

Adaptation preparedness scoreboard:

Country fiche for Croatia

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 sectors² 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

¹ The first versions of the fiches, prepared in consultation with the Member States in 2014-15, were unpublished and used to fine-tune the scoreboard.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

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".

Table of contents

List of abbreviations	4
POLICY FRAMEWORK	6
Adaptation strategies	6
A1. National adaptation strategy	6
A2. Adaptation strategies adopted at subnational levels	7
Adaptation action plans	7
B1. National adaptation plan	7
B2. Adaptation plans adopted at sub-national level	7
B3. Sectoral adaptation plans	8
SCOREBOARD	8
Step A: Preparing the ground for adaptation	8
1. Coordination structure	8
2. Stakeholders' involvement in policy development	10
Step B: Assessing risks and vulnerabilities to climate change	12
3. Current and projected climate change	12
4. Knowledge gaps	16
5. Knowledge transfer	16
Step C: Identifying adaptation options	18
6. Adaptation options' identification	18
7. Funding resources identified and allocated	20
Step D: Implementing adaptation action	20
8. Mainstreaming adaptation in planning processes	20
9. Implementing adaptation	22
Step E: Monitoring and evaluation of adaptation activities	23
10. Monitoring and reporting	23
11. Evaluation	25
SUMMARY TABLE	26

List of abbreviations

CCCCMA	Coordination Commission for Policy and Measures for Climate Change Mitigation and Adaptation
CDRRP	Croatian Disaster Risk Reduction Platform
DHMZ	Meteorological and Hydrological Service
draft NAS	Draft Climate Change Adaptation Strategy in the Republic of Croatia for the period to 2040 with outlook to 2070
draft NAP	Draft Action Plan for implementing the Climate Change Adaptation Strategy in the Republic of Croatia for the period from 2019 to 2023
DUZS	State Directorate for Protection and Rescue
EMFF	European Maritime and Fisheries Fund
EIA	Environmental impact assessment
EAFRD	European Agricultural Fund for Rural Development
ERDF	European Regional Development Fund
ESF	European Social Fund
ESIF	European Structural and Investment Funds
EU	European Union
EUSAIR	EU Strategy for the Adriatic-Ionian Region
EUSDR	EDU Strategy for the Danube Region
FZOEU	Fund for Environmental Protection and Energy Efficiency
HAOP	Croatian Environment and Nature Agency
HZJZ	Croatian Public Health Institute
ICZM	Integrated Coastal Zone Management
IPCC	Intergovernmental Panel on Climate Change
MFOP	Maritime and Fisheries Operational Programme 2014-2020
MMR Regulation	REGULATION (EU) No 525/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC
MZOE	Ministry of Environment and Energy of the Republic of Croatia
NAS	National Adaptation Strategy
NAP	National Adaptation Plan

NDRA	National Disaster Risk Assessment
OPCC	Operational Program Competitiveness and Cohesion 2014-2020
RCP	Representative Climate Pathways
RDP	Rural Development Program 2014-2020
RBMP	River Basin Management Plan
SEA	Strategic environmental assessment
UNEP/MAP	United Nations Environment Programme / Mediterranean Action Plan
UNFCCC	United National Framework Convention on Climate Change
ZZJZ	Public Health Institute dr. Andrija Štampar

POLICY FRAMEWORK

Adaptation strategies

A1. National adaptation strategy

The draft National Adaptation Strategy³ (NAS) and the draft National Action Plan (NAP)⁴ have been developed within a project funded through the EU Transition facility⁵. The project lasted from May 2016 to November 2017, and the official drafts of both documents were finalised and presented to the public in November 2017. The draft documents will first undergo a strategic environmental assessment (SEA) procedure in 2018, including a public hearing and public consultation, collection and addressing of comments. Finalisation of the draft NAS and NAP for submission to the governmental and the parliamentary adoption procedure is expected by end of 2018, and the documents are expected to come into effect in 2019⁶. The draft NAS is based on the Air Protection Act⁷, and covers the period until 2040 with a view to 2070, and is based on the results of climate modelling carried out for these two time-periods. Following consultations with key stakeholders in July 2017, the draft NAS document was finalised (White Paper) to include conclusions from e-consultations held in October 2017. The draft NAP has also been prepared for the first five years (2019-2023). The draft NAP and draft NAS focus on 10 sectors identified as most vulnerable to climate impacts: hydrology, water and marine resources, agriculture, forestry, biodiversity, physical planning and coastal zone management, tourism, energy, fisheries, risk management and health. In addition, they include two supra-sectoral measures: strengthening capacities for applied research in the area of climate modelling, analysis, and interpretation, and development of impact indicators for vulnerable sectors.

Until the NAS and NAP are adopted, the 6th and 7th National Communications to the United Nations Framework Convention on Climate Change (UNFCCC)⁸ (submitted in 2014 and in May 2018 respectively) formally set the overarching framework and preconditions for activities aiming at adaptation to climate change effects. These are primarily related to the upgrading and completion of a climate change monitoring and forecasting system, strengthening of applied research for adaptation measures, and building awareness and capacities.

³ 2017; Draft Climate Change Adaptation Strategy in the Republic of Croatia for the period to 2040 with a view to 2070 (White book); URL: <http://prilagodba-klimi.hr/wp-content/uploads/docs/Draft%20CC%20Adaptation%20Strategy.pdf>; accessed on 03.05.2018

⁴ 2017; Draft Action Plan for implementing the Strategy on Adaptation to Climate Change in the Republic of Croatia for the period from 2019 to 2023; URL: <http://prilagodba-klimi.hr/wp-content/uploads/docs/Draft%20CC%20Action%20Plan.pdf>; accessed on 03.05.2018

⁵ MZOE web, news page; <http://www.mzoip.hr/hr/ministarstvo/vijesti/predstavljen-nacrt-strategije-prilagodbe-klimatskim-promjenama.html>; accessed on 03.05.2018

⁶ Personal communication with MS contact

⁷ Zakon o zaštiti zraka, #Official Gazette #130/11, 47/14, 61/17; URL: http://narodne-novine.nn.hr/clanci/sluzbeni/2011_11_130_2601.html; accessed on 03.05.2018

⁸ 6th National Communication to the UNFCCC; URL: https://unfccc.int/files/national_reports/annex_i_natcom/application/pdf/hrv_nc6.pdf; accessed on 03.05.2018; accessed on 03.05.2018

Adaptation to climate change features as one of the general objectives in the country's 10-year Sustainable Development Strategy⁹, which was adopted in 2009.

A2. Adaptation strategies adopted at subnational levels

For the time being, there are no adaptation strategies being developed at subnational level.

Adaptation action plans

B1. National adaptation plan

The NAP covering a five-year period was drafted in November 2017, in parallel with the draft NAS. The national legal framework (Air Protection Act¹⁰) foresees the adoption of a NAP by the Croatian Government.

B2. Adaptation plans adopted at sub-national level

The national legal framework (Air Protection Act) requires that counties and towns adopt a programme for air and ozone layer protection and climate mitigation and adaptation. In addition, the Environmental Protection Act¹¹ requires that counties and towns adopt an environmental protection programme to implement the relevant measures from the national environmental protection plan. The majority of towns have fulfilled these obligations; regional and local government units (counties and towns) are also carrying out a number of activities that are relevant to climate adaptation: settlements and housing, municipal affairs, spatial and urban planning, protection and improvement of the natural environment, fire and civil protection. In addition, a number of adaptation projects have been carried out at local and regional level, in particular in the area of data gathering and awareness-raising of local and regional stakeholders on adaptation, and pilot vulnerability assessments for a coastal area.

