

# Common report on existing drought management status – Danube region

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## Introduction

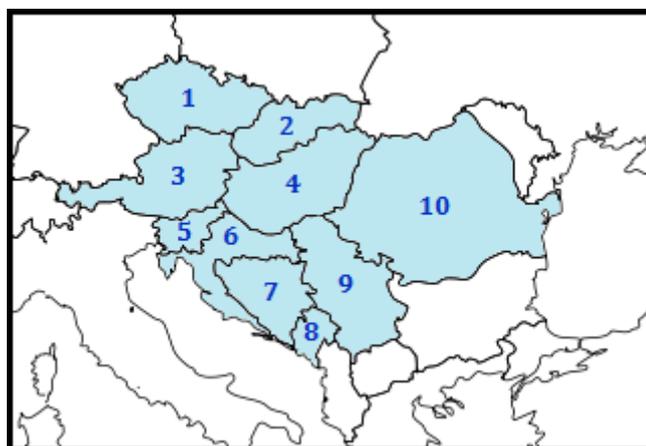
This document was prepared under Work Package 6 (Drought response) of the DriDanube project. It gives a general review of current state of national drought management systems.

The document is based on separate *Country reports on existing drought management status* (Deliverable 6.1.1), prepared by project partners in respective country of the region. Information included in separate *Country Reports* were obtained through an online survey, shared among national authorities and institutions involved in national drought monitoring and/or management. Additional source of information for preparation of Country Reports were thematic discussions with stakeholders during National Briefing Seminars, organised by project partners within respective country. Responses collected via online survey as well as stakeholders' comments and suggestions are therefore the base material of this document.

Detailed information on each section of this document can be found in respective *Country report*.

Based on climate similarities between some of the neighbour countries in the Danube region, country reviews are listed in the following order within each table of this document (see map below):

1. Czech Republic
2. Slovakia
3. Austria
4. Hungary
5. Slovenia
6. Croatia
7. Bosnia and Herzegovina
8. Montenegro
9. Serbia
10. Romania



Picture 1: order of countries reviewed within each table of this document

The document aims at giving orientation comparison on how drought is managed in participating countries in order to find existing good practices as well as fields of national drought management where improvement is needed. Findings from creating this document will serve for further activities in preparing DriDanube Strategy under Work Package 6 of the DriDanube project.

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## Acronyms

ARSO	Slovenian Environment Agency
EODC	Earth Observation Data Centre for Water Resources Monitoring GmbH
CzechGlobe	Global Change Research Institute CAS
GWP CEE	Global Water Partnership Central and Eastern Europe
OMSZ	Hungarian Meteorological Service
TU Wien	Vienna University of Technology
SZIU	Szent Istvan University
NMA	National Meteorological Administration
SPACE-SI	Centre of Excellence for Space Sciences and Technologies
DHMZ	Meteorological and Hydrological Service
SHMU	Slovak Hydrometeorological Institute
FAUNS	Faculty of Agriculture, University of Novi Sad
RHMSS	Republic Hydrometeorological Service of Serbia
IHMS	Institute of Hydrometeorology and Seismology of Montenegro
RHMZ RS	Republic Hydro-meteorological Service of Republic of Srpska
URSZR	Administration of the Republic of Slovenia for Civil Protection and Disaster Relief
EAA	Environment Agency Austria
BMLFUW	Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management
ICPDR	International Commission for Protection of the Danube River
DMCSEE	Drought Management Centre for Southeastern Europe
CZ	Czech Republic
SVK	Slovakia
AUT	Austria
HU	Hungary
SLO	Slovenia
CRO	Croatia
BiH	Bosnia and Herzegovina
MNE	Montenegro
SRB	Serbia
RO	Romania
FVC	Fraction of vegetation cover
LAI	Leaf area index
SPEI	Standardised precipitation-evapotranspiration index
SPI	Standardised precipitation index

## Executive summary

Drought frequency and intensity have increased in the Danube region in the last decades. All countries participating in DriDanube project have ratified the UN Convention to Combat Desertification (UNCCD), identifying themselves as “drought affected country” in terms of UNCCD.

Main findings from analysing and evaluating individual Country reports on existing drought management are listed below and give general picture of drought management situation in the region.

