conference can be found here (in Swedish): <http://www.vattenmyndigheterna.se/sv/nyheter/2018/sidor/reflektioner-fr%C3%A5n-konferens-kring-vattenbristuppdragen.aspx/>

The National Security Strategy also mentions threats to transport and infrastructure: Threats and risks involving transport and associated infrastructure could cause disruptions and outages that affect travellers, the business sector and the public. If critical infrastructure and related information and communication systems are damaged, this can have serious consequences for the whole of society's functionality. Specific threats and risks include disruptions to and loss of resources such as fuel, electricity supply, vehicle supply and IT/telecommunications; disruptions and the loss of important support systems such as information and communication systems and control centres; major accidents and accidents involving hazardous goods; and hostile threats in the form of sabotage and attacks against vital infrastructure, nodes or other facilities. This strategy is in line with the National Energy Agreement (Energioverenskommelsen ¹⁶). One of its goals is that Sweden should attain a robust energy system and high security of delivery. The National Security Strategy also mentions cyber threats and the spread of disinformation.

Road and Railroad Code and Road Act: Accidents in relation to railways and roads

In article 16§ 1: the road and railroad code (SFS 2004:519) prescribes for example restoration of security in railroad traffic in case of accidents, and not the least: the need to investigate the cause of the accident or the serious event or damage. Having such provisions in other risk related legislation would be necessary to investigate the causality of risk. The Road Act (SFS 1971:948) does not mention any specific hazards but is prevent and mitigate risks as 13§ says, "benefits of planning a road must outweigh the inconveniences the plan is causing individuals". In 14b§ it says if the road is presumed to have considerate consequences for the environment then consultation should also be done with other state authorities and the public and organisations which would be affected. This also includes an environmental consequence description (Swe: Miljökonsekvensbeskrivning, MKB). The County Administration Board should be actively promoting that the MKB is as comprehensive as is required.

Priority 1 considerations for DRR strategies

Although several hazards are mentioned in the context of different legislations, there is a lack of reference to preventive and mitigating DRR in relation to those hazards. While prevention and mitigation are not included in the crisis related legislation, they are also not adequately addressed in development-oriented legislation. For example, prevention of e.g. forest fire, water scarcity, urban flooding and heatwaves is not adequately addressed in the Environmental Code and the Planning and Building Act.

Lack of multi-sector engagement to address all hazards approach

One problem is also the tendency that one sector works with a particular part of the legislation, and not with others. For example, civil protection actors are

¹⁶ Agreement between the Social Democrats, Conservatives, The Environmental Party, The Center party and Christian Democrats. See: <https://www.regeringen.se/49cc5b/contentassets/b88fod28e0e48e39eb4411de2aabe76/energioverenskommelse-20160610.pdf>

predominantly working with LSO and LEH and urban planners with PBL and environmental actors with the Environmental Code. This also provides a barrier for a more holistic view on the different hazards. This results in a lack of support to local level to address the multi-hazard approach. For example, the persons working on risk and related work at local level such as risk and vulnerability assessments, their working areas only seems to be linked to the LSO and the LEH and this is not enough. This situation is expressed by one of the interviewees. An interviewee says: “These laws [LEH, LSO] are for big events, and crisis, but there are so many other things we have to consider – e.g. in May warm weather – it was not really a heatwave and at the same time we don’t have strategies for handling this in the city. The organisations that take care of elderly have strategies, but we don’t incorporate these into city planning”...” The Sendai Framework is also about smaller and mid-range crises. It is difficult for me to explain why we need to do some projects in the municipality as I don’t have anything to support my suggestions. When densifying cities, you don’t consider that removing the green structures decreases the total space that can deal with heavy rain. You construct roads so narrow that the rescue service personnel cannot gain access. So that is why it is important to widen the area of DRR and not just focus on the big crises. As such, a DRR strategy could be useful in pointing to the different instruments in relation to the diversity of possible and relevant events and using them in areas needed for crisis response, prevention and mitigation.” An interviewee stated that: “A DRR strategy is needed to coordinate and link the work with the adaptation strategy and the upcoming strategy for physical planning.”

Several interviewees believe that a multi-hazard approach needs to be strengthened.” The problem is that focus is on major risks, not multi-hazard. /.../ What is needed in Sweden is, therefore, a multi-hazard approach”. The way forward seems to be to amend such legislation such as the Planning and Building Law, or in the Environmental Code, where preventive and mitigating measures are already part of the working culture. The challenge then becomes to mainstream risk considerations in those sectors as described below in relation to the second priority.

DRR is not mentioned in key documents

Risk assessments are carried out at national and local level and at regional level. This is prescribed by LEH and guided by mandatory provisions. However, in 2017 and 2018 the term disaster risk reduction (DRR) was not mentioned in the National Risk and Capability Assessment. However, a few prioritised areas of work are mentioned that need to increase capability where DRR could be relevant, such as energy and food production, but this is not further described to be able to assess whether this is DRR or not.

Integrating the different types of risk relevant for climate change with the risks relevant for DRR in the risk and vulnerability assessments is necessary. This does present some challenges for the time perspective. One interviewee says: “RVA has often a short-term perspective, and CCA a longer-term perspective. CCA must be included in the RVA, comprehensive plan and detailed plan, but it depends on what they do. If it is about investing in infrastructure that is older than 150 years, then the RVA is not the right tool, and CP has not such a long-

time perspective, perhaps 20 years. But the CP is the longest-term planning process at local level. The PBL now prescribes the CP to include a risk assessment relevant for urban planning.”

Lack of data on natural hazards

One aspect that the interviewees have stressed is the lack of collecting data on natural hazards and relevant disaster losses. SGI also thinks that a national strategy could help to implement a learning process and learn from experiences from one region for another one and/or learning from one period of time to another, to the future, for example, e.g., through creating a database for national disasters and related data and making it available. Through this, a more thorough and coherent learning for the future is possible. It is for instance important to make geodata available for everyone and coordinate the use and distribution of geodata nationally. SGI explains that municipalities buy a lot of investigations/consultancy work for collecting data when they develop new areas, and the geodata can for instance later not be reused as it often stays in a file somewhere and/or is the property of the consultancy firm. This means that the consultancy firm will then charge for using that data again, although it was originally financed by tax money.

