EUROPEAN
COMMISSION

Adaptation preparedness scoreboard:

Country fiche for Sweden

NOTE TO THE READER

Under Action 1 of the EU's Strategy on adaptation to climate change (COM(2013)216), in collaboration with the Member States, the Commission developed an 'adaptation preparedness scoreboard'. Using the scoreboard, the Commission prepared country fiches on each Member State in an iterative consultation process.[1] The country fiches assess the Member States' adaptation policy as of June 2018, including the content of NASs and plans, for the following aspects:

- Institutional structure
- Quality of national vulnerability assessments
- Knowledge creation (national observation systems in relevant sectors[2] and climate modelling), transfer and use
- Action plans:
  - Quality (incl. the basis used for assessment of adaptation options)
  - Actual implementation mechanisms
- Funding mechanisms
- Mainstreaming into sectoral policies, in particular:
  - Disaster risk reduction
  - Spatial planning
  - Environmental impact assessment (EIA) (how the Directive is transposed)
  - Insurance policy
- Transboundary cooperation
- Monitoring mechanisms in different sectors and governance levels

[1] The first versions of the fiches, prepared in consultation with the Member States in 2014-15, were unpublished and used to fine-tune the scoreboard. The second drafts were published, after consulting the Member States, as background documents to the public consultation on this evaluation in December 2017. https://ec.europa.eu/clima/consultations/evaluation-eus-strategy-adaptation-climate-change_en The final Member State consultation on the draft fiches took place in June 2018.

[2] These relate for example to meteorology, floods, drought, sea level, coastal erosion, biodiversity, human/animal/plant health etc.

The fiches are based on internal work by the Commission and on targeted assistance from an external contractor. They also served as input to the assessment of Action 1 of the Strategy during its evaluation. Annex IX of the Commission's SWD(2018)461 on the evaluation of the Strategy presents a horizontal assessment of the 28 country fiches, while Annex X presents the list of scoreboard indicators and the methodology used in applying them.

The assessments in the country fiches (yes/no/in progress) need to be read in conjunction with the narrative that accompanies them. They assess the state of play within each EU Member State. While all effort has been made to ensure the coherence across fiches in the assessment of the same indicator, it should not be directly compared across the Member States. Two countries with a "yes" on the same indicator could have a different national situation leading to that assessment. Not all indicators have the "in progress" status, some can only be "yes" or "no".

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List of abbreviations

CAB	County Administrative Board
CBSS	Council of the Baltic Sea States
DRR	Disaster Risk Reduction
EUSBSR	European Union macro-regional Strategy for the Baltic Sea Region
FMH	Public Health Agency of Sweden (Folkhälsomyndigheten)
HaV	Marine and Water Management (Havs- och vattenmyndigheten)
MSB	Swedish Civil Contingencies Agency (Myndigheten för samhällsskydd och beredskap)
NAS	National Adaptation Strategy
RVA	Risk and Vulnerability Assessment
SGU	Geological Survey of Sweden (Statens geologiska undersökning)
SKL	Swedish Association of Local Authorities and Regions (Sveriges Kommuner och Landsting)
SMHI	The Swedish Meteorological and Hydrological Institute (Sveriges meteorologiska och hydrologiska institut)

POLICY FRAMEWORK

Adaptation strategies

A1. National adaptation strategy

The Swedish Government adopted a national adaptation strategy (NAS) in March 2018, which was discussed in the Parliament in June 2018, as a part of a Government bill. Previously, the Swedish overall policy for climate adaptation was laid out in "En sammanhållen energi och klimatpolitik - Klimat"bill of 2008[3]. Adaptation policy efforts are supported by a range of evaluation and strategic documents and implemented at national, regional and local levels.

The Swedish Commission on Climate and Vulnerability was appointed by the Swedish Government in 2005 to assess regional and local climate impacts, including costs. The 2007 vulnerability report[4] of the Commission makes recommendations, including increased responsibility for municipalities and County Administrative Boards (CABs), and facilitates Government financial support for large-scale, high-cost initiatives. Since then, the adaptation efforts in Sweden have been stepped up by various means, such as the assignments announced in "En sammanhållen energi och klimatpolitik - Klimat"[5] where the Government's overall policy for climate adaptation was laid out. Acknowledging the 2013 Council Conclusion on an EU Adaptation Strategy[6], the Swedish Government announced, in February 2016, that a national adaptation strategy (NAS) would be completed in 2018[7]. The Swedish Government appointed an inquiry with regard to financing and responsibilities to support the development of the NAS. The inquiry focused its mission on the built environment and natural climate-related hazards. The report "Vem har ansvaret"[8], which was resulted from the climate adaptation inquiry, was presented to the Government on 29 May 2017 and underpins the new NAS together with other reports, such as the "Kontrollstation 2015"[9] from the Swedish Meteorological and Hydrological Institute (Sveriges meteorologiska och hydrologiska institut, SMHI) and the report "Med miljömålen i focus – hållbar användning av mark och vatten[10]. The proposals for the NAS were developed in accordance with the general

[3] Govt. Bill 2008/09:162, En sammanhallen energi och klimatpolitik - Klimat, URL: http://www.regeringen.se/contentassets/cf41d449d2a047049d7a34f0e23539ee/en-sammanhallen-klimat--och-energipolitik---klimat-prop.-200809162

[4] Swedish Ministry of the Environment and Energy, 2007, Sweden Facing Climate Change – threats and opportunities, ID: SOU 2007:60, URL: http://www.government.se/legal-documents/2007/12/sou-200760/

[5] Govt. Bill 2008/09:162, En sammanhallen energi och klimatpolitik - Klimat, URL: http://www.regeringen.se/contentassets/cf41d449d2a047049d7a34f0e23539ee/en-sammanhallen-klimat--och-energipolitik---klimat-prop.-200809162

[6] Council of the European Union, 2013, Conclusion on an EU strategy on adaptation to climate change, URL: http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/envir/137508.pdf

[7] Regeringskansliet, 2016, Kontrollstation för de klimat- och energipolitiska målen till 2020 samt klimatanpassning, URL: Skr. 2015/16:87,http://www.regeringen.se/rattsdokument/skrivelse/2016/02/skr.-20151687/

[8] Swedish Government Official Reports, 2017, Vem har ansvaret?, ID: SOU 2017:42, URL: http://www.regeringen.se/49c4a3/contentassets/7931dd4521284343b9224e9322539e8d/vem-har-ansvaret-sou-201742

[9] SMHI, 2015, Underlag till kontrollstation 2015 , URL: https://www.smhi.se/tema/nationellt-kunskapscentrum-for-klimatanpassning/nyheter-fran-kunskapscentrumet/underlag-till-kontrollstation-2015-for-anpassning-till-ett-forandrat-klimat-1.79820

[10] Swedish Government Official Reports, ID SOU 2014:50, Med miljömålen i fokus, 2014 url: https://www.regeringen.se/rattsliga-dokument/statens-offentliga-utredningar/2014/06/sou-201450/

process of Swedish legislation and the development of policy guidelines. Proposals have been developed by the independent inquiries listed above and SMHI in cooperation with other national authorities. These are then referred to a large number of referral bodies and form the basis of the Government's proposal.

The Government adopted the NAS on 8 March 2018, as a part of the Bill 2017/18:163 "Nationell strategi för klimatanpassning"[11]. The Bill will be debated in Parliament in June and the Parliament will vote on the legislative propositions. The Bill contains two proposed changes to the Planning and Building Act (Plan- och bygglagen) (2010:900)", which aim to improve the adaptation preparedness of the municipalities. If adopted, the legal changes will enter into force on 1 August 2018. The NAS itself was adopted by the Government in March 2018 and is, thus, already in force.

The Ministry of the Environment and Energy is responsible for the Government's overarching policy work concerning climate, including climate adaptation. Each ministry is then responsible for climate adaptation within its respective area; accordingly, work on adaptation is divided among several government agencies. SMHI plays an important role among the national agencies, as it is responsible for the Swedish National Knowledge Centre for Climate Change Adaptation. This National Knowledge Centre provides tools and information to help society cope with a changing climate, and is a hub for science, policy and practice on adaptation. The Centre also runs the Swedish portal for climate adaptation, in cooperation with several Swedish authorities. As stated in the NAS, SMHI will establish a cross-sectoral expert group on adaptation and SMHI will also have a special role in following up on the work on adaptation in Sweden. As a result of the NAS the Government has decided that the National Board on Planning, Building and Housing should coordinate adaptation within physical planning[12].