Examples of adaptation planning activities at the local and regional level include:

- Within the European Commission's project "Adaptation strategies for European cities"¹² the town of Zadar in 2013 developed their local Vision document on adaptation and an Action plan¹³. The focus is so far mainly on the energy sector, i.e. promoting sustainable energy practices among citizens.
- The City of Zagreb carried out in 2013 an analysis of anticipated climate change effects. A set of 47 measures was defined with the goal of improving Zagreb's climate resilience. They include measures for protection against heat waves (buildings and green infrastructure), water management, adaptation of transport infrastructure, improvement of energy infrastructure and landslides.

⁹ Strategija održivog razvitka Republike Hrvatske; URL: http://narodne-novine.nn.hr/clanci/sluzbeni/2009_03_30_658.html; accessed on 03.05.2018

¹⁰ Zakon o zaštiti zraka; URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2017_06_61_1381.html

¹¹ Zakon o zaštiti okoliša; URL: http://narodne-novine.nn.hr/clanci/sluzbeni/2013_06_80_1659.html; accessed on 03.05.2018 http://narodne-novine.nn.hr/clanci/sluzbeni/2013_06_80_1659.html; accessed on 03.05.2018

¹² Climate Adapt project website; URL: <http://climate-adapt.eea.europa.eu/metadata/publications/eu-cities-adapt-adaptation-strategies-for-european-cities-final-report>; accessed on 03.05.2018

¹³ City of Zadar website - about Climate Adapt participation; URL: <http://www.grad-zadar.hr/eu-cities-adapt-701/>; accessed on 03.05.2018

- The UNEP/MAP's project "Integrating impacts of climate variability and change into integrated coastal zone management (ICZM)" prepared for Šibenik-Knin County an ICZM Plan¹⁴ as a tool to address climate variability and change impacts by adaptation measures.

B3. Sectoral adaptation plans

The national legal framework requires that adaptation measures are implemented in the following vulnerable sectors: water resources, agriculture, land and marine biodiversity and ecosystems, coastal management, tourism and public health. However, there are very limited adaptation actions embedded in sectoral strategies and action plans (some actions are embedded in the energy and water sectors).

Climate impacts on the water regime were considered qualitatively during the preparation of the 2016-2021 River Basin Management Plan (RBMP)¹⁵. However, the methodology for assessing the climate impacts on water regime changes has not yet been adopted. The RBMP specifies that all planning documents in the water sector shall be aligned with the NAS.

The Flood Risk Management Plan for the 2016-2021 planning period (part of the RBMP) contains a measure of the analysis of the climate impact on the concepts of protection from adverse effects of water and flood risk management, and a revision of the programme of measures is intended to include measures for climate adaptation.

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

The responsibility for climate change policy in Croatia falls within the competence of the Ministry of Environment and Energy (MZOE), Directorate for climate activities, sustainable development and protection of air, soil and of light pollution. This includes development of strategic and planning documents and carrying out the work of a national contact authority for reporting to EU bodies and other international bodies on climate adaptation policy. MZOE is responsible for the development and implementation of the NAS and NAP, supported by the two organisational units under the responsibility of MZOE (Croatian Environment and Nature Agency – HAOP¹⁶, and Environmental Protection and Energy Efficiency Fund - FZOEU), as well as the Meteorological and Hydrological Service¹⁷ (DHMZ).

¹⁴ 2016; Obalni plan Šibensko-kninske županije; URL: <http://sibensko-kninska-zupanija.hr/stranica/obalni-plan-ibensko-kninske-upanije/209>; accessed on 03.05.2018

¹⁵ Odluka o donošenju plana upravljanja vodnim područjima 2016.–2021.; URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2016_07_66_1623.html; accessed on 03.05.2018

¹⁶ HAOP website; URL: <http://www.haop.hr/>; accessed on 16.05.2018

¹⁷ DHMZ website; URL: <http://www.meteo.hr/>; accessed on 03.05.2018

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

Yes / In progress / No

The Government of Croatia established the Inter-Sectoral Coordination Commission for Policy and Measures for Climate Change Mitigation and Adaptation (CCCCMA) for the first time in Autumn 2014¹⁸. The new Decision on establishment of the CCCCMA came into force in January 2018¹⁹, that no longer includes names of technical working group members but leaves its set up at the discretion of the minister for environment, as the CCCCMA chairman. The purpose of the CCCCMA, which is administratively supported by MZOE, is to give recommendations to the Government, monitor and evaluate the implementation and planning of mitigation and adaptation policy and measures in Croatia, in line with the Air Protection Act and to improve the horizontal coordination in climate change policy making among the state sectoral actors. The CCCCMA is organised at two levels:

- The Coordination Group, nominated from the lines of public officials (assistant ministers) from the following sectoral ministries: environment (including energy and nature protection), labour, foreign affairs, science and education, economy and entrepreneurship, regional development and EU funds, finance, sea, transport and infrastructure, agriculture, construction and physical planning tourism, health, and demography
- Two technical groups: one for climate adaptation, and another for low carbon development, set up from the lines of practitioners in sectoral ministries, expert institutions, economic actors and NGOs working on climate-relevant issues – the new technical groups are still to be nominated by the Minister for Environment.

Based on the opinions and proposals of technical working groups, the Coordination Group makes recommendations on the overall policy and measures for mitigation and adaptation to climate change to the Croatian government, providing support in the implementation of policies and measures and promoting synergies and mainstreaming climate change into other public policies.

The CCCCMA was instrumental in deciding on strategic goals, policies, measures and methodologies for dealing with adaptation, which started the process of development of an adaptation strategy and action plan. The draft NAS proposes that the existing CCCCMA takes the leading role in coordinating the NAS and NAP implementation and monitoring, as well as coordinating a more active involvement of sectoral/resource ministries in the implementation of NAS.

¹⁸ Odluka o osnivanju Povjerenstva za međusektorsku koordinaciju za politiku i mjere za ublažavanje i prilagodbu klimatskim promjenama, Official gazette #114/14; URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2014_09_114_2171.html; accessed on 04.05.2018

¹⁹ Odluka o osnivanju povjerenstva za međusektorsku koordinaciju za politiku i mjere za ublažavanje i prilagodbu klimatskim promjenama, Official gazette #9/18; URL: <http://www.propisi.hr/print.php?id=13274>; accessed on 16.05.2018

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

Regional and local planning for adaptation is carried out by the respective regional and local administrations. As the adaptation policy process is in formulation, a temporary coordination mechanism has been set up between national, regional and local stakeholders in the form of participation of regional and local governments in public consultation during the process of drafting the NAS and NAP.

Although not specifically for adaptation, there are mechanisms in place that provide vertical coordination between local, regional and national level in development, spatial planning and SEA procedures, as well as in standard legislation and policy making structures. For the efficient operation of local and regional government units in climate adaptation, the draft NAS acknowledges the necessity to significantly strengthen their capacities, both strategically (through developing regional development plans and spatial plans that will include consideration of climate adaptation), as well as technical training by experts in specific areas of climate adaptation.