Local risk and vulnerability assessments (RVAs) are too heterogeneous and ad hoc

Following the introduction of the first RVA-legislation in 2002, the Swedish Emergency Management Agency (a predecessor of MSB) started to develop a common methodology for how authorities were to carry out and present the results of RVAs. However, the idea was soon abandoned, as it was not perceived possible to develop a methodology that could accommodate to the heterogeneous needs of different stakeholders. Besides, issuing compelling prescriptions on how to perform RVAs was not in coherence with the bottom-up approach to DRM as established through the adopted principles of proximity and responsibility. Instead, authorities, research groups and consultancy companies developed varied methods to support the production of RVAs, resulting in information that was difficult to compare and aggregate.

When MSB was established in 2009, it gained the right to issue regulations concerning RVAs and did so in 2010 with the goal of increasing the unity and comparability of RVAs. The regulations set out a common structure for the presentation of the results of RVAs, but did not stipulate a certain methodology for producing them. Lund University was later part of evaluating the effects of these regulations and found that they had increased the uniformity of how RVA reports were structured, whilst large discrepancies remained in terms of their substance. The regulations were updated in 2015 and supplemented by an appendix, which specifies what is sought in relation to each of the reporting point that RVA reports need to address. The new regulations also incorporate an expanded glossary to unify the ways that different actors perceive and use key terms. However, akin to the former regulations, the current ones do not stipulate which consequence dimensions (e.g. life, health, economy, environment, etc.) that should be used. Nor do they contain scales or indicators for assessing the likelihood and consequences of risk scenarios. Although no

similar evaluation of the effects of the updated regulations has been carried out, it is likely that the discrepancies regarding how authorities evaluate and describe likelihood and consequences endure. If comparing and synthesizing the contents of municipal RVA reports becomes too difficult, it may reduce the willingness on part of the county administrative boards to devote the time and energy to assess their RVAs. Ultimately, this risk undermines the bottom-up approach to risk governance in Sweden.

Interviewees have also been commenting on the fact that the decentralisation of powers to the municipalities and the lack of adequate national coordination on the contents of the risk and vulnerability assessments have resulted in local risk assessments being inadequate i.e. missing important aspects which later turned out to be a risk, and very uneven in quality and scope/lack of consistency. For example, one interviewee says he does not think the RVA works particularly well, as it is too ad hoc and free regarding its focus (e.g. which hazards to include). He thinks that a national DRR strategy can support the improvement of local RVAs. He thinks the RVA should be completely redone.

It is difficult to assess vulnerabilities

The LEH puts emphasis on assessing the vulnerabilities and capabilities, which also is relevant for civil defence. As such, the LEH prescribes the need for a risk and vulnerability assessment, (RVA) with guidance provided, and a plan for how to deal with those risks. If, for example, the rescue service carries out activities in relation to an extraordinary event, both laws are applied in parallel. Local vital societal functions are activities that in their absence or in a disturbance can lead to serious local consequences. One interviewee thinks that it is easier to look at the hard indicators (such as numbers of hospitals or emergency beds) and more difficult to investigate the softer aspects (such as social vulnerabilities) which requires more qualitative methods.

Involved sectors

The following sectors are identified e.g., in the MSB guideline for risk and vulnerability analysis:

Sector in society	Examples of critical societal functions
Energy supply	Production of electricity, distribution of electricity, production and distribution of energy for heat, production and distribution of fuels.
Financial services	Payments, access to cash, central payment system, financial trading
Trade and industry	Building and construction, commercial trading, manufacturing
Health and elderly care	Emergency health care, supply of medicines and materials, childcare, care for disabled and elderly, primary healthcare, psychiatric care, social services, epidemic mitigation
Information and communication	Telephone, internet, radio communication, distribution of mail, production and distribution of newspapers, web-based information, social media
Municipal services	Drinking water services, sewage treatment, sanitation, storm water, road maintenance

Food	Distribution of food, primary production of food, control, production of food
Transport	Air, railway, sea, road, public transport
Public administration	Local governance, regional governance, national governance, funeral services, diplomatic and consular activities
Protection and security	Courts, prosecutor, military defence, criminal custody, coastal guard, police, Rescue service, alarm service, customs, border control and immigration, surveillance and security activity
Social insurance	Public pension system, insurance in case of illness and unemployment

This is in line with the “Words into Action Guideline” (UNISDR 2018b) supporting the development of a national DRR strategy, which mentions that critical sectors for disaster risk reduction include the following:

- Agriculture
- Health
- Energy
- Telecommunications
- Transportation
- Water and sanitation
- Energy
- Financial
- Building and construction
- Education
- Tourism
- Media

Sweden has in addition stressed public administration, protection and security, and social insurance. (See the last three rows of the table.) The UNDDR guideline has stressed in addition education, tourism and media.

Priority 2: Strengthening Disaster Risk Governance to Manage Disaster Risk

Sendai Framework: “Disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk. Clear vision, plans, competence, guidance and coordination within and across sectors, as well as participation of relevant stakeholders, are needed” (UNISDR 2015: 17).

Key legislation and strategies for Priority 2

The Swedish Civil Protection Act (LSO) regulates operations to prevent and limit injury to people and damage to property and the environment as a result of accidents and emergencies. The responsibility for operations lies primarily with the municipalities. Government authorities are responsible for certain types of operation following for example an emission of hazardous substances at sea or an emission of radioactive substances from a nuclear power plant. LSO outlines the responsibilities of municipalities and state authorities and the need for collaboration between them. It also describes the

responsibilities of individuals. It also prescribes the need for action plans at local level (decided by the political decision makers) for preventive activities but does not specify what that is.

The Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (LEH), governs some of what the municipalities and regions (formerly referred to as county councils) should do. Linked to the LEH law they also get funding for this through an agreement between SKL and MSB (Johansson and Wagner 2017). This agreement was first made in 2013 for 2014-2018 (MSB and SKL 2013). A new item for this agreement is that municipalities need to develop a steering document / governing document which should include analysis, and planning in preparation for extraordinary events. It also includes the opportunities to do measures that go beyond normal mandates in an extraordinary situation. The LEH also describes forms of additional governance in times of disasters (a crisis council) which can take over certain activities. It includes a local geographical responsibility that means coordination at local level, and exchange with other municipality, education and exercises, and reporting to the state. This act thus focuses on crisis preparedness and response (Johansson and Wagner 2017).