The NAS outlines the main principles for Sweden's work on climate adaptation. These guiding principles are sustainable development, reciprocity, scientific basis, the precautionary principle, integration of adaptation measures, flexibility, management of factors of insecurity and risk, time-perspective and transparency. The NAS also aims at clarifying responsibilities, improving coordination and establishing a policy cycle for monitoring, evaluation and revision[13].

A2. Adaptation strategies adopted at subnational levels

Since 2009, the administrative boards of the regions, CABs, are responsible for coordinating climate adaptation at regional level[14]. They also support the adaptation work of the local authorities, who have the main responsibility for climate adaptation at the local level. Since 2013, the CABs have additional responsibilities regarding climate adaptation, such as the development of regional action plans, in cooperation with relevant stakeholders, to guide the

[11]Regeringen, 2018, Govt. bill 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[12] Regeringen, 2018, M2018/01716/Kl, Uppdrag att samordna det nationella klimatanpassningsarbetet för den byggda miljön.

[13]Regeringen, 2018, Govt. Bill 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[14] Klimatanpassningsportalen, 2017, Vem har ansvaret?, URL: http://klimatanpassning.se/roller-och-ansvar/vem-har-ansvaret/vem-har-ansvaret-1.25819, Date accessed: 15/05/2018

local and regional climate adaptation efforts[15]. Many of the regional adaptation plans (see B2) are also strategic in nature, but there are no specific regional adaptation strategies.

Adaptation action plans

B1. National adaptation plan

There is no national adaptation plan. Instead, the 21 CABs have developed regional adaptation plans and the CABs and 32 national authorities are assigned through an ordinance to develop action plans within their own areas of responsibility.

B2. Adaptation plans adopted at sub-national level

Climate impact assessment studies have been carried out for all 21 regions; most of them were performed by the SMHI, following a decision by the Government in 2015[16]. Following a government decision, all 21 CABs have adopted regional adaptation plans[17]. These plans cover the whole of Sweden, with nearly 800 proposed actions[18]. The main actions proposed in the plans concern flood protection, protection of drinking water, shoreline protection, infrastructure (roads, railways), adaptation of agriculture and forestry, resilience to heat waves and health care. An overview of the regional adaptation plans is available as a summary and some of the CABs have updated their adaptation plans since 2016[19].

There is considerable coordination and exchange activity between the 21 CABs, partly through the National Network for Adaptation (Myndighetsnätverket för klimatanpassning, for more see Indicator 1b)[20].

Much of the responsibility for climate adaptation action lies with the municipalities. The municipalities are responsible for water supply, waste management, urban planning and disaster risk reduction. The engagement around adaptation questions at municipal level is, according to the CABs, increasing, but there is still substantive work to be done at the municipal level (see Indicator 9a below).

In the NAS, the Government states that the needs in relation to different levels of responsibility and coordination, including the responsibilities of the CABs, should be clarified[21].

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[15] Regeringen, Social Departementet, 2013, Regeringsbeslut IV:7, Regleringsbrev, 39. Regionala planet for klimatanpassningsarbetet, URL: https://www.esv.se/statsliggaren/regleringsbrev/?RBID=14887

[16] Regeringen, Miljödepartementet, 2015, Regleringsbrev för budgetåret 2015 avseende Sveriges meteorologiska och hydrologiska institut, URL: https://www.esv.se/statsliggaren/regleringsbrev/?RBID=16410

[17] Regeringen, Social Departementet, 2013, Regeringsbeslut IV:7, Regleringsbrev, 39. Regionala planet for klimatanpassningsarbetet, URL: https://www.esv.se/statsliggaren/regleringsbrev/?RBID=14887

[18] Government Offices of Sweden, Ministry of the Environment and Energy, 2017, Sweden's Seventh National Communication on Climate Change, p. 92, URL: http://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/6950713_sweden-nc7-1-swe_nc7_20171222.pdf

[19] Klimatanpassningsportalen, 2018, Regionala handlingsplaner for klimatanpassning, URL: http://www.klimatanpassning.se/roller-och-ansvar/vem-har-ansvaret/regionala-handlingsplaner-for-klimatanpassning-1.77455, Date accessed: 15/05/2018

[20] Klimatanpassningsportalen, 2017, Verksamhetsbeskrivning, URL: http://www.klimatanpassning.se/polopoly_fs/1.114883!/Verksamhetsbeskrivning%20Myndighetsn%C3%A4tverket%20f%C3%B6r%20Klimatanpassning.pdf

In June 2018, the Riksdag approved two amendments to the Planning and Building Act (2010: 900), which aims to improve the preparedness of the municipalities for climate change. One of the amendments requires municipalities to give their opinion in the Municipal Comprehensive Plan on the risk of damage to the built environment from floods, landslides and erosion caused by climate change, as well as on how such risks can be reduced or eliminated. This is a step towards local action plans for adaptation, integrated into the ordinary processes of the municipality.

B3. Sectoral adaptation plans

Within the existing adaptation framework, work is largely organised into relevant sectors, which is being undertaken in a considerable number of them. A number of government agencies (about 30) are actively working on climate adaptation and, by June 2018, 32 national authorities and the CABs were assigned through an ordinance to develop action plans within their own areas of responsibility.

Seventeen national agencies have already developed, or are in the process of developing, action plans for the sectors for which they are responsible[22]. These are; the National Electrical Safety Board (Elsäkerhetsverket), The Swedish Agency for Marine and Water Management (Havs- och vattenmyndigheten, HaV), the Swedish national heritage board (Riksantikvarieämbetet), the Sami Council (Sametinget), the Swedish Forest Board (Skogsstyrelsen), Swedish Geotechnical Institute (Statens geotekniska institut), the Swedish Board for Agriculture (Statens jordbruksverk), the National Veterinary Institute (Statens veterinärmedicinska anstalt), the Geological Survey of Sweden (Statens geologiska undersökning, SGU), the Swedish Agency for Economic and regional Growth (Tillväxtverket), the Swedish transport administration (Trafikverket), the Swedish Transport Agency (Transportstyrelsen), the Public Health Agency of Sweden (Folkhälsomyndigheten, FMH), the Swedish Environmental Protection Agency (Naturvårdsverket), Swedish Meteorological and Hydrological Institute (SMHI), the Swedish Armed Forces (Försvarsmakten) and the National Food Agency (Livsmedelsverket).

The Government also delegates various adaptation-related assignments to sectoral agencies. In 2018, a number of agencies were tasked with creating a sectoral adaptation plan or report on their adaptation work, including the Swedish Armed Forces (Försvarsmakten), FOI (Totalförsvarets forskningsinstitut), Swedish Energy Agency (Statens energimyndighet), Swedish grids (Svenska kraftnät), the National Electrical Safety Board , SMHI, Swedish Environment Protection Agency (Naturvårdsverket), the Swedish Agency for Marine and Water Management, the Swedish transport administration, the Swedish Marine Administration (Sjöfartsverket) and Swedish Civil Contingencies Agency (Myndigheten för samhällsskydd och beredskap, MSB). As most adaptation issues are multidisciplinary, they are largely addressed in collaboration between different actors and sectors at the national, regional and local level.

[21]Regeringen, 2018, Govt. bill 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[22]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

An overview of the remits of national agencies and their completed[23] and ongoing[24] adaptation activities is available at the climate adaptation portal.

SCOREBOARD

Step A: Preparing the ground for adaptation

1. Coordination structure

1a. A central administration body officially in charge of adaptation policy making

Yes / No

In Sweden, the Ministry of the Environment and Energy has overall responsibility for coordinating the Government's policy work on climate mitigation and adaptation.

The responsibility for implementing climate adaptation policy lies with the CABs and the local authorities, as well as with a number of the Government's ministries and agencies[25].

In the NAS, the Government states that the responsibilities relating to climate adaptation policy will be clarified and that national agencies shall initiate, support and evaluate climate adaptation actions within their area of responsibility[26]. The Government decided on a new ordinance giving such a mandate to 32 national authorities and the CABs in June 2018.

1b. Horizontal (i.e. sectoral) coordination mechanisms exist within the governance system, with division of responsibilities

Yes / **In progress** / No

The Ministry of the Environment and Energy has overall responsibility for coordinating the Government's policy work on climate mitigation and adaptation.