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

Based on the initial inter-sectoral consultation that was carried out through the CCCCMA²⁰, which brings together national authorities, academia, business, industry and non-governmental organisations, a public consultation process was implemented. The public consultation is required by the national legal framework (Air Protection Act²¹) for the drafts of strategies and plans, and so it was planned and carried out in the frame of the technical assistance project “Strengthening the capacity of the Ministry of Environment and Energy for adaptation to climate change and preparation of the Draft Climate Change Adaptation Strategy”.

Within the process of drafting the NAS, a series of 10 workshops for experts in the sectors covered under the NAS (see Section A1) were carried out regarding climate modelling, applying the results of modelling and scenarios for impact and vulnerability assessment, assessing measures, etc. Another series of 10 workshops was aimed at civil servants at national, regional and local level and the public concerned (Gospić²², Osijek, Rijeka²³,

²⁰ Odluka o osnivanju Povjerenstva za međusektorsku koordinaciju za politiku i mjere za ublažavanje i prilagodbu klimatskim promjenama; Official Gazette #9/18; URL: <http://www.propisi.hr/print.php?id=13274>; accessed on 03.05.2018

²¹ Zakon o zaštiti okoliša; Official gazette #130/11, URL: http://narodne-novine.nn.hr/clanci/sluzbeni/2011_11_130_2601.html; and #47/14, http://narodne-novine.nn.hr/clanci/sluzbeni/2014_04_47_874.html; accessed on 03.05.2018

²² Project news – Stakeholder workshop in Osijek; <http://prilagodba-klimi.hr/2016/11/16/osijek-zupanijska-ulica-4-zupanijska-vijecnica-za-sluzbenike-na-nacionalnoj-i-lokalnoj-razini-te-za-zainteresiranu-javnost-odrzana-je-radionica-o-utjecaju-klimatskih-promjena-i-o-mjerama-p/>; accessed on 03.05.2018 Project news –

Zadar²⁴, Varaždin²⁵, Dubrovnik²⁶, four events in Zagreb)²⁷. The aim was to discuss and raise awareness of climate impacts, inform on the process of development of the NAS and engage stakeholders. The key topics included information on expected climate change, impacts, vulnerability and possible climate adaptation in key sectors for the geographical area of the workshops.

The working version of the Climate Change Adaptation Strategy (Green Paper) was prepared and published on the project website in July 2017²⁸, with a call to stakeholders and interested public to give their opinion, suggestions and comments to improve and harmonise the document. In addition, meetings were organised with ministries and agencies from sectors covered by the NAS to present and discuss the Green Paper. Comments were considered during preparation of the final draft of NAS (White Paper²⁹).

The White Paper was also published on the project page and passed an internet consultation with the interested public.

Finally, the public will also have an opportunity for participation through public hearing and e-consultation during the strategic environmental assessment procedure that will be carried out for the NAS, planned during 2018.

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

Yes / No

Transboundary cooperation in terms of climate adaptation is present but limited to river basin management issues, in the context of international river commissions for Sava and Danube Rivers, especially on floods.

Croatia also takes part in the implementation of the two macro-regional strategies (EU Strategy for the Adriatic and Ionian Region, EUSAIR; and EU Strategy for the Danube

Stakeholder workshop in Osijek; <http://prilagodba-klimi.hr/2016/11/16/osijek-zupanijska-ulica-4-zupanijska-vijecnica-za-sluzbenike-na-nacionalnoj-i-lokalnoj-razini-te-za-zainteresiranu-javnost-odrzana-je-radionica-o-utjecaju-klimatskih-promjena-i-o-mjerama-p/>; accessed on 03.05.2018

²³ Project news – Stakeholder workshop in Rijeka; URL: <http://prilagodba-klimi.hr/2017/02/16/rijeka-riva-boduli-1-za-sluzbenike-na-nacionalnoj-i-lokalnoj-razini-te-za-zainteresiranu-javnost-odrzana-je-radionica-o-utjecaju-klimatskih-promjena/>; accessed on 03.05.2018

²⁴ Project news – Stakeholder workshop in Zadar; URL: <http://prilagodba-klimi.hr/2017/03/15/zadar-za-sluzbenike-na-nacionalnoj-i-lokalnoj-razini-te-za-zainteresiranu-javnost-odrzana-je-radionica-o-utjecaju-kp/>; accessed on 03.05.2018

²⁵ Project news – Stakeholder workshop in Varaždin; URL: <http://prilagodba-klimi.hr/2017/03/21/varazdin-velika-skupstinska-dvorana-zupanijske-palace-franjevacki-trg-7-za-sluzbenike-na-nacionalnoj-i-lokalnoj-razini-te-za-zainteresiranu-javnost-odrzana-je-radionica/>; accessed on 03.05.2018

²⁶ Project news – Stakeholder workshop in Dubrovnik; URL: <http://prilagodba-klimi.hr/2017/04/03/dubrovnik-velika-vijecnica-grada-dubrovnika-pred-dvorom-1-za-sluzbenike-na-nacionalnoj-i-lokalnoj-razini-te-za-zainteresiranu-javnost-odrzana-je-radionica-o-utjecaju-klimatskih-promjena/>; accessed on 03.05.2018

²⁷ Project news - Stakeholder workshops in Zagreb; URL: <http://prilagodba-klimi.hr/category/vijesti/http://prilagodba-klimi.hr/category/vijesti/http://prilagodba-klimi.hr/category/vijesti/>; accessed on 03.05.2018

²⁸ Draft NAS project website (Green paper); URL: <http://prilagodba-klimi.hr/wp-content/uploads/2017/11/ZELENA-KNJIGA.pdf>; accessed on 13.06.2018

²⁹ Draft NAS project website (White paper); URL: <http://prilagodba-klimi.hr/wp-content/uploads/docs/Nact%20Strategije%20prilagodbe.pdf>; accessed on 13.06.2018

Region, EUSDR) by participating in regional cooperation projects to address various climate-related challenges shared in the region, through research, knowledge transfer, capacity building and awareness activities, such as DriDanube – Drought Risk in the Danube Region30 project.

The Water and Climate Adaptation Plan for the Sava River Basin³¹ (covering five countries including Croatia) was developed by the International Sava River Basin Commission (ISRBC) in 2015, as a guidance document for adaptation measures in navigation, hydropower, agriculture, flood protection, economic evaluation of climate impacts. It suggests a methodology to examine effects of (only) climate change on those sectors, although the integrated effects have not been considered due to lack of data. A joint operational flood forecasting and early warning system for the riparian countries in the Sava River Basin³² was launched in June 2016³³ and should be finalised by September 2018. In addition, a Joint Flood Risk Management Plan for the Sava River Basin is in preparation, scheduled for finalisation by July 2018. An Outline of the Climate Adaptation Strategy and basin-wide priority measures for the Sava River Basin³⁴ was prepared in January 2018 for ISRBC, for consultation purposes.

Transboundary cooperation has been addressed in the draft NAP through one measure for the water sector: “Development of international cooperation in the implementation of monitoring of the state of the inter-state watercourses and the Adriatic Sea with the aim of sustainable management and protection” in terms of project cooperation and knowledge exchange within existing international processes/commissions and bilateral cooperation with neighbouring countries.

