



Adaptation preparedness scoreboard:

Draft country fiche for Bulgaria

Disclaimer

This draft country fiche was prepared in the context of the implementation of the EU's Strategy for Adaptation to Climate Change (EUAS). The indicators were developed and agreed with experts from the Member States (MS). This draft version of the fiche is published as background information to the public stakeholder consultation about the evaluation of the EUAS running from early December 2017 to early March 2018. It constitutes work in progress, a particular stage of information collection and dialogue between the Commission and the Member States. It presents a snapshot of the status in the country as of September or October 2017. The fiches are planned to be finalised and published as an annex to the strategy's evaluation report in the fourth quarter of 2018, before which they will be further updated and modified. Should you have any specific comments on the draft fiche, please send it to the mailbox CLIMA-CLIMATE-CHANGE-ADAPTATION@ec.europa.eu

Please note that the assessments (yes/no/in progress) need to be read in conjunction with the narrative that accompanies them. They assess the state of play *within* each country. 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 MS. 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". For a more detailed explanation of what each indicator means and how its value is determined, please refer to the description of the scoreboard, a document published alongside the country fiches.

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POLICY FRAMEWORK

Adaptation strategies

A1. National adaptation strategy

Bulgaria has not yet adopted its National strategy on climate change. A new Climate Change Mitigation Act, adopted by Parliament in February 2014,¹ includes a commitment to draw up a National Adaptation Strategy for a period running until 2030.

The Ministry of Environment and Water (MOEW), and within it the Climate Change Policy Directorate, is responsible for organising the development of a National Adaptation Strategy in cooperation with other relevant ministers and following consultation with the National Expert Council on Climate Change and National Coordination Council on Climate Change. The process for developing the National Adaptation Strategy has already started and follows two stages.

The first consists of a risk and vulnerability assessment. In early June 2014 a framework document "National climate change risk and vulnerability assessment for the sectors of the Bulgarian economy"² was finalised and covered: agriculture, forestry, water, urban environment, energy, transport, construction and infrastructure, ecosystems and

¹ <http://www.lex.bg/laws/ldoc/2136124027> - Act on Climate Change Mitigation, 2014

² http://www5.moew.government.bg/?page_id=51457 – link to Vulnerability Assessment document

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biodiversity, human health and tourism. A separate chapter on cross-border cooperation on issues related to the impacts of climate change is included in the document.

The Framework document on risk and vulnerability assessment should serve as a basis for the further development of a National Adaptation Strategy. The competent authorities will be involved in the development of measures for each sector, as well as NGOs and the scientific community.

Another very important part to be integrated in the NAS is insurance. The MOEW already has developed an analytical document "Financial disaster risk management and insurance options for climate change adaptation in Bulgaria". The document was prepared with the financial and technical support of the World Bank and its purpose is to analyse the role and importance of the insurance business for the prevention of risks that occur as a result of climate change and for the development of adaptation measures.

The MOEW took further actions for finishing the development of the NAS with the implementation of the project „Climate Change National Adaptation Strategy and Action Plan" (NAS) under the Operational Program "Good Governance" 2014-2020. The Ministry implements the project with the expert support of the International Bank for Reconstruction and Development with which a reimbursable advisory services agreement was signed.

The Strategy will serve as a reference document that defines the framework for adaptation activities and priority axes, identifies and confirms the need for action on climate change at both the general economic and sectoral levels and sets out the implications of non-compliance.

The NAS will include the following sectors: agriculture, forestry, biodiversity and ecosystems, water sector, energy, transport, infrastructure and construction, urban planning, human health and tourism.

A2. Adaptation strategies adopted at subnational levels

The Ministry of Environment has adopted a sectoral rather than a regional approach to climate change adaptation. Nevertheless, regional development plans³ include a separate chapter on climate change related measures, mainly adaptation measures relevant at local level (see B2)

A Strategy on Adaptation to Climate Change for Sofia Municipality has been developed under the EU funded project "Transitioning towards Urban Resilience and Sustainability "TURAS".

Adaptation action plans

B1. National adaptation plan

In accordance with the Reimbursable Advisory Service Agreement signed between the MOEW and the International Bank for Reconstruction and Development, a National Adaptation Plan will be developed alongside the National Adaptation Strategy. The Action Plan will include summary of the adaptation measures identified during the sectoral assessment. These measures are based on sources such as the "National climate change risk and vulnerability assessment for the sectors of the Bulgarian economy" and other

³ <http://www.mrrb.government.bg/regionalni-planove-za-razvitiie-na-rajonite-ot-nivo-2-za-perioda-2014-2020-g-prieti-s-reshenie-na-ms/> - website of the Ministry of Regional Development, with links to the regional development plans

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relevant documents. The Action plan will take the responsible institutions, resources, timeline, targets and monitoring indicators needed for the implementation of priority adaptation measures into account.