Horizontal coordination within the Government also takes place through regular working arrangements between the Government offices, in which the Government's decisions are taken by consensus.

Each ministry is responsible for climate adaptation within its respective area of responsibility[27]. Accordingly, the work on climate adaptation is divided among several government agencies, based on their respective sectoral responsibilities. Agencies also have responsibilities for emergency-response management.

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[23] Klimatanpassningsportalen, Vad har gjorts på myndigheterna, URL: http://www.klimatanpassning.se/roller-och-ansvar/genomforda-aktiviteter/vad-har-gjorts-pa-myndigheterna-1.100055, Date accessed: 15/05/2018

[24] Klimatanpassningsportalen, På gång fran myndigheterna 2018, URL: http://www.klimatanpassning.se/roller-och-ansvar/kommande-underlag/pa-gang-fran-myndigheterna-2018-1.134104, Date accessed: 15/05/2018

[25] Klimatanpassningsportalen, Vem har ansvaret http://www.klimatanpassning.se/roller-och-ansvar/vem-har-ansvaret/nationellt-1.26917, Date accessed: 15/05/2018

[26] Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[27] Regeringskansliet, 2017, Vem har ansvaret?, ID: SOU 2017:42, URL: http://www.regeringen.se/49c4a3/contentassets/7931dd4521284343b9224e9322539e8d/vem-har-ansvaret-sou-201742

During 2016, the previous network of authorities behind the climate adaptation portal was transformed into the National Network for Adaptation, with a wider remit. Nineteen national agencies with responsibilities for adaptation, as well as the 21 CABs participate in the network, which aims to increase societal resilience to climate change[28]. The secretariat for the Network is provided by SMHI.

The participants in the Network work together to strengthen the adaptive capacity of all elements of society. The cooperation includes development of information and data, increased engagement to spread information, sharing information, education, evaluation and impact assessment, and coordination around identified needs and finance.

There are a number of sectoral networks and delegations. These include networks for coastal erosion, drinking water, hillside erosion and landslides, animal health and husbandry and water flow in dams[29].

The Government has established a national expert council for climate adaptation to follow up work on climate adaptation and secure a holistic picture of the work under way. It is intended that this council should have a broad mandate from society and have contact with representatives from academia, business and sectoral organisations, national and regional authorities and the Swedish Association of Local Authorities and Regions. The council is also expected to identify knowledge gaps and be a part of the evaluation and revision of the NAS.[30].

The NAS further clarifies the sectoral responsibility of the national agencies. As a result of the NAS, the Government has decided on an ordinance that stipulates that 32 agencies should initiate, support and evaluate climate adaptation work within their sector[31]. The strategy clarifies which agencies have responsibilities for adaptation measures and coordination and calls for the establishment of new mechanisms for coordination, monitoring and evaluation.

1c. Vertical (i.e. across levels of administration) coordination mechanisms exist within the governance system, enabling lower levels of administration to influence policy making

Yes / **In progress** / No

The roles and responsibilities of climate adaptation in Sweden are divided across different levels – from local and regional to national (see Sections A1, A2, B1).

[28] Government Offices of Sweden, Ministry if the Environment and Energy, 2017, Sweden's Seventh National Communication on Climate Change, p. 92, http://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/6950713_sweden-nc7-1-swe_nc7_20171222.pdf

[30]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[31]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

The CABs have a regional network, which aims to facilitate coordination of adaptation[32].

At the municipal level, the Swedish Association of Local Authorities and Regions coordinates a virtual network, which gathers local authorities to exchange about best practices and challenges in relation to climate adaptation[33]. The aim is to support local authorities in their adaptation work, and to provide a forum for dialogue and exchange of experiences.

Since 2009, the CABs provide an annual report to the Government on their progress with climate adaptation[34]. The CABs have also been active in preparing reports and commenting, as referral bodies, on the reports "Med miljömålen i fokus – hållbar användning av mark och vatten[35]", "Vem har ansvaret?[36]" and "Kontrollstation 2015" by SMHI. Representatives from the Government Offices working with adaptation also take part in the CABs national meetings twice per year.

The CABs follow up on the adaptation work carried out at local level and have the power to review and examine decisions on physical planning taken by the local authorities. Inter-municipal and transboundary aspects, such as floods, are also being coordinated.

There is a network for sustainable cities, "Hållbar stad", involving actors from different levels, which aims to share knowledge, best practices and create new opportunities linked to urban adaptation[37].

2. Stakeholders' involvement in policy development

2a. A dedicated process is in place to facilitate stakeholders' involvement in the preparation of adaptation policies

Yes / No

Stakeholder involvement is an established practice in Sweden; stakeholders are involved in developing adaptation plans at the county and municipal level, as well as in various research projects exploring sectoral adaptation policy options, e.g. in forestry. Numerous stakeholders contribute to Sweden's adaptation policy landscape. The overall Swedish policy is to actively support dialogue, participation and the creation of networks between relevant actors at all levels. Stakeholders engaged are typically from the public bodies (including academic experts) as well as from private companies. Each sector is responsible for their area of work and for ensuring that actions are taken by different stakeholders concerned. The level of progress across sectors differs; some sectors have come a long way while others are just starting. Four dialogue events with representatives of private companies were organised in

[32]Regeringskansliet, 2017, Vem har ansvaret?, ID: SOU 2017:42, URL: http://www.regeringen.se/49c4a3/contentassets/7931dd4521284343b9224e9322539e8d/vem-har-ansvaret-sou-201742

[33]Sveriges Kommuner och Landsting, Nätverk, klimatanpassning, URL: https://skl.se/samhallsplaneringinfrastruktur/planerabyggabo/klimatanpassning/natverkklimatanpassning.3497.html, Date accesed: 08/05/2018

[34]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[35] SOU 2014:50

[36] SOU 2017:42

[37] Hållbarstad, URL: https://hallbarstad.se/om-oss/, Date accessed: 10/05/2018

2014. Such events were also held in 2015, as part of SMHI's work on the report "Underlag till kontrollstation 2015 för anpassning till ett förändrat klimat". In addition, there is on-going sector-specific dialogue between national agencies and various stakeholders.

2b. Transboundary cooperation is planned to address common challenges with relevant countries

Yes / No

Sweden is one of the leading countries in the context of the EU Macro-Regional Strategy for the Baltic Sea Region[38], and there is exchange of information with other Nordic Countries mainly at the scientific level. The climate agenda is driven by the active work of the Baltic 2030 Unit of the Council of the Baltic Sea States (CBSS) Secretariat[39] which is in charge of the EUSBSR Horizontal Action CLIMATE[40]. The EUSBSR is a front runner in the area of climate change. The Baltadapt project[41] formulated a Strategy and Action Plan on Adaptation to Climate Change in the Baltic Sea Region. The governance mechanisms, such as the Baltic Sea Region Climate Dialogue Platform[42], involve all countries around the Baltic Sea and their various levels of governance thereby helping to advance climate adaptation in the Baltic Sea countries. There are many significant projects on adaptation being implemented under the EUSBSR, e.g. iWater Integrated Storm Water Management (2015–2018)[43].

During its presidency of the Arctic Council in 2011-2013, Sweden initiated work with the Arctic Resilience Report. The goal was to integrate work on resilience into the actions of the Arctic Council, something that is now a reality even if there is space for improvement.

Sweden holds the presidency in the Barents cooperation in 2018-2019 and the Swedish Government has decided to prioritise climate mitigation and adaptation during its presidency[44].

In the NAS, there is a section describing current transboundary cooperation to address common climate adaptation challenges and a general acknowledgement of the importance of transboundary cooperation, especially in relation to food production. However, the NAS does not outline and actions relating to transboundary cooperation[45].