The Act on Measures to be taken by Municipalities and County Council in Preparedness for and during Extraordinary Incidents during Peacetime and Periods of Heightened Alert aims to reduce the vulnerability of municipalities and regions (formerly county councils) in their work and to enhance their capacity to deal with peacetime emergencies and crises. Through this, municipalities and regions should attain a fundamental capacity for engaging in civil defence activities. The act regulates planning of and preparations for the handling of complex, extraordinary incidents that demand coordinated management between various societal activities at local and regional levels. Through the Emergency Preparedness and Heightened Alert Ordinance, the government regulates the demands on government authorities at the national and regional levels. The aim is to ensure that government authorities reduce societal vulnerabilities and develop a good capacity for handling their tasks during peacetime emergencies and crises and during periods of heightened alert.

Disaster Risk Governance in Sweden

Disaster risk governance at the national, regional and global levels is vital to disaster risk reduction in all sectors and ensures coherence between national and local frameworks of laws, regulations and public policies. They define roles and responsibilities as well as guide, encourage and give incentives to public and private sectors to address disaster risk. In line with the Sendai Framework, in particular priority 2, the Swedish disaster risk management (DRM) system is based on the conviction that an integrated, whole of society approach is necessary to efficiently being able to deal with disaster risk. This requires an inter-exchange of information and collaboration between a range of public and private actors across functional and administrative borders.

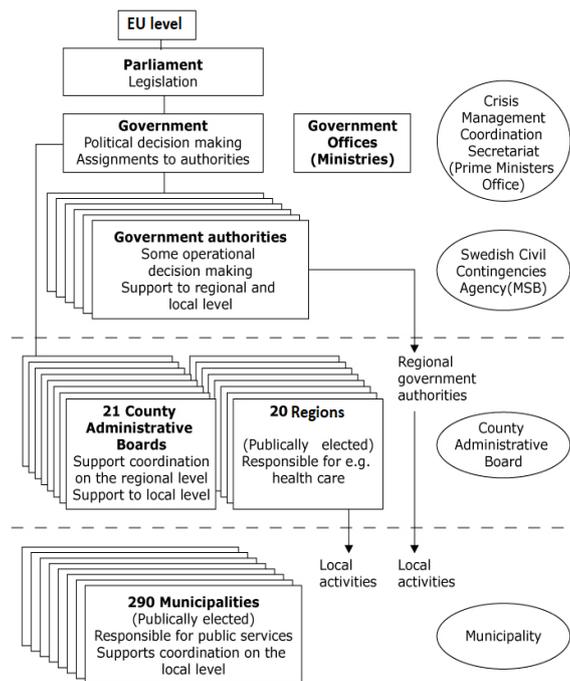


Figure 1: Swedish disaster management structure (adapted from Vademecum Civil protection 2018).

Disaster risk management embraces all levels of governance in Sweden (local, regional and national). Sweden consists of 21 regions (called *län*). Sweden has furthermore 290 municipalities, each of them with its own elected assembly. At national level, the Swedish emergency preparedness system is primarily based on the principle of responsibility, which means that whoever is responsible for an activity under normal conditions maintains the corresponding responsibility and initiates cross-sector cooperation during emergencies. Some laws are relevant for the general governance of municipalities including the rescue service and preventive actions in relation to fire, such as the Local Government Act (SFS 2017:725). This Act mainly focuses on regulating the democratically elected entities and the employees. The Swedish Administrative Procedures Act (SFS 2017:900) focuses on administrative procedures, including decision-making processes in public authorities and courts. Whereas the Ministry of Justice carries the overall political responsibility for DRM, the MSB is tasked to support and coordinate activities that various authorities undertake before, during and after the occurrence of disasters.

The national priorities in Sweden have shifted in recent years from downgrading crisis management issues and defence to again prioritising them. This is illustrated by the move of MSB from the Department of Defence by the previous government in 2014) to the Department of Justice. This also included a move of the crisis management function to the Department of Justice that previously was situated directly under the prime minister. This added more distance between the prime minister and such functions.

In the recent report (entitled “Resilience”) from the Swedish Defence Commission a number of proposals regarding the Swedish total defence

concept and the future development of Sweden's civil defence for the next defence bill period 2021-2025 are described: It states that "In order to create a comprehensive planning process in peacetime and coordinated action in war, the command structures of civil defence in government agencies have to be clarified and strengthened (Ds 2017). The commission finds that this calls for a central government agency for planning, command and coordination of the civil defence efforts. The commission proposes that the Swedish Civil Contingencies Agency (MSB) gets a clarified and extended mandate in this regard." The suggestions also include new geographical governance areas for coordination of the defence (Ds 2017).

Priority 2 considerations for DRR strategies

Decentralisation of disaster risk management. Sweden has a high level of decentralised power to the local level. With regards to disaster risk management, it is the municipalities that are the central actors in Sweden. A policy change occurred in Sweden in 1996, where municipalities obtained an increased responsibility for risk, preparedness and safety (Government bill prop. 1994/95:230). This is reflected and fostered by the principles of proximity, parity and responsibility.

The *proximity principle* states that crises and emergencies should be handled where they occur and by those closest to them. This typically means by the lowest level of authority – i.e. the municipalities. National and regional authorities may assist municipalities with equipment and advice, but it is the municipalities that are expected to lead the efforts. The *parity principle* entails that location and organization of activities, as far as possible, should be the same during crises and emergencies as in normal situations. In addition, the *principle of responsibility* stipulates that whoever is responsible for an activity under normal conditions should retain this responsibility during crises and emergencies. The principle of responsibility also embrace a responsibility on part of authorities to collaborate with each other (Government bill, 2002, p. 22).

The three principles appeared the first time in the Government investigation "Security in a new age" (SOU 2001:41). It was later adapted through two propositions (Government bill 2005, 2008). Interestingly enough, the principles do not appear in the actual laws, only in guidelines. The concept of collaboration, (Swedish: samverkan) however, is seen in two laws (SFS 2006:544 and SFS 2015:1052). In addition to the three principles, MSB's guide for common guidelines for collaboration and command is aimed at guiding the work of crisis responders during incidents (MSB 2018d). The decentralised powers mean, for example, that in case of a larger accident the municipality decides whether help is needed from a higher level. In other countries, like in the UK, the initiative for inquiring whether a local area needs assistance is completely flexible between the local and the national level. An interviewee commented: "The other thing that I doubt will change in the near future is the division of labour between central, regional and local, which in terms of risk

management I don't think it's appropriate, ... and the sense of... that the responsibility is at the local level, and if they need help, they will call but they don't. As a model of operations it's inappropriate... there has to be much more clarity on, the national level's role, but that they have responsibility for taking the initiative to ...call them and say it looks as if you need help, ... rather than wait for them to realise that they need help. The defined roles and relationships between the different authorities in the national administrative and political structure is not the best for risk management, and I am sure I'm not the only one saying this."

