Fact Sheet 1: Climate change adaptation strategies: Amazon region

General description

The Amazon Cooperation Treaty Organization (ACTO) and its Permanent Secretariat (PS) was established in 1998, based on the Amazon Cooperation Treaty (ACT) signed on 3 July 1978 by representatives of Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and the Bolivarian Republic of Venezuela. In November 2009, the Heads of State of the Member Countries issued a Declaration on ACTO to "prepare a new Strategic Agenda for ACTO for the short, medium and long term including regional actions to support the national initiatives with a view to strengthening the cooperation process." [1]

Figure 1. Map of the Amazon Basin (©Soil and Environment)

The New Strategic Agenda includes the vision, mission and strategic objectives of ACTO based on two cross-cutting axes (conservation and sustainable use of renewable natural resources, and sustainable development). It establishes the role and action guidelines of the Permanent Secretariat, ACTO's own project cycle and the institutional structure to manage the Agenda and the various finance modalities considered. In addition to emerging topics such as regional development, climate change and energy, it also presents a thematic approach that integrates the areas covered by the ACT: forests; water resources; management, monitoring and control of endangered wild fauna and flora species; protected areas; sustainable use of biodiversity and promotion of biotrade; indigenous affairs; knowledge management and information sharing; regional health management; infrastructure and transport; commercial navigation; and tourism.[1]

The strategic objectives of the Agenda are to:[1]

- facilitate exchange and cooperation among the Member Countries, promoting strategic sustainable development and sustainable livelihoods in the region to improve the quality of life of its inhabitants, with emphasis on vulnerable populations, indigenous peoples and other tribal communities;
- ensure that the interests and sovereignty of the Member Countries are respected and promoted;
- facilitate and foster actions to preserve, protect, conserve and sustainably use the forest, biodiversity and water resources of the Amazon;
- promote the management of Amazonian resources in a context of respect and harmony with nature and the environment;
- promote and disseminate the cultures of the Amazon, and foster respect and protection of ancestral and current knowledge and wisdom;
- promote coordination of plans and programmes of MCs for the development of Amazonian populations, paying particular attention to vulnerable populations, indigenous peoples and other tribal communities.

The Agenda is 70 pages long.

Formulation process

The Strategic Agenda was developed by the Permanent Secretariat of ACTO based on the mandate by the Ministers of Foreign Affairs of the Treaty's Member Countries and in close cooperation with these countries. The formulation process took around one year. The Agenda has an eight-year planning period. It covers a wide range of themes such as climate change, which is seen as an emerging issue that has to be incorporated in the annual work plans. In drafting the Agenda, shareholders were involved in regional sectoral dialogues.

Policy, legal and institutional framework

The Strategic Agenda is incorporated in the cooperation between the Amazon countries and covers the policy, legal and institutional issues. Implementation of the Agenda is coordinated by ACTO, but has to be carried out by the Member Countries. The Agenda took into account the national strategies which will in turn be influenced by the Agenda when they will be updated.

Information used/required

Information was gathered from the Member Countries. Climate change is considered an emerging issue but is not specifically incorporated. As a result, the Agenda does not build on projections of climate change or vulnerability assessments. Measures defined in the Agenda regarding climate change include carrying out studies.

Adaptation objectives and measures

The mission of the Agenda is: "To be a permanent cooperation, exchange and information forum guided by the principle of reducing regional asymmetries among the Member Countries through its actions, cooperating in national processes for socioeconomic progress and enabling a gradual incorporation of these vast territories into the national economies, promoting regional cooperation actions to improve the quality of life of Amazonian inhabitants, and working under the principle of sustainable development and sustainable livelihoods in harmony with nature and the environment and considering the internal laws of the Member Countries."[1]

The Agenda has an eight-year planning period.

Financing mechanism

Four probable sources of funding are identified:[1]

- fixed annual contributions from the Member Countries or annual grants that can be used to finance specific plan activities in addition to enabling the functioning of the Permanent Secretariat structure;
- extraordinary contributions dedicated to specific strategic activities;
- international cooperation contributions within the framework of Resolution X MRE-OTCA/7 (Meeting of Ministers of Foreign Affairs of the Member Countries of the Amazon Cooperation Treaty Organization of November 30, 2010) of the Organization's project cycle;

- Contributions of national state-owned or private entities for activities to value the Amazonian culture, as approved by the Member Countries and in accordance with the Organization's project cycle guidelines.

The Permanent Secretariat of ACTO, with support from the Member Countries, shall explore and identify opportunities related to triangular cooperation as a funding alternative.

Implementation, Monitoring and Evaluation

The Agenda's execution will be subject to an annual periodical monitoring and review, to ensure its constant improvement and full implementation. To this end, several criteria and indicators were defined:[1]

a. Agenda's effectiveness and impacts: Number of cooperation projects and initiatives (exchange, interaction in frontier areas, support to reduce asymmetries, support to improve quality of life) identified, started and completed.

b. Thematic design and implementation strategy:
    1. Percentage of activities carried out with respect to the activities planned, according to subtopic and topic, and by the coordinating office.
    2. Percentage of resources applied by funding source for the activities carried out.

c. Active participation of the Parties:
    1. Percentage of counterparts and/or focal points indicated with respect to the requests made to implement the Agenda.
    2. Percentage of the Member Countries participation in regional events.
    3. Percentage of observance of the regulatory consultation deadlines.

d. Operating capacity of the Permanent Secretariat of ACTO:
    1. Rate of response by the Member Countries to information requests.
    2. Number of project proposals sent to the Parties for consideration.
    3. Percentage of technical and financial implementation of annual operating plans.

Contact

Amazon Cooperation Treaty Organization, Permanent Secretary, SHIS QI 05 Conjunto 16 Casa 21, Lago Sul, 71615-160 Brasilia – DF, Brazil, CEP: 71615-160. T: +55 61 3248 4119/4132. F: +55 61 3248 4238. www.otca.info

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Fact Sheet 2: Climate change adaptation strategies: ASEAN Action Plan on Joint Response to Climate Change

General description

The Association of Southeast Asian Nations (ASEAN) was formed on 8 August 1967 by Indonesia, Malaysia, the Philippines, Singapore and Thailand. At a later stage, Brunei, Burma (Myanmar), Cambodia (1999), Lao PDR (1995) and Viet Nam (1995) also became members (Figure 1). Its aims include socio-economic development and regional peace and stability.

Figure 1. ASEAN Member States (©Astore International).

***Source**: The ASEAN Economic Community for 2015 presents Opportunities for Entrepreneurs to Grow (*see www.nextupasia.com/the-asean-economic-community-for-2015-presents-opportunities-for-entrepreneurs-to-grow/)

The ASEAN region is vulnerable to climate change due to their long coastlines (173,000km). The area is a combination of relatively small, densely populated urban areas and relatively large rural areas that depend on agriculture, fisheries and forestry. The ASEAN region is endowed with rich natural resources that sustain essential life support systems and ecosystems, both for the region and the world. The rich marine life and abundant mineral resources supports important economic activities such as oil exploration, foreign trade, navigation, commercial and small-scale fisheries and tourism.[1]The ASEAN region is endowed with a variety of unique ecosystems, such as the Mekong River Basin, Ha Long Bay and Lake Toba.[1]

In both rural and urban areas, climate change may have adverse impacts on economies, livelihoods and communities. Vulnerability to climate change has been recognized and highlighted in many ASEAN reports and meetings.[2] In 2009, an ASEAN Climate Change Initiative (ACCI) was designed. In 2010, the government leaders of ASEAN Member States adopted the Statement on Joint Response to Climate Change, which recognizes that the Southeast Asian region is vulnerable to climate change and that climate change will seriously limit future socio-economic development in the region and the achievement of the Millennium Development Goals. Subsequently, the ASEAN Action Plan on Joint Response to Climate Change (AAP-JRCC) was developed in 2012 in order to: (i) to develop opportunities for regional cooperation on adaptation and mitigation (technology, knowledge transfer, finance, and capacity building); (ii) enhance research collaboration on climate change science in ASEAN; and (iii) contribute to the global negotiation process of the United Nations Framework Convention on Climate Change (UNFCCC).