### POSITIVES:

1. Despite inexistent clear drought management policy, there is noted interest in establishing proactive approach in fighting drought which is also slowly becoming a priority in countries of the region.
2. Initiatively, several key documents such as action plans and management plans in relation to drought are under development.
3. There is legal framework established on post-drought procedure for economic estimation of drought damage in some countries of the region.

### WEAKNESSES – in all countries of the region:

1. No document addressing drought directly. Drought or drought management is only partially and insufficiently considered in several different strategic documents, laws, regulations, programmes etc. in reference to emergency situations or natural disasters.
2. No unified/clear definition of drought. Terms like dryness, dry periods, heat waves, water scarcity, drought seem to be used interchangeably, therefore distinction of drought and its meaning from other natural phenomena mentioned above is required.
3. No unified concern for drought among meteorologists, hydrologists, soil (and forestry) scientists.
4. Weak cooperation among relevant sectors.
5. Despite drought monitoring being relatively sufficient in most countries of the region, it is not inter-connected and no complex and integrated drought management is based on its outputs.
6. Missing national inter-institutional scheme of data flow and responsibility flow, including clear regulations and institutional responsibilities to take actions under specific conditions.
7. Missing inter-institutional communication scheme.
8. No systematic collection of inter-sectoral drought impacts data and information.

### WEAKNESSES – in most countries of the region:

1. Missing drought early warning system established.
2. Weak link in drought monitoring-management chain.
3. Weak implementation of existing action plans and measures.

### WEAKNESSES – in some countries of the region:

1. Missing information system focused on specific target groups such as farmers.
2. Lack of drought assessment and plans established to adequately manage drought risk on national and local levels.

### REQUIREMENTS FOR IMPROVEMENT:

1. Drought monitoring of all types should be improved by means of implementing new drought indices and use multifaceted approach.
2. Establishment of drought management system (umbrella document addressing drought, drought authority, drought plans).

# 1. Determining drought

According to UNCCD, drought is defined as natural phenomenon that occurs when precipitation amount significantly deviates from mean values over certain area and causes serious changes in hydrological balance and soil production system.

## 1.1 Meteorological drought

### Definition:

Meteorological drought is defined as extended time period of precipitation deficit in reference to long-term period (climatological mean).

### National approaches of meteorological drought monitoring:

Indices most commonly used in region to determine meteorological drought are:

- SPI,
- % of precipitation amount in reference to long-term period,
- precipitation amount in percentile classes.

Also in use are:

- SPEI,
- SSM,
- number of days when precipitation amount falls within certain small quantities,
- consecutive days with no precipitation.

Country	Indices in use	Thresholds		Reference period used	
<b>CZ</b>	<i>unknown</i>				
<b>SVK</b>	SPI	SPI ≤ -1			
	SPEI	SPEI ≤ -1			
<b>AUT</b>	<i>unknown</i>				
<b>HU</b>	SPI	SPI ≤ -1		1961-1990	
	Country average sum of precipitation	Monthly values significantly below long-term average		1981-2010	
	% of average precipitation	//			
<b>SLO</b>	SPI	SPI3 ≤ -1		Past 30 years (1981-2010 curr. in use)	
	% of average precipitation	//			
<b>CRO</b>	SPI	∈ [-1, 1]	Normal	1961-1990	
		∈ (-1.5, -1]	Moderate dry		
		∈ (-2, -1.5]	Very dry		
		≤ -2	Extremely dry		
	Precipitation percentiles	25 <sup>th</sup> - 75 <sup>th</sup>	Normal		
		9 <sup>th</sup> - 25 <sup>th</sup>	Moderate dry		
		2 <sup>nd</sup> - 9 <sup>th</sup>	Very dry		
	< 2 <sup>nd</sup>	Extremely dry			

Country	Indices in use	Thresholds		Reference period used
<b>BiH</b>	Temperature, precipitation, water balance.	Focus is on period of unusually dry weather when precipitation deficit causes serious damage (hydrological imbalance, water shortage for particular activity...)		
<b>MNE</b>	SPI	//		1961-1990 and 1981-2010
	% of average precipitation			
	Precipitation percentiles			
	Consecutive dry days			
<b>SRB</b>	% of average precipitation	//		
	SPI	€ [-0.935, 0.935]	Near normal	
		€ [-1.282, -0.935]	Moderate drought	
		€ [-1.645, -1.282]	Severe drought	
		≤ -1.645	Extreme drought	
<b>RO</b>	Cumulative precipitation of consecutive calendar days of month below certain quantities	1 <sup>st</sup> -10 <sup>th</sup> in month	≤ 5 l/mp	
		11 <sup>th</sup> -20 <sup>th</sup> in month	≤ 10 l/mp	
		21 <sup>st</sup> -end of month	≤ 25 l/mp	