[38] EUSBSR, EU Strategy for the Baltic Sea Region, URL: http://www.balticsea-region-strategy.eu/, Date accessed 16/05/2018

[39] Council of the Baltic Sea States, EUSBSR Horizontal Action Climate, URL: http://www.cbss.org/strategies/horizontal-action-climate/, Date accessed 16/05/2018

[40] Council of the Baltic Sea States, 2015, Cooperation on sustainable development in the Baltic Sea Region – climate change adaptation case study, UL: http://www.cbss.org/wp-content/uploads/2015/11/CBSS-PL-PRES-non-paper-on-sustainable-development-and-climate-change-adaptation.pdf

[41] Balt adapt, URL: http://www.baltadapt.eu/, Date accessed 16/05/2018

[42] Council of the Baltic Sea States, EUSBSR Horizontal Action Climate, URL: http://www.cbss.org/strategies/horizontal-action-climate/, Date accessed 16/05/2018

[43] Integrated storm water, URL http://www.integratedstormwater.eu/, Date accessed 16/05/2018

[44] Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[45]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

Step B: Assessing risks and vulnerabilities to climate change

3. Current and projected climate change

3a. Observation systems are in place to monitor climate change, extreme climate events and their impacts

Yes / **In progress** / No

SMHI and its Rossby Centre collects observational data[46] nationally on the atmosphere, rivers and surrounding seas. These data are quality controlled and used in weather forecasting, climate modelling and assessments. SMHI has also produced climate indicators to show changes or to illustrate complex phenomena in a simple way. The common measures are yearly, seasonal or monthly values for different parameters that describe the climate. SMHI's Rossby Centre pursues research on climate processes and the behaviour of the climate system. The principal tools are global and regional climate models developed within the research unit.

The Swedish Environmental Protection Agency is responsible for coordinating environmental monitoring. This monitoring not only helps those concerned to follow climate impacts on all biogeochemical systems but also how adopted measures affect ecosystems and society in the long term.

A database of natural disasters is kept by the Civil Contingencies Agency but does not contain information about costs. Some monitoring on economic impacts is carried out by the industry association for insurers, Swedish Assurance.

3b. Scenarios and projections are used to assess the economic, social and environmental impacts of climate change, taking into account geographical specificities and best available science (e.g. in response to revised IPCC assessments)

Yes / In progress / No

SMHI's Rossby Centre presents climate scenarios[47] as maps, diagrams and downloadable data, with scenarios extending to 2100. The four scenarios presented and adapted for Sweden are based on representative concentration pathways (RCP2.6, RCP 4.5 and RCP 8.5) from the IPCC Fifth Assessment Report (AR5) as well as A1B from IPCC AR4[48]. There is also information explaining the results and the models on which they have been based. An introduction to climate scenarios is available[49], as well as guidance[50], that provides support for interpreting and using climate scenarios. Reports from SMHI provide geographically-detailed information about climate trends in Sweden, depending on future levels of greenhouse gases.

[46] SMHI, Climate indicators, http://www.smhi.se/en/climate/climate-indicators/climate-indicators-1.91461, Date accessed: 9/05/2018
[47] SMHI, Climate scenarios, https://www.smhi.se/en/climate/climate-scenarios, Date accessed: 9/05/2018
[48] SMHI, Climate scenarios, https://www.smhi.se/en/climate/climate-scenarios#sc=rcp85, Date accessed: 9/05/2018
[49] SMHI, Klimatscenarier, https://www.smhi.se/klimat/framtidens-klimat/2.2248/2.2252/2.2274, Date accessed: 9/05/2018
[50] SMHI, Klimatscenarier, https://www.smhi.se/klimat/framtidens-klimat/2.2248/2.2252/2.2274/haag.html#natvar, Date accessed: 9/05/2018

3c. Sound climate risks/vulnerability assessments for priority vulnerable sectors are undertaken to support adaptation decision making

Yes / In progress / No

Since 2015, a number of sectoral action plans have been developed (see Section B3 for a list). Many of these also contain risks and vulnerability assessments and in some sectors are translated into actions. An ordinance adopted by the Government in June 2018 stipulates that 32 national authorities within different sectors (such as agriculture, biodiversity, construction, defence, energy, fisheries, forestry, health, industry, and water), as well as the CABs, shall undertake climate risk and vulnerability assessments and develop action plans based on them. Many adaptation actions are already happening. Examples include the National Board of Housing, Building and Planning (Boverket), which is developing updated building standards based on climate assessments[51], and the Swedish transport administration, which has integrated risk and impact assessment in its work with transport systems. Adaptation actions are highly sector-driven but initiated and evaluated at national government level.

In the NAS, the Government outlines that specific risk areas in relation to erosion, landslides and floods will be identified in terms of probability, potential consequences and specific circumstances and these risk areas will be prioritised. In addition, the NAS states that responsibilities in relation to flooded agricultural lands will be analysed.[52]

In June 2018, the Riksdag approved the Government proposal in the Bill 2017/18:163 to make it compulsory for local authorities to undertake comprehensive climate risk assessments and use them as a basis when creating master plans[53].

3d. Climate risks/vulnerability assessments take transboundary risks into account, when relevant

Yes / **In progress** / No

Climate risk and vulnerability assessments sometimes take transboundary risks into account where relevant, usually in research projects. In the Nordic region, collaboration is under way on the national web portal for climate adaptation and on the development of climate services. Swedish researchers are involved in many international research projects and programmes that address adaptation, such as: JPI Climate; the Nordic Top-Level Research Initiative (TRI) Collaboration Projects Green Growth in an Era of Climate Change; and the Nordic Centre of Excellence (NCoE) NORD-STAR, which aims to develop tools to help the Nordic countries address a warmer climate and its policy impacts. Through work in the Baltic Sea Region[54] (see Indicator 2b), there is also regional cooperation to address transboundary risks.

[51] Boverket, URL: http://www.boverket.se/en/start-in-english/, Date accessed: 11/05/2018
[52]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf
[53]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf
[54] EUSBSR, EU Strategy for the Baltic Sea Region, URL: http://www.balticsea-region-strategy.eu/, Date accessed 16/05/2018

While these examples demonstrate that there are a significant number of transboundary projects, they have not yet reached the stage of planning for actual transboundary adaptation initiatives.

4. Knowledge gaps

4a. Work is being carried out to identify, prioritise and address the knowledge gaps

Yes / In progress / No

Based on the Government's research proposition 2017[55], the Swedish Research Council – Formas was commissioned to set up a ten-year national research programme on climate and another on sustainable urban development. The programmes will promote community-relevant research on, among other things, climate adaptation[56].

Climate change and preserving biodiversity, the marine environment and a non-toxic environment are the Government's top environmental priorities[57]. Various institutions fund climate adaptation research, notably the Swedish Foundation for Strategic Environmental Research (MISTRA), the Swedish Research Council (Vetenskapsrådet) and the Swedish Environmental Protection Agency. Public and private stakeholders are encouraged or required to be engaged in many of the funded projects (notably MISTRA, Swedish Environmental Protection Agency), with the project teams and with the advisory boards.

In setting priorities for programming, the emphasis is on involving representatives from the science administration rather than from societal stakeholder groups or policy makers. Prioritisation of knowledge gaps often takes place on an ad hoc basis rather than systematically in a formal setting. Identified knowledge gaps are used to prioritise public funding for research on climate impacts, vulnerabilities and adaptation. MISTRA has recently asked an international group of experts to evaluate MISTRA's climate research and advise on knowledge gaps and future research priorities.

Knowledge gaps have also been identified and addressed in other ways, for example, in some of the national agencies' action plans. For example, the Environment Protection Agency has analysed research challenges presented by storm water[58].

The Government highlights in the NAS that there is a need for more research on climate impacts, which it emphasises needs to be made available for use in climate adaptation and development[59].

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[55] Regeringen, Proposition 2016/17:50, Kunskap i samverkan – för samhällets utmaningar och stärkt konkurrenskraft, URL: http://www.regeringen.se/4adad0/contentassets/72faaf7629a845af9b30fde1ef6b5067/kunskap-i-samverkan--for-samhallets-utmaningar-och-starkt-konkurrenskraft-prop.-20161750.pdf

[56] Regeringen, Proposition 2016/17:50, Kunskap i samverkan – för samhällets utmaningar och stärkt konkurrenskraft, URL: http://www.regeringen.se/4adad0/contentassets/72faaf7629a845af9b30fde1ef6b5067/kunskap-i-samverkan--for-samhallets-utmaningar-och-starkt-konkurrenskraft-prop.-20161750.pdf

[57] Altogether, there are 24 strategic research areas identified, including climate models, effects on natural resources, ecosystem services and biodiversity, and research on the marine environment.