The decentralisation of power to the municipality is also influencing the nature of flood risk management planning. Currently, the municipal planning initiative is not in line with the EU Flood Directive where management should be taken at the river basin scale. The work should go hand in hand with the implementation of the EU Water Framework Directive, but in practice there has been very little progress in this area. This also means that there are little synergies between preventing and mitigating floods and reducing the risk of water pollution, although many measures involving green infrastructure would provide such synergies. Instead, solutions are predominantly local and focus on (hard) infrastructure development (Wamsler and Brink 2014; Johannessen & Granit 2015).

In addition, interviewees mention that because of the decentralisation of powers, municipalities handle issues differently and interpret their responsibilities differently. As such, there is a need for more guidance and regulations. That municipalities offer different service, means that residents get very different treatment. One interviewee says: "For example, in relation to flooding of cellars in private properties, what can be expected from the municipality and their rescue service, whether the rescue services can/will help or not is unclear. Some decline and some don't." The planning monopoly of municipalities also means that top-down regulations/strategies are not easy to implement, says another interviewee.

Inter-organisational exchange and collaboration can enhance DRR

To further promote inter-organizational exchange of information and collaboration, the local municipalities, regional county administrative boards and the central government also carry a *geographical area of responsibility*. This cross-sectoral responsibility obliges them to coordinate all DRM-measures undertaken before, during and after disasters within their respective administrative areas (Government bill, 2008, p. 92). To foster inter-agency cooperation at the national level, MSB has also created six *forums for crisis preparedness* (FCPs) where agencies with related responsibilities collaborate to ensure the functionality of operations within certain societal domains, e.g., transportation, technical infrastructures, and safety and security (MSB, 2014). Such are prescribed by the crisis preparedness ordinance (linked to the LEH) [examples of these areas are economical security, dangerous goods, geographic responsibility, protection, rescue and care, technical infrastructure, transports. In peacetime the focus is to be better prepared for times of crisis. One interviewee thinks it would be important to invest in further developing the coordination forums as currently, their potential is not used. Collaborative

forums for information exchange also exist on the regional and local levels. Most county administrative boards and municipalities have set up crisis management councils where public authorities and private organizations deliberate on ways to reduce disaster risk or support operations during response and recovery. Inter-organizational collaboration supplements measures taken by each authority to ensure the functionality of their own operations. The production of RVAs is fundamental to these efforts.

Lack of coordination and cross-sectoral cooperation between climate change adaptation and DRR

In coordinating actions between climate change adaptation, disaster risk reduction coherence seems to be missing between the relevant laws. For example, one interviewee pointed out that the National security strategy has little on climate change adaptation and DRR (although looking at the document, climate change is significantly mentioned, but DRR not at all), and the plan for protection of vital and social functions and critical infrastructure has nothing on climate change adaptation.

This lack of referencing is also reflected in the lack of collaboration. Two interviewees believe that there are several overlaps of the climate change adaptation and DRR issues, but little cooperation. In certain processes, there are direct overlaps but no collaboration at the authority level. One interviewee gives the examples of the work on reduction of flood risk, and risk management plans, which are done independent if we have climate change or not. The result is that they work in parallel doing the same things, for example, people working on the EU Flood Risk Directive solve some issues for the people working on climate change adaptation, but they do not know it, and the interviewee thinks that this is a pity.

In addition, SMHI has come in as a new actor responsible for climate change adaptation while MSB has remained responsible for DRR. One interviewee comments on this: "I question whether SMHI should take the lead on something which MSB has been leading for many years, ... so that's my perspective. It is institutional and legislative issue but also a sense of political direction that is not quite correct yet."

Risk and vulnerability assessments should be used when developing a DRR strategy

According to Swedish legislation (SFS, 2006:637, 2015:1052) all municipalities, regions, and county administrative boards, as well as all national authorities, are obliged to carry out risk and vulnerability assessments (RVAs) to identify, assess and mitigate risk and vulnerabilities within their areas of responsibility. They require municipalities to report to their county administrative board (called *länsstyrelse*) every 4 years. The regions in turn report to the National Board of Health and Welfare (cf. SFS 2006:544). These RVAs draw on the collected outputs of DRR work in accordance with other legislation as noted in this study and are, hence, a very important instrument to be able to monitor as well as identify gaps and measures to ensure that Sweden complies with the goals and intentions of the Sendai Framework.

Akin to the overall Swedish DRM system, the process of producing and communicating RVAs is based on a bottom-up approach, where reports from municipal RVAs are communicated to and used as basis for assessments carried out by the county administrative boards and regions, which in turn feed into RVAs produced by authorities at the national level. Based on the collected outputs of assessments from regional and national authorities, the Swedish Civil Contingencies Agency (MSB) is supposed to compose a national assessment of risks and vulnerabilities in the country as a whole and brief the government (Ministry of Justice) about it. Moreover, in tandem with other EU member states, the Swedish government (through the MSB) is also to compile and communicate a report on the risks of national concern to the European Commission as basis for an overall apprehension of risks to societal safety in the EU.

To this end, the MSB is using the aggregated outputs of the RVAs produced by governmental authorities as well as the results of scenario analyses carried out centrally at a national level by MSB in cooperation with relevant stakeholders. MSB promotes the scenario analysis approach and asserts that it functions as a good complement to the RVA reports. A key component of many of the scenario analyses carried out is a joint workshop with the relevant stakeholders. The workshop element has, when used, provided a chance to obtain information from private stakeholders who are not formally obliged to conduct or communicate the results of RVA's. Joint discussions amongst authorities from all administrative levels also facilitate the identification of functional dependencies across administrative, sectorial and geographic borders. In addition, workshops may reveal false assumptions about redundancies or generate ideas on how the collected resources of assembled stakeholders may be combined with synergetic effects. Finally, the workshops have been instrumental in building networks and trust between people who may have to collaborate during real disasters.

Aside from communicating risk information “upwards” in the RVA system, authorities at higher administrative levels are expected to provide feedback on the contents of the RVA reports they receive from authorities at lower administrative levels. These processes are illustrated by figure 2.

Figure 2 illuminates the bottom-up approach to disaster risk management as envisioned by the Government, which posits that capabilities should be built from the local to the national level, via the regional level. This is rational, given that the system is filled with information from the actors that are closest to, and with the best knowledge about, the objects and systems that are supposed to be protected. However, the model is also contingent on a number of presumptions, which are difficult to achieve in practice.

