



# Adaptation preparedness scoreboard:

## Country fiche for Finland

### 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.<sup>1</sup> 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<sup>2</sup> 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

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.

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<sup>1</sup> The first versions of the fiches, prepared in consultation with the Member States in 2014-15, were unpublished and used to fine-tune the scoreboard.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](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.

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

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

AMAP	Arctic Monitoring and Assessment Programme
CBSS	Council of the Baltic Sea States
EIA	Environmental Impact Assessment
ELASTINEN	Proactive management of weather and climate related risks project
EU	European Union
FinLTSER	Finnish Long-Term Socio-Ecological network
FICCA	Finnish Research Programme of Climate Change
FMI	Finnish Meteorological Institute
GCM	General Circulation Model
ISTO	Climate Change Adaptation Research Programme
LUKE	Natural Resources Institute Finland
NAP	National Climate Change Adaptation Plan 2022
NAS	National Adaptation Strategy
NESA	Finnish National Emergency Supply Agency
RCM	Regional Climate Model
SEA	Strategic Environmental Assessment
SYKE	Finnish Environment Institute

## **POLICY FRAMEWORK**

### **Adaptation strategies**

#### **A1. National adaptation strategy**

In Finland, a national adaptation strategy (NAS) was adopted in 2005<sup>3</sup>, as an independent element of the wider National Energy and Climate Strategy<sup>4</sup>. The evaluation process resulted in a government resolution and publication of a new national climate adaptation framework in November 2014, known as the National Climate Change Adaptation Plan 2022<sup>5</sup> (NAP). This NAP replaced the 2005 NAS. Finland's Climate Act<sup>6</sup> (approved on 6 March 2015) stipulates that the Government approves long-term and medium-term strategic mitigation plans and that it will approve a national plan on adaptation at least every ten years.

The NAP focuses on the horizontal aim that the Finnish society should have the capacity to manage the risks associated with climate change and adapt to changes in the climate. Based on this aim, the following objectives are set for the period to 2022:

- Adaptation should have been integrated into the planning and activities of both the various sectors and their actors
- The actors should have access to the necessary climate change assessment and management methods; and
- Research and development work, communication, and education and training should have enhanced the adaptive capacity of society, developed innovative solutions and improved citizens' awareness on climate adaptation.

The Ministry of Agriculture and Forestry was responsible for the preparation of the NAP (the updated NAS), with the practical work steered by a broadly-based coordination group appointed by the Ministry.

#### **A2. Adaptation strategies adopted at subnational levels**

Already 125 municipalities (approximately 40% of all municipalities) have a climate strategy<sup>7</sup> and 60% of those reported that both climate mitigation and adaptation are part of their climate measures. By the end of 2012, 16 out of 18 regions had published a climate strategy that includes some recognition of adaptation<sup>8</sup>.

The Helsinki Metropolitan Area (Helsinki, Espoo, Vantaa and Kauniainen) has a dedicated adaptation strategy for the period 2012-2020<sup>9</sup>, which includes measures for land use, traffic

<sup>3</sup>[http://mmm.fi/documents/1410837/1721050/MMMjulkaisu2005\\_1a.pdf/63f5d78d-8492-4621-b019-fe38d7aeb709](http://mmm.fi/documents/1410837/1721050/MMMjulkaisu2005_1a.pdf/63f5d78d-8492-4621-b019-fe38d7aeb709)

<sup>4</sup><http://tem.fi/en/energy-and-climate-strategy>

<sup>5</sup><http://mmm.fi/en/nature-and-climate/climate-change-adaptation>

<sup>6</sup> In Finnish: <https://www.finlex.fi/fi/esitykset/he/2014/20140082.pdf>

<sup>7</sup> In Finnish: [http://shop.kunnat.net/product\\_details.php?p=3159](http://shop.kunnat.net/product_details.php?p=3159)

<sup>8</sup> <https://julkaisut.valtioneuvosto.fi/handle/10138/41419> (In Finnish, Documentation Page in English)

<sup>9</sup>[http://ilmastotyokalut.fi/files/2014/10/11\\_2012\\_Helsinki\\_Metropolitan\\_Area\\_Climate\\_Change\\_Adaptation\\_Strategy.pdf](http://ilmastotyokalut.fi/files/2014/10/11_2012_Helsinki_Metropolitan_Area_Climate_Change_Adaptation_Strategy.pdf)

and technical networks, buildings and construction, water and waste management, rescue services and safety, health care and social services and research and information. Some other bigger cities have also focused on climate adaptation and vulnerability to extreme weather events (Pori, Turku) or by planning green infrastructure (Lahti, Jyväskylä). Other Finnish municipalities have climate change strategies which mostly focus on mitigation. Three Finnish cities are signatories to the Covenant of Mayors for Climate & Energy in relation to adaptation<sup>10</sup>.

## **Adaptation action plans**

### **B1. National adaptation plan**

The NAP aims to identify the most important tasks to promote adaptation nationally and in each sector in the next few years, and to ensure that Finnish society has the capacity to manage the risks relating to climate change and adapt to the changes.

### **B2. Adaptation plans adopted at sub-national level**

The NAP calls for municipalities to integrate climate proofing reviews into emergency preparedness and security of supplies planning. The Plan tasks the joint regional offices (ELY-keskus) of the Ministry of Employment and Economy, the Ministry of Environment, the Ministry of Transport and Communications and the Ministry of Agriculture and Forestry to develop climate resilience guidance for municipalities.

In 2017, most of the municipalities implemented systematic climate actions and, although predominantly focused on climate mitigation, climate adaptation was also promoted. By the end of 2015, regional flood risk management plans were published for every significant flood risk areas (21 areas) and implementation of identified measures is ongoing. In addition, several bigger cities and municipalities are active in adaptation, e.g. the city of Helsinki (in vulnerability assessment) and the city of Vantaa (nature-based solutions in runoff water management).

### **B3. Sectoral adaptation plans**

The NAP aims to incorporate adaptation into regular planning and activities of all sectors and actors. Adaptation is included in the Climate Act (approved on 6 March 2015). According to this Act, the State authorities must, as far as possible, promote the implementation of the NAP in their actions.

The Action Plan for the Adaptation to Climate Change of the Environmental Administration (2016)<sup>11</sup> covers the period up to 2022. It replaces the Ministry of the Environment's Action Plan in 2008, which was later supplemented by an update in 2011, following an assessment undertaken in 2013 (Assessment of the Environmental Administration's Action Plan for Adaptation to Climate Change). The action plan sets measures concerning biodiversity, land

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<sup>10</sup> As of 15th June 2017: Jyväskylä, Lappeenranta and Oulu. See: [http://www.covenantofmayors.eu/about/about/signatories\\_en.html?q=Search+for+a+Signatory...&country\\_search=fi&population=&date\\_of\\_adhesion=&status=&commitments1=1&commitments2=1&commitments3=1](http://www.covenantofmayors.eu/about/about/signatories_en.html?q=Search+for+a+Signatory...&country_search=fi&population=&date_of_adhesion=&status=&commitments1=1&commitments2=1&commitments3=1)

<sup>11</sup> <http://julkaisut.valtioneuvosto.fi/handle/10024/79789>

use, buildings and construction, environmental protection and the use and management of water resources. The plan also sets targets for research activities and communications.

