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Sendai Framework Midterm Review

Country Report Sweden

Sendai Framework Midterm Review – Country Report Sweden

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Executive Summary

This report is Sweden's contribution to the Sendai Framework Midterm Review. It provides an overview of the current state of play for risk context, risk governance and implementation of the Sendai Framework in Sweden. The report describes Sweden's progress in disaster risk reduction during the period 2015 – 2022. It also highlights some of the challenges Sweden faces in its work with disaster risk reduction.

Sweden remains a strong advocate of UNDRR's work in general and for the Sendai Framework in particular. Recent events have again instilled the urgency in understanding and reducing risk. The fragility in society's fabric and the disastrous effects of not being adequately prepared have become clearer in light of recent crises. In this report a major structural reform for civil preparedness is outlined. It is an important change for Sweden and comes from a tightened security policy situation and lessons learned from recent disasters. It clarifies coordination and responsibilities between agencies and different levels of government within the civil preparedness which also contributes to the future implementation of the Sendai Framework.

Sweden's commitment to disaster risk reduction goes beyond this current civil preparedness reform. There is a clear need to identify and mitigate a broader set of risks including small-scale and slow-onset disasters. Agencies need to understand how risks differ among the population and how to target support according to individual needs and capacities. Three closely linked frameworks – the 2030 Agenda, the Paris Agreement and the Sendai Framework - together seek to address these issues. In its future work, Sweden seeks to combine efforts to implement these frameworks in order to further develop disaster risk reduction and climate change adaptation, and towards a more sustainable society.

This first chapter introduces the report, provides an outline of the Swedish hazard and risk context and describes the methodology of the report.

The second chapter provides an overview of the impact of risks in Sweden during 2015 – 2022. It also describes the Swedish system for risk governance as well as changes in Sweden's work with disaster risk reduction during 2015 – 2022. This includes a description of the current structural reform. Furthermore, the second

chapter lists progress made towards the seven global targets of the Sendai Framework, including data reported to the Sendai Monitor.

In the third chapter, recent changes in the Swedish context, that bear relevance for the Sendai framework, are highlighted. Several of the contextual shifts outlined here, e.g. the pandemic and recent changes in the security context; provide a background to the ongoing civil preparedness reform.

The fourth chapter is forward-looking and describes how Sweden aims to continue implementation of the Sendai framework. This section places the Sendai Framework within some of the major ongoing shifts in civil preparedness. It also highlights certain development areas Sweden will need to continue to implement as regards the Sendai Framework alongside the ongoing crisis preparedness reform.

The final fifth chapter includes best practice examples from the past years of implementation, showcasing work carried out at the municipal level as regards understanding and mitigating risk.

Stockholm, 13/10/2022

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1. Introduction

1.1 Introduction to national hazard and risk context

Compared with the most parts of the world, Sweden is a country in which disaster risk is considerably low. Hazards are not so severe and resilience levels are relatively strong. Large disasters occur very rarely and the consequences are often limited. Disasters and crises lead to economic consequences, but loss of human life is rare. The ongoing Covid-19 pandemic, a biological hazard, is however a significant exception. Natural hazard risks are expected to increase with a changing climate, both hydrometeorological, geological and biological. The overview of risks below is based on the National Risk Assessment reported to the European Commission in 2020.

Natural hazards:

Storms are frequently occurring and the natural hazard that has caused the largest economic loss in Sweden. The main consequences include disturbances in energy supply, electronic communications and transportation as well as extensive damage to forests.

Floods occur regularly in Sweden and can result in significant economic loss. Sweden has a long coastline and the risk of coastal flooding is likely to increase as a result of sea level rise. Fluvial floods also affect many parts of the country. Twenty five areas, throughout the country, are identified in the EU Floods Directive as areas of potential significant flood risk. Pluvial floods in urban areas are becoming more common and can incur severe economic costs. Climate change will lead to more heavy rainfall events throughout the country.

Landslides are costly and historically some of the most deadly disasters due to natural hazards. Large landslides in populated areas are uncommon but Sweden has a number of populated and built-up areas where the risk of landslides is high, e.g. areas with quick clay. The risk of landslides and its consequences for society are expected to rise as a result of climate change.

Heat waves will become more frequent in Sweden due to climate change. Temperatures may not reach the same levels as warmer parts of the world but Swedish society is often less prepared and more vulnerable to heatwaves resulting in excess mortality rates. High temperatures in combination with low precipitation has also led to summer **droughts** with consequences for agriculture and and disruption to water supply.

Wildfires occur frequently but most fires are limited and easily managed. The probability of large wildfires, or multiple wildfires, requiring major operations has been limited. The risk of wildfires is however increasing with the higher temperatures and lower precipitation that follow from climate change. Wildfires

cause economic loss, mainly for the forestry sector, as well as damages to buildings and infrastructure as well as disruption to vital services.

Low temperatures and **heavy snowfall** are common in Sweden. Resilience to such situations is therefore high and the consequences usually limited. However disruption to transportation, energy supply and electronic communications does occur. The probability of **ice storms** is low in Sweden.

Erosion can lead to landslides and have consequences for built up areas, transport and infrastructure. The southern coast of Sweden and the islands of Gotland and Öland are particularly vulnerable to erosion, and similarly a number of lakes and rivers.

Biological hazards such as **epidemics** and **pandemics** are regularly occurring and have a large potential to affect human health and cause deaths. The Covid-19 pandemic has also proved that it can lead to extensive economic losses and seriously affect vital services in society. Animal disease (so called epizootics) also affect society, the consequences are usually limited to animal health and economy.

Man-made hazards:

Chemical hazards are mainly connected to industries or transportation of hazardous goods. Sweden has several industries where with a potential risk of an accident. Risk management and regulations as regards chemical industries are extensive which makes the probability for an accident low. An accident could mean large consequences on human health, environment and economy. An occurrence of a specific type of a chemical accident, such as oil spill at sea could have widespread consequences. A **radiological accident** at a nuclear power plant has a very low probability but could potentially have disastrous consequences.

A variety of **technical accidents** and **major transportation accidents** could occur in Sweden. Serious accidents have not happened often. However, these kind of accidents have the potential to cause serious consequences on human lives and health, economy and environment and could lead to disturbances in society's vital services.

1.2 Methodology

Due to time constraints, Sweden opted for a streamlined report towards the Sendai Mid Term Review. The Swedish Civil Contingencies Agency (MSB) coordinated the reporting process. A desk-based study of recently completed reports, reforms and evaluations into disaster risk reduction in Sweden was used to produce a first draft of the report. Government agencies, regional authorities and universities, involved in implementation of the Sendai framework, were invited to provide input to questions in the retrospective as well as the prospective review. Local authorities engaged in Making Cities Resilient 2030 campaign were invited to provide input regarding best practices of their ongoing work with disaster risk reduction.