Additional country specifics:

**Hungary** – With purpose of providing financial aid compensation to farmers to mitigate losses due to drought, Complex Agricultural Risk Management System uses the following administrative rather than scientific definition of drought, as codified in Act 168/2011 and further modified on 15 June 2017:

- precipitation amount < 10mm during consecutive 30 days (before 15 June 2017),
- precipitation amount < 25mm during 30 consecutive days as well as daily T<sub>max</sub> > 31°C during 15 consecutive days (after 15 June 2017).

## 1.2 Agricultural drought

Definition:

Agricultural drought is defined as insufficient quantity of soil water for normal development of agricultural plants.

National approaches of agricultural drought monitoring:

Indices most commonly used in the region to determine agricultural drought are:

- soil water content,
- SPI,
- surface water balance.

Also in use are:

- Palmer Z,
- SPEI,
- precipitation deficit,
- FVC,
- LAI,
- Palfai indices,
- Agro-Hydro Potential,
- Gördülő vízháztartási mutató index.

Country	Indices in use	Thresholds	
<b>CZ</b>	Anomalies of calculated decadal soil water content in percentiles (in reference to 1961-2010)	> 30 <sup>th</sup>	no drought (normal)
		20 <sup>th</sup> - 30 <sup>th</sup>	low water content (S0)
		10 <sup>th</sup> - 20 <sup>th</sup>	beginning of drought (S1)
		5 <sup>th</sup> - 10 <sup>th</sup>	strong drought (S2)
		2 <sup>nd</sup> - 5 <sup>th</sup>	very strong drought (S3)
		1 <sup>st</sup> - 2 <sup>nd</sup>	extraordinary drought (S4)
		< 1 <sup>st</sup>	extreme drought (S5)
<b>SVK</b>	Anomalies of calculated decadal soil water content in percentiles (in reference to 1961-2010)	> 30 <sup>th</sup>	no drought (normal)
		20 <sup>th</sup> - 30 <sup>th</sup>	low water content (S0)
		10 <sup>th</sup> - 20 <sup>th</sup>	beginning of drought (S1)
		5 <sup>th</sup> - 10 <sup>th</sup>	strong drought (S2)
		2 <sup>nd</sup> - 5 <sup>th</sup>	very strong drought (S3)
		1 <sup>st</sup> - 2 <sup>nd</sup>	extraordinary drought (S4)
		< 1 <sup>st</sup>	extreme drought (S5)
<b>AUT</b>	<i>unknown</i>		
<b>HU</b>	Palfai Aridity Index (PAI)	< 6	normal
		6 - 8	moderate drought
		8 - 10	medium drought
		10 - 12	heavy drought
		> 12	extremely heavy drought
	Palfai Drought Index (PaDI)	< 4	droughtless year
		4 - 6	mild drought
		6 - 8	moderate drought
		8 - 10	medium strength drought
		10 - 15	serious drought
		15 - 30	very serious drought
	Gördülő vízháztartási mutató index	GVM < 1	
	Agro-Hydro Potential (AHP)	0.8 - 1.0	water scarcity is theoretical
		0.5 - 0.8	water demand increasingly restricted
		0.3 - 0.5	water stress develops
< 0.3		severe water stress	
modelled soil moisture data	//		
Maximum Soil Water Deficit index			
<b>SLO</b>	precipitation deficit	//	
	FVC		
	meteorological water balance in percentiles	75 <sup>th</sup> - 90 <sup>th</sup>	dry conditions
		90 <sup>th</sup> - 98 <sup>th</sup>	very dry conditions
		> 98 <sup>th</sup>	extremely dry conditions
	Decadal index of drought stress (DISS) in percentiles	75 <sup>th</sup> - 90 <sup>th</sup>	dry conditions
		90 <sup>th</sup> - 98 <sup>th</sup>	very dry conditions
> 98 <sup>th</sup>		extremely dry conditions	
<b>CRO</b>	not monitored		
<b>BiH</b>	precipitation deficit	//	
	SPI		
	water balance		