[58] Naturvårdsverket, 2017, Analys av kunskapsläget för dagvattenproblematiken, URL: http://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/regeringsuppdrag/2017/analys-kunskapslaget-dagvattenproblematiken.pdf

5. Knowledge transfer

5a. Adaptation relevant data and information is available to all stakeholders, including policy makers (e.g. through a dedicated website or other comparable means)

Yes / In progress / No

SMHI's Rossby Centre collects, develops and disseminates information about climate change through publications, seminars, lectures, films, education material for schools, etc. SMHI also runs the portal for climate adaptation, "Klimatanpassningsportalen"[60], an initiative by the National Network for Adaptation. The portal supports those who work on adaptation issues at all levels of Swedish society. A dialogue is maintained between the agencies to gradually develop the portal at regular intervals. Every agency is responsible for their area of expertise and the combination provides a broad spectrum of information. The portal provides information on potential impacts in a wide variety of sectors; energy, spatial planning and housing, cultural heritage, agriculture and forestry, natural environment and ecosystems, land and soil, water and sewerage, health care. It also provides information on the impact on Sweden of global changes. The portal contains information about risk management, how an adaptation plan can be developed and examples of how climate adaptation can be integrated in daily work. The information is intended to support both short and long-term adaptation. There is a special emphasis on content for municipalities and county administrative boards. The portal includes a lot of useful materials, including case studies that offer insights that can be transferred to other areas. It also includes tools, such as VisAdapt, which aims to increase Nordic homeowners' adaptive capacity to climate change by guiding them as to how they can reduce weather-related impacts. There is ongoing communication with the other Nordic portals and the EU portal, Climate-ADAPT.

There are also a number of sector-specific information portals and websites, for example, the Flood portal[61] and the map service for landslides and erosion[62] from the Swedish Geotechnical Institute. These more general analyses have been used as a basis for the NAS[63].

There are numerous knowledge centres in Sweden for climate information that promote active dialogue for the purpose of providing knowledge and high-quality decision support in the area of climate mitigation and adaptation for the public and business sectors as well as for citizens, such as the Swedish Environmental Protection Agency, Swedish Energy Agency, Swedish Consumer Agency, Swedish Forest Agency, Swedish Board of Agriculture, SMHI, Swedish Transport Administration, Swedish Defence Research Agency and, notably, the Swedish Civil Contingencies Agency, which has a national database for natural hazards.

In the NAS, the Government emphasises the need for accurate climate information to enable decision making and planning. There is a specific emphasis on the need for mapping and data collection[64].

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[59]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[60] Klimatanpassningsportalen, URL: http://www.klimatanpassning.se/, Date accessed: 12/05/2018

[61] MSB, Översvämning, https://www.msb.se/sv/Forebyggande/Naturolyckor/Oversvamning/, Date accessed: 11/05/2018

[62] SGI, Kartvisningstjänst för vägledning ras, skred, erosion, http://www.swedgeo.se/sv/produkter--tjanster/kartor-data-och-verktyg/vagledning-ras-skred-erosion/, Date accessed: 11/05/2018

[63]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

5b. Capacity building activities take place; education and training materials on climate change adaptation concepts and practices are available and disseminated

Yes / In progress / No

The work of the Rossby Centre is guided by the Government's instructions, which accord with strategic priorities that are identified by systematic analysis of stakeholder requirements, for example, with the help of the national network on adaptation, and informed by SMHIs climate expertise and research.

The Centre collects, develops and shares research, information from authorities and learning examples to facilitate sound decision making. The Centre also offers lectures and customised training courses on climate change for companies, local authorities and Government agencies. Interactions with counties, municipalities and businesses (see Indicator 2a) could be regarded as having a capacity-building element.

In addition, there are several examples of innovative approaches to disseminating knowledge about adaptation. One example is the on-line courses offered by the National Board of Housing, Building and Planning though their online academy[65]. Another example is production of specific films for certain target groups, for example, on adaptation to heat waves, offered by the Public Health Authority[66].

Step C: Identifying adaptation options

6. Adaptation options' identification

6a. Adaptation options address the sectoral risks identified in 3c, the geographical specificities identified in 3b and follow best practices in similar contexts

Yes / No

The adaptation options are based on early analysis in the 2007 report, which identifies both climate risks and corresponding adaptive measures to reduce the vulnerability of each sector concerned. This was updated in 2015 by SMHI in the report "Basis for Check point 2015 (for adaptation to a changing climate?)"[67]. The report was developed in cooperation with a large number of government agencies and other stakeholders from, among others, private companies. About 30 government agencies covering key vulnerable sectors[68] are working with different actions, such as developing guidelines or altering existing policies. A total of 17 national agencies and the CABs have or are in the process of developing sectoral action

[64] Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[65] Boverket, Klimatanpassning i planeringen, URL: https://boverket.onlineacademy.se/external/play/2331, Date accessed: 10/05/2018

[66] Folkhälsomyndigheten, Beredskap vid värmebölja, URL: https://www.folkhalsomyndigheten.se/livsvillkor-levnadsvanor/miljohalsa-och-halsoskydd/beredskap-vid-varmebolja/, Date accessed: 16/05/2018

[67] SMHI, 2015, Underlag till kontrollstation 2015 för anpassning till ett förändrat klimat URL:http://www.smhi.se/polopoly_fs/1.86329!/Menu/general/extGroup/attachmentColHold/mainCol1/file/Klimatologi%20Nr%2012.pdf

[68] Klimatanpassningsportalen, Vad har gjorts på myndigheterna, URL: http://www.klimatanpassning.se/roller-och-ansvar/genomforda-aktiviteter/vad-har-gjorts-pa-myndigheterna-1.100055, Date accessed: 10/05/2018

plans, which include risk assessments and identification of adaptation options (see Section B3). As a result of the NAS, the Government has mandated 32 national authorities and the CABs to initiate, support and follow up climate adaptation within their area of responsibility, to assess climate vulnerabilities and develop adaptation action plans. Adaptation options have also been identified by the CABs in the regional adaptation plans.

6b. The selection of priority adaptation options is based on robust methods (e.g. multi-criteria analyses, stakeholders' consultation, etc.) and consistent with existing decision-making frameworks

Yes / No

Since selection of priority adaptation options is taking place at the local, regional and sectoral levels, it is difficult to assess the basis of their selection in general terms. However, actions highlighted in the regional action plans are selected and prioritised based on expert judgement and stakeholder consultation. The same is true for the national sectoral action plans.

6c. Mechanisms are in place to coordinate disaster risk management and climate change adaptation and to ensure coherence between the two policies

Yes / **In progress** /No

Sweden has a framework for disaster risk reduction, which includes working in forums[69] on crisis preparedness; work that is coordinated by the MSB. The CABs are responsible for acting as coordinators with regard to disaster risk reduction within their geographical area. No evidence is provided on how climate adaptation practitioners are involved in such forums.

All counties, municipalities and other local authorities are required to carry out a risk and vulnerability assessment (RVA)[70]. Climate adaptation is an integral part of an RVA. The MSB supports municipalities and county administrative boards to integrate climate adaptation in their work. MSB has developed a number of pieces of guidance on how to integrate climate adaptation in the municipal RVAs. Several risk scenarios, such as on heat waves, floods and cloud bursts, are made available to be used in planning crisis preparedness.

7. Funding resources identified and allocated

7a. Funding is available to increase climate resilience in vulnerable sectors and for cross-cutting adaptation action

Yes / In progress /No

While no specific budget is attached to the NAS, funding is available for adaptation actions.

[69] MSB, 2014, Swedish Forums for Crisis Preparedness, URL: https://www.msb.se/RibData/Filer/pdf/27455.pdf

[70] MSB, Förebyggande kresberedskap, Risk och sårbarhetsanalyser, URL: https://www.msb.se/sv/Forebyggande/Krisberedskap/Risk--och-sarbarhetsanalyser/, Date accessed: 10/05/2018

For 2018-2020, the Government has proposed SEK461 million (app. EUR 44.8 million[71]) of public funding for climate adaptation and climate services, capacity building, the Swedish National Knowledge Centre for Climate Change Adaptation and the portal for climate adaptation[72]. Through this allocation, resources are also provided to a number of public agencies, such as SMHI, MSB, the Swedish Mapping, Cadastral and Land Registration Authority and the Swedish Geotechnical Institute to further develop knowledge in the area of adaptation. Activities financed include flood mapping, mapping of landslides and erosion, mapping of heavy rainfall and a national elevation model. From 2018, funding has also been earmarked for work on preventing landslides in a particularly vulnerable area of Sweden.

In addition to the above-mentioned allocation for adaptation, national government funding is made available to prevent or mitigate the negative consequences of natural hazards. SEK75 million (app. EUR 7.3 million[73]) was made available in 2017 for municipalities to take disaster risk reduction or prevention measures.