The action plan for the Adaptation to Climate Change of the Ministry of Agriculture and Forestry 2011 to 2015 will be revised in 2017 to 2018, building on a comprehensive study<sup>12</sup> of vulnerability and adaptation in agriculture, forestry, fisheries, game and reindeer husbandry sectors that was completed in 2017 by Natural Resources Institute Finland (Luke).

The Climate Programme for Finnish Agriculture – Steps towards Climate Friendly Food (2014)<sup>13</sup> presents climate adaptation and mitigation measures relating to the food system. The objectives of the National Forest Strategy 2025<sup>14</sup> (replacing the National Forest Programme) include “increasingly diverse sustainable forest management supports climate mitigation and adaptation’.

The Climate Policy Programme for the Ministry of Transport and Communications’ administrative sector for 2009–2020 aims to adapt to climate change without lowering the current service level in transport and communications. To attain this goal, the Ministry’s together with the Transport Agency will update its instructions about transport infrastructure construction, maintenance and management, outline an action plan for exceptional circumstances and invest in research.

In addition, there is the Energy and Climate Programme of the Finnish Defence Forces (2014), updated in 2018.

## **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 Finland, the Ministry of Agriculture and Forestry is responsible for adaptation policy-making and coordination at the central government level. This includes, for instance, appointing and chairing the monitoring group for climate adaptation.

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

**Yes** / In progress / No

The NAP was prepared by a coordination group appointed by the Ministry of Agriculture and Forestry, with representatives from the Prime Minister’s Office and the relevant ministries

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<sup>12</sup> In Finnish: <http://jukuri.luke.fi/handle/10024/538722>

<sup>13</sup> [http://mmm.fi/documents/1410837/1890227/Climate\\_programme\\_agriculture\\_WEB\\_03072015.pdf/](http://mmm.fi/documents/1410837/1890227/Climate_programme_agriculture_WEB_03072015.pdf/)

<sup>14</sup> <http://mmm.fi/documents/1410837/1504826/National+Forest+Strategy+2025/197e0aa4-2b6c-426c-b0d0-f8b0f277f332>

(Ministry of Environment, Ministry of the Interior, Ministry of Education and Culture, Ministry of Economy and Employment, Ministry of Social Affairs and Health), research institutes (Finnish Meteorological Institute; Finnish Environment Institute and the Natural Resources Institute) and regional actors (ELY, Municipalities).<sup>15</sup> In 2017, the group was updated with new expert organisations in fire and rescue services, and financial services. In addition, experts from the Ministry of Foreign Affairs, Ministry of Defence and from other organisations participate in the meetings, if needed.

The various ministries are responsible for the implementation, monitoring and evaluation of the plan within their respective administrative branches. A national monitoring group is appointed to follow and evaluate the implementation of the adaptation plan, with representatives from the relevant ministries, research institutions, regional and local bodies and other actors. The group is responsible for the implementation, follow-up and communication relating to the adaptation plan.

**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 vertical coordination mechanisms within the governance system are in place and regional actors participated in the drafting of the NAP<sup>16</sup> (see Indicator 1b). Representatives of municipalities (the Association of Finnish Local and Regional Authorities) and the Helsinki Metropolitan Region are also included in the coordination group. In addition, a significant share of the practical adaptation measures is taking place in the regions or at local level. The NAP also includes a key measure of promoting local and regional adaptation studies.

In Finland, the Covenant of Mayors initiative does not have dedicated coordination at national or regional level. However, the Association of Finnish Local and Regional Authorities (Kuntaliitto) is an advocate for all Finnish municipalities and regions. In addition, the Association of Finnish Local and Regional Authorities and Ecofellows Ltd./City of Tampere are supporting partners in the Covenant of Mayors. In 2017, 12 Finnish municipalities were part of the Covenant of Mayors but only three had signed up to the adaptation commitment, available since 2015.

**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

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<sup>15</sup> Membership of the coordination group is not static but evolves in time, usually with the addition of new members.

<sup>16</sup> <http://mmm.fi/en/national-climate-change-adaptation-plan>

The Ministry of Agriculture and Forestry was responsible for the preparation of the NAP, with the practical work steered by a broadly-based coordination group appointed by the Ministry.

The preparation of the NAP involved a wide range of stakeholder consultations, including<sup>17</sup>:

- A “stock taking” questionnaire in Spring 2013, sent to a wide group of stakeholders on climate impacts and risks, recognised sectoral or regional vulnerabilities and views about the strategic goals and other relevant aspects to be taken into consideration in the revision process
- An open “mid-process” seminar (29 October 2013) on the draft strategic goals
- The draft NAP (7 March 2014) was sent for comments; 63 organisations representing administration (national, regional), research institutes and universities, NGOs and interest groups sent comments. At least 57 organisations commented on the draft NAP
- Presentation and discussions on the draft NAP in different fora
- An open seminar (“public hearing”) 10 April 2014 of the NAP.
- The draft NAP was in the “*Have your say*” –eParticipation forum for public (April-May 2014).

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

**Yes** / No

Transnational cooperation is one of the actions of the NAP. The action focuses on the development of the Finnish, Norwegian and Russian nature conservation cooperation in the Fennoscandia Green Belt, and on threats to the ecosystem services from climate change. There is also an intention to step up cooperation with Russia on climate adaptation, especially focusing on transboundary water use and management, and on invasive species. An Action Programme of the Joint Finnish-Russian Commission on the Utilisation of Frontier Waters on Risk Management in Case of Adverse Hydrological Conditions in the Vuoksi River Basin District was accepted in Commission’s meeting on 20 October 2017. Climate change was one of the key drivers for the establishment of this action programme. Invasion of Finnish inland waters by an alien moss animal was discussed in a Commission’s working group meeting in April 2018.

Adaptation is also part of transnational cooperation (e.g. Arctic Council<sup>18</sup>, Barents Euro-Arctic Council<sup>19</sup>, cooperation in the Baltic Sea region<sup>20</sup>). Finland has supported the development of the Arctic Resilience Action Framework<sup>21</sup> during 2015-2017 with the Arctic

<sup>17</sup> <http://www.cbss.org/wp-content/uploads/2014/04/Finland-CCA-Strategy-Presentation.pdf>

<sup>18</sup> <http://www.arctic-council.org/index.php/en/>

<sup>19</sup> <http://www.barentscooperation.org/en>

<sup>20</sup> <https://www.interreg-baltic.eu/home.html>

<sup>21</sup> <https://oaarchive.arctic-council.org/handle/11374/1790>

Council and the implementation of this framework has started during Finland's chair period 2017-2019. The first Arctic Resilience Forum will take place in Rovaniemi, Finland in September 2018.<sup>22</sup>

Finland has also participated in the cooperation with the Baltic2030 expert group of Council of the Baltic Sea States (CBSS)<sup>23</sup> related to sustainable development, climate adaptation and resilience. The transboundary river agreements between Finland and its neighbouring countries include prevention of flood damages.