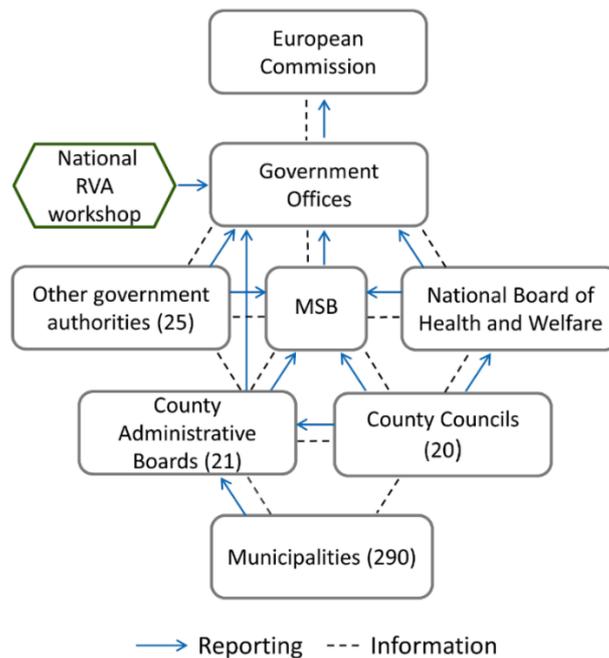


Fig. 2. The flow of risk information and RVA reports in Sweden. The numbers in brackets represent the number of units of different types of stakeholders involved. The dashed lines indicate two-way communication involving, e.g., feedback, requests for clarifications and supplementary information (adapted from MSB, 2012)

Present challenges in the Swedish RVA-system

There are many challenges to the Swedish RVA, which presently undermines the possibility of attaining a comprehensive and valid picture of disaster risk in Sweden (Månsson, 2018; Abrahamsson and Tehler 2013; Cedergren et al. 2018; Cedergren and Tehler 2014; Lin and Abrahamsson 2015; Vastveit, Eriksson, and Njå 2014). In brief, these have been described as the following:

- Lack of awareness of dependencies, i.e. a mapping of the internal and external actors who are involved in providing the goods and services necessary for maintaining one's operations. This is due to lack of resources and capacity (time, personnel and knowledge) to analyze these.
- Both private and public stakeholders may be reluctant to reveal information on vulnerabilities that may harm their reputation or cause them to be exploited by competitors or antagonistic actors.
- Although concealing sensitive information arguably makes a RVA less accurate, many authorities question the need of having access to information on a level of detail that makes it sensitive. For example, for preparedness purposes, it is enough to understand the potential likelihood and consequences of a power outage without knowing where the most sensitive nodes in an electrical grid are located or how they may be disabled.
- Public agencies may also be reluctant to share information on vulnerabilities with each other if they are perceived in a negative way amongst their peers, and for example evoke demands for remedial actions that can be costly. The reverse may also be true, i.e. that public agencies may deliberately underestimate their capabilities if this leads to an allocation of resources.

- A general challenge, expressed by risk managers at public authorities across all administrative levels, is the vast amount of information. RVA reports typically span between 30-120 pages and a county administrative board has to process and synthesize the reports of up to 20 municipalities. At the national level, MSB faces the same challenge, having to consider RVA reports from 21 county administrative boards and 25 national agencies.
- Many risk managers experience a lack of feedback on the RVA reports they submit, which can be demotivating and reducing quality in the next cycle. The lack of feedback is explained by higher administrative levels by shortages of time and man power. The possibility of providing relevant feedback is also inhibited by the lack of an easy-to-follow checklist on what constitutes a “good RVA”.

Direct and indirect effects of challenges in the Swedish RVA system

The challenges presented above result in difficulties to produce comprehensive pictures of disaster risk. This may have both direct and indirect negative effects such as frustration and sub-optimal bases for decisions.

Most DRR related legislation lacks norms and goals

Environmental legislation includes norms and goals that the DRR legislation lacks. For example, the Environmental Code prescribes the use of environmental goals and norms that should be acted on according to an action programme. As such, the Environmental Code has set limits for certain environmental risks like noise, where for example, developments may not be experiencing a certain limit of noise, which is then considered a form of pollution. Natural hazards do not have these types of normative limits. One interviewee says: “Current DRR legislation has gaps, but when you work within the framework of Agenda 2030, you have to work on these areas and you can see the consequences on the local level if you don’t handle them”. There is a gap in the legislation on the DRR side. For example, PBL states that society has to be built in a “safe way”. With such phrasing it is not very clear what needs to be done. When this needs to be put in a local context, for example to adapt the buildings around a road which transports hazardous goods, there is no legislation which deals with that, and therefore he thinks it is not being done in a really good way, as they only have recommendations and the actions to adapt the buildings are not really wanted.

There is a law on hazardous goods, which states what type of goods can go on the road, but not what type of buildings can be built next to the road or railway. In contrast, in the Environmental Code you have an exact value for the accepted noise from industries in residential areas, but when you have risk there are no exact values, only that you should build it safe, whatever that means. As such, the risk considerations have to be better built into the building code, because it is a code that planners follow. Things that are outside this framework are hard to get accepted. He thinks the building codes are going to be upgraded because of Agenda 2030 and the weather this summer. “So this is also a good moment for including DRR more broadly. “

Simple amendments to the Environmental Code could incorporate DRR

Reading the Environmental Code, it has some relevant sections that could be easily amended to consider risk such as floods. For example, "existing environmental problems" are identified in relation to an environmental impact assessment (paragraph 11, c), where a permit is needed and decided by the County Administration Board, at the regional level. Environmentally hazardous activities are defined as for example black water, solid waste and pollution. Here, definitions could be extended to also include hazards such as floods. The Environmental Code also has paragraphs (paragraph 18) related to old decisions by the Land and Environment Court concerning the joint property associations (for water issues) where "unforeseen damage" has been identified for an individual or public good. If there can be question of damage, the water activities need to be adjusted so that they prevent and reduce future damage.