ASEAN is addressing climate change, not only through a policy on climate change, but also through the framework of ASEAN community building. Strategies and actions rooted in the various development and sectoral areas are adopted, for example, mainstreaming climate change adaptation in other policy domains such as freshwater resources management. As a result, there is no climate change adaptation strategy at the ASEAN transboundary scale. However, there are some specific transboundary activities in the field of coping with current climate variability:

- Sub-regional institutional frameworks have been established to address the fire and haze situations in the respective regions considering the different circumstances and weather patterns in the southern ASEAN and Mekong regions.[1]

- Climate change adaptation is mainstreamed in the ASEAN Socio-Cultural Community (ASCC Blueprint), the ASEAN Agreement on Tranboundary Haze Pollution,[1] the ASEAN Peatland Management Strategy,[3] and the associated National Action Plans in Indonesia, Malaysia, Philippines, and Viet Nam.

- ASEAN is also pursuing concrete, on-the-ground activities in the Mekong and southern regions of ASEAN, including bilateral initiatives by Malaysia and Singapore with Indonesia. Regional and national plans of actions and targets have been set to reduce fires through the monitoring of hotspot activities and preventive actions.

- Disaster risk reduction measures are immediate response measures to adapt to climate change. The ASEAN Committee on Disaster Management (ACDM) has included climate change adaptation as part of the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Work Programme 2010-2015.

- In October 2008, the ASEAN Ministers on Agriculture and Forestry (AMAF) agreed on developing an ASEAN strategic approach to address climate change in the agriculture, forestry and fisheries sectors: the ASEAN Multi-sectoral Framework on Climate Change and Food Security (AFCC). AFCC pursues a cross-sectoral programme approach for effective policy making and implementation, and provides an arena for ASEAN to better coordinate the support from its partners.

The Action Plan is 8 pages.

Formulation process

Timeline for formulating a joint response to climate change: 2009-2011

In 2009, the ASEAN Climate Change Initiative (ACCI) was designed. In 2010, the government leaders of ASEAN Member States adopted the Statement on Joint Response to Climate Change. The ASEAN Action Plan on Joint Response to Climate Change (the "Action Plan") was endorsed in principle by the 13th Informal ASEAN Ministerial Meeting on the Environment (IAMME) on 18 October 2011, in Phnom Penh, Cambodia. Thailand was appointed as the lead country for climate change adaptation-related actions.

Stakeholder involvement

The Action Plan was formulated by the Member States with the involvement of ministers and associated civil servants. The Action Plan encourages cooperation and collaboration with other regional and sub-regional institutions and initiatives, for example, the Greater Mekong Sub-region that includes China, the Mekong River Commission (MRC) and the Heart of Borneo Initiative.

Since the strategy could be described as mainstreaming climate adaptation, stakeholder involvement is probably arranged via existing stakeholder networks in the field of peat land management, disaster management, water management, food production and forestry.

Policy, legal and institutional framework

The Ministers of the Environment of each ASEAN Member State, who meet on a regular basis, are primarily responsible for the implementation of the Action Plan in their respective countries. They are also responsible for mainstreaming ASEAN climate policies into environmental policies and for promoting them within socio-economic fields and cultural policies.

Information used/required

Information used generally includes Intergovernmental Panel on Climate Change (IPCC) reports. Strategy and action plans are mentioned in the ASEAN policy documentation, but not specific climate impact or adaptation research projects. However, research needs regarding regional climate models are addressed.

The Regional Climate Outlook Forums (RCOFs) have been operational in many parts of the world with support of the World Meteorological Organization (WMO).They aim to provide collaboratively developed and consensus-based seasonal climate outlooks and related information on a regional scale. There is a similar forum for ASEAN Member States at the Meteorological Service Office in Singapore.[4] RCOF activities support both decision-making on managing climate-related risks and sustainable development. The outlooks generally include probabilistic predictions of seasonal mean rainfall, surface air temperature and other weather parameters, as well as the likely evolution of key drivers of seasonal climate variability relevant to the region such as the El Niño/Southern Oscillation (ENSO).The RCOF often has specific user-focused sessions that provide opportunities for interactions between climate scientists and sector experts. The potential for an RCOF in the Southeast Asian region has been discussed in several platforms, and consequently WMO agreed to support annual RCOF meetings in Southeast Asia. The first meeting took place on 3-5 December 2013 in Singapore.

Adaptation objectives and measures

The specific objectives regarding adaptation are to:[2]

- share information on research and developments in hydrology and agriculture practices regarding food security and water resources management, and on climate adaptation efforts in urban, rural and coastal areas;

- strengthen ASEAN climate, meteorological and oceanographical centres and networks between these centres in order to assess climate change impacts on socio-economic development, health and environment protection, to share (regional) climate data and to strengthen climate, meteorological and oceanographical observatory systems in the ASEAN region;

- assess climate adaptation options and needs for the region and sub-regions such as the Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) and the Greater Mekong Sub-region (GMS), and develop the ASEAN work programme to address loss and damage, and options for risk management and reduction.

The time horizon of the Action Plan is not made explicit. Implementation of the Action Plan began in 2009 and continues until 2015.

Financing mechanisms

Financing mechanisms are not yet in place because they are being mainstreamed within existing policies and because the formulation of climate policies is still in its strategic phase. The following financing mechanisms are planned:

- mainstreaming of climate adaptation in national policies with an available budget;
- funding from the Global Environmental Fund (GEF);

Implementation, and monitoring and evaluation

The formulation of climate policies is still in a strategic phase. The policies are being mainstreamed within national and transboundary policies.

Contact

ASEAN Secretariat, Jl. Sisingamangaraja 70A, Jakarta 12110, Indonesia
Tel: (62-21) 7262991, 7243372. Email: public@asean.org. Wbsite:www.asean.org/

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Fact Sheet 3: Climate change adaptation strategies: COMESA-EAC-SADC region

General description

The Eastern-Southern African (ESA) region is the most vulnerable to climate change in the world due to social, economic and environmental conditions that amplify susceptibility to negative impacts and contribute to low capacity to cope with and adapt to climate hazards. Current global efforts to address climate change are inadequate because they do not fully include land use, which could provide an essential part of Africa's solution to reducing poverty and declines in the productivity of African landscapes.

Figure 1. Map of Southern African Development Community

Agriculture plays a key role in the economy, industrial development and trade within the ESA region. The region faces declining agricultural yields, drought, ecosystem degradation (including deforestation) and conflicts. These drivers of poverty undermine local communities' ability to adapt to climate change, which is exacerbated by the fact that over 95 percent of agriculture in the region is rainfed.