## **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

Observation systems are in place to monitor climate change, extreme weather events and their impacts and are conducted by:

- The Finnish Meteorological Institute (FMI): Weather observations. FMI established a Climate Service Centre unit in 2014<sup>24</sup>. The Centre offers operational climate services and studies weather and climate, and their socio-economic aspects. FMI also monitors extreme weather events and their impacts.
- The Flood Centre of the Finnish Environment Institute and Finnish Meteorological Institute<sup>25</sup> was established on 1 January 2014 and is responsible for flood forecasts and warnings and maintaining a national situation awareness on floods.
- Finnish Environment Institute (SYKE)<sup>26</sup>: Monitoring for physical, chemical and biological state of inland waters and marine waters.
- Finnish Museum of Natural History<sup>27</sup>, Natural Resources Institute Finland (Luke)<sup>28</sup>, state enterprise Metsähallitus<sup>29</sup>, and SYKE: Collecting information on the changes taking place in ecosystems and habitats, species and species communities, and genes and genotype.

FMI produces a monthly climate monitoring bulletin and web material with information on extreme weather events. FMI is also collecting information on impacts of weather events, especially high-impact events, which cause negative impacts on health, property or critical

<sup>22</sup> <https://www.arcticfinland.fi/events/Arctic-Resilience-Forum-/39334/41fdbf10-4f1d-4ef4-a14c-ef4876f4a10e>

<sup>23</sup> <http://www.cbss.org/cbss-baltic-2030-expert-group-sustainable-development-16th-meeting/>

<sup>24</sup> <http://en.ilmatieteenlaitos.fi/climate-service-centre>

<sup>25</sup> <http://en.ilmatieteenlaitos.fi/press-release/340236095>

<sup>26</sup> <http://www.syke.fi/en-US>

<sup>27</sup> <https://www.luomus.fi/en>

<sup>28</sup> <https://www.luke.fi/en/>

<sup>29</sup> Metsähallitus is a state enterprise that administers the state-owned land and water areas. <http://www.metsa.fi/web/en>

functions of the society. Information is based on data gathered by authorities, research institutes and/or private sector. Information on impacts of weather are produced sector-wise, e.g. rescue operations, electricity distribution network failures, railway passage delays and cancellations. This data is located within operators but FMI has been developing its own weather impacts data base.

Information on floods and their impacts is mainly collected by SYKE. SYKE acts as a coordinating body for the Finnish Long-Term Socio-Ecological network (FinLTSER). The Network brings together the Finnish research sites and scientists that conduct research on long-term socio-ecological processes and issues. FinLTSER currently consists of nine research platforms, representing the main ecosystems (marine, terrestrial, lake, sub-arctic, urban) in Finland, which provide a national infrastructure for long-term site-based ecosystem and biodiversity research in Finland, including climate impacts.

The Forest Centre collects data on damage to forests including weather related damages. The forest damage advisory service at Luke is responsible for monitoring forest pests and diseases and their damage, some of which may be related or initiated by weather events, especially storms.

THL is a Finnish expert agency that provides reliable information on health and welfare for decision-making and activities in the field. THL monitors the incidence of infectious diseases through use of several surveillance systems. THL is also collecting information on impacts of weather events and climate change on drinking water security and human health, heatwave-associated health impacts and other climate-related health effects.

### **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

Climate projections based on the most recent (RCP-based/AR5) GCM and RCM simulations have been analysed for Finland and are explained in Ruosteenoja et al. (2016)<sup>30</sup>. Various datasets have been developed to fulfil the needs of different user groups, such as impact and vulnerability studies. Some of the climate scenarios have been developed on a 10x10 km grid. Ensemble-based climate scenario analysis has been common in most studies in Finland. Work is currently being undertaken to develop national SSP-based socioeconomic scenarios, e.g. in the Academy of Finland funded project PLUMES<sup>31</sup>.

Various climate impact and vulnerability studies are using these projections. Some of these results (e.g. from hydrological models) are also being portrayed in the national climate change portal, Climate Guide<sup>32</sup>.

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<sup>30</sup> [http://www.geophysica.fi/pdf/geophysica\\_2016\\_51\\_1-2\\_017\\_ruosteenoja.pdf](http://www.geophysica.fi/pdf/geophysica_2016_51_1-2_017_ruosteenoja.pdf)

<sup>31</sup> <http://en.ilmatiiteenlaitos.fi/plumes>

<sup>32</sup> <https://ilmasto-opas.fi/en/datat/vaikutukset#SykeDataPlace:vaikutukset>

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

**Yes** / In progress / No

A general assessment of vulnerability across sectors was the basis for the NAS in 2005. For the publication of the NAP, a comprehensive study of the impacts of climate change and vulnerability of sectors was conducted in 2013<sup>33</sup>. After the publication of the NAP, more detailed and systematic vulnerability assessments<sup>34</sup> have been done in specific sectors or specific environments and include water, indirect economic effects owing to floods, forestry, biodiversity, agriculture, transport, health, and for the Arctic Region. Most of these were coordinated by the Ministry of Agriculture and Forestry; sector ministries are responsible for their administrative branches.

There are various studies on climate impacts and vulnerability assessments in different sectors. For example, the Academy of Finland funded the Finnish Research Programme of Climate Change (FICCA 2011-2014)<sup>35</sup>. This programme produced several research projects, which covered flooding, urban water management, energy, forest, biodiversity, marine ecosystem and spatial planning, agriculture, transport, health, the Arctic region and urban planning.

The vulnerability of natural resources sectors (agriculture, forestry, game and fisheries and reindeer management) was thoroughly analysed as a part of the State of adaptation assessment project (Sopeutumisen tila 2017 by Luke).

In central level active management of weather-related and climate-related risks, project ELASTINEN (2015–2016)<sup>36</sup> provided information and sought solutions for strengthening the capabilities of different sectors to assess and manage risks related to weather, climate, and the economy. The assessment and development project SIETO<sup>37</sup> (2017–2018) funded by the Government's analysis, assessment and research activities has prepared a national weather and climate risk assessment as well as a plan on how to develop the production and collection of information and data for future vulnerability and risk assessments.

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

**Yes** / In progress / No

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<sup>33</sup> Sorvali, J. 2013: Ilmastonmuutoksen haitalliset vaikutukset ja toimialojen haavoittuvuus (only available in Finnish).