One interviewee supports this analysis that the environmental regulations could be updated to include DRR considerations: That person said, "Among the most mature regulations are the environmental ones, that I think probably need to be updated to fit today's challenges, but I also know from my collaboration with MSB that at times the environmental and the risk management strategies collide, because someone has to decide at the local level, ... it will be normally quite a short-term decision, and we can see this also with this whole coastal area development and some of the infrastructure. I think that the environmental regulation at every level is an important one." After having analysed a diversity of government investigations and legislations a wide spread phenomenon can be observed: In the governance system, there is often a division between aspects of environmental quality (such as water quality) and quantity (such as water flows and extreme rainfall) although in practice they are intrinsically linked. For example, the current investigation on water governance (to be finalised around Dec 2019) including legislation, organisation and financing is predominantly about water quality. In addition, plans to reduce flooding is often not institutionally coordinated with the plans related to the quality aspects of water management, although the activities have a great potential of being mutually reinforcing.

Strengthening international DRR governance

Strengthening international governance of DRR and the shifting geopolitical landscape is mentioned in the National security strategy. Institutional strengthening is seen to contribute to important decisions about development funding, the 2030 Agenda and the Sustainable Development Goals, and a global climate agreement. Success was achieved when for example the Ebola epidemic was stopped before becoming more catastrophically widespread.

Priority 3: Investing in Disaster Risk Reduction for Resilience

In the Sendai Framework it is stated: “Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment. These can be drivers of innovation, growth and job creation. Such measures are cost-effective and instrumental to save lives, prevent and reduce losses and ensure effective recovery and rehabilitation” (UNISDR 2015:18).

Several documents that refer to investments in DRR made by different actors in Sweden.

Key legislation and strategies related to Priority 3

The Civil Protection Act (LSO) describes the need for investing in preventing fires, chemical disasters and reducing its damage. The government investigation “Security in a new age” (SOU 2001) accounts for a number of general principles for financing of the measures before, during and after a crisis. The investigation concludes that publicly run or publicly regulated activities within crisis management can be financed through taxation, fees and own financing. The investigation is also concluding that the financial responsibility for the state within crisis management should be limited to extreme events with low probability but with large consequence that are difficult to handle in a rational way for other actors than the state. The financial responsibility of the state for measures concerning heightened alert is a special case of this principle.

As far as the financing of societal activities before, during and after a serious crisis, this study proposes the following: 1) that negotiations be initiated with the municipalities about the design of a new compensation system related to the planning efforts related to heightened alert and other serious crisis situations in the municipality, and 2) that the costs for the physical protection largely should be financed by the developer for new productions and that it is important that a policy is developed for compensating those who have been exposed to serious crisis situations.

The Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (SFS 2006:544) makes provisions for (so called 2:4) funding of crisis preparedness activities set out in a plan (SKL and MSB 2013). Similar provisions exist in relation to regional and national governmental agencies as well as voluntary organizations (MSB, 2018c). In relation to great accidents and extraordinary events, the government has also secured resources to provide extra support (MSB 2016).

Priority 3 considerations for DRR strategies

Increase capacities and funding resources to invest in DRR. There is a great difference between smaller municipalities and larger municipalities when

considering a city's capacity and resources. This has been identified as very important to consider, for example:

1. There needs e.g. to be a lowest level to fit small municipalities, while larger ones can work more long term with the issues.
2. Small municipalities are considered to be at a disadvantage. If small municipalities get their funding withdrawn for not reaching the (municipality) agreement (see Appropriation 2:4 funding according to LEH, outlined in an agreement by SKL and MSB), then all opportunity is taken from them to get anything done. Then it is better to put more effort on good relations with their municipalities and not make demands about the financing (Johansson and Wagner 2017).

Financing risks related to landslides

In different budget propositions, there are several references to how the state has invested in DRR. For example, the state has been co-financing of landslide measures along Göta River. Through the initiative, more large-scale measures have been possible. The Swedish Geotechnical Institute (SGI) received in 2018 62 million SEK in increased funds to create a delegation to Göta River and finance measures to reduce landslides (Government bill 2018).

Financing water related risks

Similar co-financing initiatives have been considered necessary for local investments in large critical infrastructure for example in Gothenburg to meet flood risk from the sea. For example, the Gothenburg harbour is considered to be of regional, if not national importance, and financing its protection would, according to municipal planners in Gothenburg, need to be solved at that level.

The national climate change adaptation strategy mentions that the municipality and the county administration board should analyse the risks as part of comprehensive planning, and that property owners are responsible for adaptation and prevention in the development phase. However, it is not clear who is responsible for adaptation and hence financing of already existing developments. The costs for flooding in existing development are increasing. In terms of damage reports to the insurance companies, the costs are around 300 million SEK per year. Some years are costlier. In 2014, the extreme rains incurred insurance costs of about 900 million SEK. In Malmö alone, the extreme rains and consequent flooding costed 600 million SEK. However, what the real costs are for responding to floods are unclear. This includes costs for sandbags, barriers and pumps and costs for repairing roads and infrastructure¹⁷. In the future, considering sea level rise the needs for investing in adaptation will be even larger, as more than every tenth swede lives within 500 meters from the coast, or one of the four largest lakes. Great estate values are therefore at risk when the sea level rises a meter or more.

MSB has in its guidance for mapping of extreme rainfall (MSB 2017b) included that municipalities should have a structural plan for water before

¹⁷ www.aftonbladet.se/nyheter/a/RxBgMW/oversvamningar-kostar-miljontals-kronor

they can develop a plan of action for which measures can be taken. A structural plan for water describes how extreme rainfall or cloudbursts can be handled from a river basin perspective. It shows where different measures can be made such as storage and discharge. It means that the water is prevented from entering vulnerable areas with the help of physical barriers or identifies which roads can function as runoff channels. The structural plan can be used as a decision support for comprehensive and detailed plans. However, only a few cities have made such a plan (e.g. Gothenburg). Financing of the measures identified though such a plan are seen to be the challenge.

In the new government investigation for water services (SOU 2018: 34), the suggestion is that the water and wastewater provider should be organise the financing for climate change adaptation (such as flood prevention) via the water and wastewater fees. However, this suggestion has been questioned by the Swedish Water and Wastewater Association who considers the financing issues to lie predominantly with other actors than the water and wastewater provider. However, it is currently unclear what these incentives should look like for these actors to contribute to flood mitigation and prevention e.g. though urban planning and development.

In general, investing in preventive measures are difficult to motivate. Prevention means investing money for a risk of something that has not occurred, and where the benefits to the investor are unclear. Therefore, multi-criteria analyses are needed which can clarify the added benefits of more long-term investments and even provide financing for them here and now. In such analyses, social and environmental factors are also included (Mechler et al. 2014). Adding a spatial dimension to this, investments can be made to avoid cascading risk, for example for urbanisation and flood risk, making it possible to invest upstream in the catchment area, to mitigate floods downstream in the urban area. Here the municipal planning monopoly makes it more complicated to coordinate actions in a river basin.