B2. Adaptation plans adopted at sub-national level

In 2013, the Council of Ministers adopted the 2014-2020 Regional Development Plans of level 2 regions⁴. The plans outline the development of the Northeast, Northwest, Southwest, Southeast, North Central and South Central Regions. Each plan includes a section about the region's vulnerability to climate change, and adaptation measures at regional level are provided. The sectors most vulnerable to climate change in the different regions include agriculture, biodiversity, tourism, water resources management, power generation, fisheries, and forestry.

Local authorities (municipalities) have an important role to play, particularly regarding the implementation of adaptation actions, which is reflected in the operational programmes⁵ for the new programming period.

B3. Sectoral adaptation plans

The First River Basin Management Plans in 2010⁶ provides for the development of environmental protection and water management measures within the basins. The preparation and publication of the Second River Basin Management Plans was completed in December 2015 and December 2016 for each of the four regional basins in the country.⁷ These plans focus on the elaboration and implementation of Drought Management Plans. This entails, amongst others, options for the construction of facilities to capture and use biogas in waste water treatment plants, water savings and efficiency, reduction of erosion in water catchment areas, and inclusion of a resilience selection criteria for projects to be financed. The Drought Management Plans are based on an assessment of the impact of climate change on water resources and water use.

Flood Risk Management Plans⁸ for all four river basins in the country were approved by the Council of Ministers on 29 December 2016. These built upon the preliminary assessment of flood risk for the four basin regions in Bulgaria that was completed in 2011. The Ministry of Environment and Water has developed hazard and flood risk maps and methodologies for preliminary assessment of Flood Risks. The areas at significant flood risk were identified in 2013 in relation to disaster management.

The Executive Forest Agency has presented a "Programme of measures to adapt forests in the Republic of Bulgaria and mitigate the negative impact of climate change on them"⁹. The document was officially adopted by the Ministry of Agriculture, Food and Forestry on 3 May 2011 and will be integrated into the National Adaptation Strategy. In addition, the Ministry of Agriculture, Food and Forest has adopted National Forest

⁴ <http://www.mrrb.government.bg/?controller=articles&id=521> – link to the Regional Development Plans of level 2 regions 2014-2020

⁵ <http://www.mrrb.government.bg/regionalni-planove-za-razvitie-na-rajonite-ot-nivo-2-za-perioda-2014-2020-g-prieti-s-reshenie-na-ms/> - website of Ministry of Regional Development, with links to the regional development plans and details on the plans

⁶ <http://www.moew.government.bg/?show=top&cid=66> – link to the First River Basin Management Plans in 2010

⁷ River Basin in the East Aegean region (http://earbd.org/indexdetails.php?menu_id=505); West Aegean region (http://www.wabd.bg/docs/plans/PURB/EO/BDZBR_02.12.2016_%20Blagoevgrad.pdf); Danube region (http://www.bd-dunav.org/uploads/content/files/upravlenie-na-vodite/PURB-2016-2021-final/Summary_RBMP_DR_29122016.pdf); Black sea region (http://www.bsbd.org/bg/index_bg_5493788.html)

⁸ http://www5.moew.government.bg/?page_id=24259 - Ministry of Energy and Environment web site, section on Flood Risk Management Plans with links to the respective plans

⁹ http://www.iag.bg/data/docs/Programa_ot_merki.pdf - link to the Forestry Program

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Strategy 2013 – 2020¹⁰ which also includes measures for strengthen the resilience of forest ecosystems to climate change.

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 Ministry of Environment and Water (MOEW) is the central body coordinating the policy-making process related to adaptation.

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

Yes / In progress / No

Horizontal coordination mechanisms exist within the governance system, with division of responsibilities. The 2014 Climate Change Mitigation Act clarifies the responsibilities of different institutions with regards to climate change, including adaptation. Horizontal coordination is currently focused on the preparation of the National Adaptation Strategy.

Institutions with responsibilities for integration of climate change (both mitigation and adaptation) include: the Ministry of Agriculture, Food and Forestry; the Ministry of Transport, IT and Communications; the Ministry of Finance; the Ministry of Interior; the Ministry of Foreign Affairs; the Ministry of Health; the Ministry of Education and Science; the Ministry of Labour and Social Policy; and the Environment Executive Agency. Moreover, some adaptation measures have been taken at the national level by the Ministry of Economy, the Ministry of Energy, and the Ministry of Regional Development. Relevant ministries are in charge of climate change adaptation in their respective sectors.

Article 3, paragraph 4 of the Climate Change Mitigation Act governs the establishment of the National Expert Council on Climate Change as an advisory body to assist the Minister of Environment and Water in the elaboration of positions, statements and taking initiatives to fully implement the state policy on mitigation and adaptation to climate change.

To ensure efficiency and coordination between competent institutions in 2016 the MOEW established a National Coordination Council on Climate Change (comprising representatives of government ministries and agencies, at Deputy-Minister level), with a view of raising awareness on climate change risks and adaptation options, strengthening consensus on climate action and fostering climate networks for successful implementation of resilience (and mitigation) measures (including such networks as the Expert Council and Coordination Council), as well as enhancing capacity to integrate adaptation considerations in policies, programs, and investments.