The municipalities are requesting increased government funding for adaptation measures at the municipal level[74].

Step D: Implementing adaptation action

8 Mainstreaming adaptation in planning processes

8a. Consideration of climate change adaptation has been included in the national frameworks for environmental impact assessments

Yes / No

In the Swedish Environmental Act (Miljöbalken, 1998:10[75]), climate is included as one of the aspects of environment that might be affected by an action, which must undergo an environmental impact assessment or a strategic environmental assessment. In Sweden the definition of an environmental impact assessment is a strategic environmental assessment (SEA) or a specific environmental impact assessments (EIA). The Swedish Parliament broadened the scope of environmental impact assessments to include climate impact, by approving the Bill 2016/17:200 in 2017[76]. In the Environmental Impact Ordinance (Miljökonsekvensförordning 2017:966[77]), Paragraph 18, it is further clarified that the environmental impacts as a consequence of the actions climate vulnerability need to be included in the assessment.

[71] XE.com, Date accessed: 16/05/2018

[72] Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[73] XE.com, Date accessed: 16/05/2018

[74] Swedish Government Official Reports, 2017, Vem har ansvaret?, ID: SOU 2017:42, URL: http://www.regeringen.se/49c4a3/contentassets/7931dd4521284343b9224e9322539e8d/vem-har-ansvaret-sou-201742

[75] Svensk Författningssamling, Miljöbalken (1998:808), URL: http://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/_sfs-1998-808/#K6

[76] Riksdagen, 2017, Govt. bill 2016/17:200, URL: http://www.riksdagen.se/sv/dokument-lagar/dokument/proposition/miljobedomningar_H403200/html

[77] Svensk Författningssamling, Miljöbedömningsförordning (2017:966), URL: http://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/_sfs-2017-966

8b. Prevention/preparedness strategies in place under national disaster risk management plans take into account climate change impacts and projections

Yes / **No**

Since 2007, Sweden has had a National Platform for Disaster Risk Reduction. In 2016, a summary of risk areas and scenario analyses for 2012–2015 was published by the MSB, which covered climate-related risks[78]. The report presents an overall compilation of various types of risks facing Sweden that can lead to serious consequences.

The MSB's website contains information on many climate risks[79], such as floods, heat waves, landslides, coastal erosion, forest fires and other that are relevant for crisis preparedness. A new portal providing an overview with flood maps has been developed. These maps are an important basis for climate adaptation, spatial planning and risk management. MSB conducts regular research[80] in the area of natural disasters and climate adaptation and has also developed tools for local authorities on how climate impact projections can be taken into consideration when developing disaster risk management plans[81].

SMHI provides early warnings of hazardous meteorological, hydrological and oceanographic events.

Although risk analyses of future climate extremes are conducted, it is unclear how these analyses are factored in to disaster risk management plans.

8c. Key land use, spatial planning, urban planning and maritime spatial planning policies take into account the impacts of climate change

Yes / No

In the Planning and Building Act (2010:900[82]) and the Planning and Building Ordinance (2011:338[83]),) it is stipulated that built environment and construction works must be located on land that is suitable for the purpose, and that the risk of accidents, flooding and erosion must be taken into account. The Act also highlights that planning must give due regard to environmental and climate aspects. Municipal plans should play a key role in climate adaptation, and environmental and climate aspects must be considered in planning and in reviewing other types of applications. According to a recent study from Lund University, 40% of 15 municipalities studied have integrated climate adaptation in their risk and vulnerability analysis.

[78] MSB, Strategier och styrande dokument för klimatanpassning och katastrofriskreducering, URL: https://www.msb.se/RibData/Filer/pdf/26229.pdf

[79] MSB, Översvämningskartering, URL: https://www.msb.se/sv/Forebyggande/Naturolyckor/Oversvamning/Oversiktlig-oversvamningskartering/, Date accessed: 16/05/2018

[80] MSB, Forskning om klimat och naturolyckor, URL: https://www.msb.se/sv/Forebyggande/Naturolyckor/Forskning/, Date accessed: 16/05/2018

[81] MSB, 2011, Vägledning för Kommunala handlingsprogram, URL: https://www.msb.se/RibData/Filer/pdf/25931.pdf

[82] Boverket, Planning and Building Act (2010:900), URL: http://www.boverket.se/globalassets/publikationer/dokument/2016/legislation.pdf

[83] Boverket, Planning and Building Act (2010:900), URL: http://www.boverket.se/globalassets/publikationer/dokument/2016/legislation.pdf

As a result of the NAS the Government has decided that the National Board for Planning, Building and Housing should have a stronger coordinator role in relation to adaptation within physical planning[84]. The strategy also clearly states that the responsibility to protect property lies with the owner, public or private. The same applies for the responsibility to prevent and repair damage caused because of extreme weather or other climate-related events[85].

8d. National policy instruments promote adaptation at sectoral level, in line with national priorities and in areas where adaptation is mainstreamed in EU policies

Yes / In progress / No

Sweden's climate adaptation work is to a large extent organised into sectors. Since 2015, several national agencies have developed or are currently developing action plans. A total of 14of these have been developed using funds made available by SMHI to support the development of action plans and policy instruments for adaptation, according to the appropriation directions in 2016 and 2017. Prioritised sectors have been food production, human health, national environmental objectives and planning/construction. So far, sectors that have received funds include forestry, human health, construction/land use and reindeer herding/Sami culture. Using the same funds, tools to assist with adaptation work have been developed. These include tools to handle uncertainties in adaptation work, nature-based methods to prevent flooding and designs to prevent beach erosion.

The NAS emphasises the sectoral responsibility of the national agencies. Each agency should take responsibility for, initiate, support and evaluate climate adaptation work within its sector. The Government has regulated this through an ordinance[86].

8e. Adaptation is mainstreamed in insurance or alternative policy instruments, where relevant, to provide incentives for investments in risk prevention

Yes / **No**

There is little relevant information available about incentives for investments in risk prevention in insurance or alternative policy instruments.

The Insurance Contracts Act (2005:104) is based insurance companies deciding for themselves which risks they are prepared to accept. An insurance policy in Sweden is a comprehensive product that covers many types of accidents and damages. Thus, damage from natural disasters is usually included in the insurance companies' regular products. This also means that the part of the premium relating to damage caused by natural disasters is difficult to distinguish.

In some cases, adjustment of a premium can be made in certain cases after damage has occurred. For example, a customer can avoid an increased premium by taking preventive

[84] Regeringen, M2018/01716/Kl, Uppdrag att samordna det nationella klimatanpassningsarbetet för den byggda miljön.
[85]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf
[86]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

measures. However, this is normally an agreement between the customer and the insurance policy, and is not made public.

There are a number of streams of Government funding for climate risk mapping and prevention[87]. There is also a system of "green loans", initiated by the state, where local authorities can borrow money for climate adaptation and risk prevention. This is financed by "green obligations" in which private investors are encouraged to invest[88].

9. Implementing adaptation

9a. Adaptation policies and measures are implemented, e.g. as defined in action plans or sectoral policy documents

Yes / **In progress** / No

Action plans have been developed for a number of sectors (see B3), and the work to implement the measures in the plans has started. Some sectors are still in the process of developing action plans. According to the ordinance regulating the national authorities work on adaptation, the SMHI will provide guidance on how to report as well as following up on reporting. On the portal for climate adaptation there is a list of government agencies working on climate adaptation as well as information on the work[89]. The actions are very varied and depends on the tasks given by the Government.

There has also been feedback from the CABs that it should be clarified in the sectoral adaptation plans how national authorities support adaptation at the local level.

At the regional level, all 21 CABs have action plans with identified measures of action. These are being implemented, and are followed up yearly. Recommendations have been developed and are being used for guiding the planning processes in municipalities. The SMHI report from 2015[90] concludes that there is a discrepancy between the CABs in relation to the implementation of the action plans. The implementation this far has largely focused on knowledge gathering and capacity building. The dialogue work with the municipalities has also started and most CABs have established communication between the relevant actors on climate adaptation. Some of the implementation of the action plans has also focused on physical planning. However, the road to implementing climate adaptation measures based on identified risks is generally seen as very long. Local authorities are often of the view that there is a need for additional funding on local level as well as improved coordination and a clearer division of responsibilities.