Common Market for Eastern and Southern Africa (COMESA), East Africa Community (EAC) and Southern African Development Community (SADC) Member States individually have developed climate response strategies such as the National Adaptation Programmes of Action (NAPAs) and the Comprehensive Africa Agriculture Development Programme (CAADP) investment frameworks. In 2009, it was concluded that within the ESA region, adaptation to climate change is needed in order to achieve sustainable food, water and energy security.[1] Subsequently, COMESA, EAC and SADC developed the Programme on Climate Change Adaptation and Mitigation in the Eastern and Southern Africa (PCCAM-ESA),[2] which was published in 2011. The programme aims to increase investments in climate-resilient and carbon-efficient agriculture and its linkages to forestry, land use and energy practices by 2016. One of the key objectives is to complement and support other projects and programmes in the region aimed at scaling up conservation agriculture[3,4]. This would bring significant livelihood and food security benefits to at least 1.2 million small-scale farmers through the application of well-tested, climate-smart agriculture that combines crop production with agroforestry and livestock management. In addition, biomass production from agriculture and forestry plays a role in sequestering carbon.

The document is 118 pages.

Formulation process

The PCCAM-ESA Programme will build on the progress made since 2008 by the COMESA Climate Change Initiative supported by the Norwegian Government. The Programme is a five-year initiative that started in 2010 aiming to integrate Africa's Unified Position on Climate Change into the post-2012 United Nations Framework Convention on Climate Change (UNFCCC) global agreement to unlock resources for promoting strategic interventions that sustain productivity and livelihood improvements for millions of climate-vulnerable people in the region.

The Programme's content (2011) was revised by the Secretariats from COMESA, EAC and SADC with input from policy makers from 26 Member States, as well as national knowledge institutes and farmers associations. Particular attention was paid to youth and women through the gender policies of the three regions.

The main beneficiaries of the Programme will be the farmers and farmer organizations whose capacities will be strengthened to practise climate-resilient conservation agriculture by gradually developing improved and more stable crop yields. In turn, the populations of the Member States will benefit from enhanced food security and livelihoods, which will reduce budgetary demands for relief support. The business communities in the region will draw benefits from the flow of resources that will be catalysed by the Programme, which will result in expanded retail, infrastructure and marketing capabilities.

At the continental level, this Programme's key stakeholders are being targeted through the African Union's (AU) New Economic Partnership for Africa's Development (NEPAD)[5] priority areas, particularly agriculture and food security, environment and climate change, culture, tourism and the Comprehensive Africa Agriculture Development Programme (CAADP).

Policy, legal and institutional framework

Responsibility for the Programme will be vested through the Council of Ministers in the Tripartite COMESA-EAC-SADC reporting structure. Programme management will be the responsibility of the Climate Change Unit of COMESA supported by Programme Coordination Units in EAC and SADC.

In Africa, the Regional Economic Communities (RECs) group together individual countries in subregions to achieve greater economic integration. They are described as the 'building blocks' of the African Union (AU) and are also central to the strategy for implementing the New Partnership for Africa's Development (NEPAD).

The Programme partners are:

- the World Agroforestry Centre (ICRAF),which generates scientific evidence in support of the African Climate Solution;[6]
- the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), which is sub-contracted to bring on board the leading African institutions and stakeholders;
- The Food and Agriculture Organization of the United Nations (FAO),which builds the capacity of the conservation agriculture taskforces and to set up conservation agriculture demonstrations;
- the Centre for International Forestry Research (CIFOR), a non-profit, scientific facility that conducts research on the most pressing challenges of forest and landscapes management around the world;

- the African Conservation Tillage Network (ACT), a pan-African organization that spearheads the promotion and adoption of conservation agriculture in the continent;
- the University of Zambia (UNZA) and the Natural Resources Development College (NRDC) in Lusaka, that both provide scientific support to the Programme.

Monitoring and Evaluation (M&E) will be a central aspect of this Programme. The COMESA Climate Change Unit will have a dedicated M&E section supported by the resources of COMESA's M&E Department. There will be quarterly planning and reporting on the progress of the Programme, supplemented by annual reports summarizing main activities and results.

Conservation agriculture projects are only funded when a detailed annual work plans and budgets are submitted and approved by the Tripartite and the Governments, respectively.

Information used/required

This Programme is mainly action-based increasing local capacities to cope with climate change and current climate variability in land use. As a result, uncertainties are not addressed via the 'scenarios–impacts–adaptation' chain, but climate resilience is increased and vulnerability of land use to climate change is reduced.

ICRAF,[7] CIFOR,[8] UNZA and the Natural Resources Development College (NRDC)[9] in Lusaka are research partners to the Programme that will help to implement research programmes to develop the scientific knowledge base and to explore additional aspects of climate change science.

Adaptation objectives and measures

In the international arena, the Programme aims to include agriculture and forestry in the climate change regime of United Nations Framework Convention on Climate Change (UNFCCC) and expand the application of mitigation measures in the land use and clean renewable energy sectors. It also aims to derive a larger share of the resources available from climate change initiatives for Africa. It also aims support Member States in accessing adaptation funds and other climate change financing sources and mechanisms through national investment frameworks for climate adaptation in agriculture, forestry and other land uses.

In the COMESA-EAC-SADC region, the Programme aims to mainstream climate change; for example, the Programme concurrently addresses the Millennium Development Goal of eliminating poverty and a key CAADP goal of attaining food security. Notwithstanding the opportunities of climate adaptation and mitigation, HIV/AIDS, malaria, deforestation, land degradation and environmental pollution do constitute constraints on productivity. These constraints are compounded by imbalances in gender roles. To strengthen the adoption of climate-smart conservation agriculture, other projects and programmes aimed at scaling up conservation agriculture are complemented and supported in the region, e.g. the Conservation Agriculture Programme II (CAPII), which brings significant livelihood and food security benefits to at least 1.2 million small-scale farmers.

In addition, the Programme plans to conduct climate vulnerability assessments and analyses in order to address the impacts of climate change and build economic and social resilience for present and future generations. It is also planned to apply mitigation solutions in the region with carbon trading benefits and to establish a regional catalytic facility to support investments in national climate-smart agriculture programmes.

A specific time horizon such as in scenarios for 2050 or 2100 is not mentioned. The Programme aims to increase investments in climate-resilient and carbon-efficient agriculture and its linkages to forestry, land use and energy practices by 2016.

Financing mechanism

The initial estimated budget (2011) was US$100 million.[1,2,10] The main mechanism was fundraising via development aid programmes from Western countries and global development funds that are connected to UNFCCC (Reducing Emissions from Deforestation and Forest Degradation, or REDD), United Nations Convention to Combat Desertification (UNCCD)and Conservation Agriculture Programme(CAP).The Member States were supported in fund raising at the national level and during climate change negotiations. The initiators requested contributions from Norway, the European Union, the United Kingdom Department for International Development (DFID),[11] the Rockefeller Foundation,[12] the United States Agency for International Development[13] and others. In June 2011, Norway signed a contract with the Zambian Conservation Farming Unit[14] to support a regional programme, which originally was fully integrated in this Programme, but for practical reasons, was managed under a separate contract. Norway has also indicated willingness to provide substantial support to the overall Programme.