¹⁰ http://www.mzh.government.bg/MZH/en/ShortLinks/cross_compliance/Gorskisektor.aspx - National Forest Strategy 2013 – 2020

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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

Vertical coordination between different levels of administration takes place within each sector, as mentioned in the previous paragraph, horizontal coordination is currently focused on the preparation of the National Adaptation Strategy. Coordination across sectors between national and regional levels takes place within the six regional development plans of the Ministry of regional development (see footnote 5 and section A2 above) and the four river basin management plans of the Ministry of Environment and Water (see sections B1,2 and 3 above).

Flood Risk Management Plans have been also prepared for each of the four river basins by the Ministry of Environment and Water. Maps will be prepared and adopted by the River Basin Directorates (RBD) and will be used for the update of the River Basin Management Plans (RBMP).

Article 3, paragraph 4 of the Climate Change Mitigation Law governs the establishment of the National Expert Council on Climate Change as an advisory body to assist the Minister of Environment and Water in the elaboration of positions, statements and taking initiatives to fully implement the state policy on mitigation and adaptation to climate change. It consists of representatives of the governmental sector, National Association of Municipalities in Republic of Bulgaria, Regional governmental authorities, Bulgarian Academy of Sciences, environmental NGOs and business.

The National Expert Council on Climate Change was established in 2014 by order of the Minister of Environment and Water. The operation of the Council is regulated by rules also approved by order of the Minister of Environment and Water.

At the national level, the coordination of municipalities on different issues is carried out through a National Association of Municipalities in the Republic of Bulgaria (NAMRB). In 2015 the members of NAMRB were 265. NAMRB's activity is focused on three main areas:

- Representation of municipalities in front of the central government: research, analysis, evaluation and development of proposals for change and improvement of policy on local government; lobbying;
- Support to municipalities in executing their powers: studying of municipal opinions and developing consensus positions and strategies; providing a wide range of consulting services and training programs; issuing thematic and advisory guides; providing its own training centre for municipalities;
- Participation in Bulgarian and international forums; and organizational strengthening of NAMRB. Last but not least the NAMRB has its representatives in the National Expert Council on Climate Change.

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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The Climate Change National Strategy Adaptation and Action Plan is being developed with wide public participation through ongoing public consultation and consideration of all key milestones in the development of the Strategy at the National Expert Council on Climate Change. As adaptation to climate change is horizontal, our main objective is to integrate it into all sectoral policies at all levels of government, too. For this purpose an operational body - the National Coordination Council on Climate Change (consisting of deputy ministers and experts from the competent departments) has been established to review, evaluate and deliver opinions and proposals on individual documents before submitting them for discussion to the National Expert Council on Climate Change. This is to provide support at all levels and in all sectors while developing the Strategy and for the measures, which will be included in the action Plan.

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

Yes / No

The Third National Action Plan on Climate Change is being implemented and the preparation of a national adaptation strategy is underway (See webpage of the Ministry of Environment and Water of Bulgaria, section on Climate)¹¹. In the publication: "National climate change risk and vulnerability assessment for the sectors of the Bulgarian economy", a separate chapter on cross-border cooperation on issues related to the impacts of climate change is included.

In 2013 under the IPA Cross-border Cooperation Programme Bulgaria – Serbia¹² was realized the project "Click"-Climate change- Kick-off". The project aims to raise public awareness of the impact of climate change and how to adapt by developing the capacity of NGOs to participate actively in the preparation and implementation of measures and policies for adaptation. In the IPA Cross-border Cooperation Programme Bulgaria – Serbia 2014-2020¹³ one of the priority axis is towards protecting the environment and promoting climate change adaptation and mitigation, risk prevention and management.

In relation with the preparation of Bulgaria's regional river basins management plans for 2016-2021, Bulgaria has signed Declarations on transboundary rivers cooperation with Greece and Turkey. These declarations have facilitated various meetings and exchange of information for the preparation of the regional river basins management plans (in Bulgaria).¹⁴

From an implementation point of view, it is worth noting the activities of joint planning, sharing best practices and joint capacity building facilitated by the EU Strategy for the Danube Region, as well as the proposed joint actions regarding tackling flood risks, desertification and heatwaves to be implemented with the support of the Bulgaria-Romania Cross-border Cooperation Programme 2014-2020. This program includes measures for Promoting climate change adaptation, risk prevention and management (see Thematic Section 5 on p. 25 of the Program)¹⁵

¹¹ http://www5.moew.government.bg/?page_id=23699 - link to webpage of the Ministry of Environment and Water of Bulgaria, section on Climate – link to the Third National Action Plan on Climate Change

¹² <https://www.ipacbc-bgrs.eu/search/node/climate%20change> – for the IPA Cross-border Cooperation Programme Bulgaria – Serbia

