



**Convention of the Protection and Use of
Transboundary Watercourses and International Lakes
Tenth meeting of the Task Force on Water and Climate
1 May 2019**

Progress report of the global network of basins working on climate change adaptation as of February 2019

The global network of basins working on climate change adaptation was created by the secretariat of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention), serviced by the United Nations Economic Commission for Europe (UNECE), in cooperation with the International Network of Basin Organizations (INBO) in 2013. It aims to promote cooperation on adaptation in transboundary basins, to compare different methodologies and approaches for adapting to climate change and to promote a shared vision between the participating basins.

The network includes on the one hand several pilot basins where UNECE and partners implement activities and, on the other hand, additional basins which primarily work on their adaptation activities themselves in accordance with the agreed decisions of their governing bodies or with the terms of reference of international projects. The network allows for the exchange of experience, learning from each other, establishing contacts between basins and their experts, discussing challenges and lessons learnt etc. The network activities include regular meetings of all basins, larger workshops, development of guidance and trainings, for example on preparing bankable projects for climate change adaptation in transboundary basins (21-23 June 2017, Dakar, Senegal).

The following basins are included into the global network:

1. The Chu Talas river basin, shared by Kazakhstan and Kyrgyzstan¹, activities implemented by the Chu Talas Water Management Commission, United Nations Development Programme (UNDP) and UNECE,
2. The Congo river basin, shared by Angola, Cameroon, Central African Republic, Gabon, Democratic Republic of the Congo and Republic of the Congo, activities implemented by the International Commission of the Congo-Oubangui-Sangha Bassin (CICOS),
3. The Danube river basin, shared by Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Republic of Moldova, Montenegro, Romania, Serbia, Slovenia, Slovak Republic and Ukraine, activities implemented by the International Commission for the Protection of the Danube River (ICPDR).
4. The project “Dauria going dry” on the Amur River and Lake Baikal basins, shared by China, Mongolia and the Russian Federation, implemented by WWF Russian Federation, Daursky Biosphere Reserve and Rivers without Boundaries International Coalition,
5. The Dniester river basin, shared by the Republic of Moldova and Ukraine, activities implemented by the Commission on Sustainable Use and Protection of the Dniester River Basin UNDP, Organization for Security and Cooperation in Europe (OSCE) and UNECE,
6. The Drin river basin, shared by Albania, the Former Yugoslav Republic of Macedonia, Kosovo² and Montenegro and Greece, activities implemented by the Global Water Partnership Mediterranean, on behalf of the Drin Core Group,
7. The Lower Mekong River Basin, shared by Cambodia, Laos, Thailand and Vietnam, activities implemented by the Mekong River Commission
8. The Meuse river basin, shared by Belgium, France, Germany, Luxembourg and the Netherlands, activities implemented by the International Meuse Commission,

¹ The listed countries include only the members of the river basin organisations in all basins where they are established.

² United Nations administered territory under Security Council Resolution 1244 (1999).

9. The Neman river basin, shared by Belarus, Lithuania and the Russian Federation, activities implemented by UNDP, United Nations Educational, Scientific and Cultural Organization (UNESCO) and UNECE.
10. The Niger river basin, shared by Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Guinea, Mali, Niger and Nigeria, activities implemented by the Niger Basin Authority,
11. The North Western Sahara Aquifer System (NWSAS), shared by Algeria, Libya, Tunisia, activities implemented by the Sahara and Sahel Observatory (OSS).
12. The Rhine basin, shared by France, Germany, Luxemburg, the Netherlands and Switzerland, activities implemented by the International Commission for the Protection of the Rhine (ICPR),
13. The Sava river basin, shared by Bosnia and Herzegovina, Croatia, Montenegro, Serbia and Slovenia, activities implemented by the Sava River Basin Commission,
14. The Senegal river basin, shared by Guinea, Mali, Mauritania and Senegal, activities implemented by the Senegal River Basin Development Authority,
15. The Sixaola river basin, shared by Costa Rica and Panama, activities implemented by the Binational Commission of the Sixaola River Basin,
16. Lake Victoria basin, shared by Burundi, Kenya, Rwanda, Tanzania, and Uganda, activities implemented by the Lake Victoria Basin Commission,
17. The Volta river basin, shared by Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali and Togo, activities implemented by the Volta Basin Authority.

More information about the activities and progress of the pilots and basins 1-17 is included in the annex ¹³.

³ Updates provided by the basins; the UNECE secretariat is not responsible for the correctness of the information. Information on the activities in the Meuse river basin (9) has not been provided at the time of preparation of this report.

ANNEX 1. DESCRIPTION OF PROGRESS OF EACH BASIN OF THE GLOBAL NETWORK

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1. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE CHU TALAS BASIN

1. Name and short description of the project/ activities – *this information will be put on the website*

The UNECE project “*Enhancing climate resilience and adaptive capacity in the transboundary Chu-Talas basin*” (September 2015 – December 2018) funded by the Finnish government aims to establish a framework for regular and strategic climate change adaptation action in the Chu-Talas River Basin and enable the Chu-Talas Commission and local authorities to facilitate climate change adaptation in the basin. It also aims to increase awareness and knowledge of Chu-Talas Commission and other key stakeholders of adaptation options in the river basin and the need for transboundary cooperation in adaptation as well as to implement some pilot adaptation measures.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, impacts on water quality, etc.?

The Chu-Talas River Basin is highly vulnerable to climate change. The overall growth of aridity and the declining availability of water resources are the most likely and serious impacts of climate change in the Basin. Climate variability also already affects water resources in the region. In 2014, only half of the usual resources were available in the basin, but in 2016, the runoff was extremely high, many settlements were flooded, and several bridges destroyed. Because of dramatic rise of air temperature, glaciers in both basins may be almost completely disappearing by 2100. Water security is closely linked with political and economic implications (hydropower production vs. irrigated agriculture) that establish a direct link between changes in hydrological regimes and water availability, and regional security. These changes are expected in the context of a significant projected increase by mid-century in the demand for water as a result of economic development and population growth. Regulation of runoff of the Chu and Talas Rivers between Kyrgyzstan and Kazakhstan is an issue already today, particularly in the growing season.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

In Kyrgyzstan the sectoral plans and programs include an assessment of the sector current state, vulnerability assessment and justification of the adaptation measures to climate change and the actual plans with the estimated costs required for the implementation. The key adaptation measures in the emergency sector are the following: improvement of the monitoring and forecasting system; improvement of early warning systems for the population and organizations to prevent the human loss and minimize the economic damage; improvement of building codes to ensure the infrastructure resilience to dangerous climatic events; development of an insurance system for climatic risks; development of preventive measures to prepare the public, health and social institutions to work in an emergency, and to assist populations impacted by floods, wildfires, severe frosts and heat waves, as well as by other climate change related emergencies. In Kazakhstan there are no any national or sectoral climate change adaptation plans.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

The Transboundary Diagnostic Analysis (TDA) of the Chu-Talas River Basin developed under the GEF project “*Enabling Transboundary Cooperation and Integrated Water Resources Management in the Chu and Talas River Basins*” includes “*The Thematic annex to the TDA: impact of climate change*” with an analysis of potential climate change impacts in the basin and outlining existing gaps. Then the draft of the Strategic Action Programme (SAP) was developed upon the TDA. The program provides a wide range of adaptation measures to climate change in the basin, indicating potential executive and funding organizations.

Three pilot projects were identified and implemented:

- more than 5,000 seedlings of fruit and hardwood were planted, which will strengthen the floodplain of the Chu River, help preserve biodiversity, strengthen the ecological environment;
- seminars were held to demonstrate the economic and environmental benefits of advanced irrigation

technologies;

- a feasibility study has been developed for the information and diagnostic safety monitoring system of the Kirov dam.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Capacity of the Chu Talas Commission and local stakeholders and farmers to support climate change adaptation activities in the basin is very limited. Lack of resources for implementation of adaptation measures is the main problem which is still not solved.

The key relevant sectoral climate change adaptation plans were developed in Kyrgyzstan, including the one for the Ministry of Agriculture and Melioration, covering water resources. However, these sectoral plans were developed at a national level and do not consider transboundary issues. That is why an establishment of a framework for regular and strategic climate change adaptation actions on a transboundary level is particularly timely in the Chu-Talas basin.

6. Which lessons learned would you like to share with other basins?

Kazakhstan's and Kyrgyzstan's cooperation on the Chu and Talas rivers is managed by a joint bilateral Commission. It is a good example of transboundary water cooperation built on a solid institutional and legal basis. It allows discussing problems and finding solutions.

Involvement of local stakeholders at all levels into discussion of adaptation measures is crucial for their successful implementation.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

Three pilot adaptation measures were funded by the UNECE project. Having good examples, showing the economic benefits of adaptation measures, regional and local stakeholders will try to finance them themselves; the banks will be more willing to provide loans. Also, the attention of governments will be attracted to the need to incorporate adaptation measures into development plans. It will ensure replicability and sustainability of the project results.

Funding for major events is usually provided with technical and financial support from partners through projects. The Strategic Action Program for the Chu Talas basin defines a list of potential partners.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

Transboundary climate change adaptation measures have a good link with national sectoral adaptation programmes in Kyrgyzstan.

In Kazakhstan it would be good to show the economic benefits of adaptation measures. As a result, the attention of national governments will be attracted to the need to incorporate adaptation measures into national adaptation plan which is under inter-agency discussion.

9. Future planned activities

The following main areas of activities are very important immediately after approval of the Strategic Action Programme by both sides, Kyrgyzstan and Kazakhstan:

- to identify and start implementing those activities which have favourable conditions for good progress;
- to detail adaptation measures that have a priority at the transboundary level;
- to search for partners to implement the afore-mentioned activities;
- to mobilize funding for adaptation.

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2. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE IN THE CONGO BASIN

1. Name and short description of the project and basin

The project *"Technical assistance to International Commission of the Congo-Oubangui-Sangha Bassin (CICOS) on Integrated Water Resources Management (IWRM) and space hydrology. Strengthening Congo's hydrological monitoring to consider climate change adaptation in IWRM"* in the Congo Basin. This project, funded by the French Development Agency (AFD), aims to provide the Congo Basin with an operational water resources monitoring system, both through the traditional use of hydrological data and the processing of data produced by space technologies.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

Climate change is reflected in the baseline study of CICOS Water Development and Management Master Plan. An in-depth study of climate change impacts "Climate Change Scenarios in the Congo Basin", with the support of the German Cooperation, was jointly carried out from 2010 to 2013 by the GIZ, the Hamburg Climate Service Center (CSC) and the Wageningen Research Center. In sum, the assessment revealed that predicted changes in precipitation are unlikely to provoke widespread water scarcity in the basin. However, the assessment concluded that a greater likelihood of prolonged and more frequent drought periods.

Climate change impacts by sector:

- navigation: strong impact with decreased flow resulting in navigability loss on the rivers in the northern hemisphere of the basin: Ubangi and Sangha;
- hydropower potential: hydropower generation may become less reliable due to increased runoff variation;
- aquatic fauna: likely effects on the river due to decreased river flows and temperature variations;
- drinking water and sanitation: little impact;
- irrigation: little impact;
- industries and mines: little significant influence on activities in terms of water resources;
- environmental impacts: more frequent extreme or violent events: floods, landslides, droughts, eutrophication of water bodies;
- the effects of climate change are already detrimental, especially to hydropower and river navigation.