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

The Croatian Meteorological and Hydrological Service conducts meteorological observations to monitor the impacts of climate change for general climate indicators. There is still work needed to expand the set of climate change indicators (e.g. to coastal, marine, biodiversity

³⁰ Dri-Danube project website; URL: <http://www.interreg-danube.eu/approved-projects/dridanube>, accessed on 16.05.2018

³¹ Project information “Water and Climate Adaptation Plan for the Sava River Basin“; URL: https://www.savacommission.org/project_detail/18/1; accessed on 15.05.2018

³² Presentation of the project “Flood forecasting and warning system for the Sava River Basin“; URL: http://www.savacommission.org/dms/docs/dokumenti/events/workshop_on_flood_risk_management_measures_and_links_to_eu_wfd/presentations/11.pdf; accessed on 15.05.2018

³³ Project news “Flood Forecasting and Warning System for the Sava River“; URL: <https://www.royalhaskoningdhv.com/en-gb/news-room/news/pre-release-of-flood-forecasting-and-warning-system-for-sava-river-basin/6956>; accessed on 16.05.2018

³⁴ Thomas Dworak; 2018; Outline of the Sava Climate Adaptation Strategy for the Sava River Basin; URL: http://www.savacommission.org/dms/docs/dokumenti/peg_rbm/ad.3.1_wm_issues_doc_8_outline_of_the_climate_adaptation_strategy_for_the_sava_rb.pdf

etc.). There is a need to modernise the existing climate observation and prediction system, namely improving the quality and availability of meteorological data (including climatological and hydrological data) and infrastructure that will allow a better understanding of climate change and as a result enable adequate adaptation policy measures. Modernisation of the meteorological network – METMONIC³⁵ started in 2015 and is planned to go on until 2022. Contributions to this project are made by DHMZ, HAOP, the Croatian Waters and other research and monitoring institutions through EU-funded and bilateral donor projects.

Meteorological data are available on extreme weather events of climate change relevance, such as heatwaves, floods, strong winds and thunderstorms causing forest fires, and snow and ice. Furthermore, there are data on related health impacts and infrastructural damage costs, all with varying degrees of detail. Data on heatwaves and their impacts have been systematically monitored since 1983 by the Public Health Institute dr. Andrija Štampar” (ZZJZ) but only for the Zagreb City area. Data on floods are available from the early 20th century onwards for the entire country’s territory by Croatian Waters, and data on forest fires is available from 1981 (State Directorate for Protection and Rescue - DUZS). DHMZ provides climate monitoring data on extreme weather events (systematically covering period from 1961 onwards) and cooperates with DUZS and other sectoral institutions to provide warnings for citizens and set up precautionary, protection and rescue measures, including transboundary actions and data exchange for cases of floods and fires³⁶.

The Ministry of Finance records damage due to natural disasters, in cooperation with the State Commission for the Assessment of Natural Disasters³⁷. The statistical data on extreme weather events, coupled with climate scenarios, provide for more precise projections and can result in stronger prevention and response measures, which will be further elaborated in the future strategy for disaster risk reduction. Improvement of data integration, inventorying and monitoring of climate-related environmental indicators has, therefore, been included among the priority measures in the draft NAS.

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

Within the project of the draft NAS and draft NAP development, in addition to the historical climate simulation for the period 1971-2000, scenarios and projections have been produced for Croatia. In these scenarios, the Croatian Meteorological and Hydrological Service took geographical specificities into account using the regional climate model RegCM on the basis of the calculated change (forecasts) for the future climate in two periods: 2011-2040 and 2041-2070, using the IPCC AR5 scenarios RCP4.5 and RCP8.5. The spatial integration domain covered the wider Europe area (Euro-CORDEX) combined with marginal conditions

³⁵ METMONIC project page; URL: <http://klima.hr/razno.php?id=projekti¶m=metmonic>; accessed on 17.05.2018

³⁶ DUZS; Procjena rizika od katastrofa za Republiku Hrvatsku; 2015; URL: <http://stari.duzs.hr/download.aspx?f=dokumenti/Clanci/ProcjenarizikaodkatastrofauRH..pdf>; accessed 17.05.2018

³⁷ Odluka o imenovanju državne komisije za procjenu šteta od elementarnih nepogoda; OG #43/96; URL: http://narodne-novine.nn.hr/clanci/sluzbeni/full/1996_05_43_844.html; accessed 17.05.2018

from four global climate models (GCM, Cm5, EC-Earth, MPI-ESM, HadGEM2). Climate simulations until the end of the century were done with a 50 km horizontal resolution³⁸. For climatological parameters with higher spatial variability (precipitation, snow cover, wind, etc.) or depending on the different characteristics of small spatial scales (orography, land-sea contrast), a finer horizontal resolution of 12.5 km was planned. However, due to the complex orography, particularly in the coastal belt of Croatia, this demanding numerical modelling extends beyond the NAS drafting process, and is expected to be finalised by the end of 2018.

A comprehensive assessment of climate impacts and vulnerabilities was carried out as part of the NAS development process in May 2017, using the climate projections until 2040 and 2070. The measures of the Croatian draft NAS were determined according to the moderate RCP4.5 scenario, as the most common scenario used in drafting adaptation strategies.

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

Yes / In progress / No

A vulnerability assessment was developed in May 2017³⁹ in the framework of the NAS development covering the eight most vulnerable sectors and two cross-sectoral thematic areas, including economic, social and environmental impacts.

The Air Protection Act⁴⁰ recognises sectors exposed to climate impacts and prescribes the obligation of undertaking adaptation measures in those sectors (hydrology and water resources, agriculture, forestry, biological diversity and natural inland ecosystems, biological diversity and marine ecosystems, coast and coastal area, tourism, and human health). Vulnerable sectors are also defined in the 6th National Communication to the UNFCCC (2014)⁴¹ and in the 7th National Communication to the UNFCCC (2018)⁴²

³⁸ EPTISA Adria d.o.o. for MZOE; 2017; Rezultati klimatskog modeliranja na sustavu HPC Velebit za potrebe izrade nacrtu Strategije prilagodbe klimatskim promjenama Republike Hrvatske do 2040. s pogledom na 2070. i Akcijskog plana; URL: <http://prilagodba-klimi.hr/wp-content/uploads/2017/11/Klimatsko-modeliranje.pdf>; and Dodatak rezultatima klimatskog modeliranja na sustavu HPC VELEbit: Osnovni rezultati integracija na prostornoj rezoluciji od 12,5 km; URL: [http://prilagodba-klimi.hr/wp-content/uploads/docs/Dodatak Klimatsko modeliranje VELEbit 12.5km.pdf](http://prilagodba-klimi.hr/wp-content/uploads/docs/Dodatak_Klimatsko_modeliranje_VELEbit_12.5km.pdf); accessed on 03.05.2018

³⁹ EPTISA Adria d.o.o. for MZOE; 2017; Izvještaj o procijenjenim utjecajima i ranjivosti na klimatske promjene po pojedinim sektorima; URL: <http://prilagodba-klimi.hr/wp-content/uploads/docs/Procjena-ranjivosti-na-klimatske-promjene.pdf>; accessed on 03.05.2018