¹³ <https://www.ipacbc-bgrs.eu/> - link to the Interreg –IPA CBC Bulgaria-Serbia 2014-2020

¹⁴ http://www5.moew.government.bg/?wpfb_dl=17218 –website of the Ministry of Environment and Water, Plan for river basins management, 2016-2021, page 16

¹⁵ http://www.fpdd.bg/userfiles/files/RO-BG_CBC_2014-2020_EN_full.pdf - link to Bulgaria-Romania Cross-border Cooperation Programme 2014-2020

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Bulgaria is also part of cross-border co-operation programme Bulgaria-Turkey¹⁶ and Bulgaria-Macedonia¹⁷. Both of the programmes envisage priority axes related to protecting the environment and promoting climate change adaptation and mitigation, risk prevention and management, In addition, Bulgaria co-operates with Greece through Interreg V-A Greece-Bulgaria¹⁸ as one of its priority axes is focused on a sustainable and climate adaptable Cross-Border area.

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

Climate change is monitored by the National Institute of Meteorology and Hydrology at Bulgarian Academy of Science (NIMH-BAS).¹⁹ The Institute has several weather stations included within the Regional Basic Synoptic Network and Regional Basis Climatological Network in RA VI (Europe) - about 40 synoptic and more than 90 climatic stations across the country. There are no Global Surface Network and Global Upper Air Network stations in Bulgaria. There is only one Global Atmosphere Watch station in the country (Rojen). Wind and temperature are measured every three hours and the results are published on the Institute's website (showing the date and time of the measurement) and also submitted through the system for international exchange of meteorological information. Hydrological information is presented on a separate website.²⁰

National Institute of Meteorology and Hydrology is the chief executive of research and operational activities in Meteorology, Agro meteorology and Hydrology in Bulgaria

The Ministry of Environment and Water has 4 (four) Regional Directorates for each of the national river basins (East and West Aegean region, Danube region and Black Sea region), as well as 16 (sixteen) Regional Inspectorates for environment and water which altogether carry out the control and monitoring of the waste water within their assigned territorial boundaries²¹. Each of the Management Plans for the 4 river basins in Bulgaria (2016-2021) has a section on Programs for monitoring the status of the surface and subterranean waters (section 4 of the Plan)²² Under these monitoring programs, the model MONERIS is used for monitoring the impact of nitrogen and phosphorus content in the Danube River basin, and the model PegOPERA is used for the same analysis in the basins of the rivers Iskar and Yantra. The Monitoring Programs envisage (i) expansion of the water monitoring network through setting up new monitoring posts which provide water quality monitoring in compliance with Directive 2009/90/EU, (ii) enhancement of

¹⁶ <http://www.ipacbc-bgr.eu/> - link to IPA CBC Bulgaria-Turkey

¹⁷ <http://www.ipa-cbc-007.eu/> - link to IPA CBC Bulgaria-Macedonia

¹⁸ <http://www.greece-bulgaria.eu/> - link to Interreg V-A Greece-Bulgaria

¹⁹ <http://www.meteo.bg/en> web site of the National Institute of Meteorology and Hydrology at Bulgarian Academy of Science (NIMH-BAS)

²⁰ <http://hydro.bg/> - link to a website of the National Institute of Meteorology and Hydrology for hydrology information

²¹ http://www5.moew.government.bg/?page_id=23341 – see portal page, section on Water, MOEW

²² http://www5.moew.government.bg/?wpfb_dl=17218 – see page 4, Plan for river basins management, 2016-2021

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staffing and information management systems, (iii) application of data management and training models and software.²³

A Program of the Ministry of Agriculture for adaptation of forests to climate change, established in 2011, includes the following systems for monitoring the following: (i) early detection and warning about forest fires, (ii) forest diseases, and grass coverage in high altitude mountains as well as provides for putting place land and air firefighting patrols.²⁴

The Bulgarian Academy of Sciences (BAS) is the leading scientific institution in the country with long-established and well-deserved international recognition. It carries out research and development activities on climate change, examining fluctuations, adaptation of the individual sectors, etc.

The National Institute of Meteorology and Hydrology at Bulgarian Academy of Science publishes monthly hydrometeorological bulletin²⁵. It provides an overview of the main processes and phenomena of the meteorological, agrometeorological, hydrological and ecological point of view for the territory of the country. Operational information gathered from NIMH's national network enables a rapid and overall assessment of the impact of these phenomena and processes on different spheres of the economy and public life, optimal management decisions and increased economic benefits from business activity and the comfort of life.

In addition every year is developed a National Report on the State of Environment in Bulgaria by experts team of the of the Executive Environmental Agency (ExEA), the Ministry of Environment and Water (MOEW) and other institutions. The Report includes chapter "Climate change" where could be found current information relating the rainfall, temperature and snow characteristics, assessment of indicators, climate phenomena and climate scenarios for Bulgaria.²⁶

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

Much of the current knowledge regarding the observation of extreme climate events and their impacts derives from IPCC reports or from EU-funded projects (e.g. CLAVIER (Climate Change and Variability: Impact on Central and Eastern Europe) project²⁷ funded by FP6).