<sup>34</sup> See more here: Vulnerability Assessment of ecosystem services for Climate Change Impacts and Adaptation (VACCIA): <http://www.syke.fi/projects/vaccia>; Climate change: a regional assessment of vulnerability and adaptive capacity for the Nordic countries (CARAVAN): <http://www.iav-mapping.net/CARAVAN/CARAVAN.html>; Assessing the adaptive capacity of the Finnish environment and society under a changing climate (FINADAPT): <http://www.syke.fi/projects/finadapt>; Map-based assessment of vulnerability to climate change employing regional indicators (MAVERIC): <http://www.syke.fi/projects/maveric>.

<sup>35</sup> <http://www.aka.fi/en/research-and-science-policy/academy-programmes/completed-programmes/ficca/>

<sup>36</sup> <http://en.ilmatieteenlaitos.fi/elastinen>

<sup>37</sup> <http://en.ilmatieteenlaitos.fi/climate-service-centre-projects>

Vulnerability assessments have been conducted as parts of regional cooperation, i.e. for the Barents Region, the Arctic or the Baltic Sea (BACC II)<sup>38</sup>. Finland is a participant in the Arctic Monitoring and Assessment Programme (AMAP), which is an intergovernmental monitoring and research programme under the Arctic Council. The main goal of AMAP is to provide reliable and sufficient information on the status of, and threats to, the Arctic Environment. Assessing climate impacts on the Arctic environment is one of the priority areas.<sup>39</sup> Transboundary risks and transnational cooperation are also considered in the NAP.

Vulnerability studies consider transboundary effects where relevant, for example, trade flows in a project conducting a study on adaptation of the food sector and socio-economic impacts of climate change in North-East Europe<sup>40</sup>.

#### 4. Knowledge gaps

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

**Yes** / In progress / No

The NAP calls for practical research on implementation of adaptation measures. The knowledge gaps identified throughout the policy process have triggered periodic research, programmes and projects. They have produced comprehensive knowledge on, e.g., climate impacts and vulnerabilities in different sectors for planning of the adaptation measures. Examples include the Climate Change Adaptation Research Programme ISTO (2006–2010) with about 16 research projects, and the Proactive management of weather and climate related risks project ELASTINEN (2015–2016), which provided information and solutions for strengthening the capabilities of different sectors to assess and manage risks related to weather, climate, and the economy.

The Academy of Finland (i.e. the national research council) has a climate change research portfolio of tens of millions of Euros as part of its annual grants and other annual funding. The national climate change research programme (FICCA) 2011–2014, funded by the Academy of Finland, responded to a broad range of scientific knowledge gaps posed by climate change including adaptation research.

The main examples of the current projects on adaptation include the assessment and development project SIETO (2017–2018) funded by the Government's analysis, assessment and research activities. The project has prepared a plan to develop the production and collection of information and data for future vulnerability and risk assessments.

The TASAPELI-project (2018-2019), which is funded by the Government, develops nature-based solutions for regional adaptation. The national Strategic Research Council (SRC) has large programmes that identify and include adaptation and resilience for sustainable growth.

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<sup>38</sup> <http://www.baltic-earth.eu/BACC2/>

<sup>39</sup>

Finland's Seventh National Communication under the United Nations Framework Convention on Climate Change. 2017. Ministry of the Environment and Statistics Finland, Helsinki. 314 p.

<sup>40</sup> [http://www.aka.fi/Tiedostot/Tiedostot/FICCA/FICCA%20tutkijasesminaari%202.-3.12.2014/ADIOSO\\_presentation\\_FICCA%2003122014.pdf](http://www.aka.fi/Tiedostot/Tiedostot/FICCA/FICCA%20tutkijasesminaari%202.-3.12.2014/ADIOSO_presentation_FICCA%2003122014.pdf)

A large consortium project funded in an SRC programme is Sustainable, climate-neutral and resource-efficient forest-based bioeconomy FORBIO<sup>41</sup> (2015–2020). It will provide smart means, solutions and tools needed to sustainably improve resource-efficiency and climate-neutrality of Finnish forests and to adapt to the changing environment. Another large research project is From Failand to Winland<sup>42</sup> (2016–2019) which provides insight into possible futures with the help of scenarios, decision analysis and co-creation methods. The project studies how water, food and energy related pressures, shocks and policy responses affect Finland's overall security.

The Ministry of Agriculture and Forestry is funding projects to fill knowledge gaps regarding climate adaptation. The analysis of knowledge gaps and research needs was funded in 2017<sup>43</sup>. Other current research initiatives include the ones by the Climate Research Centre at the Finnish Meteorological Institute and the Flood Centre of the Finnish Environment Institute and the Finnish Meteorological Institute.

## 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

Adaptation relevant data and information is available to all stakeholders on a web portal<sup>44</sup>. The Climate Guide portal, available in Finnish, Swedish and English, offers research information including mapping tools, data and infographics and also case studies, observational data, climate scenarios, impacts and step-by-step guidance to support both mitigation and adaptation actions.

A website ([www.climateguide.fi](http://www.climateguide.fi)), co-ordinated by the FMI and SYKE, provides an overview of observed and projected climate (temperature and precipitation) and the impacts of climate change on water resources, potential energy demand and natural decomposition rate of dead plant material. The maps show impacts for the present-day as well as future climate. Other knowledge transfer services are flood maps co-ordinated by SYKE and the wind atlas co-ordinated by FMI.

The Finnish Climate Change Panel was established in December 2011 to enhance science-policy interaction for the climate and energy sectors as well as public discussion<sup>45</sup>. The Government nominated the third Climate Panel in January 2016 for the period of 2016-2019<sup>46</sup>.

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<sup>41</sup> <http://www.uef.fi/en/web/forbio>

<sup>42</sup> <http://winlandtutkimus.fi/english/>

<sup>43</sup> Arnkil, N. & Lahti, E. 2018. Ilmastonmuutokseen sopeutumisen tieto- ja osaamistarpeet Suomessa. Kohti tutkimusohjelmaa. Tapion raportteja nro 24.

<sup>44</sup> [www.Climateguide.fi](http://www.Climateguide.fi)

<sup>45</sup> Finland's Seventh National Communication under the United Nations Framework Convention on Climate Change. 2017. Ministry of the Environment and Statistics Finland, Helsinki. 314 p.

<sup>46</sup> <http://www.ilmastopaneeli.fi/fi/in-english/>

The Panel's members come from universities and research organisations and represent different branches of science from educational sciences to atmospheric sciences. It produces reports to support the preparation and implementation of climate policy and legislation in Finland. The Panel can receive assignments from different Ministries and Ministerial working groups or it can launch its own projects. The status and the general assignment of the Finnish Climate Panel is determined in the Climate Change Act (2015).

## **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

Capacity building activities take place in Finland. An example is a workshop for NGOs on how they can influence the preparedness of citizens for climate impacts. In addition, the Climateguide website lists upcoming climate change related events.

Education and training materials are available and disseminated. A Teachers' Climate Guide for primary and secondary school teachers was published in 2016. The material is available in Finnish and can be downloaded as a pdf<sup>47</sup>, with an overview published in English<sup>48</sup>. For University students an interdisciplinary elementary course in climate change is available that is also publicly accessible<sup>49</sup>. The NAP contains actions to develop and implement a communication plan on adaptation issues and educational material on adaptation for all levels of education. Therefore, it is expected that the examples presented above on climate change will be accompanied with further training materials focusing on climate adaptation.