Implementation, and monitoring and evaluation

The Programme will end in 2014. Achievements[3] to date are as follows:

- The Programme supported ICRAF in generating and compiling scientific and other technical information in support of the African Position at the UNFCCC negotiations.
- The Programme developed and financed African negotiators' draft positions on agriculture.
- The Programme convened consultative round tables in several Member States and regional meetings on the upscaling of climate-smart and conservation agriculture.
- The programme has helped a number of Member States complete their National Adaptation Plans (NAPAs).
- Within the Programme, a regional gender study, "Integrating female farmers in agribusiness into regional and global value chains" was conducted in Kenya, Uganda and Mauritius. A Framework of the Regional Strategy on Mainstreaming Gender in Agriculture and Climate Change was drafted, and a regional Strategy and Strategic Action Plan for Mainstreaming Gender into Agriculture and Climate Change was launched. In Zambia and Kenya, women groups were directly funded to practise climate-smart agriculture through the provision of greenhouse facilities.
- In 2012, the COMESA Secretariat commenced a study on municipal waste management in three model cities in Kenya, Zambia and Zimbabwe.
- Ahead of the sixteenth and seventeen Conference of Parties (COP 16 and COP 17), COMESA co-funded Regional Youth Conferences in climate change that took place in Lilongwe, Malawi in 2010, and in Lusaka, Zambia in 2011.
- The COMESA carbon fund was registered in September 2010 in Mauritius. In 2012, this started a process of supporting a Rwanda correctional services bio-gas project with a view to registering as a Clean Development Mechanism (CDM) project.

Country (Member States)	SADC	EAC	COMESA
Angola	X		
Botswana	X		
Democratic Republic of the Congo	X		
Lesotho	X		X

Country (Member States)	SADC	EAC	COMESA
Madagascar	X		
Malawi	X		X
Mauritius	X		X
Mozambique	X		X
Namibia	X		
Seychelles	X		X
South Africa	X		
Swaziland	X		X
United Republic of Tanzania	X	X	
Zambia	X		X
Zimbabwe	X		X
Uganda		X	X
Kenya		X	X
Rwanda		X	X
Burundi		X	X
Comoros			X
Djibouti			X
Egypt			X
Eritrea			X
Ethiopia			X
Liberia			X
Sudan			X

***Figure 1**. Member States of COMESA, EAC and SADC.*

Contact

Project Coordinator, Tripartite Programme on Climate Change Adaptation and Mitigation
SADC, Sebele Satellite Office. P/Bag 0095. Gaborone, Botswana

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Fact Sheet 4: Climate change adaptation strategies: Danube River Basin

General description

Figure 1. The Danube Basin (© ICPDR)

With more than 800,000 km², or 10 percent of Continental Europe, the Danube River Basin extends into the territories of 19 countries. It is considered the most international river basin in the world. The 14 countries that have more than 2,000 km² of the basin are, together with the European Union (EU), contracting parties of the International Commission for the Protection of the Danube River (ICPDR). At the Danube Ministerial Conference 2010, ministers and high-level representatives responsible for water management in the Danube countries and from the EU endorsed the Danube Declaration,[1]which expresses the commitment to further reinforce transboundary cooperation on sustainable water resources management within the Danube River Basin, including adaptation to climate change. As an essential step in this ongoing process, the "Danube Study – Climate Change Adaptation" (the Danube Study),and possible adaptation to it in the Danube River Basin began in December 2010 and was finished by the end of January 2012.[2,3] On the basis of this study, ICPDR developed the ICPDR Strategy on Adaptation to Climate Change for the Danube River Basin (the Strategy).[4]

The impacts of climate change will increase and develop into a significant threat in the Danube River Basin if the reduction of greenhouse gas emissions is not complemented by climate adaptation measures.[2]The strategy aims, therefore, to enable the Danube riparian countries to take the required adaptation steps. This strategy is based on a step-by-step approach that includes an overview of relevant research and data collection, and a vulnerability assessment. This would ensure that measures and projects were climate-proof, that there were 'no regret measures', and that climate adaptation issues were fully integrated in the 2nd Danube River Basin Management Plan and the 1st Danube Flood Risk Management Plan in 2015.[4]

The document is 44 pages.

Formulation process

The adaptation strategy was fully developed within the policy context of the ICPDR. The development was based on the Danube Declaration[1] and its adoption by the Danube Ministerial Conference 2010. The Danube Study was performed within the framework of the ICPDR to collect the available information on climate change and adaption in the region, and was, among others, based on existing National Adaptation Strategies (see Figure1). Based on the study, the ICPDR developed the adaptation strategy.[4]

Three variables are used in the study to determine a certainty category for climate parameters and impacts: certainty of statements; level of agreement between different statements; and number of analysed studies. Science can, however, further reduce the uncertainty of the results of a scenario simulation by improving the skills of global and regional climate modelling as well as of the diverse climate impact models over the next decades. Furthermore, the implementation of the strategy is incorporated into the River Basin Management Plans (RBMPs) and Flood Risk Management Plans (FRMPs). In this way, a six-year cycle is ensured that enables regular updates of the scenarios and vulnerability assessments, thus reducing the uncertainty.

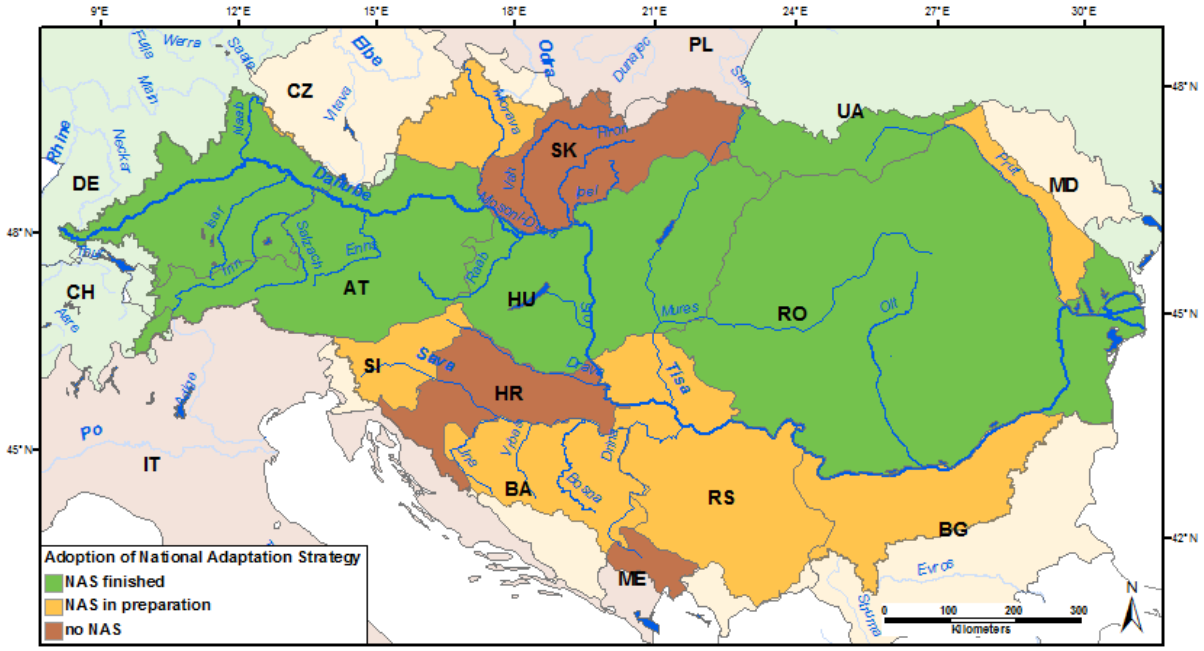

Figure 2. Adoption of National Adaptation Strategies (NASs). (Source: ICPDR Strategy on Adaptation to Climate Change. International Commission for the Protection of the Danube River [2013])

The Strategy will be reviewed and, if necessary, revised in accordance with the six-year planning cycles of the Water Framework Directive (WFD) and the European Floods Directive (EFD).