Joint concerted actions will have to be identified and carried out, in support of and in addition to those provided for in the Intended Nationally Determined Contributions (INDCs), in the framework of the UNFCCC.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

- Provision of a historical database on space altimetry with validation;
- characterization of data accuracy: comparison between space altimetry and in situ data;
- baseline study on hydrological monitoring and space applications in the Congo Basin;
- establishment of two hydrometric stations along a satellite track in the Congo Basin;
- operational Development of the Congo Basin Hydrological Information System (HIS);
- application of the system to uses in the Congo Basin: hydropower and inland navigation;
- calculation of flows based on altitudes.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Data collection and communication on the results of the CICOS support project activities. Organization of a national and regional consultation platform.

6. Which lessons learned would you like to share with other basins?

Data collection should not be an additional burden for the countries, but rather a support to existing national mechanisms.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

Joint actions will have to be identified and carried out in support of and in addition to those provided for in the Intended Nationally Determined Contributions (INDCs) of the CICOS member states in the framework of the UNFCCC. The CICOS will contribute to the coordination of transboundary actions; funding is mobilized from various international partners.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

In the CICOS member states, the main needs concern agriculture, energy and transport sectors, with access to enhancing drinking water supply and sanitation. Controlling GHG emissions related to electricity production and consumption mainly depends on two types of measures:

- increased energy efficiency of the economy;
- development of decarbonized production means.

On this basis, the Economic Community of Central African States (ECCAS) and the Central African Economic and Monetary Community (CEMAC) have drawn up a document on hydropower development aiming to ensure an over 80% hydropower-based electricity supply by 2025. The CICOS will contribute to the coordination of transboundary actions.

9. Future planned activities

Pilot project on the development of water information systems for climate change adaptation in the Congo Basin.

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3. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE DANUBE BASIN

1. Name and short description of the project and basin

International Commission for the Protection of the Danube River (ICPDR), Danube River Basin

The ICPDR Strategy on Adaptation to Climate Change aims at offering guidance on the integration of climate change adaptation into ICPDR planning processes. It promotes action in a multilateral and transboundary context and serves as a reference document influencing national strategies and activities. The ICPDR Strategy on Adaptation to Climate Change 2012 was updated and revised in 2018 taking into account new scientific results and implementation steps taken in the Danube countries.

More information at <https://www.icpdr.org/main/activities-projects/climate-change-adaptation>

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

Due to the expected changes in climatic conditions, water availability is likely to decrease in the southern and eastern parts of the Danube River Basin, whereas it will remain unchanged or even increase in the northern and western part. Changes in water availability can highly differ locally and regionally. Nevertheless, a north-westward shift of regions affected by water stress is expected until the end of the 21st century. Runoff is projected to significantly decrease until the end of the 21st century, whereas only little change is projected in the next decades. According to precipitation, changes in runoff seasonality are expected. The assessment of future extreme hydrological events like floods and droughts includes high uncertainty. However, there is consensus that extreme hydrological events will occur more often and be more intense. Following the future increase in air temperature, water temperature will most likely increase in the Danube River Basin. Due to changes to all temperature-dependent chemical and biological processes, as well as increasing flood and drought events, the pressure on water quality in rivers and lakes will increase. An intensification of extreme events, such as floods and droughts, leads to high impacts for agriculture, forestry and industry, as well as built-up areas and infrastructure. As a consequence of decreasing water availability, a shortage in water supply is expected in some areas. There will not be enough water to meet the requirements for irrigation in agriculture and the vegetation period will shorten in large areas in the south of the Danube River Basin. In contrast, in the northern parts there will be enough water for productive farming. A shift in species distribution and an increasing risk of invasive species is expected due to changing climatic conditions. An increase in air and water temperature, combined with changes in precipitation, water availability, water quality and increasing extreme events, such as floods, low flows and droughts, may lead to changes in ecosystems, life cycles, and biodiversity in the long-term.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

The ICPDR follows the approach of Integrated Water Resources Management (IWRM) as basis of its activities and, in particular, by coordinating the implementation of the Water Framework Directive and Floods Directive in the Danube River Basin.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

The ICPDR Strategy on Adaptation to Climate Change describes the approach of the ICPDR to integrate the issue of climate change adaptation into its activities, in particular, into the Danube River Basin Management Plan and the Flood Risk Management Plan. The relevance of the Danube basin wide Climate Change Adaptation Strategy for Danube countries – in addition to national and regional strategies – is foreseen in the context of promoting action in a multilateral and transboundary context since it is one of the key priorities of the EU Strategy on Adaptation to Climate Change. The ICPDR Climate Change Adaptation Strategy serves as a reference document influencing national strategies and activities in general and more specifically providing input for national RBMPs and FRMPs on possible adaptation measures for the Danube River Basin.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Climate change is a cross-cutting issue, causing impacts to different sectors on a transboundary scale. The quality of water and its availability are very much at the heart of the expected changes and therefore require coordinated action in an integrative way. Due to the transboundary character of water and its relevance for various issues and water-related sectors such as biodiversity and ecosystems, energy, transport, agriculture, floods and droughts, integrated river basin management is a key priority for the ICPDR's approach to climate change adaptation. Building on this basic rationale, work on climate change adaptation is anchored in existing ICPDR structures and planning instruments as well as the corresponding national institutions and structures.

6. Which lessons learned would you like to share with other basins?

The ICPDR approach for integrating climate change adaptation in ICPDR activities includes a joint understanding of scenarios, impacts and adaptation measures and does not include a separate programme of measures, but the relevant actions are incorporated in the Danube River Basin Management Plan and Flood Risk Management Plan. The ICPDR Climate Change Adaptation Strategy focuses on issues relevant at the Danube basin-wide level (level A) and needs to be complemented with further detailed planning for adaptation at sub-basin, national and/or sub-unit levels. Consultation on different uses and priorities is needed to consider and prevent potential target conflicts and competition between different water-related users and sectors such as agriculture, navigation, water supply, energy, industry, tourism, environment and nature protection. Communication, coordination and stakeholder involvement on climate change adaptation issues between different levels of management in the Danube River Basin is ensured at the national level through the ICPDR and also through different projects. Building resilience against climate change impacts on water resources through capacity building, transboundary cooperation and benefit-sharing is a key priority to address climate change in the Danube River Basin.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

The ICPDR approach for integrating climate change adaptation in ICPDR activities does not include a separate programme of measures, but the relevant actions are incorporated in the Danube River Basin Management Plans and Flood Risk Management Plans.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

The scientific knowledge base of the updated ICPDR Strategy on Adaptation to Climate Change is the updated and revised Danube Study, which was completed in 2018. In this study, all available information on future climate change in the Danube River Basin and its effects on the water sector were compiled and analysed. Moreover, existing adaptation strategies and documents dealing with climate change adaptation such as national communications were analysed as well. The ICPDR Climate Change Adaptation Strategy focuses on issues relevant at the Danube basin-wide level (level A) and needs to be complemented with further detailed planning for adaptation at sub-basin, national and/or sub-unit levels.

9. Future planned activities

Awareness of ongoing adaptation processes is raised and experts working on adaptation share experience at different levels, such as national, sub-basin or international levels. This will be guaranteed through the involvement of national experts in the international working groups of the ICPDR, respectively via existing coordination approaches between the basin-wide and the sub-basin level within the Danube River Basin (Sava, Tisza, Danube Delta, Prut). The ICPDR Strategy on Adaptation to Climate Change will be fully taken into account during the next steps of the implementation of the Water Framework Directive and Floods Directive in the Danube River Basin. Closing of knowledge gaps and identification of further research requirements will be constantly aimed for.

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4. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE "DAURIA GOING DRY" PROJECT

1. Name and short description of the project/ activities.

Dauria Going Dry pilot project, initiated by Rivers without Boundaries Coalition, Dauria International Protected Area (DIPA) and WWF under auspices of the UNECE Water Convention, aimed at harmonizing transboundary river protection and management in the river basins flowing from Dauria Ecoregion (initially Eastern Dauria – the Upper Amur River basin).

The key question that the project addresses is how to prevent destruction of Daurian natural ecosystems, enhance their resilience and save globally endangered species in circumstances of economic development and climatically caused periodical water deficit.

The project seeks to develop and promote science-based adaptation measures to complex cycling climate of Dauria region, which is severely affected by global warming. The project addresses domestic and international policy-making, as well as selected conservation and monitoring practices in the field through:

- strategic assessment of river management options in the light of ecosystem-based adaptation to climate change;
- establishing wetland monitoring system;
- enhancement of protected areas network as one of the key adaptation measures;
- awareness raising program on climate change adaptation in transboundary context and preventing maladaptive development of large infrastructure in the name of "climate adaptation measures".

From 2014 the pilot project has expanded further into the Western Dauria – Baikal Lake watershed, where we cooperate with Buriat Regional Organization for Baikal (BROB), Plotina, and several other environmental groups.

Acute crisis in Lake Baikal water management triggered by climate change, pollution and impacts of hydropower has become obvious since winter 2014/2015 and requires involvement of world-wide expertise and support of international organizations to develop adaptation solutions.

The project mobilizes expert community and civil society to support and promote science-based adaptation measures for management of Lake Baikal, through:

- strategic assessment of the Lake Baikal water management options in the light of ecosystem-based adaptation to climate change;
- public participation in discussion of Irkutsk reservoir operating rules and other regulations governing the Lake Baikal water management;
- public support to implementation of the World Heritage Convention, that requires to develop comprehensive management and monitoring system for the Lake Baikal;
- international cooperation to enhance Lake Baikal basin water management practices with findings and techniques developed in other lake/river basins.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, impacts on water quality etc.?

Extreme droughts and floods are more and more pronounced in the region. The most catastrophic flood during the

whole period of observation took place in the Amur River basin from July to September 2013. Our project with UNECE support in 2016 prepared a publication with comprehensive analysis of cooperation between China and the Russian Federation in integrated flood management. In summer 2018, a flood occurred in the Shilka River basin (Zabaikalsky Province of the Russian Federation), which demonstrated that despite recent 2013 experience preparedness to flood risks is still low. Moreover, an infrastructure development within floodplain areas in Chita City is increasing vulnerability of the area to floods.

In the Ulz River and Selenge Baikal basins the 2001-2017 has been extremely dry period during which habitats available to wetland species shrank, competition between nature and humans for water was very pronounced, agriculture was affected by aridization of huge expanses of grasslands caused primarily by climatic changes/fluctuations on Mongolian territory in 1998-2017.

In addition, as part of the measures to adapt to climate change impacts, Mongolian Government made unilateral decision to build several large reservoirs in the Selenge river basin, which are intended for electricity generation and inter-basin water transfers (with reference to Mongolia's NDC). According to UNESCO World Heritage Committee such water infrastructure may threaten Lake Baikal ecosystem and according to review by the World Bank Inspection Panel changes in water regime also may affect well-being of local population in river valleys. Since 2013 Mongolia actively promotes construction of Egiin Hydro on large tributary of the Selenge River which is poorly adapted to climate fluctuations that may have negative impacts on critical river habitats, Selenge Delta Ramsar wetlands and Lake Baikal World Heritage site (with reference to World Heritage Committee decisions on Lake Baikal 2015-2018).

In the Russian Federation, there is a need for better preparedness of the Angara river hydropower cascade and riparian municipalities to extreme drought and extreme floods alike. Management response to droughts has been not enough systematic whereas more attention is needed for protecting lake ecosystems and local communities. The situation is also worsen by serious rise in Lake Baikal water temperature and lack of sewage treatment in the coastal facilities. Since 2013 Lake Baikal near-shore waters have massive outbreak of exotic *Spirogyra* algae killing native sponges and other endemic species.

Since 2018 water inflow into Lake Baikal is increasing and drought will likely be changes by a period of extreme water abundance which requires the authorities to choose between urgent restoration of floodplain water absorption capacity in Irkutsk City downstream of Irkutskaya Hydro and extreme flooding of Baikal lakeshores due to artificially high levels raised by the dam.