Involve civil society and the private sector in DRR investment scheme

Civil society is an important part of crisis preparedness, for example, when a crisis occurs, resources may not be sufficient. Every year MSB allocates 33 million SEK to training oriented towards civil society and the public at large to increase the individual's capacity to prevent and manage accidents, serious events and crises. However, two interviewees state that there is a lack of comprehensive engagement of civil society, of citizens, citizen groups and NGOs, although engagement is on the rise. "I think we have seen more community engagement in the last years, for example Missing People, an NGO with volunteer citizens and search and rescue resources that police and military or a municipality can use. But in Sweden we are not good at using these NGOs and that can be improved. Also, they need to be part of developing these [DRR] strategies."

Private stakeholders operate a sizeable portion of vital societal functions, a fact that is acknowledged by the authorities. In spite this, many interviewees mention that the private sector is usually not involved in discussions or in processes related to crisis management. For example, since the creation of the forums for crisis preparedness (FCPs) in 2002, these have included only

public agencies. The crisis management councils at the regional and local levels do embrace private actors, but meetings are scarce and of a strategic character.

Financing of DRR in development cooperation

The National Security Strategy mentions development cooperation (that is: essentially investments) as one of the six priority areas. “Sweden is among those countries that provide the most development assistance in relation to their GDP. We are a world leader in humanitarian aid that alleviates the effects of war, conflict and crises. Sweden also conducts important initiatives to eliminate the underlying causes of conflicts. Sweden aims to increase the percentage of development assistance that goes to failing states and to protect human rights and democratic institutions.”

Priority 4: Enhancing Disaster Preparedness for Effective Response and to Build Back Better in Recovery, Rehabilitation and Reconstruction

The Sendai Framework indicates the need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate disaster risk reduction in response preparedness and ensure that capacities are in place for effective response and recovery at all levels. Empowering women and persons with disabilities to publicly lead and promote gender equitable and universally accessible response, recovery, rehabilitation and reconstruction approaches is key. Disasters have demonstrated that the recovery, rehabilitation and reconstruction phase, that needs to be prepared ahead of a disaster, is a critical opportunity to build back better,” through integrating disaster risk reduction into development measures (UNISDR 2015:21).

Key legislation related to priority 4

Central to this section is the **Civil Protection Act (LSO)** that prescribes aspects for the effective response, e.g. that the municipality should be responsible for the rescue service (e.g. at sea, in air, in the mountain, in case of radioactive disasters) that should have a plan for action decided by the political decision makers for each mandated period. It also prescribes the role of the municipality for follow up after a disaster, e.g. replacing costs incurred during the response.

Also central is the **Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (2006:544) (LEH)** which focus on extraordinary events, which seriously disturb critical societal functions

Priority 4 considerations for DRR strategies

The previous sections have been describing the system for enhancing disaster preparedness for effective response extensively, as this is one of the major focus for the Swedish crisis preparedness system.

Swedish crisis preparedness has for the last few years, been dismantled in conjunction with the lower priorities of defence issues, i.e. the end of the cold war. However, with the changing geopolitical challenges, including the risks of extreme weather, IT-attacks, and terror, policy and political priority in this area has recently changed. Preparedness received a boost in 2018 in the form of the information campaign “If the crisis or war comes” (Swedish: Om krisen eller kriget kommer). This brochure was distributed to all Swedish households. In addition, according to the policy for Sweden’s defence 2016-2020, the civil defence will be further strengthened over the coming years. This builds on the understanding that handling crises during peace also builds capacity for handling war.

Recovery is mentioned in some policies documents. For example, the strategy on critical infrastructure mentions reconstruction: The whole chain before, during and after serious disturbances need to be considered for society to be able to resist, manage, and recover as well as learn and develop from such disturbances. Coordination during recovery is also described in the ordinance (SFS 2017:868) and (SFS 2017:870) about the crisis management of the county administration boards. However, several interviewees identify that especially recovery, rehabilitation and reconstruction are not often practiced: “We are not very good at building back better. We have no preparation plans for that. We are good at acting on events. The work afterwards is without plans.”

Annex 4: Alignment with UNDRR's ten criteria for national and local strategies

Signatory states should adopt and implement national and local disaster risk reduction (DRR) strategies and plans, which include targets, indicators and time frames aimed at preventing the creation of risks, reducing existing risks and strengthening economic, social, health and environmental resilience.

In line with the seven global targets and priorities of the Sendai Framework, the UNDRR has stipulated that national and local strategies for DRR should seek to meet 10 criteria (UNISDR, 2017d, p. 115), listed below.

On this basis, the main questions discussed are: a) whether and, if so, how the examined documents meet these ambitions or b) if there is a need of a new and coherent DRR strategy covering the national and local level to this end.

The ten criteria are enumerated below together with an indication of how certain criteria specifically correlate with the four priority areas as stipulated by the Sendai Framework.

UNDRR's criteria for DRR strategies

- 1) Have different timescales, with targets, indicators and time frames.
- 2) Have aims at preventing the creation of risk.
- 3) Have aims at reducing existing risk.
- 4) Have aims at strengthening economic, social, health and environmental resilience.
- 5) Be based on risk knowledge and assessments to identify risks at the local and national levels of the technical, financial and administrative disaster risk management capacity.
- 6) Mainstream and integrate disaster risk reduction within and across all sectors.
- 7) Guide to allocation of the necessary resources at all levels of administration for the development and the implementation of DRR strategies in all relevant sectors.
- 8) Strengthen disaster preparedness for response and integrate DRR response preparedness and development measures to make nations and communities resilient to disasters.
- 9) Promote policy coherence relevant to disaster risk reduction such as sustainable development, poverty eradication, and climate change, notably with the SDGs and the Paris Agreement.
- 10) Have mechanisms to follow-up, periodically assess and publicly report on progress.

Analysis and results about alignment with criteria for DRR strategies

Summary: Initially one may note that the combined substance of the studied documents meets all ten criteria. That is, each document mentions at least one of the criteria, and some of the criteria are embodied in the documents more

than others. In other words, existing legislation and strategies seems at a first glance to ensure the allocation of resources to promote integrated, whole-of-government approaches to risk reduction, sustainable development and climate change adaptation at national as well as local levels in Sweden. However, to get a more in-depth understanding of how these criteria really satisfy an integrated and holistic system, a more in-depth analysis would be needed (e.g. see Annex 3). In addition, the existence of different aspects in a dispersed form would still require an approach/ strategy to link these elements together.