Country	Indices in use	Thresholds
<b>MNE</b>	SPI	//
	FVC	
	LAI	
<b>SRB</b>	Palmer Z index	//
	SPEI	
	water balance (incl. PET)	
	dry periods	
	CROPSYST model	
	FVC	
<b>RO</b>	soil moisture measurements	//
	soil moisture reserve calculations (via Penman equation)	

Additional country specifics:

**Croatia** – There is no systematic monitoring of agricultural drought. However, for agricultural drought research and reports De Martonne aridity index is used and in some cases also drought assessment performed according to evapotranspiration estimations.

**Hungary** – Hungarian Drought Index (HDI) is in process of establishment. It takes into account daily values of precipitation, temperature and soil moisture. The index was in evaluation process in 2015-2016 before establishing Drought and Water Scarcity Management System in Hungary by the General Directorate of Water Management.

**Montenegro** – FVC and LAI indices are being monitored through DMCSEE activities.

**Serbia** – Regarding agricultural drought as a common term for disturbed plant water balance and development, it is being differed between *atmospheric drought* (disturbance appears due to high temperatures, low air humidity) and *soil drought* (disturbance appears due to deficit of soil moisture).

### 1.3 Hydrological drought

Definition:

Hydrological drought is defined as lack of water in hydrological system, manifesting itself in abnormally decreased quantity of surface waters and abnormally decreased level of groundwater

Country	Monitoring approach		
	Water body	Methodology (indices, thresholds)	Reference period
<b>CZ</b>	<i>unknown</i>		
<b>SVK</b>	Surface waters	Comparison of discharge values in low-flow period with long-term characteristics from the low-flow part of the duration curve (M-day discharge – mainly $Q_{330d}$ , $Q_{355d}$ , $Q_{364d}$ )	1961-2000
		Mean monthly and mean annual values.	

Country	Monitoring approach		
	Water body	Methodology (indices, thresholds)	Reference period
	Groundwater	Statistical assessment of monthly averages in the evaluated hydrological year in reference to 1981-2010. Drought intensity is then determined through 5 categories, based on quantiles, for groundwater levels ( $\varphi_{10}$ , $\varphi_{40}$ , $\varphi_{60}$ , $\varphi_{90}$ ) and for spring yield ( $Q_{10}$ , $Q_{40}$ , $Q_{60}$ , $Q_{90}$ ).	
<b>AUT</b>	unknown		
<b>HU</b>	unknown		
<b>SLO</b>	Surface waters	<p>Indices used:</p> <ul style="list-style-type: none"> <li>• 30-day statistics of hydrological variables in values and percentiles (spring discharge, stream discharge, water temperature)</li> <li>• 5-day weather forecast</li> </ul>	<p>Approach no.1 (=definition of <i>dry stream discharge</i>): when values of moving 30-day average stream discharge at hydrological station falls in lowest 5<sup>th</sup> percentile.</p> <p>Approach no.2 (=definition of <i>mean low stream discharge</i>): annual minimum of all lowest daily averaged discharges at hydrological station (minimum of all <math>Q_{np}</math>) is taken into account. Calculated average of these values for 1981-2010 period (<math>sQ_{np}</math>) represents the threshold.</p>
	Groundwater	Frequency statistics of groundwater levels in percentile classes: < 5 <sup>th</sup> , 10 <sup>th</sup> , 25 <sup>th</sup> , 75 <sup>th</sup> , > 75 <sup>th</sup> .	
<b>CRO</b>	<ul style="list-style-type: none"> <li>• Intensity: in practice done by estimating anomalies of current water status (in particular, water discharge, water level) with respect to reference values.</li> <li>• Duration: estimated according to time duration of extremely low water levels/flows measured at hydrological stations.</li> </ul>		
<b>BiH</b>	not monitored		
<b>MNE</b>	SPI (SPI9, SPI12)		
	stream flow		
	level of reservoirs		
	level of groundwater		
<b>SRB</b>	snowfall amount		
	RHMS issues early warnings when river discharge is approaching its biological minimum and cause unfavourable conditions to river navigation, water quality and water supply.		
<b>RO</b>	Hydrological drought is monitored via checking river flows and lake levels. In various levels, codes of different colours are emitted at regional and national levels.		