The ICPDR developed the Strategy. Germany was nominated as lead country for this task. In this role, the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety supported a study (the Danube Study) with the aim of providing the knowledge base for a common, Danube-wide understanding of future impacts of climate change on water resources and suitable adaptation measures as a basis for the development of the Danube Climate Adaptation Strategy. The study was conducted by the Ludwig-Maximilians Universität Munich in Germany.[2]

A close collaboration with experts in the Danube River Basin (DRB) was achieved within the Danube Study. Several meetings, workshops and conferences were organized to present and discuss the outcomes of the study. Additionally, a special study workshop with experts of the DRB was organized in Munich, on 29-30 March 2012, to discuss the first results and determine further project step in a roundtable discussion at the halfway of the project.[3] The Strategy was developed by the ICPDR Secretariat in close consultation with the experts from the contracting parties.

The strategy took around three years to be formulated.

Policy, legal and institutional framework

The Strategy was fully developed within the policy context of the ICPDR. The development of the strategy was based on the Danube Declaration[1] and its adoption by the Danube Ministerial Conference 2010. A study[3] was performed within the framework of the ICPDR to collect the available information on climate change and adaption in the region and was, among others, based on existing National Adaptation Strategies (Figure 1). Based on the study, ICPDR through its structure developed the adaptation strategy.[4]

The Strategy links to the national adaptation strategies through the RBMPs and FRMPs. The plans are developed on the national scale taking into account the national adaptation strategies and then coordinated on the international scale.

Information used/required

A study was performed to provide the foundation for a common, Danube-wide understanding of the future impacts of climate change on water resources and suitable adaptation measures as a basis for the development of the Danube Climate Adaptation Strategy, including the main relevant impacts and fields of action. Impacts on water availability, extreme hydrological events, water quality, water use/land use and ecology were included. Most of the future projections analysed within the Danube Study are based on the Intergovernmental Panel on Climate Change – Special Report on Emissions Scenarios (IPCC SRES) scenarios A1B and A2. As meteorological drivers, different global (GCM) and regional circulation models (RCM) are used. Thereby, the spatial resolution varies between 0.3 and 2° (50–150 km) (GCMs), and between 20 km and 50km (RCMs). Finally, different dynamical and statistical downscaling methods are applied to model the future development of air temperature and precipitation with a spatial resolution between 1 and 10 km.[3]

There is currently no consistent and homogenous qualitative (descriptive) or quantitative (based on indicators) vulnerability assessment for the Danube River Basin as a whole. The most comprehensive studies covering larger parts of the Danube River Basin are the European Observation Network for Territorial Development and Cohesion (ESPON) Climate and Climate Adaptation – Modelling Water Scenarios and Sectoral Impacts (ClimWatAdapt) projects.[4]

Adaptation objectives and measures

The strategy was developed within the framework of the ICPDR, in which, existing national adaptation strategies developed within the UNFCCC framework were used. The strategy will be implemented within the frameworks of the EU Water Framework Directive (WFD) and EU Floods Directive through the Danube River Basin Management Plans (DRBMP) and Danube Flood Risk Management Plans (DFRMP). The main objective of the strategy is to provide guidelines to fully integrate climate adaptation into the 2nd DRBM Plan and the 1st DFRM Plan, which are also the tools for the implementation of climate adaptation measures. The Strategy therefore does not include a jointly agreed Programme of Measures on adaptation, but rather outlines, together with the study, a set of possible adaptation measures.[4]

In developing the strategy, scenarios were used for 30-year periods up to 2100. In 2018, consideration will be given to whether the strategy needs to be updated.

Financing mechanism

The implementation is financed by the individual countries through their management plans. ICPDR is responsible for cross-border coordination, financed through the ICPDR budget. In specific situations, financing may be sought from the EU or other international funds.

Implementation and Monitoring and Evaluation

Climate adaptation issues were already identified under the first DRBMP in 2009, for which the EU Common Implementation Strategy (CIS) Guidance no. 24 was used.[5] As a result of this process, the following recommendations should be considered:

- In line with the step-wise and cyclic approach for the implementation of the WFD and EFD, verify whether the Strategy[4] should be updated and revised. This verification should occur within an appropriate timeframe in order to take into account updated information regarding the knowledge base on climate change and adaptation, in particular on climate change scenarios and water-related impacts in the Danube River Basin.

- Take into account the updated and revised strategy for the planning process of the 3rd DRBM Plan and the 2nd DFRM Plan, which is due by 2021. Based on these considerations, it is proposed to check the need for an update of the ICPDR Strategy on Adaptation to Climate Change in 2018, linking it with the six-year planning cycles according to the WFD and EFD.

Contact

ICPDR Secretariat, Vienna International Centre, Room D0412, WagramerStrasse 5, A-1220 Vienna, Austria. E-Mail: icpdr@unvienna.org. Tel: +431 260 60 5738. Fax: +431 260 60 5895

Endnotes

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Fact Sheet 5: Climate change adaptation strategies: European Union Adaptation Strategy

General description

The temperature of the European land area over the last decade (2002-2011) has been on average 1.3°C above the pre-industrial level, indicating that the increase in Europe has been faster than the global average. Some extreme weather events have increased, with more frequent heat waves, forest fires and droughts in southern and central Europe. Heavier precipitation and flooding are projected in northern and north-eastern Europe, with an increased risk of coastal flooding and erosion. A rise in such events is likely to increase the magnitude of disasters, leading to significant economic losses, public health problems and deaths.[1]

Figure 1. Political Map of Europe showing the European countries (© nationsonline.org)

Although there is no real comprehensive overview of adaptation costs in the European Union (EU), additional flood protection measures are estimated at EUR1.7 billion a year by the 2020s and EUR3.4 billion a year by the 2050s. These measures can be highly effective because for each euro spent on flood protection, the Member States may save EUR6 in damage costs.

In 2013, 15 EU Member States adopted the EU Adaptation Strategy. However, adaptation is in most cases still at an early stage, with relatively few concrete measures on the ground. The European Commission (EC) considered it useful to deepen the experience and to have a systematic exchange of best practices on how to adapt to climate change. This was the reason for which an adaptation strategy was launched, covering the whole of the EU and respecting the principles of subsidiarity and proportionality, and the rights enshrined by the Charter of Fundamental Rights of the European Union.[2] The EU Adaptation Strategy highlights the importance of transboundary issues and EU's experience in addressing them.[3]

The overall aim of the EU Adaptation Strategy is to contribute to a more climate-resilient Europe by enhancing the preparedness and capacity to respond to the impacts of climate change at the local, regional, national and EU levels, developing a coherent approach and improving coordination.[2]

The overall strategy description is 11 pages, which is accompanied by a series of documents.[4]

Formulation process

In April 2009, the EC presented a White Paper on adapting to climate change, which presents the framework for adaptation measures and policies to reduce the EU's vulnerability to the impacts of climate change. Since the adoption of the White Paper, the Commission has consulted widely, including with the Adaptation Steering Group consisting of representatives from EU Member States and a wide range of stakeholders, including business organizations and non-governmental organizations (NGOs). It also conducted an online public consultations and thematic seminars to consult Member States and key stakeholder groups on specific dimensions of the adaptation strategy (e.g. knowledge, insurance and standards). On the basis of the various inputs, the Adaptation Strategy was developed.