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[87] Klimatanpassningsportalen, Hur kan klimatanpassnings finansieras i kommuner, URL: http://www.klimatanpassning.se/atgarda/2.2183/hur-kan-klimatanpassning-finansieras-i-kommuner-1.126972, Date accessed: 14/05/2018

[88] Klimatanpassningsportalen, Hur kan klimatanpassnings finansieras i kommunder, URL: http://www.klimatanpassning.se/atgarda/2.2183/hur-kan-klimatanpassning-finansieras-i-kommuner-1.126972, Date accessed: 14/05/2018

[89] Klimatanpassningsportalen, 2017, Vad har gjorts på myndigheterna?, URL: http://www.klimatanpassning.se/roller-och-ansvar/genomforda-aktiviteter/vad-har-gjorts-pa-myndigheterna-1.100055, Date accessed: 30/05/2018

[90] SMHI, 2012, URL: http://www.smhi.se/polopoly_fs/1.86326!/Menu/general/extGroup/attachmentColHold/mainCol1/file/Klimatologi%20Nr%2012.pdf

At the local level, reporting by the CABs show that adaptation is to an increasing extent taken into account in planning processes, particularly when it comes to physical planning, risk- and vulnerability analysis and care for cultural heritage. This can also be seen in projects and developments, some of which are presented on the portal for climate adaptation. Larger cities tend, in general, to have come further in their adaptation work than small cities and towns. The focus of the work is also largely guided to the geographical context, as this often determines the risks and opportunities that face the municipalities. In relation to the municipalities, there is still substantive work to be done. In a 2017 survey, 184 (total 202 replies) out of 290 municipalities answered that they are working with climate adaptation. From the respondents only 50% communicate that there have been political decisions taken regarding climate adaptation, 40% have allocated human resources to climate adaptation and 30% have either allocated financial resources or/and created action plans for climate adaptation[91].

Sweden's municipalities are obliged to carry out risk and vulnerability assessments as a basis for coping with extraordinary events and crises under the Act on municipal and county council measures prior to and during extraordinary events in peacetime and during periods of heightened alert. Such risk assessments often lead to the development and implementation of adaptation measures in vulnerable locations.

9b. Cooperation mechanisms in place to foster and support adaptation at relevant scales (e.g. local, subnational)

Yes / No

The roles and responsibilities for climate adaptation in Sweden are divided across different levels – from local and regional to national. Collaboration between the different sectors and levels is essential to achieve the adaptation targets. The CABs are responsible for coordinating climate adaptation at the regional level[92]. There are climate adaptation coordinators in each county that have the mission to assist the municipalities in their county. Each CAB produces reports, analysis and other material on climate adaptation available on its website.

The coordination of the cooperation and the responsibilities is though not very clear and the implementation work would highly benefit some a clarified division of responsibilities and an enhanced coordination.

9c. Procedures or guidelines are available to assess the potential impact of climate change on major projects or programmes, and facilitate the choice of alternative options, e.g. green infrastructure

Yes / No

The Swedish portal for climate adaptation contains guidance materials for planning and implementing adaptation measures but there are no formal guidelines. Some sectoral portals may include some suggestions for assessment tools. The CABs have developed several

[91]Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[92]Klimatanpassningsportalen, Vem har ansvaret?, URL: http://www.klimatanpassning.se/roller-och-ansvar/vem-har-ansvaret/regionalt-1.26916, Date accessed: 14/05/2018

guides, for example, guidance on climate adaptation in physical planning[93] and "Health Effects of Climate Change – risks and actions in Stockholm County"[94], which outlines appropriate human health-related actions based on climate scenarios for the region until the year 2100. Currently, the CABs are working on regional action plans for green infrastructure, which are to be completed in 2018. In 2014, Sweden adopted a strategy on strengthening biodiversity[95] and securing ecosystem services, which promotes green infrastructure and notes links with climate change, but a formal link with climate adaptation or disaster risk reduction is not apparent.

Climate change is taken into account in a systematic way for large infrastructure projects, for example, the rebuilding of Slussen in Stockholm and for the construction of a railway tunnel underneath the city of Gothenburg. such consideration of climate change is achieved through project-specific collaborations between public bodies and private companies.

9d. There are processes for stakeholders' involvement in the implementation of adaptation policies and measures

Yes / No

On a national level there are a number of non-public administration bodies actively participating in the implementation of adaptation policies. Examples include a cooperation project between companies and academia identifying possible climate threats and opportunities to the economy and business, Swedish Insurance actively contributing with information and ideas linked to climate adaptation and the national association for property owners sharing guidelines and best practises on how to "climate-proof" property[96].

Many of the actions identified in the regional action plans on adaptation are to be implemented by different stakeholders. The means of involvement vary between the CABs, but most include developing and sharing information, guidelines and best practises and in this work involving the relevant interest groups[97].

For the sectoral action plans, examples include the forestry and agriculture sector, where landowners are the target of knowledge dissemination measures and will in turn carry out the implementation activities.

[93]Länsstyrelserna, 2012, Klimatanpassning i fysisk planering – vägledning från länsstyrelserna, URL: http://www.lansstyrelsen.se/stockholm/SiteCollectionDocuments/Sv/publikationer/2012/klimatanpassning-fysisk-planering.pdf

[94]Länsstyrelsen i Stockholms Län, 2012, Hälsoeffekter av ett förändrat klimat + risker och åtgärder i Stockholms län, URL: http://www.lansstyrelsen.se/stockholm/SiteCollectionDocuments/Sv/publikationer/2012/halsoeffekter-av-ett-forandrat-klimat.pdf

[95] Regeringen, 2014, A Strategy for Biodiversity and Ecosystem Services, a translation of relevant parts of Government bill on biodiversity and ecosystem services A Swedish strategy for biodiversity and ecosystem services Gov. Bill 2013/14:141, URL: https://www.cbd.int/doc/world/se/se-nbsap-v3-en.pdf

[96] Klimatanpassningsportalen, Roller och ansvar/Nätverk, URL: http://klimatanpassning.se/roller-och-ansvar/natverk/naringsliv-i-sverige-1.100112, Date accessed: 10/05/2018

[97] Klimatanpassningsportalen, Roller och ansvar/Kommande underlag, URL: http://klimatanpassning.se/roller-och-ansvar/kommande-underlag/pa-gang-fran-lansstyrelserna-2018-1.134148, Date accessed: 14/05/2018

Step E: Monitoring and evaluation of adaptation activities

10. Monitoring and reporting

10a. NAS/NAP implementation is monitored and the results of the monitoring are disseminated

Yes / **No**

No monitoring of the NAS has yet taken place, as it has been only recently adopted.

The NAS establishes a five-year policy cycle, which includes implementation, follow-up, evaluation and revision[98]. The NAS outlines that SMHI, in cooperation with other relevant agencies, will be tasked to continue the development of a system for monitoring and evaluation.

To date, monitoring and reporting has been carried out in other ways. The CABs report annually to the Government on the implementation of their regional action plans. National agencies that receive funds from the allocation "Adaptation to climate change" report annually on their actions. A short summary of actions taken is included in the budget bill to the Parliament. CABs are to some extent following up on the adaptation activities carried out by the municipalities and local authorities.

In 2016, a study[99] was carried out by the SMHI in order to propose a system for evaluating and monitoring adaptation actions in Sweden. The proposed evaluation model focuses on three main pillars: 1) What processes are needed for efficient adaptation actions on the ground? To what extent are adaptation actions integrated in the Swedish governance system? 2) What has been implemented to reduce negative climate impacts and vulnerabilities? Which are the priority sectors and what challenges have been addressed? 3) What progress can be seen in reducing negative climate impacts?

The conclusion of the study was that a strategic national framework for climate adaptation is needed to achieve effective and continuous implementation. The framework should be based on a policy cycle in line with the EU Adaptation Strategy.

10b. The integration of climate change adaptation in sectoral policies is monitored and the results of the monitoring are disseminated

Yes / No

Ongoing sectoral adaptation actions are published on the adaptation website[100]. The level of adaptation action in sectors seem to vary. Sectoral bodies with adaptation action plans have included monitoring mechanisms. Some specific monitoring tasks have also been allocated.