Additional country specifics:

**Austria** - From several documents, hydro drought is addressed in relation to evapotranspiration and precipitation (trends) as well as regional and seasonal impacts on surface waters and groundwater levels.

**Hungary** – Not enough detailed information gained regarding indices used to monitor hydrological drought. The following indices may be in use in hydrological practice:

- water balance drive index (SRI),
- water exploitation index (WEI),
- surface water supply index (SWSI),
- regional deficiency index (RDI),
- regional drought area index (RDAI).

**Slovenia** – Particular method to determine thresholds for hydrological drought is not defined yet, although in practice the upper approaches are in use. Additionally, standardized groundwater index (SGI) to improve groundwater monitoring is in process of preparation and establishment.

**Croatia** – Hydrological drought and its definition are directly related particularly with regard to achievement and conservation of water and aquatic environment protection objectives, as well as with regard to availability of water for different uses (particularly on islands) and risk of sudden and accidental pollution when declaration of emergency (drought) triggers actions specified by the National Plan of Measures for Sudden and Accidental Water Pollution.

**Bosnia and Herzegovina** – Although institutions have no special treatment of hydrological drought, information related to water level and discharge is regular for daily reports.

### 1.4 Weaknesses and gaps of national drought determination

Country	Weakness
<b>CZ</b>	//
<b>SVK</b>	- No unified definition of drought and water scarcity in national legislation. - No unified concern for drought among meteorologists, hydrologists, soil (and forestry) scientists.
<b>AUT</b>	- Missing definition of each type of drought in national legislation. - No definition of drought to distinguish it from related terms such as desertification, dryness, etc.
<b>HU</b>	//
<b>SLO</b>	- Missing unified method to determine hydrological drought and its thresholds.
<b>CRO</b>	//
<b>BiH</b>	- Institutions have no special treatment of hydrological drought and do not measure groundwater reserves.
<b>MNE</b>	//
<b>SRB</b>	//
<b>RO</b>	//

## 2. National legislation material addressing drought

### 2.1 Umbrella documents addressing drought

Country	Type*	Document title	Field	Main points related to drought
CZ	umbrella	<b>No umbrella document.</b>		
	other	<i>Concept for protection against drought effects for the territory of the Czech Republic</i>	Drought management	<ul style="list-style-type: none"> <li>a strategic document, approved by the Government in July 2017.</li> <li>main objective: to create a strategic framework for the adoption of effective legislative, organizational, technical and economic measures to minimize the impacts of drought and water scarcity on population, environment and overall quality of life in CZ.</li> </ul>
		<i>The Strategy for Adaptation to Climate Change in the Czech Republic</i>	Climate change	In terms of climate change, drought is considered as one of the highest risk factors (though significantly increasing forest fires risk, especially in spruce woods, having a negative impact on the productivity of forest ecosystems).
SVK	umbrella	<b>No umbrella document.</b>		
	other	<i>The Constitution of the Slovak Republic</i>	Constitution	Lately amended Article 4 was supplemented by a completely new paragraph no. 2 which increases water protection in Slovakia by introduction of a ban of export of water outside the borders of Slovak Republic.
		<i>The Water Framework Directive Implementation Strategy in the Slovak Republic</i>	Water management	<ul style="list-style-type: none"> <li>updated with the plan of tasks in more detail for the next two years,</li> <li>fully respects <i>the EU and the Commonwealth of the Independent States and ICPDR Strategy</i>.</li> </ul>
		<i>Water Plan of Slovakia</i>	Water management	<ul style="list-style-type: none"> <li>includes <i>The River Basin Management Plans</i>,</li> <li>price policy proposal in water sector prepared: it is a set of measures applied to pricing process, being in accordance with current legislation in the field of water management, economic relations, pricing policy and cost concept respecting <i>EU Water Framework Directive</i> principle – “polluter pays”.</li> </ul>

