Integrated Drought Management in Central and Eastern Europe

ACTIVITY LIST

1. BASIC INFORMATION

Number of Activity:	**Activity 5.2**
Title of the activity:	**Assessment of drought impact on forests**
Duration of the activity:	**April 2013 – March 2015**
Activity leader:	Activity leader: **Galia Bardarska** (bwp@dir.bg) National activity leaders, responsable for technical issues: **Vesselin Alexandrov (BG)** (vesselin.alexandrof@gmail.com) **Gintautas Stankūnavičius (LT)** (gintas.stankunavicius@gf.vu.lt) **Urša Vilhar (SI)**(ursa.vilhar@gozdis.si) **Igor Buksha (UA)** (buksha@ukr.net; buksha@uriffm.org.ua)
Chairman of the CWP:	Chairs of CWPs, responsible for organization and dissemination of results: **Ivan Raev (**bwp@dir.bg) **Bernardas Paukstys** (bernardas@iti.lt) **Martina Zupan** (martina.zupan@siol.net) **Anna Tsvietkova** (Atsvet@mama-86.org.ua)
Description of the activity:	
Forests are significantly dependent on water regime and, in turn, have a significant impact on the water regime of territories. The water regime is a factor of extreme importance for the forest management today and in the conditions of climate change. For the quantitative assessment of the drought impacts, the values of the drought index after De Martonne will be used. After determination of vulnerability zones of the forests and forest life zones in drought situations, key objective of the case study is identification of mitigation and adaptation measures to be developed for forests in Bulgaria, Lithuania, Slovenia and pilot area in Ukraine. The case study will result in good drought management practices available for application in different parts of GWP CEE region. The case study will be documented in a report with practical evidence and incorporated into a compendium of good practices (act. 7.1) The climate changes in 21st century will lead to clearly notices worsening of the moistening of the GWP CEE forests, especially on lower altitude above sea level. This will have influence on the productivity and sustainability of the forests and watersheds.The vulnerability zones of the forest vegetation in Bulgaria, Lithuania, Slovenia and pilot area in Ukraine under dryness index of De Martonne will be defined for current climate (1950-2000), as well as for future (2050 and 2070) climate conditions. The scale of De Martonne index is as follows: under 20 comes degradation of the forest tree vegetation - lack of moisture; from 21 to 30 exists lasting difficulties for growth; from 31 to 40 exist only temporary growth	

difficulties; above 40 - the optimal climate conditions, when the forest vegetation is in climax formation, and above 71 starts again worsening of the climate conditions - warmth lack. The regresion analyses will be used for describing the correlation between the relief and the relevant characteristic of the air temperature and precipitation. The vulnerability zones according to De Martonne index will be described for different scenarios and shown at the maps. Program of measures for forest adaptation measures and mitigation the negative effect of climate change on them will be established in 4 GWP CEE countries and dissemination to policy and decision makers, stakeholders, NGOs etc.

2. CONTRIBUTING ORGANIZATIONS / EXPERTS

Country	Organization	Contact
Lithuania	- Dept. of Hydrology & Climatology with Vilnius university – DHC-VU, - Lithuanian Research Centre for Agriculture and Forestry with Institute of Forestry - RCAF _ IF	- Gintautas Stankūnavičius - leader - Vidas Stakėnas
Slovenia	Slovenian Forestry Institute, Department for forest ecology	- Primož Simončič - Urša Vilhar - Lado Kutnar - Andrej Kobler
Bulgaria	- National Scientific Center for Global Changes, - Forest Research Institute-BAS, - Scientific Technical Union for Water Affairs, - GWP-Bulgaria	- Vesselin Alexandrov – leader - Ivan Raev - Galia Bardarska
Ukraine	- Ukrainian Research Institute of Forest and Forest Melioration - GWP –Ukraine	- Igor Buksha – leader - Tatiana Pyvovar - Maksym Buksha - Volodymyr Pasternak - Anna Tsvetkova

3. PLAN for IMPLEMENTATION of the activity

Name of the OUTPUT 1	**Establishment of methodology for assessment of drought impact on forests**
Type of the output (analysis, report, guideline, workshop, brochure, etc.):	Kick-off meeting in Kiev and training by emails and Skype
Form (website, CD, printed, database, audio-visual, computer software, etc.):	Drought indexes and models – definitions and software
Purpose of the output:	The methodology for assessment of drought impact on forest ecosystems is needed for determination the vulnerability zones in 2050 and 2070
Structure and description (contents, requirements for use, chapters, etc.)	Approval of the content of the forest case study including assessment of the current forest situation in 4 GWP CEE countries and development of the methodological chapters

Name of the OUTPUT 2	**Determination of vulnerability forest zones in current climate (1950-2000), 2050 and 2070 according to IPCC AR5**
Type of the output (analysis, report, guideline, workshop, brochure, etc.):	National reports with maps, second NCD
Form (website, CD, printed, database, audio-visual, computer software, etc.):	CD
Purpose of the output:	The climate changes scenarios in 21st century and vulnerability forest zones will lead to clearly notices on worsening of the moistening of the forests of 4 GWP CEE countries, especially on lower altitude above sea level. This will have influence on the productivity and sustainability of the forest ecosystems and watersheds.
Structure and description (contents, requirements for use, chapters, etc.)	The vulnerability zones of the forest ecosystems for current climate (1950-2000) and for the years 2050 and 2070 will be defined using the climate scenarios of IPCC AR5 for Bulgaria, Lithuania, Slovenia and pilot area in Ukraine, as well as using

calculations of complex climate index of De Martonne.