2. Retrospective Review – disaster risk reduction in Sweden 2015-2022

2.1 Impact of risk in Sweden 2015-2022

The most severe impact of risk in Sweden in the period 2015-2022 has naturally been that of the Covid-19 pandemic which has had enormous consequences all over the world. The consequences for Sweden are described further below.

Besides the Covid-19 pandemic natural and climatological hazards have had the most impact in recent years. In the period 2015-2022, Sweden has experienced its warmest summers since the measurements began almost 200 years ago. Heat records have been broken and several heat waves have occurred¹. High temperatures have resulted in severe forest fires and reductions in ground and surface water levels that have caused water scarcity². At the same time, changes in rainfall patterns and water availability have also been noted. Several heavy rainfall events have occurred and pluvial floods in urban areas have had significant economic consequences³.

Covid-19 pandemic 2020-

The Covid-19 pandemic is globally the most severe disaster in modern time and the consequences in mortality and number of infected is extensive. Compared to most other countries, Sweden remained relatively open instead of having complete or partial lock-downs. Instead Sweden issued restrictions and recommendations⁴. There was generally a large spread of the virus in Sweden and a high death toll. In September 2022, just over 20,000 deaths have been registered due to the pandemic⁵. This said, Sweden has had one of the lowest excess mortality rates in Europe, during 2020- 2021.

The statistics show that the effect of Covid-19 differ across social groups. The highest mortality is among the elderly. Other vulnerable groups such as foreign-born citizens with low education also stand out with high death rates. Economic consequences were also extensive, but on an overall national level, Sweden's economy has fared relatively well. There were some disturbances in educational

¹ Värmebölja <https://www.smhi.se/kunskapsbanken/klimat/varmebolja-1.22372>

² Skogsbränderna sommaren 2018, SOU 2019:7
<https://www.regeringen.se/4906d2/contentassets/8a43cbc3286c4eb39be8b347ce78da16/skogsbranderna-sommaren-2018-sou-2019-7.pdf>

³ Pluviala översvämningar. Konsekvenser vid skyfall över tätorter <https://rib.msb.se/filer/pdf/26609.pdf>
⁴ Frågor och svar om den tillfälliga pandemilagen <https://www.regeringen.se/regeringens-politik/regeringens-arbete-med-coronapandemin/om-halsovard-sjukvard-och-aldreomsorg-med-anledning-av-covid-19/fragor-och-svar-om-den-tillfalliga-pandemilagen/>

⁵ Folkhälsomyndigheten <https://experience.arcgis.com/experience/09f821667ce64bf7be6f9f87457ed9aa>

services, health services and transportation⁶. Since February 2022, Sweden no longer classifies Covid-19 as a disease dangerous to society and restrictions have been lifted⁷.

Heat wave, forest fires and water scarcity summer 2018

The summer of 2018 was warm and dry in Sweden. The heat waves and lack of precipitation resulted in low water levels and water scarcity, especially for agriculture⁸. The heat was also a contributing factor to multiple and intense forest fires that occurred from the end of May until mid-August. The fires were mostly widespread in July when they covered 20,000 hectares. Lightning storms were a dominant cause and led to fires throughout Sweden's forested landscape. The fires spread rapidly in different directions at the same time, making them difficult to control. To manage the fires Sweden received support through the Union Civil Protection Mechanism at the EU level. Large areas of forest burnt down and both the forestry and agricultural sectors suffered heavy economic losses⁹.

The storm Alfrida 2019

In the beginning of January 2019, the storm Alfrida hit Sweden. The storm caused widespread damage to forests. The power grid was also affected resulting in long-term power outages. One hundred thousand households were left without electricity, some of them for several weeks. The disruptions in the electricity supply also affected healthcare, electronic communication, water and sewage, and transportation. Those communities affected by the storm were unable to meet the needs of vulnerable groups. Fortunately, there were no deaths, but the storm caused considerable financial losses¹⁰.

Floods in Gävle 2021

August 2021 was a rainy month for many parts of Sweden and led to very high flows in smaller watercourses. A particularly heavy rainfall hit the city of Gävle. In one day, 161 mm of rain fell, 101 mm in two hours, which is exceptional in Sweden. The extreme precipitation led to widespread flooding and extensive damage to buildings, infrastructure and vehicles, as well as significant economic loss. People had to be evacuated from their homes due to water damage¹¹. In

⁶ Slutbetänkande SOU 2022:10 <https://coronakommissionen.com/publikationer/slutbetankande-sou-2022-10/>

⁷ Vad hände under covid-19-pandemin?

<https://www.folkhalsomyndigheten.se/contentassets/a058cccd25894dc1b2ad798d0d421ac7/tidslinjen-som-pdf-januari2022-maj2022.pdf>

⁸ Vad hände under covid-19-pandemin?

<https://www.folkhalsomyndigheten.se/contentassets/a058cccd25894dc1b2ad798d0d421ac7/tidslinjen-som-pdf-januari2022-maj2022.pdf>

⁹ Skogsbränderna sommaren 2018, SOU 2019:7

<https://www.regeringen.se/4906d2/contentassets/8a43cbc3286c4eb39be8b347ce78da16/skogsbranderna-sommaren-2018-sou-2019-7.pdf>

¹⁰ Alfrida och Jan. Utredning och sammanställning av några viktiga erfarenheter

<https://rib.msb.se/filer/pdf/28826.pdf>

¹¹ Alfrida och Jan. Utredning och sammanställning av några viktiga erfarenheter

<https://rib.msb.se/filer/pdf/28826.pdf>

accordance with the EU Floods directive MSB commissioned a report from the County Administrative Board in Gävle^{12 13}.

2.2 Risk Governance in Sweden

Sweden has nationwide structures in place to work strategically with risk governance and investment in resilience building efforts. Sweden's National Security strategy is the overarching framework for civil preparedness. It defines civil preparedness as a national priority and task all actors to prepare and coordinate for crisis. Risk governance is further defined by legislation (2006:544 LEH, 2003:778 LSO, 2010:900 PBL) and by government decree (2022:524, 2022:525).

Sweden's work with managing risks is guided by three principles:

Responsibility

Organisations with specific responsibilities retain those responsibilities in times of crisis. E.g. regions responsible for healthcare retain this responsibility in times of crisis.

Proximity

Any crisis should be managed where it occurs by those most directly involved.

Continuity

Organisations shall, as far as possible, retain their structure in times of crisis.

Responsibility for risk governance is shared between the Government, government agencies, county administrative boards, regions and municipalities. Actors have responsibility for risk governance within their thematic area of responsibility or a geographic area. From the principle of responsibility follows that municipalities have a key role. In addition to being responsible for a range of critical services, e.g. schools and water supply, municipalities also have responsibility within their geographic area. Sweden's county administrative boards are responsible for support towards municipalities and for regional coordination. Regions are responsible for healthcare and public transport. In addition, government agencies are responsible for risk governance in their respective domain e.g. the agency responsible for Sweden's electrical grid will during crisis retain that responsibility and will work to ensure safe, and interference free electricity.