Country	Type*	Document title	Field	Main points related to drought
		<i>The Documents of The State Water Resource Balance of Slovak Republic</i>	Water management	<p>According to Water Law §6, main objectives of the documents are:</p> <ul style="list-style-type: none"> <li>- to know the quantitative balance state of water resources and long-term prognosis of water demand,</li> <li>- to evaluate the water resources exploitation,</li> <li>- to explore the relationship water demands vs. water resources,</li> <li>- provide the basic information for planning in Slovak Republic.</li> </ul>
		<i>The Strategy of Adaptation to Climate Change</i>	Climate change	<ul style="list-style-type: none"> <li>• all type of drought included in it in the form of sectoral information and mostly in form of potential adaptation measures,</li> <li>• update prepared in 2017 in which proposal of adaptation measures against drought are included in sectors of biodiversity, forestry, agriculture, urban environment, water management, energy and industry.</li> </ul>
<b>AUT</b>	umbrella	<i>National Action Plan for Adaptation to Climate Change</i>	Climate change	<ul style="list-style-type: none"> <li>• addresses all main economic sectors on adaptation options to climate change, among others threats including also all types of drought,</li> <li>• the objectives of drought management are the identification of vulnerabilities to drought of different sectors, and the recommendation of sector-specific actions and adaptation options.</li> </ul>
<b>HU</b>	umbrella	<b>No umbrella document.</b>		
	other	<i>National Water Strategy</i>	Water management	<p>It defines four cornerstones for future actions:</p> <ul style="list-style-type: none"> <li>- avoiding the global water crisis,</li> <li>- preserving our water resources,</li> <li>- using their potential effects,</li> <li>- safeguarding ourselves from water hazards.</li> </ul> <p>The key instrument towards these goals is integrated water resources management.</p>
<b>SLO</b>	umbrella	<b>No umbrella document.</b>		

Country	Type*	Document title	Field	Main points related to drought
	other	<i>Protection Against Natural and Other Disasters Act</i>	Civil protection	<ul style="list-style-type: none"> <li>addresses protection of people, animals, property, cultural heritage and the environment against natural disasters,</li> <li>drought included in it as a type of natural disaster,</li> <li>main objective: to reduce number of natural disasters and to prevent or reduce number of casualties and other consequences of natural disasters,</li> <li>lists also fundamental tasks to be accomplished in order to achieve the main objective.</li> </ul>
		<i>Natural Disaster Recovery Act</i>	Civil protection	<ul style="list-style-type: none"> <li>the aim is to help people affected by natural disaster by providing financial aid to ensure their safe stay and re-establishment of their activities if their properties or land were damaged or destroyed,</li> <li>determines conditions and method of use the funds of Republic of Slovenia's budget for elimination of consequences of natural disasters as well as their acquisition or allocation, as to individual farmers as well as for elimination of consequences in agriculture and economy sectors.</li> </ul>
<b>CRO</b>	<b>No umbrella document.</b>			
<b>BiH</b>	<b>No umbrella document.</b>			
<b>MNE</b>	<b>No umbrella document.</b>			
<b>SRB</b>	<b>No umbrella document.</b>			
<b>RO</b>	umbrella	<i>National Strategy for Mitigating the Effects of Drought and Combating Land Degradation and Desertification on Short-, Medium- and Long-term</i>	Land degradation and desertification	The overall goal: to indicate short, medium and long term actions to reduce the vulnerability of local communities, natural ecosystems and socio-economic activities, and to diminish their social, economic and environmental effects.
		<i>Programme of Measures for the Elaboration of the National Strategy for Mitigating the Effects of Drought on Short-, Medium- and Long-term</i>		The purpose: to establish effective measures at all levels involved in the implementation of the National Strategy for mitigating the effects of the drought on short, medium and long term.

Country	Type*	Document title	Field	Main points related to drought
	other	<i>Water Framework Directive</i>	Water management	Emergency Ordinance no. 38/2002 regarding the elaboration and financing of the pedological and agrochemical studies and the financing of the National Soil-field Monitoring System for agriculture, as well as soil-forest vegetation for forestry.
		<i>The River Basin Management Plan</i>		It aims at balanced management of water resources as well as protection of aquatic ecosystems with the main objective of achieving "good state" of surface waters and groundwater.
		<i>The Flood Risk Management Plan</i>		The program of measures in a basin is based on structural and non-structural measures. Role of structural measures is to protect, prevent and mitigate the effects of floods and are being implemented to reduce the peak flow of floods. Their implementation implies, as a rule, for a long time and requires a wide-range analysis from several points of view (technical, economical, environmental and social etc. criteria).

\* Umbrella document – the document in which drought and drought monitoring are addressed directly.  
 Other documents – documents in which drought is included only partially or indirectly; semi-related document.