More detailed analysis and argumentation: A sizeable proportion of the documents comprise plans for handling crises, emergencies and disasters if they do occur (criterion 8 and priority 4 of the Sendai Framework). What seemingly is missing, however, is a generic (multi-hazard) document collating various information which is now scattered in different legislation, guidelines, fact sheets and checklists, without explicit linkages. Examples are:

- 1) Pertinent risk scenarios associated with the national risk assessments (MSB, 2016b);
- 2) The set-up of the Swedish disaster management system (including the principles of responsibility, parity and proximity and the notions of sectoral and geographical areas of responsibility);
- 3) A description of roles and responsibilities of the main public and private organizations connected with the 11 societal sectors that MSB has identified as essential for societal safety (MSB, 2011a);
- 4) Systems for public alerts; procedures and systems for inter-agency communication and collaboration; mandates of and potential reinforcement resources at the national level;
- 5) Expertise and means of voluntary organizations; routines and templates for requesting national and international assistance.

Bringing such scattered information together in a coherent, but still concise, document/plan would purportedly benefit individual actors as well as the disaster management system as a whole. Moreover, such a document would be an essential basis of trainings for MSB liaison personnel that are deployed to facilitate inter-agency collaboration and the management of risk and crisis management at various authorities and administrative levels in Sweden.

In addition, one notes that few documents address allocation of resources to facilitate DRR, sustainable development and climate change adaptation (criterion 7 and priority 3 of the Sendai Framework). However, the Act on Municipal and County Council Measures prior to and during Extraordinary Events in Peacetime and during Periods of Heightened Alert (SFS 2006:637) contain provisions for the state to financially compensate municipalities and regions (formerly county councils) for implementing measures to reduce disaster risk¹⁸. Similar provisions exist in relation to regional and national governmental agencies as well as voluntary organizations (MSB, 2018c).

These financial procedures are well established and there are arguably no impediments for using these funds for activities intended to mitigate the anticipated negative effects of climate change. Notwithstanding, municipalities

¹⁸ These provisions are further regulated in an agreement between MSB and the Swedish Association of Local Authorities and Regions, SKL (MSB & SKL, 2018).

voice the need of attaining additional resources for this purpose (Government bill, 2017, pp. 46-47). If a specific strategy is to be developed for the implementation of the Sendai Framework in Sweden, it is advisable that the Government investigates whether existing mechanisms and funds for DRR measures can also be used for attaining goals as expressed in the Agenda 2030 action plan (Regeringskansliet, 2018) or the 16 national environmental quality objectives as presented in Naturvårdsverket (2011) and vice versa. Ensuring and communicating that measures for climate change adaptation could for instance be funded through existing DRR instruments, would signal a recognition of the linkages between these hitherto often separated policy areas and further integrate climate change adaptation into the broader DRR-agenda.

With regards to criterion 9, the Paris agreement and the Sustainable Development Goals (SDGs) are only mentioned in five documents. This is not surprising, however, as most of the studied documents were created before the Paris agreement and the SDGs were established in 2015. This does however not mean that e.g. poverty reduction and environmental protection are new priorities in Swedish politics. For example, the notion of “climate change” is not mentioned once in the 110 pages long Swedish Environmental Code from 1998, albeit environmental protection is at heart of the document. On the contrary, Sweden has long been actively promoting such values and was, inter alia, the initiator of the first international conference on the relationships between humans and the environment held in Stockholm in 1972 (Regeringskansliet 2018, p. 10). Nonetheless, it is noticeable that ideas on sustainable development and climate change have become more prominent in official documents in recent times. Consequently, related aspects are not sufficiently included in existing policies, nor linked to DRR.

Most documents include requirements or measures which enable follow-up on progress (criterion 10), but few relate to the possibility of monitoring achievements in relation to specific goals or indicators. Rather, they may contain requirements of documenting response operations to support learning from the management of occurred events (e.g., MSB, 2014; SFS, 2003:778, 2006:637). Other documents call for documentation that facilitate control of the extent to which authorities comply with laws and norms (SFS 2003:778, 2010) or are subjected to IT-security breaches (SFS 2015:1052). Some documents also comprise requirements on the creation and periodical review and adaptation of risk reducing plans and strategies (MSB, 2015a, 2016a; SFS, 1998:808, 2003:778, 2009:956, 2010:900).

Most of the documents also entail obligations to inform authorities at higher administrative levels about planned or implemented measures to reduce risk or ensuring a sustainable development (MSB, 2015a, 2016a; SFS, 2003:778, 2006:637, 2006:544). Although such measures probably are aligned with the intention and overall goals of the Sendai Framework, the authorities often have great leeway in terms of choosing which types of risks they address and how. Moreover, none of the studied documents enforces the authorities to develop and present indicators to monitor the progress of the objectives they set (criterion 1).

Actually, only three of the documents contain or relate to indicators used to monitor the compliance with objectives as formulated by the Government or the Swedish Civil Contingencies Agency. These are the Action plan for Agenda 2030: 2018–2020 (Regeringskansliet, 2018); MSBs mandatory provisions and general advice about municipalities RVAs (MSB 2015a) and about state authorities RVAs (MSB 2016a). Together these three documents lie at the heart of implementing the goals of the Sendai Framework. To further institutionalize the integration of climate change adaptation with mainstream DRR work and sustainable development, the Swedish Civil Contingencies Agency need to make use of its possibility (as granted by MSB, 2016a) to direct which scenarios governmental authorities should use as basis for their risk and vulnerability assessments. Ideas presented in Mossberg Sonnek, Lindgren, & Lindberg (2011) could be conducive to such efforts.

The findings stress the need for and value of a coherent policy document that could explain the interconnection between existing national and local mechanisms, laws and strategies and how they help in realizing the goals and priorities expressed in the Sendai Framework. As pointed out by UNDRR, a “national DRR strategy may take any of a variety of formats, depending on the context of the country or sub-national governments. It may be one comprehensive strategy document or a system of strategies across sectors and stakeholder with one overarching document linking them” (UNISDR, 2018b, p. 3).

Developing a strategy that helps in understanding the “bigger picture” of how individual laws and strategies are interlinked and connected to global objectives, may increase motivation for achieving aims in line with specific DRR initiatives, prompt inter-agency communication and collaborations and, thus, accelerate the fulfilment of both national and global objectives.

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