The CLAVIER project supports research on linkages between climate change and its impact on weather patterns, air pollution, extreme events, and on water resources. An evaluation of the economic impact on agriculture, tourism, energy supply and the public sector is conducted as well.

²³ http://www5.moew.government.bg/?wpfb_dl=17218 – see page 16, Plan for river basins management, 2016-2021, see section on Water, Portal of MOEW

²⁴ http://www.iag.bg/data/docs/Programa_ot_merki.pdf - a Program of Measures of the Ministry of Agriculture for adaptation of the forests of the Republic of Bulgaria to climate change by vulnerability zones.

²⁵ <http://www.meteo.bg/en> -the monthly can be found at the bottom of the page

²⁶ <http://eea.government.bg/bg/soer/2015/climate/climate0>

²⁷ <http://www.clavier-eu.org/?q=node/5> - website of CLAVIER project

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The Bulgarian entities participating in the project include the National Institute of Meteorology and Hydrology (NIMH)²⁸ in Sofia and the University of National and World Economy (UNWE)²⁹ in Sofia.

The CECILIA (Central and Eastern Europe Climate Change Impact and Vulnerability Assessment) project³⁰ provides high resolution simulations covering the region and capturing complex topographical and land use features related to climate change impacts on large urban and industrial areas, including hydrology, water quality, and water management (focusing on medium-sized river catchments and the Black Sea coast).

Scenarios and projections for the coming decades derive from the CLAVIER and CECILIA projects mentioned above or from the HadCM3 model.

The preparation of the Assessment of the Vulnerability of the Sectors of the Bulgarian economy to Climate Change³¹ included relevant research from the projects PESETA and PESETA II, financed by the EC and implemented by the Joint Research Centre (JRC) of the EC.

The "National climate change risk and vulnerability assessment for the sectors of the Bulgarian economy" was developed by using different scenarios and climate models such as:

- Expected changes in air temperature and precipitation based on the IPCC AR4 scenarios

The existing assessments of expected changes in temperature and rainfalls in our country are based on IPCC SRES-scenarios using global (HadCM2, HadCM3 and ECHAM4, LMDZ v4, etc.) and regional (HIRHAM, REMO5.7, REMO5.0, LMDZ-regional, etc.) climate models. The global models used are with low resolution, while with the help of the regional models was achieved significantly higher resolution. The surveys affecting our country are generally realized on international projects, which is why much of their results relate not only to Bulgaria but also to larger territories (mainly Central and South-Eastern Europe).

- Expected changes in air temperature and precipitation based on the IPCC AR5 scenarios

For the purpose of this analysis, computer simulations of the expected changes in temperatures and rainfall in the four RCP- scenarios (RCP 2.6, RCP 4.5, RCP 6 and RCP 8.5) of the IPCC AR5 (2013/2014) were performed. The obtained results were generated using the analytical tools of the Web-Based Research Platform Climate Explorer of the Royal Netherlands Meteorology Institute (KNMI). The data sets used are GCM: CMIP5 (full set) and GCM: CMIP5 extremes (full set) respectively for the annual and seasonal values and for the extreme values. CMIP5 (full set) was created during the Fifth Phase of the Climate Model Intercomparison Project (CMIP5) and assembled 42 global models used in the IPCC AR5. It should be borne in mind that, regardless of the number of different individual models, they share the same weight in GCM: CMIP5 (full set). Therefore, due to the smaller number of individual models in the assembled GCM: CMIP5 (full set) for the RCP 2.6 and RCP 6 scenarios (compared to the scenario models RCP 4.5 and RCP 8.5), the results obtained for - greater uncertainty than for the RCP 4.5 and

²⁸ <http://www.meteo.bg/>

²⁹ <http://www.unwe.acad.bg/>
website of CECILIA project

³¹ http://www5.moew.government.bg/?page_id=51457 – link to the report on Vulnerability Assessment for Bulgaria

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RCP 8.5 scenarios. The seasonal values are averaged and refer to winter (DJF), spring (MAM), summer (JJA) and autumn (SON). Climate projections across the four climate variables scenarios cover three 20-year periods (2016-2035, 2046-2065 and 2081-2100), which is consistent with the approach adopted in the IPCC AR5.

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

Yes / **In progress** / No

In the first phase of development of the national adaptation strategy, risk and vulnerability assessments for priority vulnerable sectors were conducted, on the basis of climate models and scenarios presented in the Fourth and Fifth Report of IPCC. In the special part of the Framework document "National climate change risk and vulnerability assessment for the sectors of the Bulgarian economy" each sector is assessed by a system of indicators regarding vulnerability to future climate change in the time frame 2016-2035. The analysis noted that all sectors in Bulgarian economy are vulnerable to expected climate change although at different rate. The least resilient sectors – water sector, agriculture, tourism, are the most important ones as regards adaptation actions in the Bulgarian Republic in the future.