Although uncertainty regarding greenhouse gas emissions trajectories, future impacts of climate change and related adaptation needs is a challenge for policy making, it should not be excuse for inaction.[2]

The EC will report to the Member States and the European Parliament on the strategy in 2017 and will propose updating the strategy if desirable.[2]

Policy, legal and institutional framework

The strategy provides a policy framework to be implemented at the EU, national and sub-national levels, building on EU and consequent national legislation. The countries are responsible for the implementation of the strategy and link it to their national strategies. The existing institutional setting is used to coordinate the implementation.

Information used/required

An impact assessment was performed on the basis of wide-ranging consultation and benefits from a broad spectrum of scientific and policy expertise.[1,5,6] The indicators are based on data from in situ and satellite monitoring programmes, national and EU research programmes and a few global databases. The Special Report on Emissions Scenarios (SRES) commissioned by the Intergovernmental Panel on Climate Change (IPCC) scenarios were used for the emission projections while different existing scenarios were used for socio-economic developments.[1] The vulnerability assessment is based on the framework as developed by Fussel and Klein.[7]

Adaptation objectives and measures

The overall aim of the EU Adaptation Strategy is to contribute to a more climate-resilient Europe by enhancing preparedness and capacity to respond to the impacts of climate change at local, regional, national and EU levels and by developing a coherent approach and improving coordination.

Projections are made for 2011-2040 and 2071-2100 time horizons.[5]

Financing mechanism

The Member States provided most of the financial support, which was used for capacity building and to step up adaptation action. Also, financial support will be made available through existing programmes on agriculture, social cohesion and fisheries. The EU institutions have agreed that at least 20 percent of the EUR960 billion budget for 2014-2020 should be spent on climate mitigation and adaptation, around three times the previous level.[8] Moreover, several EU funds and international financing institutions such as the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) also support adaptation measures.[2]

Implementation, and monitoring and evaluation

The Commission will facilitate policy coordination and will cooperate with Member States through the Climate Change Committee. Member States should also appoint national contact points by the end of 2013, to coordinate communication between their countries and the Commission, and contribute to awareness-raising and reporting activities.

Information will be provided by: Member States under the Monitoring Mechanism Regulation on national adaptation planning and strategies; the annual implementation reports for programmes funded by the European Structural and Investment Funds 2014-2020; and the Fifth Assessment Report of IPCC to be issued in 2014.[2]

Contact

European Commission
DG Climate Action
B-1049 Brussels

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Fact Sheet 6: Climate change adaptation strategies –Neman River Basin

General description

The Neman River Basin is located on the territory of Belarus, Lithuania, Russian Federation (Kaliningrad Oblast), Poland and Latvia. The total river length is 914 km and the basin area is 98,200 km^2. Since there are only a few upper courses of some minor tributary streams in Poland and Latvia, these countries are not involved in the Strategy. In the average water year, Belarus accounts for 43.5 per cent of the total Neman river runoff, Lithuania, 50.0 per cent, and Russian Federation, 6.2 per cent.

Figure 1. Neman River Basin (© Zoi Environmental Network, Geneva, Switzerland)

The Neman River Basin is characterized by a large number of industrial and agricultural enterprises, as well as oil and product pipelines, which are potential sources of water resources pollution. According to the Intergovernmental Panel on Climate Change (IPCC) estimates and hydrometeorological observation data, climate change will drastically affect the water environment, which may result in negative consequences for human society and ecosystems. Therefore, measures are required to improve water resources management in the context of adaptation to the climate change using a common 'Strategy of Adaptation to Climate Change' for all Neman River Basin countries.[1]

The draft strategy is 73 pages and includes an assessment of the basin.

Formulation process

The Neman River Basin Strategy of Adaptation to Climate Change was developed during the implementation of the International Project "Management of the Neman River Basin with Account of Adaptation to Climate Change". The main goal of this project is the improvement of integrated water resources management using the basin approach in the climate change context. The project, which began in 2011 and is planned to end in 2014, entailed a vulnerability assessment (VA) of the Neman River Basin, an assessment of the uncertainties related to the VA, an assessment of the relevant legislation and policy tools, and an assessment of potential adaptation measures.[1]

Within the project, two workshops were held with representatives of regional authorities, water-related sectors, and enterprises from Belarus and Lithuania. National and international experts participated in discussions on the results of the project and the anticipated further steps. The draft strategy was submitted to the Ministries of the respective countries for endorsement.

Policy, legal and institutional framework

Regulatory acts and other ecological policy tools relating to water resources management and climate change adaptation have been used by the Neman River Basin States (Belarus, Lithuania and Russian Federation) and the European Union (EU) in order to develop the Strategy of Adaptation to Climate Change. The draft strategy was built on existing strategies, policy plans and tools and institutional structures.[1]

Information used/required

A range of hydrological and meteorological information was collected and processed. Forecasting used the well-known atmospheric general circulation model, theECHAM5 global climate model, for two scenarios: the A1B (relatively high-emission scenario) and the B1 (low-emission scenario). For each sector, an assessment was carried out on the severity of the consequences of the climate change scenarios and on the probability of their occurrence. Vulnerability was assessed as a function of the impact probability, the impact consequences, and the adaptation potential of the sector or resource. Forecasts were made for the 2021-2050 period.[1]

Adaptation objectives and measures

The main goal of the document is to mitigate the adverse effects of climate change on water resources and related natural resources, industries and vital human activities including fisheries, agriculture, health, transport, etc.

An overview of potential measures is developed, including the responsible institution, the expected implementation period, and a cost estimation for each measure. Measures are both structural and non-structural. The time horizon for the Strategy is 2050.

Financing mechanism

For each measure as inventoried, in indication is given of the possible financing source. These include, among others, the regular institutional budget, special national programmes, and potential international funds.

Implementation, monitoring and evaluation

The Strategy includes an assessment of current policies and plans, and indicates how the adaptation measures can be included in them. In addition, the Strategy proposes setting up an International Commission for the Neman River Basin as an important additional practical mechanism for implementing the strategies.

Contact

Sonja Koeppel, United Nations Economic Commission for Europe (UNECE), Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Tel: +41 (0)22 917 1218, Fax: +41 (0)22 917 0107. E-mail: sonja.koeppel@unece.org. www.unece.org/env/water/

Endnote

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Fact Sheet 7: Climate change adaptation strategies – Nile Basin Initiative

General description

The River Nile, 6,695 km in total length, is by most accounts the longest river in the world. Its basin covers an area of approximately 3 millionkm^2, which represents 10 percent of the African continent. The basin is shared by 11 African countries, ten of which are members of the Nile Basin Initiative (NBI): Burundi, the Democratic Republic of the Congo (DRC), Egypt, Ethiopia, Kenya, Rwanda, South Sudan, Sudan, United Republic of Tanzania and Uganda; Eritrea has observer status.[1,2]

Figure 1. River Nile (©Nile Basin Initiative)

A lack of long-term hydro-meteorological data in the Nile Basin, combined with the region's strong degree of natural variability in precipitation and sensitivity to climate effects make the precise projection of climate change impacts difficult.

Despite these uncertainties and challenges, the following climate trends in the Nile Basin seem likely:

- higher evaporation and consequent increased losses from reservoirs;
- higher evapotranspiration rates and rising crop water requirements leading to an increase in demand for irrigation water;
- hotter and longer dry periods, which will increase drought events, especially in traditionally dry regions;
- higher frequency and intensity of severe rainstorms that will lead to increased flood risk and serious storm damage;
- higher water temperatures in the Equatorial Lakes, which strengthen thermal stratification, increase algal productivity, accelerate microbial mineralization, and reduce oxygen dissolution, etc.;
- expansion of the range of vector-borne diseases such as malaria to higher altitudes due to warmer temperatures;
- sea-level rise that could threaten the very productive Nile Delta and the cities along the Indian Ocean coast.