To achieve an efficient system for disaster risk reduction there are also organised structures for coordination and collaboration in place. The year 2022 marks a shift

¹² See the investigation report about the floods in Gävle august 2021, <https://rib.msb.se/Filer/pdf/30020.pdf> .

¹³ There is a compilation report available from 9 flood events occurred in Sweden between 2014-2021, <https://rib.msb.se/filer/pdf/30072.pdf>

in the way cooperation within the Swedish civil preparedness is structured. As of 1st of October, a new structure for civil preparedness enters into force; see the section on context shifts and the section prospective review below for background. The new structure is defined in new government decrees (2022:524, 2022:525). The new structure is organised in geographical areas and sectors. In the new structure, Sweden will be organised geographically into six Civil Preparedness Regions. Thematically civil preparedness is divided into ten sectors (for example: Economic security, electronic communication and post, energy, finance, health and care, security, civil protection and transport)¹⁴. Each theme/sector is managed by a dedicated governmental agency and includes a set of predefined agencies (in total 60 agencies). The main changes that comes with this new structure is outlined in the section on prospective review below.

Civil Protection and the fire and rescue services in Sweden are managed at the local municipal level as defined in specific Civil Protection legislation (2003:778). Aside from municipal responsibility to respond to emergencies and disaster, fire and rescue services should also strengthen local preparedness to reduce risk of emergencies and disasters. Certain specific types of emergencies and rescue services, e.g. nuclear disasters and rescue services at sea, are the responsibility of dedicated state agencies. In larger emergencies the county administrative boards of Sweden are mandated to take lead in a specific rescue operation. MSB has oversight over all rescue services and works closely with rescue services to strengthen capacity.

All government agencies¹⁵, regions and municipalities prepare a risk and vulnerability assessment with at least biannual frequency. This analysis is an important input to the National Risk and Capability Assessment, carried out by MSB, whose findings forms the basis of Sweden's work to develop and strengthen civil protection and preparedness.

Sweden operates a national system for warning. The system, called important message to the public or VMA, uses different channels including foghorns, radio and online messaging. The Swedish Meteorological and Hydrological Institute (SMHI) works to minimize risks in society both in the short and long term. They are responsible for a national-wide weather warning system. The warning system is based on the consequences certain weather can have in a geographical area. Before a decision to issue a warning, SMHI intensifies cooperation with authorities and actors at local, regional and central level.

SMHI produces both long- and short-term forecasts that for example can be used in a situation with forest fires. SMHI also produces climatological data that other authorities can use in their work with climate adaptation. SMHI supports the work with climate adaptation and has a knowledge centre for climate adaptation, which

¹⁴ The English translation of these thematic sectors is yet to be confirmed.

¹⁵ A few agencies are exempt from preparing a risk and vulnerability analysis e.g. the Swedish Fiscal Policy Council and the Swedish Accounting Standards Board.

is a meeting place for various actors who are engaged in preparing society for a changing climate.

Funding for disaster risk reduction is integrated into the regular budget of the public authorities involved in disaster risk reduction and disaster management. MSB, further funds development projects through two annual funding allocations focusing on civil preparedness and on disasters. Examples of development projects in 2021 includes joint exercises involving county administrative boards and civil society organizations and projects focusing on drinking water supply during disasters.

Sweden's work with risk governance also relies on international cooperation. Nordic countries have since 2009 co-operated closely on risk governance through the Haga cooperation i.e. active cooperation between authorities responsible for public safety, rescue and preparedness which form joint priorities. Current priorities are; preparedness for large-scale forest fires; inter-operability in systems for crisis communication; dealing with the consequences of climate change. Sweden is also active in the European Union Civil Protection Mechanism (UCPM) and works to strengthen collaboration on preparedness on a wide range of issues including forest fires, humanitarian aid and transport of dangerous goods.

2.3 Progress in disaster risk reduction during 2015 – 2022

The Swedish system for disaster risk reduction and crisis management is developed continuously to reduce risk, strengthen society's resilience and increase preparedness. Crises that occur are investigated and the crisis management evaluated resulting in measures taken. It is impossible to give a full overview of the progress during the last years but some of the main developments are briefly described below.

The large wild fires that Sweden experienced in 2014 and 2018 initiated an overview of the rescues services. This led to changes in the legislation in order to improve the management of large fires and other major accidents.

In line with the Paris Agreement, Sweden is enhancing climate change adaptation efforts. Several climate related events in the last years have showed the need of adaptation both in today's climate and in the future. In many parts climate change adaptation is a form of disaster risk reduction. Sweden has developed a national strategy for climate change adaptation as well as legislation that prescribes that relevant national agencies have responsibilities to support climate change adaptation. The Swedish National Expert Council for Climate Adaptation published their first report in 2022. Their conclusions were, among other, that there has been progress in climate change adaptation but that there is a need to intensify the efforts further and that plans need to be put into action.

In 2022, the Swedish government dramatically increased funding for the prevention of disasters due to natural hazards. The grants budget for

municipalities' prevention measures, administered by MSB, was raised from 25 to 520 million crowns. The number of grant applications increased threefold, 36 applications with a total project cost of 1.5 billion crowns were submitted.

Climate and environmental perspectives in the crisis management system have also been strengthened with the Swedish Environmental Protection Agency being designated as an additional agency with responsibility for crisis management.

In 2020, the government commissioned the Swedish Civil Contingencies Agency and the Swedish Geotechnical Institute to identify specific risk areas for landslides, erosion and flooding. Ten national risk areas with complex climate-related threats were identified. In the report, several measures are described on what needs to be done to reduce the risks for these areas.

The pandemic as a societal disruption was mainly seen as a health-issue, but the consequences struck almost every other sector. A lesson learned from the pandemic, therefore, is that decisions taken at strategic level impacting the whole of society (i.e. restrictions and similar), need to be prepared based on a comprehensive and cross-sectoral dialogue and approach. Another lesson is the need to have certain high-level forums (heads of agencies, chief of operations) as permanent groups, upholding regular meetings in times between disasters. This builds trust among decision makers, and enables swift response mechanism to be put in place early on as a disaster unfolds.

2.4 Progress in implementing the Sendai Framework

Sweden is implementing the Sendai Framework on the back of a well-established system for risk governance as outlined above. The existing system for risk governance, while functional in the Swedish context, was not developed along the structural lines of the Sendai Framework. A challenge throughout the Sendai implementation process has therefore been to fit existing systems and plans for improvement with the ambitions and structure of the Sendai Framework. One example of this has been the ambition in the Sendai Framework that each country should have national and local strategies for disaster risk reduction.

While Sweden needs to strengthen, and has over the past seven years strengthened, its focus on disaster risk reduction it is not evident that this merits a dedicated national strategy. Instead, Sweden has opted for the broader concept of security to shape its national preparedness and systems for emergency response. As outlined in risk governance above, the current Security Strategy includes direction for Sweden's work in disaster risk reduction. This said, the strategy does not explicitly mention Sweden's commitment to the Sendai framework and its text on disaster risk reduction needs further development. The strategy is currently being revised and will likely include stronger wording relating to disaster risk reduction going forward.