## **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 NAP identifies horizontal measures for the objectives mentioned in Section A1 and preliminary timing for implementation. The objectives have twelve separate fields of actions and measures in the NAP. The adaptation objective has been integrated into the planning and activities of the various sectors and their actors focus on the sectoral adaptation options.

According to the evaluation of the NAS in 2013, many sectors, such as water resources, agriculture, land use, energy, health and tourism received a score of three or higher implying that climate impacts are relatively well known including quantitative information and adaptation measures are identified and their implementation has already started. However, there are sectors where more work is required (e.g. insurance, biodiversity, fisheries).

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<sup>47</sup> In Finnish: <http://openilmasto-opas.fi/wp/wp-content/uploads/2016/09/open-ilmasto-opas-2016.pdf>

<sup>48</sup> <http://openilmasto-opas.fi/english/>

<sup>49</sup> <http://www.ilmastonyt.fi/studies.html>

The ELASTINEN (2015–2016) project provided information and suggested solutions for strengthening the capabilities of different sectors to assess and manage weather, climate and economic risks.

Climate risk assessment and management are improved in natural resource sectors: thorough analysis of vulnerability of natural resources sectors (agriculture, forestry, game and fisheries and reindeer management) was carried out as a part of the State of adaptation assessment project (Sopeutumisen tila 2017). This analysis also takes into account geographical specificities. These specificities are also addressed in other research, such as the Academy of Finland funded research programme Pathways linking uncertainties in model projections of climate and its effects, PLUMES.<sup>50</sup>

The SIETO (2017–2018) project prepared a plan on how to develop the production and collection of information and data for future vulnerability and risk assessments, as well as how the assessment could be arranged.

**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

Finland has selected adaptation options based on expert judgement and participatory processes<sup>51</sup>. However, the adopted mainstreaming approach implies that sectors have adopted different procedures and some are more advanced than others in their adaptation work and the level of detail of the processes preceding the selection of the adaptation measures vary.

There are some studies identifying the costs and benefits of climate change and adaptation actions for certain sectors, however, Finland reports considerable uncertainties and information gaps in estimating the potential costs and benefits of impacts and measures.

**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

The NAP contains measures on disaster risk reduction, as part of international cooperation. The NAP recognises the important link between climate adaptation and the National Platform for Disaster Risk Reduction. The national progress report on the implementation of the Hyogo Framework for Action (2013-2015) includes a core indicator stating that “Disaster Risk Reduction is an integral objective of environmental-related policies and plans, including for land use, natural resource management and adaptation to climate change”; the level of progress achieved on this indicator is 4 out of 5<sup>52</sup>.

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<sup>50</sup> <http://www.syke.fi/projects/plumes>

<sup>51</sup> Self-assessment survey findings (EEA): <http://www.eea.europa.eu/publications/national-adaptation-policy-processes>

<sup>52</sup> [http://www.preventionweb.net/files/40147\\_FIN\\_NationalHFAprogress\\_2013-15.pdf](http://www.preventionweb.net/files/40147_FIN_NationalHFAprogress_2013-15.pdf)

There are procedures in place for coordination. The National Risk Assessment (Kansallinen Riskiarvio<sup>53</sup>) recognises climate change as an important source of risk. The national monitoring group for adaptation also acts as a coordination mechanism with the authorities responsible for disaster risk reduction at national and sub-national levels.

## **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

Although no detailed budget could be found for cross-cutting/coordinated adaptation action, the Ministry of Agriculture and Forestry carries out these duties as part of its regular work or through projects. Climate adaptation is integrated into the key sector activities (e.g. to dam and flood safety or the monitoring and prevention of damages in forests) and ministries are responsible for providing funding to increase climate resilience in their administrative branches. All the research and development projects have been financed by project funding. Therefore, it is challenging to monitor the funding level for climate adaptation.

The state budget has an allocated budget for communications, guidance and studies for climate and energy policies (no information on adaptation)<sup>54</sup>. Some key funding sources for adaptation work includes the Government's analysis, assessment and research activities for the ELASTINEN project (assessment of the management of weather and climate risks and evaluated ways to promote management of these risks in various sectors) and SIETO project (preparing a national weather and climate vulnerability and change assessment). National scenarios and climate services are funded through the budget of FMI or other institutions, or through research programmes.

## **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

The new Environmental Impact Assessment (EIA) legislation came into force on 16 May 2017 and includes an assessment of climate change risks for projects.<sup>55</sup> The legislation includes assessing direct and indirect impacts of the project on, for example, climate, including the vulnerability of the project to climate change. The legislation covers impacts on soil, waters, air, climate, flora, fauna, and biodiversity.

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<sup>53</sup> In Finnish: <http://urn.fi/URN:ISBN978-952-324-059-9>

<sup>54</sup> Finland's Seventh National Communication under the United Nations Framework Convention on Climate Change. 2017. Ministry of the Environment and Statistics Finland, Helsinki. 314 pp.

<sup>55</sup> In Finnish: <https://www.edilex.fi/lainsaadanto/20170252>

The Act on the Assessment of the Effects of Certain Plans and Programmes on the Environment (200/2005) and the Government Decree on the Assessment of the Effects of Certain Plans and Programmes on the Environment (347/2005), known as the Strategic Environmental Assessment (SEA) Decree, are the major pieces of legislation transposing the SEA Directive in Finland. In addition, the provisions for SEAs of land-use plans are included in the Land Use and Building Act (Act 132/1999) and Decree (895/1999). The SEA legislation includes assessment of direct and indirect impacts of plans or programmes on climate among a range of other issues, including soil, water, air, and biodiversity.

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

Yes / **No**

Finland's first National Risk Assessment, published in December 2015, is based on the EU Civil Protection Mechanism, which binds all EU Member States. Protection under the EU Mechanism covers primarily people, but also the environment and property, against all kinds of natural and man-made disasters. These include the consequences of acts of terrorism, technological, radiological or environmental disasters, marine pollution and acute health emergencies. An update of the National Risk Assessment and 18 regional assessments is ongoing. The national assessment includes 19 scenarios that define issues that might endanger vital functions of society or cause serious problems for people, property or environment. Ten of these scenarios are related to extreme weather conditions. Assessments of climate adaptation and climate and weather-related risk management will be part of the process at the regional level.

Flood risk maps and flood risk management plans have been prepared according to EU Floods Directive (2007/60/EC), under the responsibility of the Ministry of Agriculture and Forestry. The future flood risks have been considered in the preliminary flood risk assessment, completed for all river basins, coastal areas and municipalities of Finland. Several climate scenarios were used in the preliminary flood risk assessment to model their impact on floods during the next 100 years and the impact was considered when the areas of potential significant flood risk were identified.