In the Ulz River basin hosting new Russian-Mongolian World Heritage Site, the "Landscapes of Dauria", drought continued with terminal Torey Lakes remaining dry due to absence of inflow caused largely by natural reasons and complemented by increasing water intake by mining industry and agriculture. The Mongolian Government made a proposal to design interbasin water transfer from the Onon River to Ulz River as "adaptation to climate change", which urgently requires assessment of environmental and social impacts on the Lower Ulz basin designated as "Landscape of Dauria" World Heritage Site.

4. Which concrete results did you achieve in 2018 with regards to climate change adaptation?

- Daursky Biosphere Reserve has been expanded to include important climatic refugia and spawning site at lower Borzya river in upper Amur Basin;
- with the support of WWF, a new protected area of Dzhilinsky wildlife refuge was established in Zabaykalsky Province: 111 404 hectares of freshwater and boreal forest ecosystems became protected. Conservation of natural ecosystems will help to adapt to climate change (ecosystem-based adaptation);
- continued policy dialogue with various facets of WB management, Mongolian and Russian Government agencies on dams planned in the Selenge-Baikal Basin. Our experts assisted production of comprehensive Terms of Reference for basin-wide transboundary regional environmental assessment (REA) of hydropower and water management plans. Assessment may start in 2019 and will include detailed analysis of climate change impacts on water ecosystems, migratory species populations and water management. As a result by September 2018 initially narrowly defined plan to produce two feasibility studies for dams has been transformed into broader more useful basin-wide assessment;
- assisted preparation of draft decisions for the 42nd Session of the World Heritage Committee on Lake Baikal.

At the World Heritage Watch Forum reported on impact of climate change and policies for Baikal⁴;

- in 2015-2017 we prepared assessments and letters that helped freeze 1 Bln. loan from China Eximbank to Egiin Gol Hydro project in Selenge-Baikal basin, and in 2018 this loan was redistributed for more sustainable projects, including wastewater treatment plant in Ulaan Baatar;
- a chapter on management of transboundary Sino-Russian-Mongolian Amur River basin was published in a scientific monograph "China and Transboundary Water Politics in Asia"⁵;
- preliminary survey of mining impacts in Russian-Mongolian World Heritage Site "Landscapes of Dauria" has indicated likely steady increase in water consumption along the Ulz River;
- "Baikal Expedition" was initiated by local NGOs and experts to collect independent evidence of changes of the Baikal Lake ecosystem, including climate-induced dynamics.

5. Which major challenges did you face in this work? How did you overcome them?

- Competition for water between Mongolia and the Russian Federation exacerbated by climate change which makes bilateral negotiations difficult. This occurs both in the Ulz River and Lake Baikal basins;
- severe lack of ecosystem monitoring data for Baikal despite its World Heritage status;
- lack of dialogue between civil society members and hydropower companies and use of pressure on civil society activists by hydropower actors;
- not sufficient capacity in the Russian Federation and Mongolia to deal with climate adaptation issues.

We overcome those challenges with communication/education efforts (e.g. highlighting advances in other countries, etc).

6. Which lessons learned would you like to share with other basins?

- We successfully used World Bank Safeguard Policies and World Heritage Convention to assist negotiations on transboundary river issues and want to develop formal case-study to be used in the other basins.
- the greatest environmental impacts may come not from climate change per se, but from infrastructure development for "climate adaptation/mitigation" which in a long run turn to be maladaptation.
- adaptation plans should first of all include monitoring of ecosystem biological response to hydrological changes;
- ecosystem-based adaptation has several decisive advantages over excessive infrastructure measures: providing more options for adaptation for the future, sustaining resilience of natural systems, avoiding conflicts, saving money and synergy with biodiversity preservation. In 2016 we made the Asian Infrastructure Investment Bank include such statement in its Environmental Social Framework.

7. How do you finance your climate change activities within the basin? How do you plan to finance implementation of measures?

Our work is mostly funded by grants. Presently we do not have specific funds for adaptation projects. Implementation of recommendations is reliant on state budget and WB funding. In DIPA till 2017 sufficient amount of work covered by UNDP Project. Since it ended there is lack of funding.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

In the Russian Federation, the main document for climate change adaptation is Climate Doctrine of

⁴ Harmonizing World Heritage and Climate Measures. The Case of Lake Baikal. Page 13-17 in the World Heritage Watch Report. 5th International NGO Forum on World Heritage at Risk, Manama, Bahrain, 22 - 23 June 2018; <https://www.researchgate.net/publication/325544901>

⁵ pp.91-117 in Zhang, Hongzhou and Li, Mingjiang editors, China and Transboundary Water Politics in Asia, Routledge, New York.: <https://www.researchgate.net/publication/322099748>

the Russian Federation till 2020, which includes position on climate adaptation. In 2018 the Ministry of Economic Development has prepared a first version of the National Adaptation Plan (NAP) which was sent for approval to the relevant ministries and agencies. The project is in compliance with the Plan of Implementation of the Climate Doctrine of the Russian Federation till 2020. Once the NAP is approved, we will link the project activities to the demands of the NAP. In Mongolia we engage in active discussions with agencies and MDBs on the necessity to update NDCs based on real needs in the basin management.

9. Future planned activities. In 2019 we plan to:

- work on preservation of natural hydrological regime in the Ulz river basin facing challenges from mining and agriculture;
- continue activities on monitoring climate fluctuation impacts on biodiversity in Torey Lakes basin and developing recommendations for future transboundary river basin management plan;
- prepare recommendations on flow release regimes of the Middle Amur reservoirs (on the Zeya and Bureya rivers) to adjust to the conditions of recurrent floods and reduce impact on ecosystems;
- assist implementation and public participation in the Regional Environmental Assessment of Lake Baikal basin water management issues (World Bank MINIS Project).
- organize public participation and control in ESIA's for hydropower projects and reservoir regulation rules;
- assist introduction of climate adaptation and biodiversity conservation considerations into national policies of Mongolia and the Russian Federation and into the ESG commitments of publicly listed hydropower companies;
- mobilize domestic and international support for protection of the Lake Baikal in the face of climate change and growing human impacts through awareness raising;
- hold International Shapkhaev's Hearings in Buryat Republic dedicated to solutions to environmental problems and specifically to climate adaptation issues in Lake Baikal Basin.

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5. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE DNIESTER BASIN

1. Name and short description of the project – *this information will be put on the website*

The project “Enabling Transboundary Co-operation and Integrated Water Resources Management in the Dniester River Basin” is funded by UNDP/GEF and is implemented by the UNDP and OSCE with support of the UNECE and aims to develop Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP), provide support to development of the Dniester River Basin Management Plan and functioning of the Dniester River Basin Commission as well as to implement two pilot projects and practical measures on river restoration,

information sharing and public awareness. Climate change adaptation is included in all components of the project (annex on climate change in TDA, climate change as one of the issues to be analysed through SAP and a few measures focused on and taking into consideration climate change adaptation).

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

- Droughts: in general, especially in the southern part of the Dniester river basin. Insufficient amount of water in the lower part of the Dniester river during summer low-flow periods. Dniester floodplains are not flooded enough for development of aquatic living resources.
- water quality: the Dniester water quality depends on its quantity. The Dniester water is of acceptable quality, but its tributaries are characterized by poor water quality, especially in dry periods. Wastewater discharges also have a negative impact on the river water quality;
- floods: the Dniester river is regulated and protected by dikes. Overall, the Dniester river is relatively protected. However, rapidly forming floods (incl. flash floods) cause inundation in settlements and destruction of the bank protections incl. at the Dniester tributaries.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

In Ukraine, climate change is taken into account while developing legal frameworks, policies, national and regional programs in the field of environment, also while designing river basin management plans. Disaster risk reduction strategies do not exist as official documents in the Republic of Moldova; however, climate change is a priority in the development of other national strategies in environment and water related sectors.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

The Republic of Moldova and Ukraine have agreed on a climate change adaptation implementation plan for the Dniester basin. The Strategic Framework for climate change adaptation in the Dniester river basin has been developed under the UNECE/OSCE project which will serve as a basis for the river basin management plan.

According to the Articles 6 and 26 of the Agreement between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on Cooperation in the Field of Protection and Sustainable Development of the Dniester River Basin, signed on 29 November 2012 in Rome, the Commission on Sustainable Use and Protection of the Dniester River Basin was established which agrees on and implements measures for adaptation to climate change.

The following climate change adaptation measures are in the process of implementation in the Dniester basin:

- improvement of the monitoring system;
- flood risk analysis and mapping;
- inventory of protective infrastructure and reconstruction of flood protective dykes;
- awareness raising campaigns;
- water balance calculation; and
- modernization of irrigation systems.

5. Which major challenges did you face with regard to transboundary cooperation and climate change adaptation? How did you overcome them?

On the major challenges we are facing in relation to climate change adaptation in the transboundary basin is the difference in approaches and mechanisms for implementing national policies. The harmonization of transboundary priorities with national interests is also, in some cases, challenging. There is also a need for improving Moldovan-Ukrainian dialogue on transboundary cooperation in relation to hydropower development.

6. Which lessons learned would you like to share with other basins?

Ukraine is willing to share its experience of transition from the model of administrative-territorial water resource

management to the model of integrated water resource management based on the basin principle in accordance with the Water Framework Directive, particularly legislative framework development and infrastructure reforms. Ukraine cooperates with neighbouring states in the field of transboundary water protection and is willing to discuss the ways of improving the system of information exchange related to the state of aquatic ecosystems at the transboundary level.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

In Ukraine climate change activities are financed through national programs, international financial aid and technical assistance. The funding is not sufficient to fully implement the adaptation measures for the Dniester basin. In the Republic of Moldova, the main funding is provided by the international projects. Funding for climate change activities is foreseen in the national budget, however, in fact funds are not allocated. In the short term perspective, no changes in funding sources are expected.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level?

Adaptation technical measures realised in the Dniester river basin can be applied to other rivers in the Republic of Moldova, for example, information systems for water balance calculation, hydrometeorological data posted on the websites of hydro-meteorological services of the Republic of Moldova and Ukraine, clearance of riverbeds, narrow channels and channels in the lower part of the Dniester, as well as various art contests and awareness-raising activities, etc.

In Ukraine activities related to climate change adaptation in the Dniester transboundary basin can be also replicated in the other basins. In particular, the methodology of the water balance development is used for the Don river basin in Ukraine. The practice of the river day celebration, public awareness activities and art contests was also applied to other river basins in Ukraine.

The Management Plan for the basin hydrographic district of the Dniester river was approved by the Government Decision No. 814 of 17 October 2017 in the Republic of Moldova. The Programme of measures for the implementation of the Plan includes adaptation activities at the transboundary level which implementation has already started:

- approval of the national system of hydrological monitoring in accordance with the relevant systems of the Dniester hydrographic basin countries;
- analysis of climate change processes in the basin and their impact on the vulnerability of water resources;
- development of the Flood Risk Management Plan for the Dniester district;
- update of the operational rules for Dniester hydropower complex in cooperation with Ukraine;
- cooperation with Ukraine on implementation of the bilateral Agreement and establishment of the related Commission;
- calculation of water balance in the Dniester basin;
- delineation of wetlands of national importance in the Dniester district to include them to the Fund of Protected Natural Areas;
- implementation of the Program on Greening and Restoration of Coastal Protective Strips of Water Bodies of the Dniester district;
- implementation of the Program on Improvement of Ichthyofauna in the Dniester river;
- establishment of the National Park "Nistrul de Jos".