⁴⁰ Zakon o zaštiti okoliša; Official gazette #130/11, URL: http://narodne-novine.nn.hr/clanci/sluzbeni/2011_11_130_2601.html; and #47/14, http://narodne-novine.nn.hr/clanci/sluzbeni/2014_04_47_874.html; accessed on 03.05.2018

⁴¹ Ministry of Environmental and Nature Protection; 2014; Sixth National Communication and first Biennial Report of the Republic of Croatia under the United Nations Framework Convention on Climate Change (UNFCCC); URL: http://unfccc.int/files/national_reports/annex_i_natcom/application/pdf/hrv_nc6.pdf; accessed on 03.05.2018

⁴² UNFCCC; Seventh national communication and third biennial report of the Republic of Croatia under the United Nations Framework Convention on Climate Change (UNFCCC); 2018. Croatia; URL: https://unfccc.int/sites/default/files/resource/4786521_Croatia-NC7-BR3-1-VII.%20NIRH_EN_30.4.2018.%20%281%29.pdf; accessed on 03.05.2018

Eight key sectors and two cross-sectoral thematic areas have been selected for vulnerability analysis⁴³ for which the climate impacts were described in the framework of the NAS drafting process: hydrology; water and marine resources; agriculture; forestry; fisheries; biodiversity; energy; tourism; health; spatial planning and coastal areas management; and disaster risk management. Vulnerability assessment was based on modelling results and scenarios based on the Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathway RCP4.5 medium scenario and regional climate model RegCM, as well as previous research on climate impacts and adaptation in Croatia per sector (including sectoral environmental, social and economic impacts, impacts on infrastructure – buildings, transport, energy – and transboundary climate change risks assessment). Projections and assessment results provided the insights on climate impacts per sector, as well as impact interactions between different sectors, and listed the possible responses to the challenges identified. The Risk Assessment for the Republic of Croatia was adopted in November 2015⁴⁴. Its revision is planned by Autumn 2018, together with the assessment of risk management capacities for eight major risks, followed by a Strategy for Disaster Risk Reduction, which is planned for drafting in the last quarter of 2018 and adoption in 2019. Three questions were addressed within the risk assessment: 1) How does climate change affect risks? 2) What is the expected timeframe for the effects? 3) What are the reference documents that the analysis is based on? Eleven risks have been processed (earthquake, flood, plant diseases, animal diseases, soil salinisation, drought, industrial accidents, open space fires, extreme temperatures, snow and ice, and epidemics and pandemics), nine of which are related to climate change. Climate change is treated as a driver for events (such as drought, extreme temperatures, extreme precipitations, soil salinisation and floods) and is, therefore, an important factor in the risk analysis, as it affects either the intensity or frequency of the event. In addition to an analysis of threats, calculation includes analysis of vulnerability of society to disasters.

A risk and vulnerability assessment was also conducted for the human health sector on heatwaves. Every year, the protocol on procedure and recommendations for protection from heat is adopted (last in July 2017⁴⁵), with the goal to reduce risk to individuals and institutions during heat waves by implementing necessary preparedness and response procedures at the national and local level. A heatwave alert system is established for the entire territory of the Republic of Croatia and is active in the period from May to October. During that period, DHMZ constantly monitors the temperature and, in the case of 70% chance that the temperature will exceed the threshold (about 35°C, depending on region), informs the Ministry of Health and the Croatian Institute for Public Health (HZJZ) on the occurrence of a heatwave, which then forwards the alert.

⁴³ EPTISA Adria d.o.o. for MZOE; May 2017; Izvještaj o procijenjenim utjecajima i ranjivosti na klimatske promjene po pojedinim sektorima, URL: <http://prilagodba-klimi.hr/wp-content/uploads/2017/11/Procjena-ranjivosti-na-klimatske-promjene-final.pdf>; accessed on 03.05.2018

⁴⁴ DUZS; 2015; URL: Procjena rizika od katastrofa za Republiku Hrvatsku; URL: http://www.platforma.hr/images/dokumenti/Procjena_rizika_RH_FINAL.pdf; accessed on 03.05.2018

⁴⁵ Ministry of Health; 2017; Protokol o postupanju i preporuke za zaštitu od vrućine; URL: <https://zdravlje.gov.hr/UserDocsImages/2017%20programi%20i%20projekti/PROTOKOL%20-%20VRUCINA.pdf>; accessed on 03.05.2018

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

Yes / **In progress** / No

Some information on transboundary risks is given for relevant sectors in the May 2017 vulnerability assessment, including hydrology and water resources, forestry (forest fires), biodiversity and energy. The draft NAP addresses transboundary risks through one single measure in the water sector: “Development of international cooperation in the implementation of monitoring of the state of the inter-state watercourses and the Adriatic Sea with the aim of sustainable management and protection”, in terms of project cooperation and knowledge exchange within existing international processes/commissions and bilateral cooperation with neighbouring countries

Furthermore, transboundary risks are also considered in some of the transboundary cooperation initiatives mentioned in Indicator 2b.

4. Knowledge gaps

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

Yes / In progress / No

As part of the draft NAS development, analysis of research activities was carried out and presented in the document “Overview of research on impacts of climate change and adaptation”⁴⁶. This information was used to identify gaps in knowledge and information, and for identifying the topics for future research. Based on approximately 200 references from research projects, reports, studies, articles and databases analysed (collectively referred to as “research”), the research for individual sectors was found to be fragmentary, lacking a comprehensive analysis of an entire sector or of an entire climate impact phenomenon. In all vulnerable sectors there are ample data; however, research is focused on, for example, individual species or crops, individual activity types, narrow geographic areas, specific health impacts etc. In consultation with key sectoral experts and institutions, extensive recommendations were collected for future research needed in each sector to fill the current knowledge gaps. Examples include: to focus research on larger populations (health), to complete the inventory of species (biodiversity, forestry), and to improve data integration in cross-cutting areas, such as disaster risk management. The assessment showed a big gap in the research on economic impacts of climate change and cost-effectiveness of various adaptation measures.

The recently finalised project: "Capacity Building of the Ministry of Environment and Energy for climate adaptation and preparation of the Draft Strategy for adaptation to climate change"⁴⁷ aimed at strengthening technical knowledge on individual aspects of adaptation.

⁴⁶ EPTISA Adria d.o.o., Pregled dosadašnjih istraživanja i aktivnosti vezanih uz utjecaj klimatskih promjena i prilagodbu klimatskim promjenama u Republici Hrvatskoj, URL: <http://prilagodba-klimi.hr/dokumenti/>

⁴⁸ Draft NAS development - project website; URL: <http://prilagodba-klimi.hr/>; accessed on 03.05.2018

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

Two specific webpages/portals provide resources and information on climate adaptation issues:

- Draft NAS development – Project webpage⁴⁸
- MZOE – Adaptation to Climate Change⁴⁹

The draft NAS development website contains resources prepared as a part of drafting the NAS, such as the report on climate modelling, impact and vulnerability assessment reports, analysis of available research on climate change and adaptation, a capacity building needs assessment, a brochure for the general public, an overview of the NAS and NAP drafting process and the final drafts of NAS and NAP. General information on adaptation policy issues, adaptation activities in Croatia and internationally is provided on the MZOE's page on Adaptation to Climate Change. Climate data (historical data, climate projections, publications etc.) are available through the Meteorological and Hydrological Service⁵⁰.