The LUOVA (multi-hazard) early warning system was initially developed for natural hazard warnings, it is now used for weather, marine, flood, earthquake, tsunami and space weather warning in close cooperation with other technical agencies.<sup>56</sup> LUOVA provides an assessment of possible events during a restricted time of danger.

The policies on preparedness in municipalities and developing rescue activities adopted by the Board of the Association of Finnish Local and Regional Authorities state that municipalities should take the consequences of climate change into account in their own plans for preparedness. There is no evidence on how future climate risks have indeed been incorporated.

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<sup>56</sup> [http://ec.europa.eu/echo/files/news/20140717\\_FinlandPeerReport.pdf](http://ec.europa.eu/echo/files/news/20140717_FinlandPeerReport.pdf)

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

**Yes** / No

Promoting nature conservation and biodiversity is one of the statutory objectives of the Land Use and Building Act of 1999. The Act also requires the consideration of these aspects in regional and local land-use plans.<sup>57</sup> The update of the national governmental land-use guidelines in 2008 mentions the need to consider storms, heavy rains and urban flooding and the risks of major accidents during land-use planning processes. The guidelines were revised so that they would better be able to meet the new challenges of land use, especially climate change<sup>58</sup>. The Guidelines implement the Land Use and Building Act and Decree and help to ensure that issues of national interest are taken into account in land use planning and in the activities of the government authorities in Finland. The Land Use and Building Act is currently under revision and the protection of biodiversity and cultural environment is specifically mentioned as an objective.<sup>59</sup>

In 2015 The Association of Finnish Local and Regional Authorities published a report on the climate work in the municipalities. The need for adaptation measures is increasingly recognised in municipalities although the need varies between the regions and municipalities. The most common measures are related to heavy rain and disruptions due to other extreme weather events. Work on adaptation is also closely related to preparedness and contingency planning in the municipalities.

### **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

Sectoral adaptation is promoted by the NAP, and previously by the 2005 NAS.

The need for climate adaptation is relatively well-recognised in different sectors, which are in differing stages of mainstreaming. The most advanced sector is water management, where adaptation has already been integrated into decision making. For example, a digital monitoring and risk management process has been developed for dam safety regulation, flood risk management legislation and the Water Services Act.

The key policy instruments to promote climate adaptation are sectoral plans that detail the specific measures for mainstreaming adaptation into sectoral activities and planning processes, see Section B3. For example, the Action Plan for Adaptation to Climate Change of the Environmental Administration (2016)<sup>60</sup> details how adaptation has been integrated into land use planning and the building sector, along with additional measures still to be taken to

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<sup>57</sup> Biodiversity Information for Europe, <https://biodiversity.europa.eu/countries/gi/finland>, accessed 16<sup>th</sup> of May 2018

<sup>58</sup> Ministry of Environment, 2009. The Future of land use is being decided now. The revised land use guidelines of Finland. <http://www.ym.fi/download/noname/%7B331CBF76-8C6B-4AAF-93E6-95DCCF1E2AC2%7D/58466>

<sup>59</sup> [http://www.ym.fi/enUS/Latest\\_news/Press\\_releases/Revised\\_national\\_land\\_use\\_guidelines\\_tow\(45417\)](http://www.ym.fi/enUS/Latest_news/Press_releases/Revised_national_land_use_guidelines_tow(45417))

<sup>60</sup> <http://julkaisut.valtioneuvosto.fi/handle/10024/79789>

strengthen mainstreaming. Likewise, measures are included for mainstreaming adaptation into nature conservation, water management and environmental protection.

Regarding water management, long-term changes in the climate have been considered in the revised legislation on water resources and other relevant steering of the water sector. The key instruments steering the water sector are the Water Act (2011), Act on Flood Risk Management (2010) implementing the Floods Directive, Dam Safety Act (2009), Water Services Act (2014). Additionally, a handbook on preparing for floods in the construction sector was completed in 2014, suggesting minimum elevations for buildings.

Statutes aimed to improve the security of electricity supply were included in amendments to the electricity market legislation in Spring 2013.

Recent modifications to forest legislation in 2014, i.e. to the Forest Act 5 and the Forest Damages Prevention Act 6, take into account climate adaptation by allowing more diverse forest management and reduced length of timber harvesting cycles in response to pests. In addition, Finland's National Forest Strategy 2025 (2015) contains adaptation-related measures. The Forest Tree Breeding Programme 2050 (2008) includes a target for selection of suitable stock for reforestation that takes account of climate change. The use of high quality seed, suitable for different climatic conditions, is promoted by establishment of new seed orchards. New maps that take into account climate projections were released in 2017 for deployment of improved seeds and seedlings of pine and are under preparation for spruce. In addition, there is a programme for establishing a network of genetic forest reserves. The Finnish Forest Centre's forest damage contingency plan uses appointed regional experts to assist with rapid harvesting of wind-damaged trees in order to prevent consequential damage. Planning of forest-road maintenance has been developed to take into account exceptional weather and soil conditions.

Invasive alien species are a threat to all natural resource sectors, e.g. agriculture, forestry, game and fisheries and reindeer management (SOPEUTUMISEN TILA<sup>61</sup>). The EU Regulation on invasive alien species entered into force in January 2015. The list of EU invasive alien species entered into force in August 2016, and was updated in August 2017. The Finnish National Act on Managing the Risks Caused by Alien Species, as well as the Government Decree on Invasive Alien Species of National Concern (national list of invasive alien species), entered into force on 1 January 2016. The national invasive alien species portal<sup>62</sup> was published in 2014. It enables citizens to recognise and report alien species. The portal includes information on and pictures of alien species, maps of their ranges and instructions on combating them.

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

Yes / **No**

Flood insurance is a key instrument in Finland. In 2014, compensation for flood damage through governmental funds was replaced with a private-insurance-based system. Under the

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<sup>61</sup> <http://jukuri.luke.fi/handle/10024/538722>

<sup>62</sup> [www.vieraslaajit.fi](http://www.vieraslaajit.fi)

new scheme, private insurance companies will provide damage compensation for all types of floods, including urban pluvial floods. However, this will apply only to floods above a threshold, pre-defined in insurance policies. The National Flood Centre gives expert opinion on whether this threshold was exceeded or not. Flood insurance is included in a package with home insurance, with no increase to insurance premiums (at the start of policies). After a few years, it is expected that premiums will be recalculated to eventually reflect the risk level. Insurance companies may use the flood-risk maps prepared during implementation of the EU Floods Directive.<sup>63</sup>

In 2016, some private insurance companies introduced products which cover risks for extreme weather conditions. Private insurance companies offer home and property insurances that cover damage caused by exceptional floods, as well as severe weather events. A great majority of households and property owners have this insurance.

There is a state aid system for commercial fishing in case of a loss or damage of fishing equipment or vessel in Finnish marine waters. Eligible causes of loss or damage include storms and ice, with a maximum vessel length of 12 metres.