The NBI Climate Change Strategy has five strategic objectives:[1]

1. Strengthen the knowledge base to enhance common understanding of climate change risks and its impacts on water resources, ecosystems and the socio-economic system of the Nile Basin.
2. Strengthen long-term capacities for addressing climate risks and uncertainty in the Nile Basin at national and transboundary levels.

3. Support climate-resilient planning and implementation, addressing climate risks and uncertainty in NBI programmes.
4. Promote scalable low carbon development through enhanced transboundary cooperation in areas such as protection of wetlands as well as clean energy use and development.
5. Strengthen basin-wide climate finance access and the capacity for development of feasible projects in the Nile Basin.

The document of the NBI Climate Change Strategy is 28 pages.

Formulation process

The Nile Basin Initiative (NBI) is an intergovernmental partnership of riparian states of the Nile River. The NBI seeks to develop the River Nile in a cooperative manner, jointly managing its transboundary water resources and sharing the socio-economic benefits that arise from their development. The NBI is led by the Nile Council of Ministers (Nile-COM) assisted by a Technical Advisory Committee (Nile-TAC) and a Secretariat (Nile-SEC) based in Entebbe, Uganda. The NBI is committed to a shared vision of achieving sustainable socio-economic development through the equitable use of and benefit from the common Nile Basin water resources.

The process of developing the Climate Change Strategy has included comprehensive consultations and workshops at the regional and national level since 2009, involving the members of the Nile-TAC and national thematic experts, as well as a task team of technical experts from the Nile-SEC, the Nile Equatorial Lakes Subsidiary Action Program (NELSAP) and the Eastern Nile Subsidiary Action Program (ENSAP), among others. It has been informed by sub-basin-level studies commissioned by the NBI on climate change impacts on water resources and the socio-economic development of the region, vulnerabilities to climate change, appropriate coping measures and feasible development options. International experts supported the process, bringing in state-of-the-art analysis and knowledge on the topic. The finalization of the Strategy has been complemented by a screening of relevant legal and policy documents of riparian countries in order to ensure complementarity and consistency of provisions. Furthermore, key international conventions and agreements signed by riparian countries as well as international best practice were taken into consideration to assure compatibility.[1]

The NBI Secretariat will manage the processes for preparing the roadmap, implementation, M&E, risk assessment, revision, updating, dissemination and proper use of the strategy.

The development of the Strategy started in 2009 and was finalized in 2013.

Policy, legal and institutional framework

The Climate Change Strategy forms an integral part of NBI policies, strategies and guidelines, and complements national efforts of NBI member countries. It focuses on transboundary water resources management as a strategic element of climate adaptation and low carbon development in the region. It integrates key strategic plans and activities of the NBI sub-programmes and provides a broader framework for action. National responses to climate change are essential but need to be complemented by transboundary mechanisms, since the impacts on the water resources (droughts and floods) and the populations' response in the basin such as migration are transboundary in nature.[1]

The NBI provides the platform for joint action and a transboundary perspective to build on and complement national, regional and international activities that aim to strengthen climate resilience and achieve low carbon development in the basin.[1]

Information used/required

The comprehensive regional assessment carried out by Eastern Nile Regional Technical Office(ENTRO), the Multi-Sector Investments Opportunities Assessment (MSIOA) carried out by the NELSAP Coordination Unit (NELSAP-CU), specific basin monographs prepared by NELSAP-CU and the basin-wide climate change assessment carried out by the WRPM Project have been of particular relevance.[1]

Adaptation objectives and measures

The overall goal of the strategy is to build the resilience of ecosystems and economies that are most vulnerable to climate change-induced water stress in the Nile Basin countries by developing key adaptive capacity and piloting adaptation in 'hotspots' with technical, policy and financial interventions.[3]

The strategy emphasizes measures that minimize the harm caused by climate impacts while maximizing the many human development opportunities presented by a low carbon, more resilient future.[1]

Although the strategy has no specific end date, it does build on a five-year horizon.

Financing mechanism

There is a clear need for additional financing to build capacity, mainstream climate change considerations into development planning, and climate-proof existing and future investments in the basin. To access international and national climate funds, and increase additional private contributions, capacities to tap these opportunities need to be enhanced and investment conditions in target countries need to be improved. Bilateral and multilateral climate funds for developing countries, such as the Clean Technology Fund under the umbrella of the Climate Investment Funds (CIFs) are other possible sources for funding. The funding streams will be augmented by new climate investment funding, such as carbon finance funding, through the Clean Development Mechanism (CDM) and other crediting mechanisms, other emerging specialized instruments and additional financing from the private sector. In addition, NBI programmes, as feasible, shall leverage national resources such as climate funds to address climate change.[1]

Implementation, and monitoring and evaluation

An implementation plan including a roadmap on how to put the strategy into practice will be developed. The implementation plan will be based on a five-year horizon and will include further details on how the strategy will be put into action. The design and implementation of cooperative climate change responses will be based on the best available and synthesized information on climate risks, impacts and vulnerability in the Nile Basin. The NBI will implement a mechanism for both coordinating and strengthening adaptive management and climate response measures in the Nile. NBI implements a coordination mechanism to improve basin-wide adaptive management. A monitoring and evaluation (M&E) mechanism or system for following-up on the operationalization of the strategy will be put in place. For this purpose, indicators at the level of outcomes, outputs and activities will need to be identified and formulated, including a timeline for their achievement.[1]

Contact

The Nile Basin Initiative Secretariat,

Plot 12 Mpigi Road, P.O. Box 192, Entebbe, Uganda
Tel: +256 414 321424/321329; +256 417 705000. Fax: +256 414 320971
Email: nbisec@nilebasin.org
http://www.nilebasin.org/

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Fact Sheet 8: Climate change adaptation strategies: Rhine River Basin

General description

The Rhine River basin, situated in Northwest Europe, covers parts of Switzerland, Austria, Liechtenstein, France, Luxembourg, Germany, and the Netherlands. The main tributaries of the Rhine are the Aare, Neckar, Main, Mosel, Lahn and Sieg.