Additional country specifics:

**Bosnia and Herzegovina** - From time to time, there are only individual reports prepared by the ministry responsible for the type of disaster that affected the country – i.e. recently in 2017 it was the Report on the Act of Agricultural Production with the Proposal of Possible Measures, prepared by the Ministry of Agriculture in relation to agricultural drought. In the report, the situation has been described in details in all segments of agriculture, the damage expressed in money and measures, short-term and long-term actions, since adopted documents related to adaptation to climate change.

## 2.2 National River Basin Management Plans (RBMPs)

On 23 October 2000, *EU Water Framework Directive* (EU WFD) was adopted. Its purpose is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. Its primary objective is the achievement of good status (quantitative and ecological) of water bodies. By adopting EU WFD at national levels, the Member States need to prepare *River Basin Management Plans* in order to ensure a full and consistent implementation of EU WFD and its objectives.

The planning process together with the programme of measures presents the RBMPs. For each river basin district, a river basin planning process must be set up. The planning process revolves around 3 six-year planning cycles (2009-2015, 2015-2021 and 2021-2027), consisting of preparation, action and

review phases. Every sixth year, the plans have to be reviewed and revised as appropriate, i.e. if the objectives have not been reached.

Country	RBMPs adopted	Main points
CZ	1 <sup>st</sup> cycle	<ul style="list-style-type: none"> <li>• The Czech Republic has 3 river basin districts (Oder, Danube and Elbe) for which the <i>Plan of Main River basins of the Czech Republic</i> was prepared.</li> <li>• Chapter V. 1-17 contains the summary of measures for mitigating negative effects of drought.</li> <li>• There is one general measure included for all the Czech Republic territory titled “Drought and water scarcity” which contains 15 various activities for drought mitigation.</li> <li>• Some Sub-district Water Management Plans contain specific measures for mitigation and management of drought and water scarcity in watersheds with more frequent occurrence of drought (i.e. Southern Morava).</li> </ul>
	2 <sup>nd</sup> cycle	
SVK	1 <sup>st</sup> cycle	<ul style="list-style-type: none"> <li>• Consists of: analysis of characteristics of the river basins and evaluation of the human activity impacts; determination of the environmental objectives; draft and implementation of the monitoring programmes; draft and implementation of the programmes of measures.</li> <li>• Competent authority for WFD implementation: The Ministry of Environment.</li> <li>• Other governmental authorities participating in the implementation process, mainly those having specific tasks in the field of waters resulted from WFD and related directives:                             <ul style="list-style-type: none"> <li>- The Ministry of Agriculture of the SR,</li> <li>- The Ministry of Health of the SR,</li> <li>- The Ministry of Finance of the SR,</li> <li>- The Ministry of Transport and Construction of the SR,</li> <li>- others.</li> </ul> </li> <li>• Drought management is partly included within RBMP.</li> </ul>
	2 <sup>nd</sup> cycle	
AUT	1 <sup>st</sup> cycle	<ul style="list-style-type: none"> <li>• Austria has 3 river basin districts for all of which RBMPs have been adopted: Danube, Elbe, Rhine.</li> </ul>
	2 <sup>nd</sup> cycle	<ul style="list-style-type: none"> <li>• Drought management is included in RBMP.</li> <li>• Meteorological and hydrological droughts are addressed in relation to evapotranspiration and precipitation (trends), and regional and seasonal impacts on river waters and groundwater levels.</li> <li>• Indirectly, drought is addressed in water quality and water temperature monitoring, and in the analysis of rivers and groundwater bodies and drinking water resources monitoring.</li> <li>• The objectives related to drought are: the management of low river water levels and groundwater levels; and addressing recommendations for adaptations in relation to climate change.</li> </ul>