The Government compensation scheme for crop damages ended at the end of 2015, and the following year some private insurance products, which cover risks for extreme weather conditions were introduced on the market by private insurance companies. Approximately less than one per cent of the whole arable area has been insured in (the first year) 2016. At the moment, there is no state aid to make the insurance more attractive for farmers. New guidelines for the state aid by the European Union have restricted the possibility for governmental compensation of damage caused by plant pests in agricultural or horticultural production, thus, no compensation has been paid since 2014. Adjustment of the compensation scheme for forest pests to the new guidelines has not yet been carried out. Private insurance products covering losses caused by plant pest outbreaks have not been introduced on the market so far, although some private insurance companies have shown interest.

## **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

Finland's Seventh National Communication (2018) under the United Nations Framework Convention on Climate Change provides an overview of progress in climate adaptation in different sectors.<sup>64</sup> The need for adaptation measures is recognised in most sectors, impacts of climate change are known reasonably well, and adaptation measures have been identified and their implementation has started. As discussed earlier, a significant share of adaptation actions are implemented at local or regional level, such as flood protection.

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<sup>63</sup> [http://ec.europa.eu/echo/files/news/20140717\\_FinlandPeerReport.pdf](http://ec.europa.eu/echo/files/news/20140717_FinlandPeerReport.pdf)

<sup>64</sup> Climate change impacts, adaptation measures and vulnerability assessment. Chapter 6 in Finland's Seventh National Communication under the United Nations Framework Convention on Climate Change. 2017. Ministry of the Environment and Statistics Finland, Helsinki. pp. 179-216. [https://www.stat.fi/static/media/uploads/tup/khkinv/fi\\_nc7\\_final.pdf](https://www.stat.fi/static/media/uploads/tup/khkinv/fi_nc7_final.pdf)

The most advanced sector is water management, where adaptation has been integrated into decision making, and digital monitoring and risk management processes have been developed. Agriculture and food production are also relatively advanced in implementation, while transport and communication, forestry, health, energy, tourism are just beginning. Fisheries, insurance, game management and biodiversity are the least advanced although there has been some progress in these sectors, too. An example is a study on insurance for crop flood damages by the Finnish Climate Change Panel<sup>65</sup>. The action plan for adaptation to climate change of the Ministry of Agriculture and Forestry 2011 to 2015 will be revised in 2018, building on a comprehensive study on vulnerability and adaptation in agriculture, forestry, fisheries, game and reindeer husbandry sectors that was completed in 2017.

In summary the following action plans have been completed for the administrative sectors:

- Climate Programme for Finnish Agriculture – Steps towards Climate Friendly Food (2014) (will be updated in 2018)
- Ministry of Environment Action Plan (2016)
  - Built environment
  - Conservation
  - Biodiversity and ecosystems
  - Water management (including sea and fresh waters)
  - Cross-cutting measures (research, communications and international cooperation)
- The Energy and Climate Programme of The Finnish Defence Forces - objectives and measures (updated in 2018)

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

**Yes** / No

Implementation of the NAP is monitored and promoted by a National Monitoring Group for Adaptation to Climate Change, which is steered by the Ministry of Agriculture and Forestry. The municipal and regional perspective in the group is represented by the Association of Finnish Local and Regional Authorities. The National Monitoring Group is the main mechanism for horizontal and vertical coordination. The objective of the monitoring group is, among others, to promote cooperation on adaptation between the government authorities and sectors of business and society. The current term of the monitoring group runs from 2015 to 2018.

The Government has recently produced new research on managing the climate and weather risks, particularly in the municipalities, including a policy brief on how municipalities can increase climate resilience by assessing and managing risks. The brief is based on research carried out in the ELASTINEN-project that provides information and solutions for sectors and actors to manage weather and climate risks.

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<sup>65</sup> In Finnish:

[http://www.ilmastopaneeli.fi/uploads/selvitykset\\_lausunnot/ilmastopaneeli\\_ilmastomuutoksen%20riskit%202016.pdf](http://www.ilmastopaneeli.fi/uploads/selvitykset_lausunnot/ilmastopaneeli_ilmastomuutoksen%20riskit%202016.pdf)

In 2017, the project KUJA2 (2017-2019) was developed. It builds on the results of the previous KUJA (2014-2016) project, and develops preparedness and continuity management in municipalities and in the new counties. KUJA2 aims to strengthen the interconnectedness of municipalities, regional authorities and their key stakeholders and to promote common understanding related to preparedness. Climate adaptation is part of the process. Both projects are implemented in cooperation between the Association of Finnish Local and Regional Authorities and the Finnish National Emergency Supply Agency (NESAs).<sup>66</sup>

Regarding the cooperation fostering the preparation of the flood risk management plans the Ministry of Agriculture and Forestry has appointed flood groups for the inland water and coastal areas, where one or several significant flood risk areas are located, with representatives from the Centres for Economic Development, Transport and the Environment, Regional Councils, municipalities and rescue authorities. The planning involves collaboration with other parties as well as hearings of local residents and operators.

**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**

We could not find any procedures or guidelines to assess potential climate impacts on major projects or programmes and facilitate the choice of alternative options. The NAP includes measures to include climate impacts in the draft proposal for impact assessment guidelines for legislation, plans and programmes. There are some informal guidelines on increasing climate resilience in the public sector and public procurement<sup>67</sup>.

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

**Yes** / No

The coordination Group for Adaptation to Climate Change was formed in 2008 to monitor and promote the implementation of the adaptation strategy together with the network of the stakeholders. Its work is continued in a Monitoring Group on Climate Change Adaptation, which was appointed in 2015. The monitoring group has a broad representation with representatives from the Prime Minister's Office and the relevant ministries, agencies, regional and local actors, research institutes, fire and rescue services, and financial services. The group is responsible for implementation, follow-up and communication relating to the adaptation plan and also for enhancing the cooperation between administrations and actors.

There are also sectoral mechanisms for stakeholder engagement, including regular meetings and groups, the flood groups being one example.

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<sup>66</sup> In Finnish: [www.kuntaliitto.fi/kuja](http://www.kuntaliitto.fi/kuja)

<sup>67</sup> [https://prezi.com/ydwrtD0fcb\\_y/julkinen-sektori-ilmastokestavyden-tyokalut/](https://prezi.com/ydwrtD0fcb_y/julkinen-sektori-ilmastokestavyden-tyokalut/)

## **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

Monitoring of the implementation of the 2005 NAS was first published in a mid-term evaluation report in 2009. In 2013, a second evaluation report took stock of the progress on implementation.

In line with the new Climate Act, the implementation of the adaptation plan is monitored and reported to the Parliament once during the electoral term, as part as the annual climate report. The section on adaptation will include a review on the adequacy and effectiveness of the adaptation actions and, where appropriate, include a description of the implementation of the planned actions on a sector-by-sector basis. The monitoring report on climate adaptation has not yet been submitted during the current electoral term (2015-2019).