In accordance with the Reimbursable advisory services agreement signed between the MOEW and the IBRD in July 2017 the Bank presented to the Ministry an Interim Report with the Main Findings from the Draft Sector Assessments of the following sectors: agriculture, biodiversity and ecosystems, energy, forestry, human health, tourism, transport, urban environment, and water.

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

Yes / **In progress** / No

In the publication "National climate change risk and vulnerability assessment for the sectors of the Bulgarian economy", a separate chapter on cross-border cooperation on issues related to the impacts of climate change is included.

The main objective of the framework document National climate change risk and vulnerability assessment for the sectors of the Bulgarian economy is to assess the risk of natural disasters typical of the Bulgarian geographical area on the basis of climate models and scenarios for the country. The National climate change risk and vulnerability assessment for the sectors considers that climate change will have significant cross-border effect to the management of cross-border river basins. In this respect, due to the peculiarities of local geography, Bulgaria is less dependent on the distribution of water resources than neighboring countries.

However, in view of the expected climate change, it is supposed that the cross-border river basins will face major challenges such as: deficiency of water resources and drought, flood risk management and expected pressure on water consumption.

In addition, in the process of developing the NAS when the main climate change concerns have been identified and preferred adaptation options have been selected, it was established that the coordination and synergies between national and sub-national

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as well as sectoral (e.g., disaster risk prevention and management plans Member States are developing) and trans-boundary adaptation responses will be covered.

4 Knowledge gaps

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

Yes / In progress / **No**

Several relevant governmental and research institutions such as the Sofia University, Agriculture Academy, Architecture and Civil Engineering faculties or the State Forest Agency are involved in various stages and parts of the process towards the development of the national adaptation strategy, seemingly covering a broad range of issues and sectors (e.g. tourism, infrastructure, the urban environment, agriculture, water, forestry, internal affairs, health, transport, etc.). However, more clarity is still expected whether knowledge gaps are identified or whether there is ongoing work to address them.

The Adaptation Action Plan that will be developed as part of the Climate Change National Adaptation Strategy should summarize the selected adaptation options and instruments and provide a roadmap for implementation. It is expected that one of the issues that the Action Plan will address is open research questions and ways to close knowledge gaps.

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

Policy-oriented information, mostly about mitigation, is available on the Ministry of Environment and Waters website. A national information source with adaptation-relevant data could not be found.

The six regional development plans, are readily available on the website of the Ministry of Regional Development. The regional development plans provide a decentralised set of information on climate change assessment, including adaptation aspects, focusing on the specific development needs and relevant analysis in each of the six regions (see footnote 4 with reference links to the six regional development plans).

The National Expert Council on Climate Change serves as a forum for science-policy interface as it includes stakeholders such as ministries, agencies, municipalities, NGOs and the scientific community (e.g. representatives of the Bulgarian Academy of Science).

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 capacity building activities in the framework of the development of the National Adaptation Strategy

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The World Bank is providing ongoing 'advisory services' to the Government of Bulgaria, support capacity building and training in the delivery of Bulgaria's National Adaptation Strategy. The Government of Bulgaria is represented by the Ministry of Environment and Water as an institutional coordinator of the preparation process³².

Since 2014 Sofia University "St. Kliment Ohridski"³³ started a Master's programme "Climate Change and Water Management". The programme is focused on the preparation of highly qualified specialists for analysis and assessment of climate change and integrated water resources management.

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 Third National Action Plan on Climate Change mentions some potential adaptation actions for many of the priority sectors identified provisionally: agriculture, forestry, energy, transport, waste management, industrial production.

The Framework document "National climate change risk and vulnerability assessment for the sectors of the Bulgarian economy" covers the following sectors: agriculture, forestry, water, urban environment, energy, transport, construction and infrastructure, ecosystems and biodiversity, human health and tourism. Each sector is assessed by a system of indicators regarding vulnerability to future climate change in the period 2016-2035.

In accordance with the Reimbursable advisory services agreement signed between the MOEW and the IBRD in July 2017m the Bank presented to the Ministry an Interim Report with the Main Findings from the Draft Sector Assessments. In every report, for the different sectors, there is a range of priority adaptation actions proposed, arranged according to the following categories: information and knowledge, institutional capacity building, policy reform, and investments. For each of these measures, the section also includes cost-benefit analysis information and provides inputs on Monitoring and Evaluation (e.g., oversight, implementation, and reporting responsibility, indicator and target). Adaptation options will be prioritized whereas cross-cutting issues, trade-offs and synergies will be discussed.

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**

³² <http://www.worldbank.org/en/events/2017/03/01/inception-workshop-in-bulgaria> - World Bank website, with reference to the inception workshop on preparing a National Adaptation Strategy

³³ https://www.uni-sofia.bg/index.php/eng/the_university - website of Sofia University

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A prioritisation mechanism or criteria have not yet been identified.