The Environmental Strategy of the Republic of Moldova for 2014-2023 pays special attention to climate change impacts and adaptation measures throughout all sectors of the economy.

9. Future planned activities

In Ukraine, in 2019 it is planned to continue work in accordance with implementation of the Water Framework Directive incl. delineation of water bodies, development of the programs of national water monitoring in accordance with the new regulation, providing equipment to the laboratories and conducting analysis of water quality. It is also planned to finalize activities focused on protection of the banks which were destroyed during the flood in 2018. In the Republic of Moldova, it is planned to develop flood and drought risk management plans in 2019. It is also planned to reconstruct flood protection facilities at Sherpen and Gura Bicului villages in the Dniester basin.

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6. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE DRIN BASIN

1. Name and short description of the project and basin

The Global Environment Facility (GEF) supported Project "Enabling transboundary cooperation and integrated water resources management in the extended Drin River Basin" which is aligned in its content, aims and objectives with the Drin MoU and the respective action plan for its implementation.

The objective of the project is to promote joint management of the shared water resources of the transboundary Drin River Basin, including coordination mechanisms among the various sub-basin joint commissions and committees. Albania, the Former Yugoslav Republic of Macedonia, Kosovo⁶ and Montenegro are the project beneficiaries.

The GEF Drin project is structured around five components:

Component 1: Consolidating a common knowledge base

Component 2: Building the foundation for multi-country cooperation

Component 3: Institutional strengthening for Integrated River Basin Management (IRBM)

Component 4: Demonstration of technologies and practices for IWRM and ecosystem management

Component 5: Stakeholder Involvement, Gender Mainstreaming and Communication Strategies

The Project is implemented by UNDP and executed by the Global Water Partnership (GWP) through GWP-Mediterranean (GWP-Med) in cooperation with the United Nations Economic Commission for Europe (UNECE); GWP-Med is responsible for the realization of the project. The Drin Core Group is the Steering Committee (SC) of the Project.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

According to the national communications to UNFCCC of the Former Yugoslav Republic of Macedonia, climate change will have serious negative impacts in the Drin river basin including increased frequency and intensity of floods and droughts, increased water scarcity, intensified erosion and sedimentation.

⁶ United Nations administered territory under Security Council Resolution 1244 (1999).

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

The Former Yugoslav Republic of Macedonia is prone to various natural hazards and has a Crisis Management System (CMS) in place to deal with such disasters as floods, earthquakes, fires, etc. The roles and responsibilities of the stakeholders at various levels involved in this system are mentioned in several disaster risk reduction and management laws as well as national plans and strategies, including the 2004 Law on Protection and Rescue, the 2005 Law on Crisis Management, the 2008 National Security Strategy and the 2009 National Protection and Rescue Strategy.

The National DRR Strategy and Action Plan was established in 2014, but it has not yet been adopted. The expected increase in frequency and severity of such natural hazards as heat waves, droughts and floods due to climate change is acknowledged as well as the expected adverse impact of climate change on agriculture leading to direct and indirect agricultural losses. Some sectors (including agriculture) are mainstreamed into this DRR strategy and action plan; however, this is still quite limited.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

Development of the Transboundary Diagnostic Analysis (TDA) report:

- information and data collection/generation – building the Drin database;
- thematic reports on: pollution, institutional and legal setting, biodiversity and ecosystems, socio-economics, hydrology, water-food-energy-ecosystems nexus;
- preparation of TDA synthesis report.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Climate change impacts on water resources will have effects on human health, economic sectors and society since various sectors directly depend on water (such as agriculture, energy and hydropower, health, tourism and environment).

6. Which lessons learned would you like to share with other basins?

Water balance, sediment balance and water quality.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

From the national budgets, EU funds and international donors.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

Through joint projects (national and local).

9. Future planned activities

The Lake Ohrid Basin Management Plan will be prepared in accordance with the pertaining EU regulations (especially EU Water Framework Directive) and national laws.

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7. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE LAKE VICTORIA BASIN

1. Name and short description of the project and basin

There are currently two projects under implementation on the Lake Victoria Basin (LVB).

LVB Climate Change Adaptation Project applied through UNEP (USD 5 Million) Adaptation Fund

The overall objective of this project is to reduce vulnerability to the negative effects of climate change in the five Lake Victoria Basin countries, namely Burundi, Kenya, Rwanda, Tanzania and Uganda, by building climate resilience. There are five components which include:

- strengthened institutional capacity to integrate climate resilience into transboundary water catchment management;
- Improved delivery of accurate and timely climate information – with an emphasis on transboundary water catchment management – to regional and national policymakers, technical officers and local communities;
- climate change adaptation technologies transferred to communities to reduce their vulnerability to climate change;
- regional resilience to climate change promoted through innovative, community-based projects;
- improved knowledge management frameworks for the collection and maintenance of regional knowledge in transboundary water catchment management and climate change adaptation practices.

The Lake Victoria Basin in brief:

Lake Victoria (LV), with a surface area of about 68,870 Km², is Africa's largest and the world's second largest freshwater lake. It lies at an altitude of 1,134 m above sea level and touches the equator on its northern reaches. It is relatively shallow, reaching a maximum depth of about 80 m, and an average depth of about 40 m. Precipitation is the main source of water into the lake accounting for 82% while the rest, 18%, comes in through rivers. Evaporation accounts for 76% of the loss of water from the lake, the rest 24% being lost through River Nile outflow. The lake's water residence time is 23 years, while its flushing time is 123 years. The catchment covers an area of 180,950 km² with Tanzania occupying 44%, Kenya 22%, Uganda 16%, Rwanda 11% and Burundi 7%. The catchment in most of the Partner States is characterized by hilly terrain and consequently soil erosion which is a major problem.



2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

- Reduced/increased rainfall volume and increased variation in rainfall patterns;
- disasters: increased frequency of flooding events; across the LVB, a number of prolonged drought events have occurred, specifically in 1983/1984, 1991/1992, 1995/1996, 2004/2005 and 2018;
- deterioration of the water quality in the Lake Victoria;
- increased annual temperatures have resulted in heat stress in livestock, which reduces growth rates, reproductive rates, milk production etc.;
- the fisheries sector in the LVB has been adversely affected by the changes in distribution and/or quantity of freshwater resources;
- fluctuations in the volume of water in Lake Victoria affected the generating capacity of hydropower facilities and infrastructure within the LVB.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

The Climate Change issues are addressed in a number of strategies developed for the Lake Victoria Basin including:

- EAC Climate change Policy;
- EAC Climate change Master Plan;
- EAC Climate change Strategy;
- LVB Climate Change Vulnerability Impact Assessments;
- VIA future climate projections completed for 2030, 2050, and 2070 (for RCP 2.6, 4.5, and 8.5) where impact scenarios for five sectors were identified (agriculture, water, terrestrial, health and energy and transport); and
- Lake Victoria Basin Climate Change Adaptation Strategy and Action Plan.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

LVB – climate change adaptation project:

Established regional Lake Victoria Basin climate decision making framework: the project has established regional climate decision making framework which includes Regional Policy Steering Committee (RPSC) consisted of all Permanent Secretaries representing environment, agriculture, water and related climate change ministries. Responsibility of the Committee is to provide policy and decision making on the implementation of climate change adaptation projects.

Established national climate decision making and implementation framework: the project has established five multi-sectoral national coordination teams. These coordination teams are under Permanent Secretaries mentioned above and; assisting and providing them with required technical support to implement regional climate change adaptation projects. Under national coordination teams the project has established district multi-sectoral coordination teams that provide extension services to the intervention areas and report to National coordination team. These districts coordination teams are responsible to ensure mainstreaming of climate change adaptation into district and village planning and projects.

Establishment of Climate Change Project Unit at LVB: The process of establishing the LVB CC unit has started and is in its final stage. This includes the recruitment of the consultants, namely Project Manager, Account Assistance and Technical Chief Adviser.

Revised and developed project documents: a number of documents have been revised/updated namely:

- revised work plan and budget and populate in the UNEP template;
- produced monitoring and evaluation system;
- revised environment and social safeguards;
- detailed work plan and budget 2018/2019;
- inception workshop report from June 2018;
- first PSC meeting report, Quarterly Expenditure Report (Q1 – June to September 2018).

Established regional climate change institutions platform: organised a regional workshop from 1st to 2nd October in Hilton Hotel in Nairobi to establish the regional climate change platform. The workshop identified roles and responsibilities for each of the participating institutions as well as identification of the focal points. The meeting was attended by the national meteorology directors, LVBC National Focal Point Officers, National Climate Coordinators, IGAD Climate Prediction and Application Centre (ICPAC), Famine Early Warning Systems Network (FEWSNET) and the Regional Centre for Mapping of Resources for Development (RCMRD). The workshop also identified tailored climate change training packages on water conservation practices, climate-smart agricultural techniques and ecosystem-based adaptation (EbA) activities for training LVBC and national team experts. The workshop agreed on mechanisms and modalities on climate information dissemination

mechanisms and packages to deliver climate information to national policy makers.

Identification of the project intervention sites at the countries: Partner States provided pilot areas for interventions based on the developed regional criteria. The interventions identified include Kirundo and Muyinga selected by Burundi; Busia and Siaya selected by Kenya; Kihere District within Akagera river basin selected by Rwanda; Magu selected by Tanzania and Masaka and Mubende selected by Uganda.

Raising awareness on climate change and adaptation among East African Parliamentarians, policy makers, communities and other stakeholders.

Sharing LVBC experiences and challenges on issues related to climate change at various national, regional and international occasions.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Some of the challenges include:

- there are many stakeholders with various interests; this makes it difficult to agree on activities to be undertaken e.g. among farmers, fishermen, water utilities, industries, livestock keepers, etc. Consultation process in general is long and difficult;
- unavailability and unreliability of data in the region;
- countries put their national priorities first and the regional priorities come last;
- lack of knowledge on climate change and adaptation among local communities;
- limited financial resources to implement CC adaptation programmes within the basin compared to the existing problems; and
- LVB has population of more than 40 million affected by the impact of climate change. LVB has areas of 180,950 km² with different climatic conditions. To make effective impact to 40 million people more resources are required. 5US\$ million provide by AF serves as a catalyst for EAC Partner States and other development partners to see a possibility to support the efforts of AF by providing more resources.

Some of the solutions we have undertaken is to develop instruments e.g. data and information sharing protocol; increased awareness especially among members of the parliaments and policy makers; undertake training and capacity building as well as encouraging countries to invest in data collection and exchange. In addition, there is a number of initiatives undertaken by the Commission to use remote sensing, GIS as well as installation of automatic stations to enable data collection remotely. This will reduce the cost of data collection for countries which is done manually. We have also embarked on mobilising new resources to support the countries to implement CC adaptation programme. This includes using blended envelop for financing (loans and grants).

6. Which lessons learned would you like to share with other basins?

On the implementation of the current LVB – CC project, we have learnt that:

- involvement of the government of the Partner States and other key stakeholders into project development, inception and implementation as well as sites selection is a key for the ownership and smooth implementation of the programme;
- establishment of project Regional Policy Steering Committee of Permanent Secretaries (RPSC) has created willingness and commitments of countries and, thus, facilitated smooth start of the project activities in all countries. Decisions on the project implementation are made without delay. Project funds will be managed by the same Permanent Secretaries as Accounting officers of the Ministries;
- involvement of key regional and national climate institutions has created synergies with this project; and, thus, avoid duplications and ensure efficient use of resources;
- the workshop held with regional climate change authorities and regional institutions (RCMRD, ICPAC, UNEP, LVBC, FEWSNET, IUCN and WWF) created a platform of all institutions to ensure harmonised delivery of accurate and timely climate information to regional and national policymakers, technical

officers and local communities. This is the key factor to achieve climate resilient communities where their decisions will be informed by accurate climate information at right time.