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

There are ongoing actions on capacity building, mainly related to one-off projects for participation, but so far not in a coordinated manner in the absence of a NAS having been adopted. Preparation of education and training materials on climate adaptation concepts and practices as well as further trainings are envisaged by several draft NAS measures in all 10 vulnerable sectors.

- MZOE plans to implement climate-change resilience and climate adaptation schemes at national and local level to create the preconditions for implementing the NAS and NAP, funded through EU funds.⁵¹ The recently finalised project: "Capacity Building of the Ministry of Environment and Energy for climate change adaptation and preparation of the Draft Strategy for adaptation to climate change"⁵² produced an assessment of capacity building needs for addressing climate adaptation at all governance levels and among key public and private stakeholders across 10

⁴⁸ Draft NAS development - project website; URL: <http://prilagodba-klimi.hr/>; accessed on 03.05.2018

⁴⁹ MZOE webpages on adaptation; URL: <http://www.mzoip.hr/en/climate/climate-change-adaptation.html>; accessed on 03.05.2018
<http://www.mzoip.hr/en/climate/climate-change-adaptation.html>

⁵⁰ DHMZ climate portal; URL: <http://klima.hr/klima.php?id=k5><http://klima.hr/klima.php?id=k5><http://klima.hr/klima.php?id=k5>; accessed on 03.05.2018

⁵¹ Personal communication with MS contact.

⁵² Draft NAS development – project website; URL: <http://prilagodba-klimi.hr/>; accessed on 16.05.2018

vulnerable sectors. The draft NAS defines the following major areas for capacity building: Increasing human (professional), material and financial resources for the implementation of planned adaptation measures, especially through available programs for which EU funds are already secured.

- Further education of public and private sector experts on climate change and sector-specific adaptation needs.
- Targeted training of civil society experts for further education of the public.

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 official final draft of the NAS (White Paper) published in November 2017 proposes a set of 80 adaptation measures and activities for eight vulnerable sectors and two cross-sectoral thematic areas, as well as two measures that can be considered as multi-sectoral (climate modelling, and development of the implementation impact indicators for the NAS), in response to sectoral risks and geographical specificities identified.

The largest number of proposed measures falls within the so-called “non-structural” measures (administrative, political, legislative, technical and planning measures, measures to raise awareness of the need for climate adaptation, data gathering, monitoring and scientific-research work). A relatively small number of so-called “structural” measures includes certain technical interventions such as construction of protective dams and walls, construction of hydro-technical facilities, as well as afforestation, building of green infrastructure, strengthening the absorption capacity of land for the absorption of excess water, etc.

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

Options for vulnerable sectors were identified taking into account climate modelling and the impact and vulnerability assessment. Possible measures were discussed in workshops with over 130 stakeholders: sectoral experts, as well as local and regional authorities and interested general public, together with the criteria for selection of priority measures. The resulting 80 so-called ‘sectoral’ measures were divided into five groups based on the national priorities of the NAS, which were identified by stakeholders during the process of harmonising the concept of climate adaptation in the Republic of Croatia and prioritised as very high, high, or medium priority for implementation, using multi-criteria analysis⁵³.

⁵³ EPTISA Adria d.o.o.; 2017; Izrada radne verzije Strategije prilagodbe klimatskim promjenama u Republici Hrvatskoj za razdoblje do 2040. godine s pogledom na 2070. godinu (Zelena knjiga); URL: <http://prilagodba-klimi.hr/wp-content/uploads/2017/11/ZELENA-KNJIGA.pdf>

Five national priorities have been identified, within which climate adaptation measures are to be implemented:

1. Ensuring sustainable regional and urban development
2. Ensuring preconditions for the economic development of rural areas, coastal areas and islands
3. Ensuring sustainable energy development
4. Strengthening of the management capacities through a networked monitoring and early warning system
5. Ensuring continuity of research activities that were assessed with very high priority.

Most measures ranked as “very high importance” in the draft NAS were at the same time identified under the European Structural and Investment Funds (ESIF) programming priorities for the period 2014-2020, for which funding is available under Operational Program Competitiveness and Cohesion (OPCC) 2014-2020, the Rural Development Program (RDP) 2014-2020 and the Maritime and Fisheries Operational Programme (MFOP) 2014-2020. The revision of programming documents for the use of ESIF for the period 2014-2020 is envisaged in 2018. As such, some financial resources may be provided for priority measures in the “very high importance” category, which would have been contracted in the period up to 2020. This primarily relates to the use of funds from the European Regional Development Fund (ERDF), the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF), where financing of climate adaptation measures is defined in Climate Change Adaptation Strategy, but also includes European Social Fund (ESF).

The selection of measures in the draft NAP 2019-2023 has covered 42 (out of 82) sectoral measures that satisfy the ‘very high importance’ criterion from the draft NAS, and at the same time fall under the funding priorities of the three national operational programmes (OPCC, RDP and OMFP) for 2014-2020 funded through ESIF (ERDF, EAFRD and EMFF). As such, implementation of most measures could start relatively soon upon adoption of the draft NAS.

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 Croatian Disaster Risk Reduction Platform (CDRRP) is a country-level coordination mechanism led by DUZS, organised in working groups according to 11 major risk groups identified in the National Disaster Risk Assessment (NDRA). Each working group is led by one or more relevant sectoral institutions. MZOE is a permanent member in the CDRRP Committee⁵⁴ and an active member in the Risk Assessment Working Group. At the national level, the impact of climate change on disaster risk has been addressed in developing the NDRA, which serves as a good practice example of a process where all stakeholders were actively involved and tasked to undertake risk reduction under their competence. The Platform serves as an active body for developing a disaster risk reduction strategy, which will

⁵⁴ Decision on the establishment of working groups in the frame of National Platform for Disaster Risk Reduction, URL: http://www.platforma.hr/images/dokumenti/Odluka_Vlade_o_osnivanju_HP_2016.pdf; accessed on 17.05.2018

include adaptation of risk assessment and intervention plans to account for current and projected climate extremes.

Disaster risk reduction has been addressed through six measures in the draft NAS, out of which the following three have been included in the draft NAP for the period 2019-2023:

- Mapping of water sources outside the public water supply system
- Multi-sectoral risk assessment for various threat/risk scenarios associated with climate change
- Expansion of NDRRP to include climate change-related indicators for the development of an early warning system.

Measures for strengthening capacities for disaster and accident assessment and recovery, and developing models for coverage of risks and damages related to climate change will be addressed in later stages.

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

Activities to promote climate adaptation are defined within the framework of the OPCC⁵⁵ 2014 – 2020 (thematic objective ‘Promoting climate adaptation, risk prevention and management’). Until adoption of the draft NAS, the framework for climate adaptation activities is determined in accordance with the 6th and 7th National Communication to the UNFCCC. OPCC interventions are focused on improvement of the system for monitoring and evaluation of climate change, improvement of the disaster management system and addressing flood management risks. In addition, the RDP includes climate adaptation measures in the agriculture sector.

Croatia uses financial resources from the sale of emission allowances through the FZOEU to co-finance national component priorities, for the period until 2020, relating to air quality, biodiversity and climate, including cross-cutting adaptation measures and various applied research activities in the field of climate adaptation.