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 National Strategy for Disaster Risk Reduction envisages to enhance coordination between stakeholders, e.g. the disaster risk reduction and climate change adaptation community:

the expansion of the scope of activities of the Consultative Council, which supports the work of the Council of Ministers and transforming the former into an Active National Platform for reducing risks from disasters, (see footnote 40, Strategy Annex 2, Priority I.1)

the establishment of an efficient mechanism for coordination and efficient flow of information among all stakeholders (see footnote 40, Strategy Annex 2, Priority I.2), and

Development of systems for monitoring, forecasting and early warning in relation with disasters (see footnote 37, Strategy Annex 2, Priority II, activity 2)

Some coordination is already to ensure DRR-expertise flowing into adaptation actions. The National Expert Council on Climate Change (the advisory body to assist the Minister of Environment and Water in the elaboration of positions, statements and taking initiatives to fully implement the state policy on mitigation and adaptation to climate change) has included representatives of the (Bulgaria-located) NATO's Crisis Management and Disaster Response Centre of Excellence. The National Coordination Council on Climate Change has included representatives from the Chief Directorate Fire Safety and Civil Protection (CD FSCP) at the Ministry of Interior.

7 Funding resources identified and allocated

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

Yes / In Progress / No

Section 6 of the Third National Action Plan for Climate Change (2013 – 2020) (See footnotes 12 and 24, p.109 of the Third National Action Plan) outlines specific actions in key sectors supported by concrete financing plans which indicate the required financing and the corresponding sources of such financing. The sectors pursuing measures to implement the Climate Change Action Plan include energy, along with measures for energy efficiency and renewable energy development, industry, waste management, agriculture and transport. The sources of financing include EU funds, state and municipal budgets, national investment plan, private financiers, credits from international financial institutions, and enterprises for environmental management. As mentioned earlier in relation to criterion 6a, the Third National Action Plan on Climate Change outlines some potential adaptation actions for many of the priority sectors identified provisionally: agriculture, forestry, energy, transport, waste management, industrial production.

The (2016-2021) management plans for the four main river basins are supported by investment plans in key areas, including urban development, industry, agriculture, forestry, fisheries, energy, tourism, transport, flood protection, and climate change. The

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sources of financing of these plans also include EU funds, state and municipal budgets, private financiers, and enterprises for environmental management.

Furthermore, some of the adaptation projects under the six regional development plans (2014 – 2020) contain cost estimates and sources of financing (for example, see footnote 4 (i) Development Plan for North East Bulgaria, Appendix 5, Regional projects incl. adaptation projects p.222 (items 11 on strengthening coastal line, and p, 224 and 226, items 17 and 18 on road reconstruction in Varna region).

As regards cross-cutting adaptation action, the World Bank is providing ongoing 'advisory services' to the Government of Bulgaria, support capacity building and training in the delivery of Bulgaria's National Adaptation Strategy.

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 national framework for environmental impact assessment has been revised³⁴ to transpose the new EIA Directive, with aspects on climate change (greenhouse gas emissions, impacts relevant to adaptation) included.

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

Yes / **No**

The National Strategy for Disaster Risk Reduction³⁵ was adopted in 2014, and regards specific risks, including earthquakes, floods, landslides, forest fires, storms, snowfalls and extreme temperatures. The Risk Disaster Reduction Strategy recognizes the impact of climate extremes, related to increased occurrence of storms, floods, extended periods of drought, and devastating forest fires. However, there is no evidence how future climate projections are featured in disaster risk management and associated risk analysis.

There is no national multi-hazard risk assessment with a common methodology available to inform planning and development decisions (although such an assessment will need to be in place by the end of 2016, according to the regulations applicable to European Structural and Investment Funds).

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

Yes / No

³⁴ http://www5.moew.government.bg/?page_id=45703.

³⁵ http://www.preventionweb.net/files/38902_drrstrategybulgariaannex2bg.pdf - website with a link to the document of the Disaster Risk Reduction Strategy

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Climate change adaptation considerations in land use and urban planning policies have been applied through spatial planning on a national and regional levels.

The National Concept for Spatial Development for the period 2013-2025 (NCSD)³⁶ is a mid-term strategic document, which outlines the directions for land-use planning, governance and protection of the national territory and waters and creates preconditions for spatial orientation and coordination of the sectoral policies.

One of the key objectives of the NCSD is the alignment of the planning of spatial development of cities and regions to the threats and challenges of climate change, in addition to globalization, demographic changes, and energy dependence.

As an example at regional level, the regional development plan for Northern Central Bulgaria focuses on developing land use and urban planning, among others, in consideration of climate change. In this regard, the regional development plan for Northern Central Bulgaria focuses on the enhancement of environmental protection in consideration of climate change.

Another example of applying spatial urban planning policies in consideration of climate change is the TURAS project for the capital city of Sofia, described further below. The project aims at enhancing the sustainability of urban areas by ensuring high levels of resilience to climate change in the context of constantly changing urban conditions.