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[98] Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

[99] SMHI, 2016, Förslag till en metod för uppföljning av det nationella klimatanpassningsarbetet, URL: https://www.smhi.se/publikationer/publikationer/forslag-till-en-metod-for-uppfoljning-av-det-nationella-klimatanpassningsarbetet-redovisning-av-ett-regeringsuppdrag-december-2016-1.113425

[100] Klimatanpassningsportalen, Roller och ansvar, URL: http://www.klimatanpassning.se/roller-och-ansvar/kommande-underlag/pa-gang-fran-myndigheterna-2017-1.119693, Date accessed: 10/05/2018

For example, the Public Health Agency is tasked with monitoring the health of the population, including factors related to climate change.

The NAS also outlines that all agencies working on climate adaptation shall initiate, support and evaluate the work on climate adaptation within its area of responsibility. There will shortly be a new ordinance outlining this cycle[101].

10c. Regional-, sub-national or local action is monitored and the results of the monitoring are disseminated

Yes / No

As noted under Indicator 10a, CAB's are required by the Government to formal annual reviews of the regional action plans that they have prepared. A recent list of activities carried out by the national authorities is available[102]. In addition to the formal monitoring and evaluation processes, a report is published on an annual basis[103] by Swedish Insurance and IVL, reviewing and ranking municipalities' progress on adaptation.

11. Evaluation

11a. A periodic review of the national adaptation strategy and action plans is planned

Yes / No

The report "Basis for Check point 2015"[104] assesses the progress of Swedish adaptation measures to ensure that they are proceeding towards the same goal, addressing the questions: What are the priorities? How can cross-sectoral work be further developed? What are the appropriate governance arrangements? This is not a formal periodic review but gives useful insights on the progress made in Sweden in implementing adaptation actions and formed the basis for the new NAS.

In the NAS, the Government outlines a five-year evaluation cycle for the strategy. The first step will be a climate and vulnerability analysis, monitoring and evaluation of the implementation of the NAS and proposals for revisions of the Strategy by SMHI for 2019-2022. This will be followed by an updated NAS proposal from the Government to the Parliament in 2023. After that, an updated Strategy will be presented every five years[105].

11b. Stakeholders are involved in the assessment, evaluation and review of national adaptation policy

Yes / **No**

[101] Personal communication with MS contact

[102] Klimatanpassningsportalen, Roller och ansvar, URL: http://www.klimatanpassning.se/roller-och-ansvar/kommande-underlag/pa-gang-fran-myndigheterna-2017-1.119693, Date accessed: 14/05/2018

[103] IVL Svenska Miljöinstitutet och Svensk Försäkring, 2017, Klimatanpassning 2017 Så långt har kommunerna kommit, URL: http://www.ivl.se/download/18.21c9e44015c64dbb1b4159/1496844140532/Klimatanpassning%202017.pdf

[104] SMHI, 2012, URL: http://www.smhi.se/polopoly_fs/1.86326!/Menu/general/extGroup/attachmentColHold/mainCol1/file/Klimatologi%20Nr%2012.pdf

[105] Regeringen, 2018, Regeringens proposition 2017/2018:163 Nationell strategi for klimatanpassning, URL: http://www.regeringen.se/494483/contentassets/8c1f4fe980ec4fcb8448251acde6bd08/171816300_webb.pdf

The Expert Council, announced in the NAS, will be tasked with monitoring and evaluating its implementation and providing evidence for how national work on climate change should be focused when the Strategy is revised. In order to ensure that different perspectives are integrated, the Council will consult with representatives from the research community, industry, interest associations, national and regional authorities, as well as the Swedish Association of Local Authorities and Regions. The composition of the Expert Council is not yet decided but unless it includes a wide range of stakeholders, it will only seen as consulting stakeholders or providing them with information, rather than as involving them in the process of assessment, evaluation and review. In the NAS, SMHI is tasked with further developing the Strategy's evaluation and review system and at this point there is not enough information available about how this process will be implemented to justify a score of "Yes" in relation to this indicator.

SUMMARY TABLE

Adaptation Preparedness Scoreboard		
No.	**Indicator**	**Met?**
Step A: Preparing the ground for adaptation		
1	***Coordination structure***	
1a	A central administration body officially in charge of adaptation policy making	**Yes** / No
1b	Horizontal (i.e. sectoral) coordination mechanisms exist within the governance system, with division of responsibilities	Yes / **In progress** / No
1c	Vertical (i.e. across levels of administration) coordination mechanisms exist within the governance system, enabling lower levels of administration to influence policy making.	Yes / **In progress** / No
2	***Stakeholders' involvement in policy development***	
2a	A dedicated process is in place to facilitate stakeholders' involvement in the preparation of adaptation policies	**Yes** / No
2b	Transboundary cooperation is planned to address common challenges with relevant countries	**Yes** / No
Step B: Assessing risks and vulnerabilities to climate change		
3	***Current and projected climate change***	
3a	Observation systems are in place to monitor climate change, extreme climate events and their impacts	Yes / **In progress** / No
3b	Scenarios and projections are used to assess the economic, social and environmental impacts of climate change, taking into account geographical specificities and best available science (e.g. in response to revised IPCC assessments)	**Yes** / In progress / No
3c	Sound climate risks/vulnerability assessments for priority vulnerable sectors are undertaken to support adaptation decision making.	**Yes** / In progress / No
3d	Climate risks/vulnerability assessments take transboundary risks into account, when relevant	Yes / **In progress** / No
4	***Knowledge gaps***	
4a	Work is being carried out to identify, prioritise and address the knowledge gaps	**Yes** / In progress / No

Adaptation Preparedness Scoreboard		
No.	**Indicator**	**Met?**
5	***Knowledge transfer***	
5a	Adaptation relevant data and information is available to all stakeholders, including policy makers (e.g. through a dedicated website or other comparable means).	**Yes** / In progress / No
5b	Capacity building activities take place; education and training materials on climate change adaptation concepts and practices are available and disseminated	**Yes** / In progress / No
Step C: Identifying adaptation options		
6	***Identification of adaptation options***	
6a	Adaptation options address the sectoral risks identified in 3c, the geographical specificities identified in 3b and follow best practices in similar contexts	**Yes** / No
6b	The selection of priority adaptation options is based on robust methods (e.g. multi-criteria analyses, stakeholders' consultation, etc.) and consistent with existing decision-making frameworks	**Yes** / No
6c	Mechanisms are in place to coordinate disaster risk management and climate change adaptation and to ensure coherence between the two policies	Yes / **In progress** /No
7	***Funding resources identified and allocated***	
7a	Funding is available to increase climate resilience in vulnerable sectors and for cross-cutting adaptation action	**Yes** / In progress /No
Step D: Implementing adaptation action		
8	***Mainstreaming adaptation in planning processes***	
8a	Consideration of climate change adaptation has been included in the national frameworks for environmental impact assessments	**Yes** / No
8b	Prevention/preparedness strategies in place under national disaster risk management plans take into account climate change impacts and projections	Yes / **No**
8c	Key land use, spatial planning, urban planning and maritime spatial planning policies take into account the impacts of climate change	**Yes** / No
8d	National policy instruments promote adaptation at sectoral level, in line with national priorities and in areas	**Yes** / In progress

Adaptation Preparedness Scoreboard		
No.	**Indicator**	**Met?**
	where adaptation is mainstreamed in EU policies	/ No
8e	Adaptation is mainstreamed in insurance or alternative policy instruments, where relevant, to provide incentives for investments in risk prevention	Yes / **No**
9	***Implementing adaptation***	
9a	Adaptation policies and measures are implemented, e.g. as defined in action plans or sectoral policy documents	Yes / **In progress** / No
9b	Cooperation mechanisms in place to foster and support adaptation at relevant scales (e.g. local, subnational)	**Yes** / No
9c	Procedures or guidelines are available to assess the potential impact of climate change on major projects or programmes, and facilitate the choice of alternative options, e.g. green infrastructure	**Yes** / No
9d	There are processes for stakeholders' involvement in the implementation of adaptation policies and measures.	**Yes** / No
Step E: Monitoring and evaluation of adaptation activities		
10	***Monitoring and reporting***	
10a	NAS/NAP implementation is monitored and the results of the monitoring are disseminated	Yes / **No**
10b	The integration of climate change adaptation in sectoral policies is monitored and the results of the monitoring are disseminated	**Yes** / No
10c	Regional-, sub-national or local action is monitored and the results of the monitoring are disseminated	**Yes** / No
11	***Evaluation***	
11a	A periodic review of the national adaptation strategy and action plans is planned	**Yes** / No
11b	Stakeholders are involved in the assessment, evaluation and review of national adaptation policy	Yes / **No**