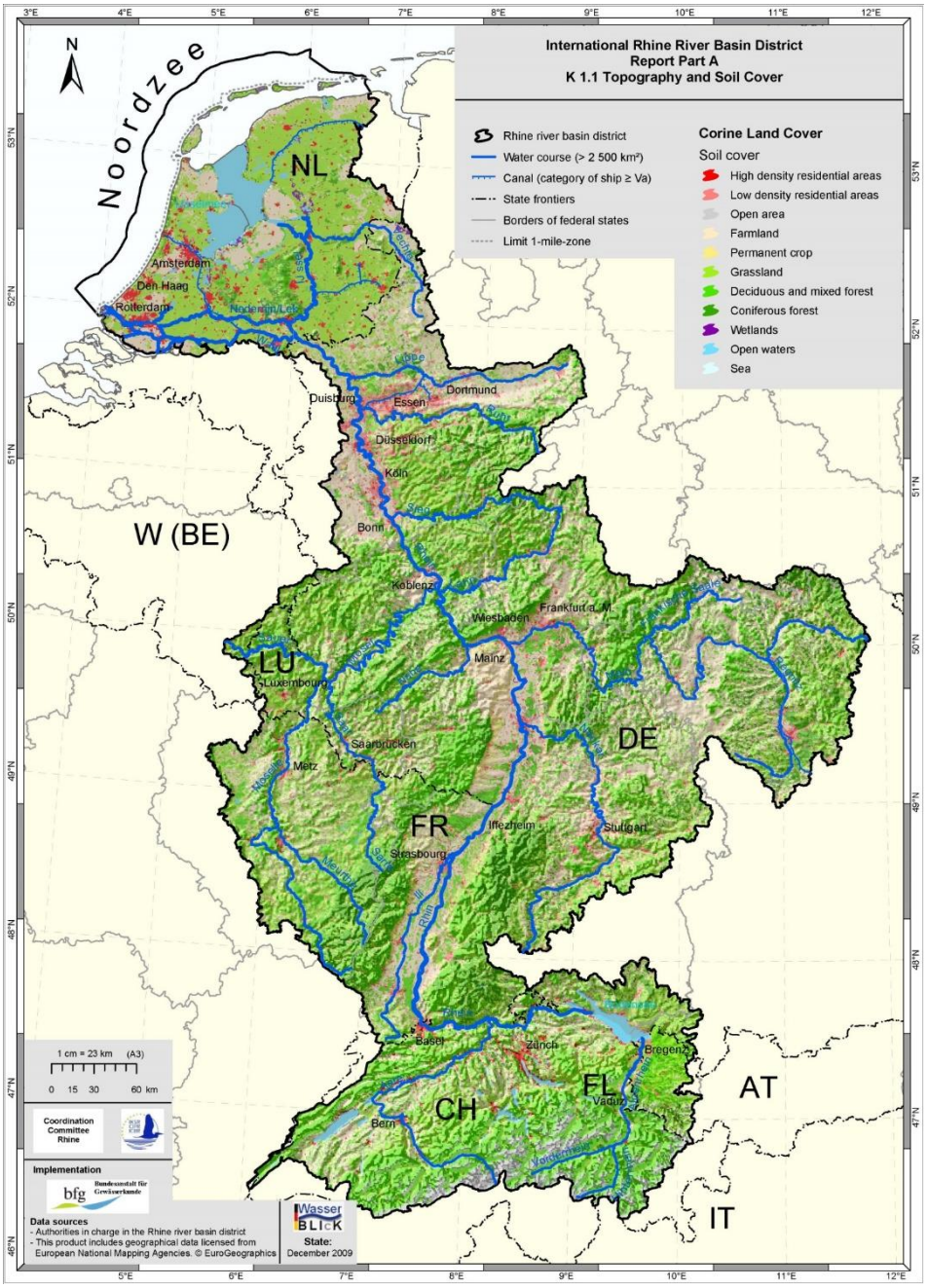

Figure 1. Overview of the Rhine basin (© EuroGeographics)

As a consequence of the great floods of the Rhine in 1993 and 1995, the International Commission for the Protection of the Rhine (ICPR) adopted the Action Plan on Floods (APF, 1998). The plan is conceived in phases and is being implemented as part of Rhine 2020– Program on the sustainable development of the Rhine[1] by all riparian countries of the Rhine by 2020, entailing a total cost of

EUR12 billion.[2] Implemented and planned measures include dyke relocation, the allocation of retention basins and land-use change to store water in head watersheds.[3]

Climate change adaptation, as described in the APF, will be mainstreamed within the European Flood Risk Directive and national flood risk management plans. Individual Member States are responsible for taking the necessary measures.

The Conference of Rhine Ministers takes decisions in matters of political importance and establishes the basis for coherent, coordinated programmes of measure. At the 15th Conference in 2013, the ICPR was asked to draft a preliminary climate adaptation strategy for the Rhine catchment based on the assessment of available studies, the analysis of the discharge regime (floods and low flow) and of the temperature regime.[4] The preliminary strategy should include proposals for adaptation measures to respond to the expected effects of climate change, based on management plans in the different states and regions. Socio-economic developments should be taken into account when drafting the strategy and all stakeholders should be involved. In the near future, the ICPR will decide on further steps, eventually on an ICPR low water management plan. The strategy is expected to be finalized in 2014 or early 2015.

Formulation process

The strategy is developed in direct cooperation with representatives from the Member States, non-governmental organization (NGO) observers and the Secretariat. The strategy will be discussed and eventually approved in the annual plenary assembly.

Stakeholders are involved at the national and regional levels where measures are identified to achieve the national objectives within the context of the European Water Framework Directive and the European Flood Risk Directive, among others. Policy makers from the different countries need to ensure that climate change is adequately taken into account in these directives.

Policy, legal and institutional framework

The Convention on the Protection of the Rhine (1999) is the basis for international cooperation for protecting the Rhine within the International ICPR.[2] The Members States include Switzerland, France, Germany, Luxemburg, the Netherlands and the European Commission. The Commission cooperates with Austria, Liechtenstein and the Belgian region of Wallonia as well as Italy. The ICPR is responsible for transboundary water management within the Rhine catchment and focuses on the following topics: ecology, water quality, pollution, floods, climate change and low water.[2]

National strategies

Several programmes are running at the national level. In Switzerland, for instance, the objective is to improve discharge and water level forecasts for the Rhine by intensifying transboundary exchange of information between specialized agencies.[5] In Germany, the federal states pay little attention to climate change adaptation, except for Bayern, which is implementing up to 2020a number of measures for flood protection, at a cost of EUR 2.3 billion.[6]In 2007, the Netherlands initiated the Room for the River project[7, 8] to implement flood risk reduction measures. Additional climate adaptation measures were evaluated within the Dutch national Delta Programme.[9-11]

Information used/required

Various studies on the impact of climate change on river discharge, water tables, water temperature, water quality and flood risks have been commissioned by the ICPR[12-15] and national research programmes.[3, 16, 17]

River discharge scenarios for 2050 were assessed by the International Commission for the Hydrology of the Rhine Basin (CHR) Rheinblick 2050 project, based on temperature rise scenarios from the Intergovernmental Panel on Climate Change (IPCC) for 2050. Uncertainty boundaries were addressed using an ensemble approach.[18] This study was also used for drafting the climate change adaptation strategy in 2014.

Adaptation objectives and measures

The strategy will include implemented and planned measures within APF including dyke relocation, the allocation of retention basins, and land-use change to store water in head watersheds. It will presumably also include preventive measures for low flow situations including for water users. Moreover, measures targeting ecosystem restoration and improving natural conditions may be considered. The time horizon for the draft climate adaptation strategy will be 2050.

Financing mechanism

Climate change adaptation is mainstreamed within national budgets.

Implementation, and monitoring and evaluation

In October 2013, the ministers and the representatives of the European Union stated that since the last big floods of the Rhine in 1995, the states in the Rhine catchment have invested over EUR 10 billion into flood prevention, flood protection and awareness raising on floods in order to reduce flood risks.[4] Since 2010, downstream of Basel (on the Upper and Lower Rhine), retention areas are available for up to 229 million m³ of water. Furthermore, in the Rhine delta, measures have been implemented to enlarge the river bed.[7, 8] Restoration measures along tributaries and smaller waters in the catchment have been carried out. Specific dyke sections have been strengthened and early warning systems (for the prediction of extreme low and high river discharges) have been improved.

The implementation of the strategy, when approved, will be the responsibility of the Member States. Monitoring and evaluation of the strategy will be conducted through the ICPR.

Contact

ICPR Secretariat, Kaiserin-Augusta-Anlagen 15, D-56068 Koblenz. Postfach 20 02 53, D-56002 Koblenz. Tel: 0049-(0)261-94252-0. Fax: 0049-(0)261-94252-52. E-mail: sekretariat@iksr.de. Internet: www.iksr.org

Endnotes

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