Generally, on the preparation of the adaptation projects, we have learned that:

- lack of capacity at basin/Lake organizations in preparing bankable projects. There is big need for support from climate funds/banks (AFDB, WB, EIB) in preparation of CC bankable projects;
- partnering with CC experienced international organisation like UNEP, World Bank, UNDP helps to develop well bankable CC projects;
- options for funding are limited for basin organisations compared with sovereign states, with climate funds such as the Green Climate Fund (GCF) only available to those projects agreed to by National Designated Authorities (NDAs); and
- river basin organization generated projects are seen as 'competition' by national institutions;
- there is a need to improve the legal status of basin/lake organizations to enable secure finance;
- there is a need to identify and develop joint development strategies (CC) agreed by all riparian countries which will make easier for the countries to submit required documents timely;
- there is a need to link national and regional climate change policies with transboundary strategies and plans;
- project preparation is a complex process requiring an extensive multi-sectoral stakeholder consultation and participation;
- lobbying and creation of the network is a key for successful implementation of the project.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

Our climate activities are financed through our development partners with support of international institutions. Current funding is from Nordic Development Fund and Adaptation Fund. We are also looking for funding through the GEF – International Waters. In addition, we also lobby for our countries to take loans since we at the regional level re searching for grants. As a result we could receive blended financing i.e. loans for the countries and grants for LVBC as a regional body.

Adaptation measures developed through our LVB Adaptation Strategy and Action Plan will be financed through our development partners as well as in kind contributions from the Partner States of the East African Community. This also includes blended envelop of loans and grants.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

The LVB Climate Change Strategy was developed jointly and with the participation of all the Six Countries of the EAC. Various consultations were undertaken and considered all available national policies which include national priorities as well as the regional priorities. Based on this the Regional/LVB CC strategy and Action Plan were developed which was a major factor for the acceptance of the Countries to provide supporting letters for the regional programme we are currently implementing with support of the Adaptation Fund. The activities proposed in the Action Plan were agreed by all the Countries and prioritized accordingly.

9. Future planned activities

Future planned activities include:

- continue to implement the LVB – CC Adaptation programme;
- finalize the agreed concept with the GEF – International waters on issues related to climate change adaptation under the Lake Victoria Environmental Management Project (phase 3) which will start in July, 2020;
- prepare for the appraisal of the WB for the Lake Victoria Environmental Management Project (phase 3)

which also include the CC adaptation component under the GEF 8 International Waters funding;

- mobilise more resources from other development partners;
- review and approve the EAC CC strategy to accommodate new areas agreed internationally;
- mobilize resources for the implementation of the LVBC Climate Change Strategy and Action Plan;
- up scaling of the current programme on the adaptation fund through UNEP;
- up scaling of the activities of the Nordic Development Fund focusing on the Public Private Partnership;
- improve existing climate change tools developed and used in LVB.

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8. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE LOWER MEKONG BASIN

1. Name and short description of the project and basin

The overall objective of Mekong River Commission's Climate Change Adaptation Initiative (CCAI) is to guide climate change adaptation planning and implementation through improved CC impacts assessments and improved strategies and plans at different scales in the Lower Mekong Basin. It supported LMB governments in introducing and improving strategies and plans for adaptation at various levels and their integration with appropriate development plans. CCAI has also ensured that adaptation performance and the status of climate change is monitored and reported on a regular basis. As an ultimate output of CCAI, Mekong Climate Change Adaptation Strategy and Action Plan (MASAP) has been developed. Currently, an implementation of the MASAP is on-going.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

The CCAI conducted a series of basin wide assessments of climate change impacts on water and water-related resources under several climate change and development scenarios: in hydrology, flood & drought patterns, hydropower production, ecosystem & biodiversity, food security and socio-economics. Specific and unique methodologies have been developed for each of these assessments, mostly based on numerical modelling tools. To illustrate some of these findings: regarding food production, for example, the projected impacts of climate change on crop yields are negative for both rice and maize with greater impacts on rice. Projected impacts on fisheries are positive or negative depending on the scenario. The flood zone habitats are likely to experience greater changes than rice paddy habitats. In term of ecosystem, substantial changes in bioclimatic conditions are projected across the LMB's ecoregions. By 2060, up to 100% of some ecoregions may experience completely novel bioclimatic conditions. Species are highly vulnerable to climate change with large numbers of fish particularly at risk due to their sensitivity to hydrological cues. The range of possible changes in hydrology is enormous. The largest ranges of predicted impact at one specific location (Kratie) associated with climate change and 2060 development scenarios are: the range of annual river flow change is estimated as -38% to

+28%; flood season peak flow -30% to +43%; minimum 1-day flow -21% to +79%. Without adaptation there will be significant deterioration of the flood conditions with more losses and people affected. The Mekong delta is impacted by both upstream increases in flow and sea level rise, affecting the largest number of people in the region. Basin development will interact with the impacts from climate change, in some cases exacerbating the change and in some cases mitigating against it. The projected impact of climate change on floods depends in large part on the model applied. Under both the wetter overall model and the increased seasonal variability model the flooded area is projected to increase for floods of all return intervals in a range of 4.6% to 27.3% increase. The biggest proportional changes are projected to occur for the smaller floods with return intervals of 1 in 2 years and 1 in 5 years: under the highest emissions scenario for the wetter overall model, the change projected to 2060 is an increase in flooded area of 38% for a 1 in 2 years flood and of 28% for a 1 in 5 years flood. Under the medium emissions scenario and wetter overall model, the flooded area is projected to increase 27% for a 1 in 2 years flood and 20% for a 1 in 5 years flood.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

Impacts of climate change on flood and droughts patterns have been assessed at the basin level. This assessment will support the mainstreaming of climate change into the updated MRC food management and mitigation strategy, planned for 2019.

At the sub catchment level, in one transboundary sub-catchment shared between Cambodia and Thailand, MRC and GIZ are implementing a joint project to mitigate flood and drought risks. At this level climate change and its impacts of future risks are also accounted for.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

- Finalise basin-wide assessment of climate change impact on water and water related resources and sectors, including seven components namely hydrology, flood, drought, hydropower, ecosystem, food security and socio-economics. This process involved a number of relevant stakeholders in consultation meeting and forum;
- finalise Status report of climate change and adaptation in the Lower Mekong Basin (LMB);
- approval of the Mekong Adaptation Strategy and Action Plan (MASAP);
- MASAP is a "Statement" of the LMB countries setting out the MRC's Strategic Priorities at basin level to address climate change risks and strengthen basin-wide resilience. The added values of the MASAP are ensured by addressing critical climate change adaptation aspects that need transboundary cooperation and by enhancing the capacity of the Member Countries in implementing their own national strategies. An action plan has been developed for the implementation of the MASAP;
- initial results of mainstreaming MASAP perspectives into national level.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Challenges:

- different level of climate change impacts and adaptation priorities of each Member Country;
- data monitoring and sharing;
- seeking funds for the transboundary adaptation projects.

Overcomes:

- enhancing regional and international cooperation and partnership on adaptation;
- support to mobilizing adaptation funds;
- enhancing monitoring, data collection and sharing;
- strengthen capacity on development of climate change adaptation strategies and plans; and

- improving outreach of the MRC products on climate change and adaptation.

6. Which lessons learned would you like to share with other basins?

- Strong leadership to address climate impact at regional level;
- consultation process with both internal and external stakeholders;
- challenges in defining transboundary adaptation and identifying relevant and feasible actions;
- challenges in convincing countries about the added value of the regional level, on top of existing national levels;
- multiplicity of initiatives and actors in the field of CCA.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

The CCAI project has received financial support from development partners: Australia, Denmark, Finland, Luxembourg, Germany, Sweden and EU. Currently the MASAP is being implemented by using MRC's basket fund – from different development partners. As a strategic priority, access to climate funds such as adaptation fund and GCF is important for mobilizing funds for the transboundary adaptation projects.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

The regional adaptation strategy and actions will be mainstreamed into relevant national strategies, policies and plans. The methodologies and tools developed at the transboundary level can be replicated and/or downscaled at national/local level. The capacity building program targeted the national levels.

9. Future planned activities

- Climate proof MRC sectoral strategies 2016-2020 and the next Basin Development Strategy;
- promote mainstreaming of basin-wide assessment findings and MASAP's adaptation strategic priorities at national level;
- promote and facilitate exchanges of good practices between Member Countries on Climate Change Adaptation;
- strengthen and/or institutionalize partnership between MRC and international climate change communities;
- consolidate the existing MRC transboundary projects with climate change adaptation measures and develop further initial ideas of new transboundary adaptation projects;
- identify approaches/mechanisms of access to climate change adaptation finance by the Member Countries and MRC;
- regular reporting on status and trends of climate change adaptation indicators;
- enhance early forecast and warning on extreme events;
- promote and support at national level the application of the MRC climate change scenarios, climate change impact and vulnerability assessment approach, methods and tools;
- formulate and implement capacity building activities;
- maintain and update MRC CCAI website, data portal and social media;
- disseminate MASAP and other CCAI products at relevant events including the Mekong Forum.

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9. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE NEMAN BASIN

1. Name and short description of the project and basin

The pilot project on river basin management and climate change adaptation in the Neman river basin was implemented by the United Nations Economic Commission for Europe under the Water Convention and UNDP Belarus, with funding from Finland and Sweden through the Environment and Security Initiative (ENVSEC) as well as the Netherlands. The overall objective of the project is to improve integrated river basin management and transboundary cooperation in times of a changing climate in the Neman river basin. The project aims to strengthen the capacity of the countries sharing the Neman river to adapt to climate change through supporting dialogue and cooperation on the needed steps to design an adaptation strategy in the transboundary context.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

The climate change forecasts until 2050 for the Neman River Basin (NRB) proved of an average increase of the air temperature in the basin with increase to the maximum in summer and in winter. The largest precipitation is forecasted during cold season of the year. The forecast summer surface runoff may decrease in the NRB and it may increase to the maximum in the winter season. The problem of low-water periods leading to droughts is more relevant for the NRB. The forecast reduction in the minimum runoff in the summer and autumn seasons may be more significant in the future than its reduction over the last 50 years. The years 2015 and 2016 were particularly low water with absolute minimums of the characteristics of the runoff and water levels over the entire observation period in the NRB. Low-water periods may result in deterioration of the state of the environment and recreational potential of surface water bodies and adjacent areas. In addition, possible increase in the frequency and duration of dry seasons may increase the risk of a substantial reduction in the summer runoff of small rivers, which would result in lower water levels and deterioration of their water quality. Spring floods are not a priority problem in the NRB, except the Neman headwaters in Belarus, western Lithuania and Kaliningrad Oblast of the Russian Federation. However, despite the fact that the flood problem is not the most urgent in the larger part of the NRB, it is relevant since floods cause substantial economic damage, specifically to agricultural production.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

Climate change addressed in the National Strategy for Sustainable Socio-economic Development of the Republic of Belarus for the period till 2030 and in the new Strategy of Water Resources Management in Belarus in the Condition of Climate Changes till 2030 in the scope of water security and disaster risk reduction.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

Belarusian and Lithuanian experts implemented priority actions towards preparation of the International River Basin Management Plan (RBMP) for the Neman river basin in 2016-2018. These activities were implemented with support of the UNECE Water Convention. The main results were devoted to comparison and harmonization of the water bodies designation and typification, assessment systems of status of surface water bodies and groundwater, designation of water bodies in the NRB and their hydromorphological assessment, classification and presentation of status of surface water and groundwater bodies, identification of significant pressures and impacts of human activity on the status of surface water bodies and groundwater. Main results of these activities were presented in the second meeting on enhancing technical cooperation in the Neman river basin in Vilnius on 12-13 July 2017 and in the EUWI+ meetings (European Union Water Initiative Plus for Eastern Partnership Countries) in Minsk on 29 May 2018 and on 5 December 2018.