Sweden's dedicated work with implementation of the Sendai framework has mainly focused on three types of measures:

- a) Commissioning and disseminating research to improve understanding of the options available for implementation;
- b) Setting up and supporting national and local networks of actors in order to strengthen knowledge, coordination and capacity;
- c) Engaging in international cooperation to support developing countries in their implementation of the framework.

In regards to research, MSB commissioned several studies since 2015 to guide implementation. In 2017 MSB commissioned The Swedish Institute of International Affairs to analyse Swedish Disaster Risk Reduction Governance with a view to improve understanding on how to implement the Sendai Framework¹⁶. In 2018 MSB commissioned 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 Sweden¹⁷. In 2020, MSB commissioned the University of Reading to conduct a gap analysis taking stock of how Sweden has implemented the fifty-nine measures indicated in the Sendai framework. The study helped to identify which measures needed further development in order for Sweden to meet the global targets, see below in the section on prospective review¹⁸.

MSB has also worked actively to build and support national and local networks guided by the Sendai framework. The former National Platform for DRR established 2010 and discontinued in 2016 was in 2017 replaced with a national working group for natural hazards. The group, which includes representatives from fifteen governmental agencies, works towards improved awareness and understanding of climate- and natural disasters with focus on prevention, mitigation and management of disasters and is guided by the Sendai Framework. The working group sets annual targets for its work and meets regularly throughout the year. In 2021, for example, actions included development of targeted information to improve understanding among real estate owners regarding disaster risk reduction.

Furthermore, Sweden has a strong engagement in the Making Cities Resilient (MCR) campaign. MSB support the coordination of a national network of local councils engaged in the MCR 2030 campaigns. The network meets biannually to exchange on progress in order to improve resilience and climate change adaptation. Two cities, Helsingborg and Malmö, have resilience hub status. Aside from implemented disaster risk reductions strategies, with bearing on the sustainable development goals, these cities will also act to disseminate learning to other cities wishing to join the MCR 2030.

¹⁶ <https://www.msb.se/sv/publikationer/the-sendai-framework--swedish-disaster-risk-reduction-governance/>

¹⁷ <https://www.msb.se/sv/publikationer/developing-a-national-strategy-for-disaster-risk-reduction-and-resilience-in-sweden--recommendations-for-the-implementation-of-the-sendai-framework-global-target-e/>

¹⁸ <https://www.msb.se/sv/publikationer/sweden-and-the-sendai-framework-for-disaster-risk-reduction-2015---2030--a-gap-analysis/>

In terms of international cooperation Sweden has worked to strengthen regional coordination and understanding of the Sendai Framework. Sweden has engaged other European countries in bilateral meetings regarding progress and challenges in implementing the Framework e.g. meetings with DRR actors from Romania in 2021. Sweden has also worked through European mechanisms, e.g. EU UCPM, to share information on implementation and coordination. Sweden was also involved in an EU funded project, Community Safety Action for Supporting Climate Adaptation and Development (CASCADE), together with agencies in Baltic States. The project strengthened regional cooperation that serves to mitigate and reduce climate change related risks.

2.5 Progress towards the global targets A-D

Sweden has followed up on the consequences of disasters and reported in the Sendai monitor. The reporting towards these global targets is a challenge as data is not readily available. Some of the indicators are also difficult to apply in a Swedish context. As data for all accidents or crises is not available, it would be a too extensive and cumbersome work to collect all the data for the reporting of all events. Sweden has therefore decided to report only the most serious events, disasters, which occur. It is also impossible to see any trends in the reported indicators. Even if all events would have been reported they occur to seldom and randomly to generate clear trends. The consequences are also limited and the range of events differ in nature and consequences. Therefore the consequences vary extremely over the years and do not give a fair representation of the development over time.

Here follow some comments on the progress of disaster risk reduction in relation to the global targets based both on the indicators, other data and efforts made.

A. Substantially reduce global disaster mortality

B. Substantially reduce the number of affected people globally

Usually, in Sweden, the mortality and the number of injured or ill persons due to disasters, is low. A larger number of people are affected economically. An exception is the Covid-19 pandemic where Sweden, at times, had high mortality rates.

C. Reduce direct disaster economic loss

The main consequences of disasters in Sweden are economic loss. Some are direct loss, such as damages on property, but usually the largest losses are indirect and difficult to identify and quantify. Even direct loss is difficult to measure and differ a lot between years depending on disasters that occur.

There is no available compiled data on economic loss due to disasters. There are specific investigations on loss for some disasters and insurance data is partly available. In 2020 a government commission analysed insurance data for loss due

to natural hazards. They could not identify any clear trends. There is continued efforts to improve data on economic loss.

Even if no clear trend in economic loss can be seen, plenty of preventive measures have been taken throughout the country, not least climate change adaptation measures, which should decrease losses. However, at the same time climate change will increase risk and to some degree create vulnerability in the built environment. To meet the challenges that climate change means for the built environment the Swedish National Board of Housing, Building and Planning together with four other agencies were in 2019 given the task to support and coordinate the national climate change adaptation of the built environment. The aim is to provide knowledge and support actors, especially the municipalities to adapt the built environment to a changing climate. This should in time decrease economic losses.

When it comes to direct economic loss to cultural heritage due to disasters, no such loss has been reported in 2015-2021. The Swedish National Heritage Board is working actively to reduce disaster risks based on risk analyses and have linked the Sendai framework to their climate adaptation plan. Areas in focus are for example a risk management tool for museum collections, national cooperation for fire protection of cultural heritage, cooperation related to natural hazards, supporting risk assessments and disaster management plans for cultural heritage and education about rescuing cultural heritage.

D. Substantially reduce disaster damage to critical infrastructure and disruption of basic services

There is even less data available on damages in critical infrastructure and disruption of basic services than there is on economic losses. Therefore, nothing certain can be said about any progress in relation to target D. However, there are many efforts made to increase the resilience of infrastructure and basic services and adapting it to a changing climate. There are also factors, like climate change, increased electrification and increased dependencies between different basic services that may increase vulnerability.

2.6 Progress toward the global targets E-G

E. Substantially increase the number of countries with national and local disaster risk reduction strategies

As described above, Sweden has a National Security Strategy that includes directions for Sweden's work in disaster risk reduction. At present the strategy does not explicitly mention Sweden's commitment to the Sendai Framework but as the strategy is currently being revised, the wordings relating to disaster risk reduction is expected to be strengthened.

F. Substantially enhance international cooperation to developing countries

Sweden's commitment to UNDRR and the Sendai Framework is also reflected in development assistance for disaster risk reduction. Sweden provides support to disaster risk reduction through several different institutions e.g. civil society, academia and multilateral organisations such as UNDRR, WFP, World Bank. Examples of projects include strengthening of early warning systems and resilient livelihoods in camp populations in Southern Somalia (WFP, 2021).