The monitoring and evaluation of adaptation to climate change has been promoted in 2015 to 2017 by building a national adaptation monitoring framework and its indicators in cross-sectoral work. In particular, climate change related risks to the society and its various functions have been emphasised. The indicators are divided into three categories: 1. indicators representing climate impacts (these indicators measure the impacts and changes in exposure, such as sea level rise), 2. indicators representing risks (these indicators measure changes in vulnerability such as through flood risk maps), and 3. implementation and decision making (indicators measuring the level of action and/or supportive decision making such as level of investment to renew sewage systems or emergency planning against heat waves in hospitals). Assembling of the indicators was completed, and the associated report has been released in May 2017.<sup>68</sup> The report, however, recognises that further work is needed, for example, on harmonising and development sector-specific indicators and monitoring mechanisms.

There is also an on-going work lead by the Prime Minister's Office on the development of sustainable development indicators that has included adaptation relevant indicators, such as on flooding. The aim is also to link climate adaptation with the on-going regional reform and the resilience and preparedness of regions.<sup>69</sup>

Information on adaptation-related expenditures at national level has not yet been addressed.

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

**Yes** / No

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<sup>68</sup> Arnkil, N., Lilja-Rothsten, S., Juntunen, R., Koistinen A. & Lahti, E. (2017). Ilmastonmuutokseen sopeutumisen indikaattorit seurannan työkaluna [Indicators As a Tool For Monitoring Climate Change Adaptation]. (in Finnish) Tapion raportteja nro 17. <http://tapio.fi/wp-content/uploads/2017/05/Ilmastonmuutokseen-sopeutumisen-indikaattorit.pdf>

<sup>69</sup> Personal communication with MS contact.

A preliminary indicator of the level of adaptation in relevant sectors on a scale from one to five was developed in connection with the evaluation of the NAS implementation conducted in 2009. In addition to the adaptation measures launched in a specific sector, this indicator takes account of the adaptation research in the sector, cooperation between sectors and recognition of the need for adaptation. The exercise was repeated in the 2013 evaluation of the NAS and included in the NAP.

Information on the implementation of adaptation actions is also monitored and disseminated through sectoral actions plans, updates and evaluations (e.g. Ministry of Agriculture and Forestry, Ministry of Environment<sup>70</sup>).

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

**Yes** / No

The suggested monitoring framework for the NAP recognises the importance of the adaptation action at local and regional level and discusses potential indicators<sup>71</sup>. In Finland, many adaptation actions are implemented regionally or locally, specifically in flood and water management. Therefore, monitoring data for actions implicitly also cover regional and local actions, even if not explicitly stated so. Local and regional authorities are also part of the Monitoring Group of the NAP (see indicator 11b).

The Helsinki Metropolitan Area is advanced in monitoring and its Adaptation Strategy (2012) has its own monitoring and reporting framework. This framework includes indicators for the seven areas of focus (land use; transport and technical networks; buildings and climate proof local environment; water and waste management; rescue services and safety; social and health services; cooperation to produce and disseminate information). Monitoring information is also disseminated, and three monitoring/progress reports have been published since 2012.

## **11. Evaluation**

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

**Yes** / No

The first evaluation report on the implementation of the 2005 NAS was published in 2009. A broader evaluation was conducted in 2013 to assess the progress in adaptation and to give feedback and recommendation for the revision of the strategy. These evaluations led to the NAP.

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<sup>70</sup> Ympäristöministeriö, 2013, Ympäristöministeriön hallinnonalan sopeutumishjelman arviointi. Available at: [http://julkaisut.valtioneuvosto.fi/bitstream/handle/10138/41467/YMra\\_3\\_2013\\_Ymparistoministerion.pdf?sequence=2](http://julkaisut.valtioneuvosto.fi/bitstream/handle/10138/41467/YMra_3_2013_Ymparistoministerion.pdf?sequence=2) (In Finnish, Documentation Page in English)

<sup>71</sup> Lilja-Rothsten et al., 2015, Ilmastonmuutoksen sopeutumisen seurannan järjestäminen. Seurantakehikko. *Tapio*. In Finnish: [http://mmm.fi/documents/1410837/1516663/MMM-%23220285-v1-sopeutumisen\\_seurannan\\_j%C3%A4rjest%C3%A4minen\\_loppuraportti\\_.pdf/0aebf686-d8e3-47a8-a213-ca3bb7e4cae8](http://mmm.fi/documents/1410837/1516663/MMM-%23220285-v1-sopeutumisen_seurannan_j%C3%A4rjest%C3%A4minen_loppuraportti_.pdf/0aebf686-d8e3-47a8-a213-ca3bb7e4cae8)

The mid-term evaluation of the NAP is ongoing and the report will be published at the beginning of 2019.

The NAP is part of the planning system for climate change policy under the Climate Change Act. The act stipulates that the government approves a NAP at least every ten years. The NAS from 2005 had a mid-term and end-term evaluations. Therefore, it is expected that each adaptation plan will be evaluated twice through a mid-term and final evaluation.

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

**Yes** / No

The Monitoring Group of the NAP is responsible for the implementation, follow-up, evaluation and communication relating to the NAP and promotes cooperation between sectors in adaptation actions and the overall awareness raising on adaptation. The Group is composed of the Ministry of Agriculture and Forestry, other ministries, research institutes, local, regional and other relevant actors and associations.

## SUMMARY TABLE

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

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

<b>Adaptation Preparedness Scoreboard</b>		
<b>No.</b>	<b>Indicator</b>	<b>Met?</b>
8d	National policy instruments promote adaptation at sectoral level, in line with national priorities and in areas where adaptation is mainstreamed in EU policies	<u>Yes</u> / In progress / No
8e	Adaptation is mainstreamed in insurance or alternative policy instruments, where relevant, to provide incentives for investments in risk prevention	Yes / <u>No</u>
<b>9 Implementing adaptation</b>		
9a	Adaptation policies and measures are implemented, e.g. as defined in action plans or sectoral policy documents	<u>Yes</u> / In progress / No
9b	Cooperation mechanisms in place to foster and support adaptation at relevant scales (e.g. local, subnational)	<u>Yes</u> / 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 / <u>No</u>
9d	There are processes for stakeholders' involvement in the implementation of adaptation policies and measures.	<u>Yes</u> / No
<b>Step E: Monitoring and evaluation of adaptation activities</b>		
<b>10 Monitoring and reporting</b>		
10a	NAS/NAP implementation is monitored and the results of the monitoring are disseminated	<u>Yes</u> / No
10b	The integration of climate change adaptation in sectoral policies is monitored and the results of the monitoring are disseminated	<u>Yes</u> / No
10c	Regional-, sub-national or local action is monitored and the results of the monitoring are disseminated	<u>Yes</u> / No
<b>11 Evaluation</b>		
11a	A periodic review of the national adaptation strategy and action plans is planned	<u>Yes</u> / No
11b	Stakeholders are involved in the assessment, evaluation and review of national adaptation policy	<u>Yes</u> / No