The Pilot project on climate change adaptation in the Neman river basin stimulated similar research for other river basins in Belarus which were supported by the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus with financing from the National budget. The monograph "Water resources of Belarus and their forecast with account to climate change" was published in September 2017.

The results of the Neman RB - pilot project were used during development of the management plan and program of measures of the Lithuanian part of the river Neman river basin district.

Full scale GEF-funded project document «Fostering multi-country cooperation over conjunctive surface and groundwater management in the Bug and Neman transboundary river basins and the underlying aquifer systems» (Bug/Neman GEF-project) was elaborated in 2018 and was preliminarily supported by the main beneficiaries.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

The financial deficit for implementation of adaptation measures on the national levels is the major challenge. The methodologically similar legislation in Belarus and in Lithuania in the frame of water quality assessment has some principal differences regarding biological monitoring especially. It is one of the major challenges which could be overcome by using agreed methodology in the frame of enhancing technical cooperation in the NRB. The dominant problem in the Neman River Basin between countries in communication is different status of membership (EU and non-EU members).

6. Which lessons learned would you like to share with other basins?

Experience in transboundary cooperation in the frame of water quality assessment and ecological water status qualification. Experience in creation of the Informational Platform in Internet which included basic meteorological and hydrological data base for assessment and forecast of climate change (Belarus and Lithuania).

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

Financing of climate change activities within the entire NRB basin in the frame of international cooperation is planned under international projects (including Bug/Neman GEF-project). Financing of the implementation of adaptation and other water management measures will be under realization of the NRB National Management Plans (Belarus, Lithuania) from the national budget, local budget and other sources including private companies and international projects.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

Strategic Framework on Adaptation to Climate Change in the Neman River Basin was used during development of the Strategy of Water Resources Management in Belarus in the Condition of Climate Changes till 2030. The main UNECE-pilot project results and of its follow up activities in 2016-2018 were taken into account during

improvement of the Water Management Plan for the Neman River Basin (Lithuanian part).

9. Future planned activities

Future planned activities are connected with realization of the Bug/Neman GEF-project which will use the outcomes of and lessons learnt from the activities implemented in 2016-2018 for preparation of the International River Basin Management Plan (RBMP) for the Neman river basin and other actions.

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10. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE NIGER BASIN

1. Name and short description of the project and basin

- The Niger Basin Authority is a transboundary basin organization created on 21 November 1980 in Faranah, Republic of Guinea, replacing the Niger River Commission, created on 25 November 1964.
- The NBA aims to promote cooperation among member countries and ensure integrated development of the Niger Basin.
- The Niger River Basin covers an area of 1.5 million km² distributed among 9 member States: Benin, Burkina Faso, Cameroon, Ivory Coast, Guinea, Mali, Niger, Nigeria and Chad.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

- Increase of the annual drought duration throughout the basin;
- drop in agricultural, pastoral and forestry production; dried out ponds and secondary streams;
- silting of the river and its tributaries due to a vegetation cover decline along the river and its tributaries;
- recurrent floods along the river and its tributaries related to the silting of the river;
- degradation of the river sources in Guinea due to drought and over-exploitation of natural resources around these sources.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

- The NBA has adopted a Strategic Plan 2013-2024, set out in an Operational Plan including 350 investment actions which are fully dedicated to climate change adaptation in the Niger Basin;
- 70% of these Operational Plan actions were gathered in a Climate Investment Plan (CIP) presented at the COP 21 in Paris with the support of the World Bank and the African Development Bank.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

During the period 2016-2018, the NBA has:

- obtained the adoption of the Operational Plan (OP) and the Climate Investment Plan (CIP) for USD 7.2 billion by the Heads of State of 9 Member States;
- mobilized 25% of its OP and CIP financing requirement, including Green Climate Fund funding;
- adapted its monitoring system for surface water resources through the improvement of:
 - its ground monitoring system consisting of 115 stations along the river with 32 Data Collection Platforms;
 - its data processing system has become more fluid in optimizing allocation and managing water resources;
- developed the satellite monitoring system for the Niger Basin resources;
- annually produced 12 newsletters on climate and hydrology, as well as early warning technical notes to national authorities and users on climate risks;
- developed its groundwater monitoring network;
- prepared the Programme for Integrated Development and Climate Change Adaptation with the ADB for USD 230 million, starting in March 2019;
- prepared a Programme for the Development of Climate Change Resilience (PDRcC) for USD 500 million with the World Bank, starting in 2019;
- prepared a Project for Improved IWRM and Governance based on Knowledge about the Niger Basin and the Iullemeden -Taoudeni/ Tanezrouft Aquifer System with the UNDP, GEF, UNEP, UNIDO and the OSS for USD 14 million, starting in March 2019.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Despite them being identified as major activities for regulating the Niger River in the 2008 Sustainable Development Action Plan (SDAP), the construction of three structures in Fomi, Taoussa, Kandadji, remained under the control of promoter countries, often creating distrust among other countries due to a communication gap.

Thanks to the modeling tools developed by the Technical Committee of Independent Experts that provided unbiased technical advice, and to negotiating efforts, this construction does no longer face institutional difficulties and activities are in progress.

Current challenges and discussions about the construction activities concern:

- their size and financing;
- project management: whether it would be joint works or works of common interest since several countries will share the benefits of these constructions.

6. Which lessons learned would you like to share with other basins?

In order to achieve its mission, a transboundary basin organization should:

- receive political support (will) from the heads of the states of the basin riparians who should have a shared vision of their cooperation (shared vision);
- this cooperation must be quickly supported by the technical documents supporting this political vision and by a consensual legal and institutional framework for its implementation (Sustainable Development Action Plan (SDAP), Strategic Plan (SP), Operational Plan (OP), Climate Investment Plan (CIP), Water Charter, institutional organization at regional and national levels);
- financial partners should be approached with a clear operational plan reflecting the consensus of the states

on the investments to be made;

- have technical knowledge of and monitoring tools for natural resources to share and exchange relevant data and information for basin management;
- involve users into decision-making process.

The mandate of the transboundary basin organization must evolve and should eventually allow it to ensure the overall management of the basin shared by several states.

At the national level it is important:

- to clarify the roles of the national services and other actors to ensure their responsiveness to the basin organization's requests;
- to express a strong level of solidarity and have mutual understanding between the member states;
- to cooperate transparently and exchange relevant information with their basin organization.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

The NBA's activities are financed by:

- NBA's traditional financial partners (African Development Bank, World Bank, German Cooperation, Canadian Cooperation, French Development Agency, EU, GEF, WAEMU, etc.);
- Green Climate Fund;
- Member Countries.

The NBA intends to continue mobilizing its financial requirement through the above partners as well as through the Member States; they have indeed committed to finance 10% of CIP cost.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

The link between investment actions at regional scale and national levels is maintained by:

- joint identification of investment actions (NBA Executive Secretariat and States);
- regular functioning of the established institutional and legal cooperation framework (Regional Steering Committee, Council of Ministers, Heads of State Summit);
- review of critical studies and key decisions at regional workshops.

9. Future planned activities

- Implement the Programme for Integrated Development and Climate Change Adaptation (PIDACC);
- evaluate the implementation of the Operational Plan and update this OP;
- finalize the Programme for the Development of Climate Change Resilience (PDRcC) with the World Bank;
- implement the Project for Improved IWRM and Governance with the GEF, UNDP, UNEP, UNIDO;
- strengthen the NBA by implementing the conclusions of the Institutional and Organizational Audit.

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11. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE NORTHERN WESTERN SAHARA AQUIFER SYSTEM

1. Name and short description of the project and basin:

Name of the project: *Integrating climate change impacts in the management of the Northern Western Sahara Aquifer System (Algeria, Libya, Tunisia).*

This component forms part of the Great WACDEP project (Water, Climate and Development for Africa) implemented by the Global Water Partnership Mediterranean (GWP-Med), the OSS and partner countries.

The objectives of the project are:

- identify climate change impacts at aquifer level;
- define adaptation measures for farms;
- simulate scenarios including the impacts of climate change on the exploitation of the basin water resources.

Brief description of the NWSAS basin: the North Western Sahara Aquifer System covers an area of nearly 1 000 000 km² and is shared by Algeria (700 000 km²), Libya (250 000 km²) and Tunisia (80 000 km²). Its very marginally renewable water resources are estimated at 60 000 billion m³.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

Implemented activities:

- campaign of 700 surveys based on a previously developed questionnaire;
- processing of the answers to this questionnaire and data analysis;
- improving the hydro-economic model by integrating climate change impacts-related data and elaborating development scenarios;
- simulating scenarios including the impacts of climate change on the basin water resources.

Obtained results:

- the main impacts of climate change include:
 - rain scarcity;
 - increased frequency of sandstorms;
 - degradation of water and soil resources quality;
 - partial degradation of the natural vegetation;
 - appearance of pest insects;
- the main adaptation proposals are:
 - abandoning crops with high water needs;
 - introducing livestock and modifying irrigation techniques.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country ?

The three countries have a Climate Plan and Climate Change Adaptation Plan. New studies within the basin take climate change into account.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

Three countries are updating and adapting their Climate Plans. The final report on the NWSAS Basin was completed and presented highlighting the conclusions covering over-exploitation of fossil water resources and degradation of water and soil quality.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation ? How did you overcome them ?

At transboundary level mitigation instruments have been established through the establishment of the NWSAS Consultation Mechanism. Cooperation in dealing with groundwater over-exploitation and managing water demand nonetheless should be reinforced.

6. Which lessons learned would you like to share with other basins?

- Information and cooperation between countries, involving civil society and local communities, especially farmers, is needed to raise awareness about water saving, the use of solar energy and the switch to non-water-intensive crops; and
- water demand management needs should to be anticipated.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures ?

Adaptation activities and measures are financed by States and various project stakeholders. The State always supports or ensures preparation of studies and the follow-up of activities.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

Collaboration and cooperation should be supported. Synergy in this case means that the plans developed at national level include or complement those defined at transboundary level.

9. Future planned activities:

The NWSAS Consultation Mechanism is responsible for both quality and quantity water resource monitoring. In particular, it develops decision-making charts, especially in previously identified risk areas, by using a data bank and a simulation model.

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12. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE RHINE BASIN

1. Name and short description of the project and basin

Implementation of the Climate Change Adaptation Strategy for the Rhine Basin and mainstreaming it with the work of the International Commission for the Protection of the Rhine. New findings on low water.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

During the 20th century and depending on the region in the Rhine catchment, air temperature changes varied between +0.5°C and + 1.2°C. The temperature rise was more distinct during the winter than during the summer and more important in low altitude (< 500 m) than in higher altitude. Precipitation during winter time has increased in the entire Rhine catchment (+ 10 to + 20%). The increase was slightly less in the Alps. Summer precipitation has hardly changed (between -5 to + 5 %).