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

Coordinated actions of mainstreaming adaptation into national policies and policy instruments have not yet started. The Climate Change Mitigation Act asks sectoral ministries to mainstream climate change mitigation and adaptation in their respective policies. Implementing this requirement in practice will require streamlining processes and much better interaction between the MOEW and the sectorial ministries and between the sectorial ministries and the scientific community.

At the same time, the Ministry of Regional Development and Public Works, as described in the previous section 8c, through the six regional development plans for the country, has included adaptation measures with support of spatial planning, also following up on achieving the objective of "Integration in the European space" (see p 6 of the NCSD).

Furthermore, the selected model for spatial development of the country has been developed in line with the priorities of the Territorial Agenda "Europe 2020" (TA 2020) "Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions", which develops further the ideas of the European Spatial Development Perspective (1999), the Lisbon Strategy (2000) and the Göteborg Strategy (2001). (see p.12 of the NCSD).

The Ministry of Agriculture, Food and Forest has adopted National Forest Strategy 2013 – 2020 which also includes measures for strengthen the resilience of forest ecosystems to climate change.

³⁶ http://www.bgregio.eu/media/Programirane/NKPR_28012013_Last_en.pdf - link to the National Concept for Spatial Development document

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In addition, the Executive Forest Agency has presented a "Programme of measures to adapt forests in the Republic of Bulgaria and mitigate the negative impact of climate change on them". The forestry sector is the only one in which a specific programme of measures for adapting Bulgarian forests to climate change was developed and approved.

At the same time, the preparation of a National Adaptation Strategy, supported by actual policy instruments, is yet to be finalised, as expected in early 2018.

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

Yes / **No**

The Ministry of Environment and Water developed an analytical document "Financial disaster risk management and insurance options for climate change adaptation in Bulgaria". The document was prepared with the financial and technical support of the World Bank and its purpose is to analyse the role and importance of the insurance business for the prevention of risks that result from climate change and for the development of adaptation measures. This document provides an entry point for enhancing further inclusion of insurance policies into the national adaptation strategy.

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**

Some autonomous adaptation actions are being carried out, for instance, by some cities or at sectoral level for agriculture, forestry, water management, and flood risk management. Examples of such regional actions have been provided earlier in the text, in the sections 8c and A2.

At the same time, as mentioned earlier, a National Adaptation Strategy remains to be prepared by early 2018, which will provide basis for preparing specific sector adaptation action plans.

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

Yes / **No**

It is not clear whether there are any cooperation mechanisms in place to foster and support adaptation at regional or local scale.

Nevertheless, the National Expert Council on Climate Change includes representatives of the National Association of Municipalities in the Republic of Bulgaria (NAMRB).

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

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Yes / **No**

Apart from various guidelines issued by the European Commission, there were no identified specific procedures or guidelines issued or used by the Bulgarian authorities for assessing the impact of climate change on major projects or programmes and for facilitating their adaptation.

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

Yes / **No**

As mentioned at point 9a, coordinated implementation action has not started yet and the specific mechanisms for ensuring the involvement of stakeholders (non-public administration bodies) are yet to be put in place.

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**

For the time being no system is in place for reporting on the implementation of the National Adaptation Strategy and actions plans as these documents remain to be prepared.

It is envisaged that provisions for monitoring and evaluation will be included in the Strategy. Moreover, the Action Plan will summarize the adaptation measures for all sectors identified in the Strategy, with a focus on implementation of priority adaptation measures, including consideration of responsible institutions, resources, timeline, targets, and monitoring indicators.

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

Yes / **No**

For the time being no system is in place for monitoring mainstreaming of adaptation into specific sectoral policies, or assessing adaptation actions that are being implemented. Related past and estimated future expenditures on some adaptation measures are presented in some of the six regional development plans

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

Yes / **No**

For the time being no system is in place for periodic review of the National Adaptation Strategy and actions plans as these documents remain to be prepared.

11 Evaluation

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

Yes / **No**

Based on the available information, it is too early to tell whether the future national adaptation strategy will allow for periodic review.

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

Yes / **No**

No evidence seems to be available on what mechanism (if any) is being used for involving stakeholders in the future evaluations of adaptation policy.

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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.	<u>Yes</u> / In progress / 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)	Yes / <u>In progress</u> / No
3c	Sound climate risks/vulnerability assessments for priority vulnerable sectors are undertaken to support adaptation decision making.	Yes / <u>In progress</u> / No
3d	Climate risks/vulnerability assessments take transboundary risks into account, when relevant	Yes / <u>In progress</u> / No

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

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Adaptation Preparedness Scoreboard		
No.	Indicator	Met?
8c	Key land use, spatial planning, urban planning and maritime spatial planning policies take into account the impacts of climate change	<u>Yes</u> / No
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 / <u>In Progress</u> / 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>
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	Yes / <u>No</u>
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	Yes / <u>No</u>
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	Yes / <u>No</u>
11b	Stakeholders are involved in the assessment, evaluation and review of national adaptation policy	Yes / <u>No</u>