The draft NAS envisages total implementation costs of EUR 3 680 000 000 (EUR 780 000 000 for the first five-year NAP), out of which State Budget resources would account for 0.23%, and the remainder would be financed from the ESIF and private sector (including public-private partnership). More than half of the estimated amount refers to implementation of "structural" measures, particularly in the sectors of agriculture and forestry ("no regret measures"), and to a lesser extent in energy and tourism. The average annual cost of implementing the draft NAS is estimated at EUR 70 million. Compared to average annual damage costs in the period from 1980 to 2015 resulting from extreme weather events (around EUR 80 million per year), benefits of implementing the draft NAS will be significant despite the high costs.

⁵⁵ Operational Programme Competitiveness and Cohesion 2014 - 2020; URL: https://strukturnifondovi.hr/wp-content/uploads/2017/03/OPKK_eng-1.pdf; accessed on 17.05.2018

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

Amendments to the Regulation on Environmental Impact Assessment⁵⁶ (EIA) were adopted to transpose the EIA Directive in January 2017. Developers are expected to assess climate change impacts and vulnerabilities of each project, and EIA reports are also assessed against potential climate-driven disaster risks. Similarly, the national SEA regulation⁵⁷ also requires consideration of aspects related to climate adaptation.

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

Yes / No

Croatia has started to adapt risk assessment and intervention plans to account for current and projected climate extremes. At the national government level, the impact of climate change to disaster risk has been addressed in developing the NDRA. Intense periods of rainfall and severe droughts have been taken into account⁵⁸, as the most frequent climate extremes in Croatia. The NDRA will be used to inform development of the national disaster risk reduction strategy. Drafting of the strategy is planned for last quarter of 2018, with adoption expected in 2019. Early warning systems are in place for all major hazards, with outreach to communities.

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

Yes / No

The July 2017 amendments to spatial planning legislation⁵⁹ include provisions related to spatial plans covering marine areas where due attention must be paid to long-term changes caused by climate change and to increasing climate resilience. The National Spatial Development Plan⁶⁰ stipulates that the spatial planning policy should include consideration of climate impacts and disaster risk reduction needs, however, this policy is not yet followed in practice. Other land use, spatial and urban planning policies do not yet specifically address climate impacts.

⁵⁶ Uredba o procjeni utjecaja na okoliš, Official gazette #61/14 , URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2014_05_61_1138.html; and OG #3/2017, URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2017_01_3_118.html; accessed on 17.05.2018

⁵⁷ Uredba o strateškoj procjeni utjecaja strategije, plana i programa na okoliš, Official gazette #3/2017; URL: http://narodne-novine.nn.hr/clanci/sluzbeni/2017_01_3_117.html; accessed on 15.05.2018

⁵⁸ Croatia: National Progress Report on the implementation of the Hyogo Framework for Action (2011-2013); url: <http://www.preventionweb.net/english/policies/v.php?id=29329&cid=43>; accessed on 15.05.2018

⁵⁹ Zakon o izmjenama i dopunama Zakona o prostornom uređenju, Official gazette 650/2017; URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2017_07_65_1494.html; accessed on 17.05.2018

⁶⁰ Odluka o izradi Državnog plana prostornog razvoja, Official gazette #39/2018; URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2018_04_39_746.html; accessed on 17.05.2018

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

The Air Protection Act⁶¹ recognises vulnerable sectors exposed to climate impacts and obliges integration of integrating adaptation measures in those sectors. However, adaptation considerations are only included currently in the water management sector (the RBMP and Flood Risk Management Plan for the 2016-2021 planning period) and, since 2017, in spatial planning through updates to sectoral legislation⁶², although there is not yet concrete evidence of adaptation considerations being included in planning documents. Integration of adaptation in these sectors was driven by EU legislation, combined with policy recommendations arising from the work of international river commissions in which Croatian authorities actively participate.

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

Yes / **No**

No evidence could be found that adaptation is mainstreamed in insurance or alternative policy instruments to provide incentives for investments in risk prevention. Such a measure is planned in the frame of the draft NAS, but not for the first five-year implementation period.

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**

In the absence of a NAS or a NAP, it can be concluded that coordinated implementation of the adaptation measures, as defined in action plans, has not yet started.

Adaptation considerations have only recently been included in two sectors: physical planning legislation and water management sectoral plans. Implementation in both sectors is at the moment only planned.

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

Yes / **No**

Pending the adoption of the draft NAS and draft NAP, systematic cooperation mechanisms for fostering adaptation at local or regional level do not seem to be yet in place. Adaptation is limited to one-off participation in European projects and initiatives, such as the Covenant of Mayors for Climate and Energy, in which 13 Croatian towns and municipalities are

⁶¹ Zakon o zaštiti okoliša, Official gazette #130/11: http://narodne-novine.nn.hr/clanci/sluzbeni/2011_11_130_2601.html, and #47/14; http://narodne-novine.nn.hr/clanci/sluzbeni/2014_04_47_874.html; accessed on 17.05.2018

⁶² Odluka o izradi Državnog plana prostornog razvoja, Official gazette #39/2018; URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2018_04_39_746.html; accessed on 17.05.2018

signatories with adaptation commitments⁶³. A regional ORIENTGATE project⁶⁴ (2012-2015) created a partnership in 13 countries to network and exchange data on the impacts of climate variability and climate change on water regimes, forests and agro-ecosystems, which includes 2 Croatian partner institutions.

In the frame of international river commissions, data and experience exchange is enabled at sub-regional level among the countries with regard to development of joint operational flood forecasting, and early warning system and a Joint Flood Risk Management Plan for the Sava River Basin.

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 EU “Guidance on integrating climate change and biodiversity into EIA⁶⁵ and SEA”⁶⁶, is translated into Croatian, as well as the EU “Guidance for project managers: How to increase resilience of vulnerable investments to climate change”⁶⁷, are available on the MZOE website and actively recommended to developers and EIA/SEA experts. The purpose of the “Guidance for project managers” is to help manage additional climate change risks and to complete the EIA reports. It is designed as a tool that can help reduce climate-induced losses in different kinds of investments, thus, increasing the resilience of investment projects and economies. Authorised professionals use the guidance when drafting EIA and SEA reports.

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

Yes / **No**

As the process of formulating national adaptation policy is in its early phases, there do not seem to be many opportunities for stakeholders' involvement in the implementation of adaptation policies and measures. However, processes for stakeholder involvement in policymaking are laid down in general laws regulating public policy development, and are systematically implemented at all governance levels; no specific additional measures are envisaged for adaptation.