Thus, the mean discharge (MQ) at the gauging stations along the main stream of the Rhine tends to increase (mostly + 10 to + 15 % for MQ). During summers, MQ decreases by up to 8 %. Mainly, this is an effect of rising temperatures (more evaporation) combined with stagnating precipitation and coincident reduced snow volume in the Alps. The mean flood discharge (MHQ) evaluated for entire hydrological years (Nov. - Oct.) indicates an increase by about + 10 %. According to the new evaluation of historical discharge series, low water events on the Rhine (NM7Q, average low-flow discharge on 7 consecutive days) were much more pronounced in the first half of the last century and occurred with lower discharges and longer shortfall durations than in the second half of the last century. This trend is mainly attributable to the influence of storage management in the Alpine region and the trend towards increasing annual precipitation in the 20th century in the Rhine catchment area. The perception that low water occurs more often than in the past is not correct. However, water users, e.g. navigation, energy production, industry and agriculture are more affected.

According to studies, by the middle of the 21st century, up to 20 % higher discharges are to be expected during winters in the Rhine catchment and up to 10 % lower discharges are expected during summers, while regional variations may occur. Thus, effects of climate change modify the discharge pattern of the Rhine and its tributaries. Presumably, periods with floods or low flow will become more frequent and more distinct. A rise in air temperatures leads to higher water temperatures which again – together with low flow – might result in an ecological and chemical modification of water bodies.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

In addition to the Climate Change Adaptation Strategy of 2015 and the newly published survey on Low water, climate change is addressed in the current Flood Risk Management Plan (FRMP, EU Floods Directive - FD), as well as in the River Basin Management Plan (RBMP, EU Water Framework Directive - WFD) of the Rhine river basin. This issue will also play a key role in the new Rhine Programme 2040 to be adopted and published following the planned Conference of Rhine Ministers in February 2020 (RMC 2020).

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

In 2013 and due to several low flow events since the 2000's and their negative impacts, the Rhine Ministers decided to address the issue of low water. In 2016, the ICPR established an Expert Group "Low water" to analyze the trend of low water since the beginning of the 20th century, to examine past low flow events and to investigate their consequences for Rhine uses. In September 2017, this issue was addressed in detail in the international symposium "Low flows in the Rhine catchment" in Basel. In 2017 and 2018, the ICPR worked on an inventory of low water conditions on the Rhine. Existing knowledge concerning low water periods in the Rhine catchment has been compiled and hydrological monitoring data since the beginning of the 20th century have been analysed providing the Rhine bordering countries with a common understanding of the low water issue and its transboundary effects. The ["Inventory of the Low Water Conditions on the Rhine"](#) was published in July 2018 (see key results under question 2). The ICPR is currently setting up a new low water monitoring system based on

historical discharge series and threshold values for classifying the low water situation in five levels (from “normal” to “extremely rare low flow”). More information: <https://www.iksr.org/en/topics/low-water/>

Concerning the general implementation of the Climate Change Adaptation Strategy of the Rhine basin, in 2017 the ICPR internally inventoried new national knowledge on the impact of climate change, scenarios and adaptation since the climate study of 2011 (report 188) and the strategy of 2015 (report 219). A review concerning new developments is planned for 2019. More information: <https://www.iksr.org/en/topics/climate-change-in-the-rhine-catchment/>

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Our main challenge was to develop a common, interdisciplinary and transboundary adaptation strategy and to mainstream/integrate it into the RBMP and FRMP as well as the new mandate and working program 2016-2021. The next challenge will be to strengthen the integration of climate change aspects in the next versions of the RBMP and FRMP, to be drafted in 2020/2021, as well as the new foreseen Rhine Programme 2040.

6. Which lessons learned would you like to share with other basins?

There are and will always be some uncertainties about climate change impacts, but the Rhine countries believe the trends to be robust enough to act and implement an (international) adaptation strategy.

So far, we have learned that a mix of top-down and bottom-up measures (from the transboundary/international level to the national and regional level and vice-versa) is the best option when developing an adaptation strategy. It is also very important not to reinvent the wheel: try to use available, realized or planned measures, e.g. the ones linked to the WFD and FD implementation or originating from former programmes (e.g. ICPR Action Plan on Floods since 1998). Finally, working on common issues like recent low flow events plays a key role to strengthen exchange, cooperation and mutual understanding between riparian states.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

The different states within the ICPR are financing the implementation of CC measures concerning their own territories. The budget of the ICPR is used only for the organization/coordination of the ICPR activities. Furthermore, national and municipal activities related to CC are being implemented and financed directly at a national level but benefit the implementation of the ICPR Climate Change Adaptation Strategy.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

The Climate Change Adaptation Strategy for the Rhine Basin was, amongst others, based on aspects included in the national adaptation strategies of the individual states. On the other hand, the Rhine bordering states can inspire themselves from the ICPR Climate Change Adaptation Strategy. Updates and progress reports are being drafted by the ICPR identifying new national developments or knowledge about CC impacts and mitigation measures/actions. Furthermore, climate change adaptation aspects are being implemented by the countries within their implementation of the RBMP and FRMP of the Rhine basin.

9. Future planned activities

The ICPR is coordinating the implementation of the 2nd RBMP and the 1st FRMP (both running from 2016 to 2021) by the states containing aspects of alleviating climate change impacts. This – as well as the implementation of the CC adaptation strategy - is being translated into the working mandate and programme of the ICPR for 2016-2021. In 2019, the ICPR will review the low flow event of 2018 and set up a low water monitoring system. The ICPR will examine a possible update of the knowledge on climate change and adaptation measures. Furthermore, the ICPR will work on the new Rhine Programme 2040 to be published within the framework of the RMC 2020. It will contain various climate change aspects. Also, until the end of 2020, two new draft plans (3rd RBMP and 2^d FRMP) will be prepared which will have to include further climate change aspects.

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13. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE SAVA BASIN

1. Name and short description of the project and basin

The Sava is a river in Central and South-eastern Europe, a right tributary of the Danube. The four riparian countries of the Sava River Basin (Slovenia, Croatia, Bosnia and Herzegovina and Serbia) ratified the Framework Agreement on the Sava River Basin (FASRB) as a unique international agreement which integrated many aspects of water resources management and established the International Sava River Basin Commission (ISRBC) for its implementation. The Sava River basin covers a total area of 97,713.2 square kilometers and is the second largest Danube tributary catchment by area size. It encompasses 12% of the Danube basin, draining into the Black Sea. The Sava represents the third longest tributary of the Danube and its largest tributary by discharge.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

The climate in all countries has already changed noticeably and increases in temperatures in all countries. For example, in Slovenia in the period 1961–2011, the average annual air temperature increased by 1.7 degrees Celsius. For Croatia, in the period 1961–2010 the average annual air temperature increased by 1.5 degrees Celsius. For the future, a further increase in air temperature is expected within the Sava basin by around +1 °C in the next 30 years.

All countries are expecting changes in precipitation. The precipitation change is complex and expected changes are very variable. In general, an increase during the winter and a decrease for the summer months is expected. Summer precipitation deficit will be more pronounced in 2041–2070 period.

As for many places in Europe it is expected that more frequent and more intense extreme weather events will occur more often in the region. There are longer periods of drought and shorter and locally distributed periods of intense precipitation predicted for the future in all countries which will also increase flood risk. The maximum flow rate in one-in-100 years return period will increase, especially in the upper part of the river basin. These changes will be followed by intensified extremes. Rate of frequency increase of high waters of 100-years return period will be higher than the increase rate for the 20-year return period, indicating an overall increase in flood risk. These claims have already been experienced during the severe basin-wide floods occurred in May 2014, while local floods along the Sava river appear nearly every year, in particular in spring and/or autumn. Extremely dangerous are flash floods, especially in the mountainous areas.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

Initiated through a request by the Danube Ministerial Conference 2010, the International Commission for the Protection of the Danube River (ICPDR) developed a climate adaptation strategy addressing also the sub-basin of the Sava. Based on a scientific study on Climate Change in the Danube Basin, the adaptation strategy was adopted in 2012. Funded by the Environment and Security Initiative (ENVSEC) through the UNECE and implemented by ISRBC in 2011, the pilot project *Building the link between flood risk management planning and climate change assessment in the Sava River Basin* dealt with compilation of various existing climate change scenarios for the region, their expected impacts on water cycle and more specifically on frequency and magnitude of extreme flood events. This study examined the meteorological-climatological aspects and impacts of climate change on flood events, and preliminary identified possible adaptation measures. In 2015 the Water and Climate Adaptation Plan (WATCAP) was developed for the Sava River Basin as result of a study undertaken

by the World Bank. The WATCAP intends to help to bridge the gap between the climate change predictions for the Sava River Basin and the decision makers in current and planned water management investment projects that will be affected by changing climate trends. Climate change has also been addressed in the 1st Sava River Basin Management Plan where it was noted that the Sava countries are at different stages of preparing, developing and implementing national climate change adaptation strategies. In the Draft Flood Risk Management Plan for the Sava River Basin (in adoption) climate change adaptation issues has also been analyzed as well as the effects of proposed measures and their contribution to adaptation to climate change. With respect to climate change all structural measures have been classified into 3 categories – high/medium/low importance for adaptation.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

A few projects and studies were finalized until 2015 (Project Water – Food – Energy – Ecosystems Nexus Assessment in the Sava River Basin, implemented within the Programme of Work for 2013–2015 under the UNECE Water Convention , Project Water and Climate Adaptation Plan for the Sava River Basin (WATCAP), implemented by World Bank, Danube Water Nexus Project – Sava Case Study, implemented by the EC Joint Research Centre and the 1st Sava River basin Management Plan). They included the activities leading towards development of the Climate Adaptation Strategy and basin-wide priority measures for the Sava River Basin. As a first step an *Outline of the Climate Adaptation Strategy and basin-wide priority measures for the Sava River Basin* has been prepared with the financial support of the UNECE. [It is available at the website of the Sava Commission.](#)

In October 2018 a common Flood Forecasting and Warning System for the Sava River basin has been established which enables the five countries involved to take the right management decisions and implement operational measures to prevent and mitigate severe flood situations on the basis of reliable forecasts of water levels and discharges with a long record of data within the entire basin.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

The framework for adaptation in the Sava Countries is quite diverse. Croatia and Slovenia are part of the EU while Bosnia and Herzegovina, Serbia and Montenegro are candidate countries to the EU. This leads to different legal frameworks and different financial possibilities for adaptation. The biggest challenges, in particular in the non-EU Countries, relate to the lack of financial and human resources for implementing adaptation measures.

6. Which lessons learned would you like to share with other basins?

Taking a river basin approach offers the advantages of:

- broadening the knowledge/information base;
- common understanding and consistency of national action programs and agendas;
- enlarging the set of available adaptation approaches;
- lessons learnt and experience sharing between EU and non-EU countries;
- avoiding “unilateral” adaptation to the detriment of other countries and parts of the basin;
- enabling better and more cost-effective solutions;
- strengthening the Sava Commission transboundary coordination role;
- support to participatory approach and sharing of common knowledge and tools;
- methodological support to the definition of priority measures at transboundary level;
- contributing to the implementation of the Danube Adaptation Strategy;
- giving international visibility for the on-going regional adaptation process.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

Due to lack of financial sources all the activities on the basin level have been performed with the external sources and support (i.e. World bank, EU, UNECE). The Sava Commission is searching for funding to develop the full adaptation strategy; however, not funds were mobilized so far.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

The afore-mentioned activities have been performed in cooperation with local experts at the national level. The draft documents have been presented and discussed by the expert groups established at the level of the Sava Commission (e.g. Permanent expert groups for River Basin Management, for Flood Protection and for Hydrological and Meteorological Issues). The final results have been presented at the Sava Commission session and at the meeting of the Parties to the FASRB.