Furthermore several government agencies drive bilateral programmes with a disaster risk reduction focus. The Swedish Meteorological and Hydrological Institute (SMHI) works with bilateral projects to strengthen forecasting, early warning and climate information capacities. MSB works to strengthen disaster risk management e.g. through an international training programme. Through mentoring and courses in problem analysis and mainstreaming of gender the programme has generated several change initiatives in e.g. Bangladesh and the Philippines.

G. Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people

As described above, national agencies, county boards and municipalities are obliged to perform risk assessments within their area of responsibility. These assessments should have a multi-hazard approach. Municipalities, county boards and some national agencies also report some of the results from their risk assessments. There is no complete overview of how these assessments are performed but it can be seen that the quality of the assessments differs and often needs to be improved. Efforts to support the risk assessments in order to increase the quality are made, including new regulations and more accessible support with risk management tools. On the local level performing risk assessments may be a challenge for small municipalities due to lack of resources. Overall risk assessments are also performed on a national level based on risk assessments from local and regional level as well as from different societal sectors.

General risk information to people is available on national level and the information is continuously developed. For example, the Swedish Civil Contingencies Agency provides risk information and advice to individuals about hazards and how to be prepared for a crisis on the website. The site Krisinformation.se provides confirmed information from agencies during a crisis but also risk information to prevent and prepare for a crisis. In 2018 the brochure *If Crisis or War Comes* containing risk information was distributed to all households in Sweden. Each year MSB supports a campaign, "Crisis preparedness week", where municipalities, NGOs and other actors are encouraged and supported to have outreaching activities about personal preparedness and crisis management. Risks are also mapped using geographic information systems to increase risk information. Ranges of hazards are mapped including flood inundation and flood risk, heat and fire. Regional and local risk information may be available via the county boards and municipalities but this differs throughout the country. A challenge is to balance the availability of risk information that is

needed for people to reduce their own risk with the need to keep sensitive risk information protected.

Sweden has a well-established multi-hazard system for detection, monitoring, analysis and forecasting of the hazards and possible consequences. The responsibility for different kinds of hazards are distributed on several actors according to their expertise. The system for weather warnings, which is managed by the Swedish Meteorological and Hydrological Institute, has recently been updated and new consequence based warnings were launched in 2021. Warnings are issued through several channels and a very high percentage of the country and populations are covered by these warnings. The latest major development when it comes to dissemination of warnings is alerts via sms (since 2017) and digital applications. Municipalities, rescue services, county administrative boards and national agencies with a responsibility for crisis management should all have a crisis management plan and staff ready to react on warnings at all times.

2.7 Sendai Monitor Data, 2015 – 2021

Data presented below covers reported events during the period 2015-2021, these being Covid-19 and the 2018 drought and forest fires. Data for year 2022 is currently unavailable. In addition, data for target F, international cooperation, is reported for the years 2015-2020. Data for years 2021-2022 are currently unavailable.

With regards to the **Covid-19 pandemic**, target A, B and D are relevant.

Target A, Mortality: The number of deaths due to Covid-19 is based on the Cause of Death Register which is administered by the National Board of Health and Welfare. The Register includes all deceased in Sweden with the cause of death based on a death certificate submitted by a physician. The statistics show deceased persons where Covid-19 was listed as the underlying cause of death on the death certificates submitted to the National Board of Health and Welfare. The number of deceased in the age group 0-14 years were so few that a disaggregation might risk the anonymity of those persons. These deaths are therefore reported together with the age group 15-65 years.

Table 1. Data Summary for Target A, Mortality

	2020	2021
A-1: Number of deaths and missing persons attributed to disasters, per 100,000 population	89	51
A-2: Number of deaths attributed to disasters, per 100,000 population	89	51
A-2a: Number of deaths attributed to disasters	9265	5319
A-2a men	4965	3106
A-2a women	4300	2213
A-2a adults (15-64)	483	532
A-2a seniors (65+)	8782	4787

A-3: Number of missing persons attributed to disasters, per 100,000 population	0	0
Hazard(s)	Covid-19	Covid-19

Target B, People Affected: The data regarding number of people ill from Covid-19 is taken from the SmiNet database administered by the Public Health Agency of Sweden. The data includes confirmed cases of Covid-19. For the disaggregated data there were 172 cases that did not have data about age, sex or geography.

Table 2. Data Summary for Target B, People Affected

	2020	2021
B-1: Number of directly affected people attributed to disasters, per 100,000 population	4381	8418
B-2: Number of injured or ill people attributed to disasters	454767	879913
B-2 men	213181	442474
B-2 women	241414	437439
B-2 adults	374533	699642
B-2 children	21580	115383
B-2 seniors	58482	64888
B-3: Number of people whose damaged dwellings were attributed to disasters	0	0
B-4: Number of people whose destroyed dwellings were attributed to disasters	0	0
B-5: Number of people whose livelihoods were disrupted or destroyed, attributed to disasters	n/a	n/a
Hazard	Covid-19	Covid-19

Target D, Critical Infrastructure and Services: The data set for 2021 is not yet compiled, therefore, only data for 2020 is presented here. Number of disruptions to basic services attributed to disasters (compound indicator): 0.028904 per 100 000 population. The services affected during the pandemic were educational services, health services and transportation.

In regards to the **drought and forest fires** of 2018 target C, economic loss, is relevant. The economic losses are for agricultural loss, both loss of crops caused by drought and loss of forests due to forest fires. Direct economic loss attributed to disasters in relation to global gross domestic product amounted to 0.0013. Direct agricultural loss attributed to disasters amounted to 710 million USD.

Target F, International Cooperation:

Table 3. Data Summary for Target F, International Cooperation

	2015	2016	2017	2018	2019	2020
F-1:* Total official international support for national DRR actions	101,3	115,5	127,9	166,8	80,3	154,4
F-2:* Total official international support for national DRR actions provided by multilateral agencies				0		
F-3:* Total official international support for national DRR actions provided bilaterally	64,7	64,1	75,8	93,7	56,6	72
F-4:* Total official international support for the transfer and exchange of DRR-related technology				2	2,2	1,8
F-5: Number of international, regional and bilateral programmes and initiatives for the transfer and exchange of science, technology and innovation in DRR for developing countries				3	2	2
F-6:* Total official international support for DRR capacity-building	33,8	19,9	16,3	19,8	11,6	15,1
F-7: Number of international, regional and bilateral programmes and initiatives for DRR-related capacity-building in developing countries	95	75	50	58	19	50
F-8: Number of developing countries supported by international, regional and bilateral initiatives to strengthen their DRR-related statistical capacity	0	0	7	11	11	10
Provider/recipient	Provider	Provider	Provider	Provider	Provider	Provider

*USD in millions

3. Changes in the Swedish context with relevance for the Sendai Framework

3.1 Global climate change

Since the end of the 19th century, Sweden has experienced a warmer climate, and for the past 50 years, the increasing temperatures in Sweden have been particularly distinct. Climate scenarios for the future show continued warming in Sweden. Because of this, the Swedish Government adopted the first *National strategy for climate adaptation* in 2018 to speed up the work to adapt society to a changing climate. In order to implement the strategy, the Government set up the *National expert council for climate adaptation* and issued a decree (2018:1428) on government agencies work with climate adaptation. According to the decree, 32 government agencies and all 21 county administrative boards must work with climate adaptation in a structured and unified manner.