⁶³ Covenant of Mayors – signatories with adaptation commitments; URL: <https://www.covenantofmayors.eu/about/covenant-community/signatories.html>; accessed on 17.05.2018

⁶⁴ Orientgate project website; URL: <http://www.orientgateproject.org/index.php?page=city-of-koprivnica-hr>; accessed on 17.05.2018

⁶⁵ EU; 2013; Smjernice za uključivanje klimatskih promjena i bioraznolikosti u procjene utjecaja na okoliša; URL: http://www.mzoip.hr/doc/smjernice_za_ukljucivanje_klimatskih_promjena_i_bioraznolikosti_u_procjene_utjecaja_na_okolis.pdf; accessed on 17.05.2018

⁶⁶ EU; 2013; Smjernice za integriranje klimatskih promjena i bioraznolikosti u strateške procjene utjecaja na okoliša; URL: http://www.mzoip.hr/doc/smjernice_za_integriranje_klimatskih_promjena_i_bioraznolikosti_u_strateske_procjene_utjecaja_na_okolis.pdf; accessed on 17.05.2018

⁶⁷ EU DG CLIMA; 2012; Neformalni dokument Smjernice za voditelje projekata: Kako povećati otpornost ranjivih ulaganja na klimatske promjene; URL: http://www.mzoip.hr/doc/smjernice_za_voditelje_projekta.pdf; accessed on 17.05.2018

The draft NAS generally acknowledges importance of stakeholder awareness raising and participation. In this respect, strengthening of local and regional government capacities is planned, both strategically (development of regional development plans and spatial plans that will include the component of climate adaptation), as well as through technical training in specific areas of climate adaptation.

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 reports on adaptation at the central level have been published, as the NAS and NAP are yet to be adopted.

According to Air Protection Act with its 2014 amendments⁶⁸, reports on implementation of adaptation measures are to be submitted to the European Commission in line with Article 15 of the EU Regulation No. 525/2013⁶⁹. Upon adoption of the NAS and NAP, reporting on the implementation of the NAS will follow formats and deadlines for reporting under EU legislation. Wherever possible, reporting procedures will rely on existing systems, with the necessary further development of the MZOE and HAOP capacities for monitoring and reporting. Currently, most of HAOP's activities in the field of climate change are related to greenhouse gas data collection and monitoring of climate impacts on species and habitats. These activities will need to expand and a database will need to be created based on the indicators proposed for monitoring the individual measures and activities listed in the draft NAS and draft NAP.

Eighty-one indicators have been proposed for monitoring adaptation measures in the priority sectors. There are an additional 15 climate indicators, most of which are already included in the National List of Indicators prepared by HAOP. The legal basis of the list is defined by the Environmental Protection Act⁷⁰ and the Regulation on the Environmental Information System⁷¹.

⁶⁸ Zakon o izmjenama i dopunama Zakona o zaštiti zraka, Official gazette #47/2014; URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2014_04_47_874.html, accessed on 16.05.2018

⁶⁹ Regulation No 525/2013 of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC; URL: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R0525>; accessed on 16.05.2018

⁷⁰ Zakon o zaštiti okoliša, Official Gazette #80/13, URL: https://narodne-novine.nn.hr/clanci/sluzbeni/2013_06_80_1659.html; #78/15, URL: http://narodne-novine.nn.hr/clanci/sluzbeni/2015_07_78_1498.html; #12/18, URL: https://narodne-novine.nn.hr/clanci/sluzbeni/full/2018_02_12_264.html; accessed on 16.05.2018

⁷¹ Uredba o informacijskom sustavu zaštite okoliša, Official Gazette #68/08; URL: <http://narodne-novine.nn.hr/clanci/sluzbeni/339831.html>; accessed on 16.05.2018

The draft NAS and draft NAP propose that CCCCMA will monitor the implementation of the NAP at its sessions, review reports and propose measures to remove obstacles and improve implementation.

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

Yes / No

No reports on adaptation in vulnerable sectors have been published, as the NAS and NAP are yet to be adopted. Nevertheless, according to Article 118a of the Air Protection Act, central state administration bodies and other public authorities that are competent in relation to a range of activities (meteorology, environmental protection, agriculture, fishery, forestry, water management, energy, physical planning, nature protection, sea, tourism and protection of human health) have an obligation to submit periodical five-year reports to the ministry responsible for environmental protection on their activities related to climate adaptation. These reports feed into periodical reporting to the European Commission on implementation of adaptation measures. The first reporting was conducted at the beginning of 2015.

Integration of climate adaptation into sectoral strategies and planning documents has been generally planned in the draft NAS, and the draft NAP specifically lists measures to integrate adaptation into several vulnerable sectors (tourism, spatial planning system, biodiversity, forestry). The adaptation measures will be coordinated between the MZOE and respective sectoral ministries. Upon adoption of the draft NAS and draft NAP the relevant national authorities will be required to integrate them in their policies and secure sufficient funding for implementation.

From the draft NAP or draft NAS, it is unclear how the dissemination of monitoring results will be organised.

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

Yes / No

The national legal framework requires reporting between different levels of government (national, counties and cities) on issues such as legislation and development planning.

Specifically, for climate adaptation, a five-year reporting obligation (see Indicator 10b) includes regional and local-level authorities in the listed sectors. First reporting was conducted in early 2015 and included a review of the implementation of measures and actions, their impacts, and identification of obstacles. The resultant report served as a basis for creating new action plans.

From the draft NAP or draft NAS, it is unclear how the dissemination of monitoring results of sub-national actions will be organised.

11. Evaluation

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

Yes / No

The first interval for evaluation will be after the first NAP 2019-2023 has expired. Any subsequent revisions of the NAS will depend on the information that will be generated by the implementation monitoring system, as well as the general climate change monitoring system.

Nevertheless, given the unusually long lifespan of the draft NAS, until 2070, a periodic review of all adaptation actions has not been clearly defined.

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

Yes / **No**

No evidence of stakeholder engagement in monitoring, evaluation or review is available, as implementation of the NAS and NAP has not yet started. In the draft NAS and draft NAP, stakeholder involvement is not specifically planned. Nevertheless, as indicated above, reporting is planned on implementation by sectoral ministries, and local and regional governments coordinated by the CCCCMA.

SUMMARY TABLE

Adaptation Preparedness Scoreboard		
No.	Indicator	Met?
Step A: Preparing the ground for adaptation		
1 <i>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.	Yes / <u>In progress</u> / No
2 <i>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
Step B: Assessing risks and vulnerabilities to climate change		
3 <i>Current and projected climate change</i>		
3a	Observation systems are in place to monitor climate change, extreme climate events and their impacts	Yes / <u>In progress</u> / 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	Yes / <u>In progress</u> / No
4 <i>Knowledge gaps</i>		
4a	Work is being carried out to identify, prioritise and address the knowledge gaps	<u>Yes</u> / In progress / No

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

Adaptation Preparedness Scoreboard		
No.	Indicator	Met?
	where adaptation is mainstreamed in EU policies	
8e	Adaptation is mainstreamed in insurance or alternative policy instruments, where relevant, to provide incentives for investments in risk prevention	Yes / <u>No</u>
9 <i>Implementing adaptation</i>		
9a	Adaptation policies and measures are implemented, e.g. as defined in action plans or sectoral policy documents	Yes / In progress / <u>No</u>
9b	Cooperation mechanisms in place to foster and support adaptation at relevant scales (e.g. local, subnational)	Yes / <u>No</u>
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	<u>Yes</u> / No
9d	There are processes for stakeholders' involvement in the implementation of adaptation policies and measures.	Yes / <u>No</u>
Step E: Monitoring and evaluation of adaptation activities		
10 <i>Monitoring and reporting</i>		
10a	NAS/NAP implementation is monitored and the results of the monitoring are disseminated	Yes / <u>No</u>
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	Yes / <u>No</u>
11 <i>Evaluation</i>		
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	Yes / <u>No</u>