The vulnerability zones are defined in the best way with De Martonne method. The biggest advantage of this method is the fact that it works with available information - average annual air temperature and annual precipitation. Besides this, they are connected in certain extend with the altitudes. This is reason why this method will be proposed as a base for the vulnerability zones of the forest vegetation in terms of climate changes in the forests of GWP CEE countries.

IDM	Climate classification	Vulnerability level
10-25	Semiarid	Very high
25-30	Moderately arid	High
30-35	Slightly humid	Medium
35-40	Moderately humid	
40-50	Humid	Low
50-60	Very humid	
> 60	Excessively humid	from Medium to Very high

Name of the OUTPUT 3	**Remedial measures for the forests to mitigate negative effects of the drought**
Type of the output (analysis, report, guideline, workshop, brochure, etc.):	Development of action plans for different period: 2050 and 2070 Recommendations for GWP CEE countries for elaboration of actions plans to mitigate drought negative effects on forests
Form (website, CD, printed, database, audio-visual, computer software, etc.):	Printed, CD
Purpose of the output:	Supporting decision and policy makers for sustainable forests management in drought periods.
Structure and description (contents, requirements for use, chapters, etc.)	The analysis of the forests in 4 GWP CEE countries in the conditions of started climate changes, the adopted climate scenarios for the expected climate in the countries during the 21st century, as well as the differentiated by zones picture for forests vulnerability, allow to be developed a program of measures for forests adaptation, aiming at mitigation of the climate changes on them.

	The measures for adaptation will be specified in each vulnerability zone for the forests areas in Bulgarian, Lithuania, Slovenia and pilot area in Ukraine. For each measure will be described the type of measure, necessary resources, responsible institutions, terms of implementation, and assessment indicators.

Name of the OUTPUT 4	**Raising policy makers and public awareness in 4 GWP CEE countries**
Type of the output (analysis, report, guideline, workshop, brochure, etc.):	Collection of all outputs of the forests case study in 4 GWP CEE countries and dissemination to national institutions, universities, forest schools, NGOs etc. Presentations at water/forest forums, publications in scientific and popular magazines etc.
Form (website, CD, printed, database, audio-visual, computer software, etc.):	CD, website
Purpose of the output:	Sustainable forest management and forest protection for next generations in GWP CEE region
Structure and description (contents, requirements for use, chapters, etc.)	The report of forest case study will be collected under activity 7.1 »Good practice compendium« of the IDMP.

No.	Steps for implementation of the activity	Output	Time period	Who is responsible		Core budget, euro			In kind, euro
					BG	LT	SI	UA	
MILESTONE 1	Kick-off meeting* of the experts for clarification of the activities and responsibility of each country. Common work of all team experts on final content of the forest case study and time schedule (training by emails and Skype). Collection of existing long term climate and forest data.	The long term climate and forests data are the base for the next outputs	April – June 2013	Chairs of CWPs about organization /financing issues and national leaders about technical issues. G.Bardarska as an activity leader is charged with	1000	1000	1000	1000	2000

No.	Steps for implementation of the activity	Output	Time period	Who is responsible		Core budget, euro			In kind, euro
					BG	LT	SI	UA	
				coordination between different parts.					
	Forest policy at UN, EU and national level and general information about forest ecosystems – comparative analysis for 4 GWP CEE countries	Forest policy is needed for the next outputs	July-September 2013	National leaders and G.B. for coordination	2000	2000	2000	2000	4000
MILESTONE 2	**Establishment of methodology for assessment of drought impact on forest ecosystems** in 2050 and 2070	**(Output 1)**	October – December 2013	National leaders. G.B. for coordination	2000	2000	2000	2000	4000
MILESTONE 3	Elaboration of maps for current climate (1950-2000)and future (2050 and 2070) climate conditions in Bulgaria, Lithuania, Slovenia and pilot area in Ukraine	Maps are the base for **output 2**	January – March 2014	National leaders. G.B. for coordination	2000	2000	2000	2000	4000
	Determination of vulnerability zones of forests for future climate conditions on the base of De Martonne index	**Output 2**	April – June 2014	National leaders. G.B. for coordination	2000	2000	2000	2000	4000
MILESTONE 4	Development and approval of methodology for adaptation measures of the forest ecosystems according to the vulnerability zones of the years of 2050 and 2070 and establishment of programme of measures for forest adaptation measures and mitigation the negative effect of climate change on them in 4 GWP CEE countries	**Output 3**	July-December 2014	National leaders. G.B. for coordination	4000	4000	4000	4000	4000
MILESTONE 5	Report of the forest case study and dissemination of the results	**Output 4**	January-March 2015	National leaders and chairs of 4 CWPs. G.B. for coordination	2000	2000	2000	2000	4000
	Total				**15000**	**15000**	**15000**	**15000**	
	TOTAL					**60000**			**26000**

*Kick-off meeting in Kiev on April 8, 2013