The work on climate adaptation has several connections with the Sendai Framework. Climate change adaptation, like the Sendai Framework, seeks to identify and mitigate risks. More information in chapter 4, prospective review.

3.2 Changes to biodiversity and ecosystem health

Developments in the state and management of our environment could increase the vulnerability of our systems and potentially exacerbate disaster risk. Two examples of emerging concerns are given below. Firstly, the state and proper management of forests are important not only for the health of our environment but also for the functioning of infrastructure and services. Rising concerns include, damage to forests due to monoculture of spruce or bark beetle infestations as well as pressures on ecosystems caused by invasive species or new species that spread disease. The latter might affect both agriculture and forestry. In addition, we currently lack an adequate understanding of the effects of forestry on some disaster risks, such as fires. Secondly, many countries are facing issues with water supply. To be able to maintain good water quality in Sweden investments in new infrastructure and technology are needed. Beyond this, a rising concern is that chemicals needed to purify water might become scarce. In addition, an increase in water pollution and microbiological risks might occur.

3.3 The COVID-19 pandemic and the threat of biological hazards

The Covid-19 pandemic still entails great human suffering and strain on all parts of society, particularly on health care and elderly care. The wider consequences of

the pandemic may affect society for a long time to come, for example through suspended and postponed health care and through financial losses. When the pandemic spread to Sweden it became clear that our society was not adequately equipped. Although society showed great commitment and flexibility, the pandemic exposed vulnerabilities e.g. supply chain issues with protective equipment and lack of qualified staff¹⁹.

3.4 Conflict and violence

In March 2022 the Swedish Government convened a working group tasked with assessing the ramifications of the invasion of Ukraine. In its report, the working group concludes that the Russian invasion drastically worsened the security situation in Europe. They judge this shift to be both a structural and a long-term shift. Consequently, the Swedish Government decided to apply for membership in NATO²⁰.

Further to this the Swedish Government and Parliament agreed to rapidly strengthen civil and military defence capacity. The Government's spring budget included a substantial new allocation to strengthening civil defence capabilities (as part of the civil preparedness).

The changed security context is bringing new risks e.g. supply chain disruptions can affect availability of products needed to maintain critical infrastructure and services.

3.5 Other emerging risks

Social Cohesion affects our resilience in many ways and social change may pose new challenges. Public attitude and public engagement during crisis is fundamental for resilience. While interpersonal trust and trust in crisis management authorities in Sweden is comparatively high, there are rising challenges²¹. Sweden is facing increasing levels of violence related to conflicts between criminal groups²². This in turn forms part of broader challenges with increasing segregation, marginalisation and an eroding overall trust and solidarity within Swedish society along with undue influence on democracy and human rights. In light of this MSB is emphasising the need to work actively to keep the public's trust²³. Increasing income disparity and differences in trust, which correlate with gender and education level, may be factors complicating this challenge. It is important to ensure a just society to ensure high social cohesion²⁴.

¹⁹ SOU 2022:10 https://coronakommissionen.com/wp-content/uploads/2022/02/summary_20220225.pdf

²⁰ DS 2022:7 https://www.regeringen.se/49a4b7/contentassets/b33a04c7ad954881ad6a571dc8553dbe/ett-forsamrat-sakerhetspolitiskt-lage---konsekvenser-for-sverige_webb.pdf

²¹ MSB. (2021). *Strengthening civil preparedness*. <https://rib.msb.se/filer/pdf/29824.pdf>

²² Brå. (2021). *Dödligt skjutvapenvåld i Sverige och andra europeiska länder*. Stockholm: Bråttförebyggande rådet. <https://bra.se/publikationer/arkiv/publikationer/2021-05-26-dodligt-skjutvapenvald-i-sverige-och-andra-europeiska-lander.html>

²³ MSB. (2021). *Strengthening civil preparedness*. <https://rib.msb.se/filer/pdf/29824.pdf>

²⁴ Person. M. (2018) *Framtida utveckling som kan påverka arbetet med samhällsskydd och beredskap - en uppdatering*. <https://www.msb.se/sv/publikationer/framtida-utveckling-som-kan-paverka-arbetet-med-samhallsskydd-och-beredskap--en-uppdatering-studie/>

The **transition to a climate neutral society and adaptation to climate** change may pose new societal challenges. Following transition to a climate neutral society, risks take on new forms and are redistributed. While climate adaptation may reduce vulnerability to climate effects and build a generally more robust society, it may simultaneously lead to increased vulnerability or risks in other areas, thus, simultaneously reducing resilience.

Technological risks may follow changes in our **energy production and consumption**. We might become more dependent on electricity due to increased electrification and digitalisation, which will likely lead to new types of risks. At the same time our energy system could become more diversified and local production could increase, this would lead to increased resilience but may also seem difficult to overview and thus vulnerable. The transition to a climate neutral society might also entail necessary limitations in the energy system that could come with new risks²⁵.

Vulnerability of cross-border infrastructure is also a concern, electricity supply is one such system. In addition, energy infrastructure is aging and suffering from low investment rates, this is a growing concern for energy supply. Alongside technical aspects, which affect resilience, the Swedish consumers are not well prepared for disruptions²⁶.

²⁵ Linnell, M. (2020). *Framtida samhällsrisiker, Energisystem och klimat i Sverige 2050*. MSB

²⁶ Person, M. (2018) *Framtida utveckling som kan påverka arbetet med samhällsskydd och beredskap - en uppdatering*. <https://www.msb.se/sv/publikationer/framtida-utveckling-som-kan-paverka-arbetet-med-samhallsskydd-och-beredskap--en-uppdatering-studie/>

4. Prospective review – Implementing the Sendai Framework

Sweden is currently undergoing major reform of its civil preparedness capacity, see section on risk governance above for detail. The primary focus of the reform is to strengthen Sweden's crisis management and total defence capacity. However, changes will also build Sweden's resilience e.g. through improved understanding of risk and through strengthened local, national and international collaboration. As such some parts of this reform will have direct bearing on Sweden's implementation of the Sendai Framework. Other risks, e.g. slow onset disasters such as climate change, will be mitigated in a new and ongoing development processes outside the current reform.

As mentioned in the section on risk governance, government agencies, regions and municipalities prepare a risk and vulnerability assessment with at least biannual frequency. Based on this, MSB performs a National Risk and Capability Assessment²⁷, which in 2021 identified seven areas in need of improvement. Here follows a brief presentation of each area of change and how they are linked to resilience, risk understanding, risk governance and risk financing as well as to Sweden's implementation of Sendai Framework henceforth.