9. Future planned activities

Taking into account the outcomes of the Outline of the Climate Adaptation Strategy and basin-wide priority measures for the Sava river basin the future activities will be focused on the development of the full Climate Adaptation Strategy for the Sava river Basin. The main activities will include:

- assessing available information and identifying gaps;
- consulting with countries and international experts on selection of vulnerability assessment targets and methodologies;
- carrying out critical vulnerability assessments to gather information about climate change exposure and impacts on relevant sectors as well as assessing adaptive capacity;
- organizing workshops to discuss and design potential basin-wide adaptation and capacity-building measures;
- consulting stakeholders to evaluate cost-benefits and prioritize proposed adaptation measures;
- making recommendations on integration of priority measures into existing strategies and plans;
- validating the investment plan associated to the strategy;
- selecting priority measures and initiating a feasibility study for their implementation.

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14. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE SIXAOLA BASIN

1. Name and short description of the project and basin

The Binational Commission of the Sixaola River Basin (CBCRS, Spanish acronym) is a platform of public and private actors of the Municipalities of Talamanca, Changuinola and Bocas del Toro. Its objective is to coordinate and develop actions to achieve integrated management, conservation of natural resources and biodiversity, promotion of a diversified sustainable production, strengthening of the binational institutional framework and sustainable development of the territory, under the Agreement for Border Development Costa Rica - Panama.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

In this basin, flood phenomena have stabilized and we have not experienced this phenomenon as frequently as before. Also, there are no long periods of drought showing a significant shortage of water. Although, during short periods with no rainfalls, a decrease of the water flows in the basin is easily noticed. Nevertheless, it is expected that climate changes could be affecting agricultural production adversely.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

The National Meteorological Institute has developed climate change scenarios and analyzed their impacts. Sometimes impacts due to water scarcity or abundance can be visualized in the region of the canton of Talamanca where the Sixaola basin is located.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

- Development of a strategic plan for Cross-border Territorial development 2017-2021;
- development of a project portfolio with its respective project profiles;
- implementation of a binational project *Strengthening of sustainable production capacities through a comprehensive model to adapt to climate change, based on food and nutritional security and sovereignty in the territory of the middle and lower basin of the Sixaola River*;
- development of the environmental education guide for the Sixaola River basin for the Panamanian sector, focusing on climate change and adaptation measures;
- development of the binational community project *Rural Tourism* to promote actions allowing rural development to improve living conditions of the population. It is funded by the Executive Secretariat of the Central American Agricultural Council through the Central American Strategy for Rural Territorial Development (ECADERT, Spanish acronym).

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Which major challenges did you face with regards to transboundary cooperation and climate change adaptation?	How did you overcome them?
Greater commitment of municipal local authorities	Training and dissemination mechanisms to the local authorities for greater ownership and participation
Mobilizing funds for the portfolio of projects agreed in the strategic plan developed by the Commission	Establishing contacts with partners to find financing and using the State's contribution for implementing the strategic plan
Active participation of the members of the Binational	Greater level of ownership of the actions of the

Commission of the Sixaola river basin (civil society and institutions)	Binational Commission of the Sixaola River Basin
Positioning of the Commission at different levels	Active participation of the Commission at the local, national and international levels
<p>6. Which lessons learned would you like to share with other basins?</p> <ul style="list-style-type: none"> - Experience in the binational project on integrated farms incl. administrative financial management and inter-agency transboundary coordination; - development of the project profiles to obtain a portfolio of projects; - activities of the Binational Commission of the Sixaola River Basin in climate change; - performance of the CBCRS within the framework of an Agreement for Border Development signed between Costa Rica and Panama. 	
<p>7. How do you finance your climate change activities? How do you plan to finance implementation of measures?</p> <p>Climate change activities are funded by strategic partner agencies such as the International Union for Conservation of Nature (IUCN), the Executive Secretariat of the Central American Agricultural Council (SE-CAC) through the Central American Strategy for Rural Territorial Development (ECADERT), the Andalusian Agency for Cooperation for International Development and other agencies that are interested in cross-border cooperation in the region.</p>	
<p>8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?</p> <p>We participate in meetings with the state authorities on climate change of the Government of Costa Rica. Regional directorates of the ministries of environment of both countries are part of the Commission which allows political advocacy in proposals for adaptation measures.</p>	
<p>9. Future planned activities</p> <ul style="list-style-type: none"> - Implementation of the <i>Binational Tourism Project</i>; and - implementation of actions from the Environmental Education Guide together with the educational centers of the Panamanian sector and sharing this experience with Costa Rica. 	
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15. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE SENEGAL BASIN

1. Name and short description of the project and basin

Organization for the Development of the Senegal River Basin (OMVS, French acronym)

The Integrated Water Resources Management Project (IWRMP) is a two-phase multisectoral and regional programme. Its development objective is to strengthen regional integration through the OMVS so that development of multiple water uses is in place for improving the living conditions of the local communities. The first phase was implemented from March 2007 till March 2013. The second phase of the project, ongoing for a period of 7 years, will pursue a specific development goal consisting in enhancing coordinated water resources management for sustainable social, environmental and economic development in the Senegal River Basin. Two hundred and forty million dollars (240,000,000) are provided by the World Bank to the member States of the OMVS for the implementation of the IWRMP II.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

Our basin faces such climate change impacts as droughts and floods as well as deterioration of water quality due to activities such as artisanal gold mining around the Falémé.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

Yes, the OMVS takes climate changes into consideration in its risk reduction strategies.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

Between 2016 and 2018, the OMVS, through the IWRMP II, in particular component 3 “Improving scientific database and knowledge of the basin’s vulnerability to climate variability and change in order to plan resilience” has managed to update strategic documents such as the TDA, the SAP, the vulnerability study as well as the database for basin monitoring. One of the results of the project will be a map of the basin (scale 1/50.000); now we have a second phase of data collection for this map. We are also developing our Climate Investment Plan (CIP) and setting up the Water and Environment Observatory in the Fouta Djallon Highlands.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

Gold mining, quality of water resources and invasive aquatic plants.

6. Which lessons learned would you like to share with other basins?

IWRMP II:

- *Strengthening good environmental governance* at regional, national and local level by enhancing the institutions’ and actors’ involvement in the formulation and implementation of sustainable measures for adaptation by 1) supporting an effective application of laws and regulations in the 4 member states, 2) building capacity and 3) supporting dialogue between stakeholders;
- *Enhancing knowledge about climate change and decision-making tools* by: 1) updating strategic documents and strengthening water and environment monitoring systems, 2) analysis of climate changes and basin vulnerability assessment, and 3) developing a regional plan for adaptation.
- *Projects and pilot actions to improve basin resilience*, two financing phases, total cost of more than USD 7 million
 - phase 1: to consolidate states’ achievements (USD 3.5 million, ongoing): a dozen of projects financed in the 4 member States on restoration and conservation of ecosystems; inclusion of climate change in key development sectors and innovative practices for rational use of water and

improved agricultural production;

- phase 2: implementation of the Regional plan for adaptation.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

Through IWRMP II (see question 6); otherwise, we will implement the CIP with guidance on the financial mechanisms.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

We work in close collaboration with the states.

9. Future planned activities

Continuing the mapping project and the development of the Senegal River Basin Climate Investment Plan (CIP).

10. Contact details

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16. ACTIVITIES ON TRANSBOUNDARY WATER MANAGEMENT AND CLIMATE CHANGE ADAPTATION IN THE VOLTA BASIN

1. Name and short description of the project and basin

Name of the project: Volta River Basin Strategic Action Program Implementation Project (VSIP)

The overall objective of the project is to strengthen the capacity of the Volta Basin Authority (VBA) for the management of transboundary water resources in the Volta River Basin. The specific objective is: institutional development and implementation of the Volta River Basin Strategic Action Program priority actions. The project has 3 main components:

- *Component 1: Development of the Water Charter*

The Water Charter defines the roles and responsibilities of riparian countries in the management of water resources in the Volta River Basin. More specifically, it makes it possible to: (i) facilitate dialogue and cooperation between the six countries in the planning and implementation of water resources projects, (ii) promote sub-regional integration, (iii) define regulations for the use and allocation of water resources among different users, (iv) strengthen real-time exchange of information between the 6 countries for flood protection, and (v) define regulation for environment protection in general and water quality in particular;

- *Component 2: Facilitation of dialogue, project control and development*

The aim is to establish a system that allows, among other things, (i) dissemination of information on ongoing and planned projects in the member States, (ii) acceleration and facilitation of dialogue, transfer and sharing of knowledge and information, (iii) identification of future collaborative projects, (iv) promotion of dialogue among stakeholders on new water issues in the basin;

- *Component 3: Implementation of the Volta River Basin Strategic Action Program (SAP)*

Four priority actions of the SAP will be implemented under this project component: (i) developing

irrigation infrastructure in the Sourou River Basin in Mali, (ii) protecting sources to maintain the low water level flow at the Mouhoun River in Burkina Faso, (iii) protecting and restoring river banks through gallery forests in Benin, Togo, Ivory Coast and Ghana.

2. Which climate change impacts are you already experiencing or expecting, such as floods, droughts, other types of disasters, impacts on water quality etc.?

Climate change impacts in the Volta River Basin include lower river flows, droughts, floods, impoverishment of agricultural land and food insecurity.

3. Is climate change addressed in the disaster risk reduction strategies in your basin and/or country?

Each member country of the Volta Basin Authority has a Climate Intervention Strategy and a Climate Investment Plan. There is also the Sahel region of Africa Climate Investment Plan (CIP), which is a COP21 recommendation resulting from the Paris Agreement. The Sahel region Climate Investment Plan was validated in October 2018 in Niamey by the Council of Ministers of the member countries. The VBA, on the other hand, is preparing its Climate Investment Plan which will be integrated to the national plans and the Sahel region Plan.

4. Concrete results achieved in 2016-2018 with regards to climate change adaptation

One of the results is informing population and raising awareness concerning climate change impacts. Their role and responsibility in the management of natural resources are known; communities are trained and empowered, riverbank and gallery forests management committees are set up. Other actions, such as reforestation, wise land use, development of income-generating activities are underway in the basin.

5. Which major challenges did you face with regards to transboundary cooperation and climate change adaptation? How did you overcome them?

In terms of transboundary cooperation, regulation for the use of natural resources between the 6 member states constitutes the main challenge. Regulation for the protection of the environment in general and water quality especially between member states is also a challenge. One of the solutions is development of the Volta Basin Water Charter and its validation by the member states which will strengthen transboundary cooperation.

With regards to climate change adaptation, the challenge was to formulate bankable climate projects to mobilize the resources needed for adaptation projects. In relation to this challenge the VBA managers received training on bankable projects with the UNECE's support.

6. Which lessons learned would you like to share with other basins?

The lessons learned are:

- inform and raise awareness among rural communities who are the first victims of climate change but have little or no information and knowledge concerning climate change. Inclusive participation including women for the management of natural resources is a success factor;
- common regulation for the protection of the environment between the different states is also a success factor for improving transboundary management of natural resources.

7. How do you finance your climate change activities? How do you plan to finance implementation of measures?

Measures are and will be financed with the participation of all actors, mainly the rural populations whose in-kind contributions have monetary value. More broadly, measures are financed with the partners' technical and financial support through projects.

8. How did you link transboundary climate change adaptation to adaptation activities at other levels, such as the national level (including NDCs, National Adaptation Plans, strategies etc.)?

There is a strong link between the VBA strategy and the member countries strategies. The VBA strategy is a part of the adaptation priorities for the countries at their national level. The VBA aligns with the NDCs, the Climate

Investment Plans, and the national climate change adaptation plans while developing and implementing its strategy.

9. Future planned activities

Future actions planned in the Volta Basin are:

- develop the Volta Basin Master Plan;
- improve knowledge for better management of the Volta Basin water resources;
- protect riverbanks;
- rehabilitate gallery forests; and
- develop income-generating activities and food security.

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