4.1 Collaboration and command

Risks challenging Sweden in the future will demand joined-up response. All evidence from recent years point in the direction outlined in the Sendai Framework. Risks will be multi-faceted often with several concurring events affecting each other. As such, improved cooperation is necessary. Government agencies, regional authorities, municipalities, the business community and civil society need well-established structures for cooperation and clear mandates for effective command in crisis. This work will strengthen risk governance and risk understanding.

A crucial element of the reform is to establish joint systems for analysis before, during and after an event. The gap analysis of Sweden's Sendai Framework implementation also identifies joint analysis as an area for improvement. Risk analysis building on a multi-hazard and inclusive approach, shared with relevant actors, strengthens resilience in society.

Linked to this, the national expert council for climate adaptation underlines the importance of increased collaboration. The council suggest that climate adaptation measures need improved collaboration between administrative and geographic

²⁷ MSB. (2021). *Strengthening civil preparedness*. <https://rib.msb.se/filer/pdf/29824.pdf>

boundaries, and private and public stakeholders. The expert council also proposes that clearer requirements must be introduced for municipalities and regions to work with climate adaptation in a structured way.

SMHI also suggests that improved guidance is needed for conducting risk assessments relating to climate change. SMHI also sees that expectations on municipalities and all governance levels needs to be clarified.

It is however not clear as to whether these ambitions can move together in one joint process. The ongoing reform has a clear focus on preparedness for crisis management whereas the Sendai Framework, the 2030 Agenda and the Paris Agreement all emphasize broader analysis, identifying risks and mitigation measures for society as a whole as well as for sudden and slow onset events.

4.2 Critical infrastructure and security of supply

The Covid-19 pandemic and the war in Ukraine has highlighted the importance of critical infrastructure and security of supply. Currently Sweden is going through a process in which civilian government agencies, regions and municipalities in cooperation with the business community and the Swedish Armed Forces are working to establish procedures for maintenance, protection and prioritisation of critical infrastructure and security of supply. In addition Sweden is joining NATO and will as a member be included in enhanced work with resilience i.e. security of infrastructure and supply.

The importance of resilient infrastructure also comes into Sweden's work with climate change adaptation and implementation of the Sendai Framework. Aside from critical infrastructure and supply chains Sweden is working to understand and mitigate the effects of climate change. This work has just started and it includes a wide range of methods: from legislation, to use of geographic information systems. The Sendai Framework highlights structures and environments with strong ties to culture and heritage as specifically important, see the work of the Swedish National Heritage Board above. Also, structures whose damage could potentially pose a threat to the environment needs protection.

As above, Sweden's work to strengthen civil preparedness is closely linked to climate change adaptation and the Sendai Framework. It remains to be seen in which way these processes can be combined.

4.3 Information and Cyber Security

Successful crisis response rests on secure and robust communications systems. Digitalisation and the growing cyber threat brings new vulnerabilities. Actors need to be able to trust systems for communication and be able to share sensitive information. Sweden is establishing a National Centre for Cyber Security. Civil and Defence agencies, involved in cyber security, pool resources to the new centre that is tasked with supporting private and public entities in protection against cyber threats.

4.4 Public preparedness

The general population's interpersonal trust and trust in authorities are crucial for all crisis management. Similarly, public interest and capacity for preparedness in everyday life greatly adds to a country's response capacity. Effective communication is the key. During the Covid-19 pandemic Sweden identified a need for improved crisis communication. Both in terms of effective broad communication using different channels as well as in carefully targeted communication aimed at different groups different parts of society.

4.5 Local preparedness

Swedish municipal responsibilities include childcare, schools management, elderly care, water supply and waste management. Recent crisis has highlighted the need for improved preparedness at the local level. The current review will define prioritisation of essential services and their funding in times of crisis.

Local preparedness goes to the heart of the Sendai Framework. Local capacity to understand risk and make necessary preparations to respond and recover is crucial for a country's sustainability. Evidence from most disasters show that central resources and systems for support, while being important for medium to long-term response and recovery, have limited effects on response to acute crisis. Local preparedness, however, can make a substantial impact to any society's ability to manage severe crisis, also during its acute phase. Sweden's implementation of the Sendai Framework, thus far, has had a strong emphasis on local preparedness. Through participation in MCR 2030 several municipalities have developed local risk and vulnerability assessments. Findings from these assessments have been used to strengthen the local preparedness. A challenge going forward is how to increase this work and enable more municipalities to use the Sendai Framework and MCR 2030 to strengthen their local preparedness. Another challenge is how to strengthen the link between local and regional preparedness as highlighted under collaboration and command above. Furthermore, risk and vulnerability assessments need to be inclusive and involve all parts of society. Civil society groups continuously make their own local risk and vulnerability assessments and are an important asset. Risk and vulnerability assessments need to include routines for taking a more differentiated approach to vulnerability, acknowledging that vulnerabilities and capacities produce different risks for different parts of society.

4.6 Cross border cooperation

Sweden's ability to muster an efficient crisis response will at times depend on cross border cooperation, both bilateral and within multilateral structures. Sweden's capacity to receive international assistance needs to be developed. This includes setting up agreements and standard operating procedures with relevant actors. Also included is joint planning and training.

In regards to the Sendai Framework, Sweden has early on advocated for regional cooperation as a foundation for implementation of the framework. Sweden is actively involved in several European initiative for DRR, e.g. EFDRR, UIPM, the Haga cooperation with Nordic states, Council of the Baltic Sea States and MCR2030 Regional Coordinating Committee. Sweden will continue to engage with these forums to increase engagement and cross-border cooperation in DRR.

4.7 Legislation

Sweden's existing regulatory framework is not adapted to the new multi-faceted and concurrent events expected in the future. As such, a review of current legislation as well as the national civil defence regulation is included in the overarching review.

The need for revised legislation and regulation is also identified in the gap analysis. Sweden's current regulatory framework is not adapted to the multitude of risks Sweden is facing going forward.

The Swedish Expert Council on Climate Change Adaptation first report identified several laws that need to be changed to enable climate change adaptation.

One example is the planning and building act (2010:900 PBL) that regulates how the municipalities plan land-use. The council suggests that the legislation is changed so that the municipalities could consider all climate-related risks in their planning.

Another example is that the council suggests changing several different legislations to promote the implementation of nature-based, multifunctional climate adaptation measures. The reason is that the measures also encourage biodiversity and other societal benefits.

4.8 Disaster Risk Reduction targeting a broader set of risks

The Sendai Framework's multi-hazard approach including small-scale and slow-onset disasters is not fully covered in the seven areas outlined above. In order to counter the global negative trend of increasing levels of loss from disasters, the Sendai Framework urges all actors to handle the underlying driving forces behind the negative effect of disasters. These include poverty, social injustice and climate change. Each society needs to identify a broader set of risks and work to strengthen the resilience of its individuals in domains such as social, economic, cultural, health and education.

Looking over the gap analysis into Sweden's implementation of the Sendai Framework, the current civil preparedness reform, and the progress in disaster risk reduction during 2015-2022, more work is needed to identify and address a broader set of risks. How to go about this will need further analysis. One important starting point would be to look at how the three frameworks (the

Sendai Framework, the Paris Agreement and the 2030 Agenda) could be further integrated in their implementation. One example could be to integrate the work on ensuring that vulnerability and capabilities assessments are inclusive and target vulnerable groups according to their needs. Another possible example would be to strengthen local preparedness and to ensure that there is a sufficient mandate and resources to tackle a broad set of risks. Stronger private and public partnerships for improved disaster risk reduction could also be a vehicle for stronger integration of the three frameworks.

For the Sendai Framework a broader set of risks should also include integration of Sweden's work in other thematic areas. Issues with social cohesion, highlighted above, could be one such thematic area. Marginalized groups are more at risk during disasters and their ability to access support and services on equal terms affects their trust in society. Another possible domain is health. Health is featured throughout the Sendai Framework, however Sweden has thus far not included its work in tackling resilience as regards to health in the efforts towards fulfilling the Sendai targets.

Finally, in regards to a broader set of risks, it would be useful to look again at the target F. Sweden is a strong contributor to international development assistance also toward disaster risk reduction and resilience programming. How these contributions build resilience and national capacity to implement the Sendai Framework in developing countries could be further explored.

5. Examples of good practice

5.1 City of Helsingborg: DRR and resilience - electricity supply and communication

During the period 2018-22, the City of Helsingborg carried out extensive work towards reducing vulnerabilities and strengthening resilience in the event of sudden and serious disruptions in electricity supply and communication. This example illustrates how tangible resilience effects can be obtained by applying a DRR and resilience strategy/framework based on MCR2030. While this example mainly focuses on electricity supply the methodology is transferable to other thematic areas.

Risk understanding

The city of Helsingborg utilises the national methodology (RSA) to identify risks and vulnerabilities in its strategic operations. It allows the City to identify, evaluate and decide on risk mitigation and risk management measures. It also includes a section focusing on capability assessments. The analysis is part of the regular risk management process involving all city-departments and municipal companies. In addition to this core-process, there are complementing processes focusing on continuity management and crisis management. The RSA is compiled before each new term of office and the Municipal Council confirms its findings.

In the RSA for the period 2018-22, the City jointly identified vulnerability and dependency to electricity supply and communication as a major risk, which seriously could jeopardise critical services provided by the City.

Risk governance

Based on the RSA the City develops strategy. The strategic process serves to turn risk understanding into mitigating actions. It also builds political endorsement for cross-departmental projects. The current strategy (2018-2022) focuses on reducing vulnerability to disruptions in electricity-supply. The strategy tasks all departments and municipal companies to work proactively with measures that contribute to reducing vulnerability and strengthening resilience related to disruptions in electricity-supply. This includes regular simulation and desk-top exercises. In the course of the strategic process the City Management department developed a special project outlined below.

Special project on electricity supply and communication:

Preliminary studies completed as preparation of the project:

- Study describing what economic costs can be expected in the event of disruptions in electricity-supply and communications.
- Study describing how people can be expected to act in the event of disruptions in electricity-supply and communications.
- Study focusing on reserve power, what capabilities exist, what the needs look like and which reinforcements should be prioritized.

Based on the preliminary studies carried out, the following measures were designed and implemented (some are on-going):

Sub-project 1 – Acquisition of mobile reserve power plants that can be used in a priority order within the city to ensure operation of critical operations.

Sub-project 2 – Fuel asset management. For example fuel depot to supply vehicle fleet and stationary/mobile backup power plants during power outages.

Sub-project 3 – Communication analyses and establishment of a redundant city-wide radio network (shortwave radio) which enables communication between departments and critical stakeholders.

Sub-project 4 – Emergency stocks. Development of concepts for the purpose of establishing storage of critical consumables, etc.

Sub-project 5 – Emergency water. Development of an emergency water plan to ensure supply of minimum water rations to residents in the event of a power outage. Includes procurement of mobile water treatment plants capable of purifying both fresh and salt water.

Subproject 6 – Continuity planning. Training and method development to implement continuity planning across all departments.

Subproject 7 – Service and safety points. Establishment of special sites where, in the event of a crisis, the population can get up-to-date information, medical care, crisis support, rest, food and water.

Risk financing

The city receives an annual government grant to carry out crisis preparedness work in the face of extraordinary events. The grant partly finances DRR staff at the city management department, and partly appointed DRR coordinators in the city's departments. DRR staff in each department jointly coordinates and propel the city's work forward, guided by RSA and prioritised areas of actions.

Partnerships for risk management

The city of Helsingborg is a relatively large municipal organization with nine departments and municipal companies active in the energy, water, sanitation and port sectors. All actors actively participate in the city's DRR and resilience work. In the example concerning electricity supply, different departments and companies

are responsible for different sub-projects that aim to strengthen resilience regarding disruptions in electricity supply and communications.

Discussion

The above example demonstrates how the City of Helsingborg manages vulnerabilities and risks applying methods adapted from the MCR2030 and the Sendai Framework. An important lesson learnt is the significance of establishing transparent, functional and iterative processes of which there is a co-shared ownership among involved stakeholders. A top-down approach should be avoided as far as possible as it tends to suppress initiatives, efficacy and engagement from participating stakeholders.

Another lessons learnt is the importance of keeping a coherent, sequential and common thread throughout the process, from risk identification to completion and follow-up of actions that contribute to reduced risk and increased resilience.

Financing is another important aspect. But it is not just about heavy infrastructure investments. A lot of resilience work can actually be achieved only by administrative actions, e.g. developing strategies, standard operating protocols and ensuring consensus and cooperation in an organization.

Finally. While a catch-all approach may be appealing it often comes to nothing. A municipality is a complex organisation with an important societal mandate. Building resilience is a long-term commitment that should start with establishing elementary structures and processes endorsed by the municipal council.

5.2 Risk analysis in Nyköping municipality

An example from **Nyköping** is a recently made municipality-wide analysis for the risks of various forms of flooding. Nyköping is a coastal municipality with several streams. The municipality analyzed the impact of flooding. Maps and available data was used to predict effects of: coastal flooding; high flows in rivers and waterways; as well the impact of heavy rainfall. The analysis identifies risk areas with a focus on critical infrastructure and services that are at risk of being affected by floods. The analysis forms a starting point for future detailed analysis and investigations to guide Nyköping's urban planning and work with climate adaptation, which also includes a preparedness perspective. The analysis included a broad public commitment and helped to build understanding and commitment for change.



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SE-651 81 Karlstad Phone +46 (0)771-240 240 www.msb.se/en