Country	RBMPs adopted	Main points
<b>HU</b>	1 <sup>st</sup> cycle	<ul style="list-style-type: none"> <li>• Objectives related to drought in national RBMP are: <ul style="list-style-type: none"> <li>- water saving in the use of water resources,</li> <li>- minimizing drought damage,</li> <li>- adaptation to drought,</li> <li>- water storage/retention in natural systems.</li> </ul> </li> </ul>
	2 <sup>nd</sup> cycle	<ul style="list-style-type: none"> <li>• Revised 2<sup>nd</sup> RBMP is compiled with the coordination of the General Directorate of Water Management.</li> </ul>
<b>SLO</b>	1 <sup>st</sup> cycle	<ul style="list-style-type: none"> <li>• EU WDF was transposed into Slovenian legislation by <i>Waters Act</i> which among other objectives targets also good ecological and quantitative status of waters as well as reducing or elimination pollution of waters by hazardous substances.</li> <li>• Slovenia has 2 river basin districts for all of which RBMPs have been adopted: North Adriatic and Danube.</li> <li>• 1<sup>st</sup> RBMP includes an overview of the state of the aquatic environment, the pressure and impacts of human activities on aquatic environment and the results of monitoring of status of waters. It also identifies effective measures for improving the status of surface water bodies and groundwater bodies.</li> </ul>
	2 <sup>nd</sup> cycle	<ul style="list-style-type: none"> <li>• Important addition in 2<sup>nd</sup> RBMP is adoption of the measure number OS3.2b8 "Preparing of selection of indicators for announcing different drought levels and thresholds" – it is the only measure included in revised 2<sup>nd</sup> RBMPs that addresses the climate change field.</li> </ul>
<b>CRO</b>	1 <sup>st</sup> cycle	<ul style="list-style-type: none"> <li>• RBMPs contain two components: (1) water status management, and (2) flood risk management.</li> <li>• Hydrological drought is included in the RBMPs.</li> <li>• Drought management is included in RBMPs only in the informal level.</li> </ul>
	2 <sup>nd</sup> cycle	

Country	RBMPs adopted	Main points
<b>BiH*</b>		<ul style="list-style-type: none"> <li>- <u>The Framework Agreement for the Sava River Basin (FASRB)</u>: coordinated by the International Sava River Basin Commission (ISRBC), it has created the conditions for the preparation of the Sava RBMP according to WDF. At the first step of this process, the Sava River Basin Analysis (SRBA) was developed and published in 2009.</li> <li>- Only <u>Sava RBMP</u> has been adopted so far.</li> <li>- <u>Water Management Plan for Adriatic Sea Basin in FBiH</u>: the objective of this project is to improve mechanisms and capacity of the project countries to plan and manage transboundary Drina River Basin, incorporating climate change adaptation. It is a regional project encompassing three countries (Bosnia and Herzegovina, Montenegro and Serbia) and will run from 2016-2020.</li> <li>- <u>Drina River Basin Nexus Assessment</u>: the objective of this project is to foster transboundary cooperation in the Drina River Basin by identifying intersectoral synergies that could be further explored and utilized, and by determining policy measures and actions that could alleviate tensions or conflicts related to the multiple uses of and needs for common resources, and to assist countries in optimizing their use of resources. The project encompasses three countries: Bosnia and Herzegovina, Montenegro and Serbia and has run from July 2016 to April 2017.</li> </ul>
<b>MNE*</b>		<u>The Sava RBMP</u> has been developed according to the requirements of the EU WFD through International Sava River Basin Commission.
<b>SRB*</b>		<p><i>National River Basin Management Plan</i> is strategic document that includes:</p> <ul style="list-style-type: none"> <li>- all rivers with basin covering more than 500 km<sup>2</sup>,</li> <li>- all transboundary rivers with basins covering more than 100 km<sup>2</sup>,</li> <li>- all transboundary rivers included in bilateral agreement with neighbour countries.</li> </ul> <p>The content of the <i>Water Management Plan</i> is defined in Article 33 of the <i>Water Law</i>.</p>
<b>RO</b>	1 <sup>st</sup> cycle	<ul style="list-style-type: none"> <li>• Romania has 1 river basin district: Danube. It is further separated into 11 hydrographical basins for all of which Sub RBMPs have been adopted: Someş-Tisa, Crişuri, Mureş, Banat, Jiu, Olt, Argeş-Vedea, Buzău-Ialomiţa, Siret, Prut-Bârlad, Dobrogea Litoral Area.</li> <li>• <i>National Management Plan</i> also for national portion of the Danube River and Coastal Waters has been adopted.</li> </ul>
	2 <sup>nd</sup> cycle	

\* for non-EU countries, table includes list and description of RBMPs-equivalents or projects that contribute to preparation of RBMPs-equivalents

## 2.3 National Action Plans (NAPs)

On 17 June 1994, *United Nation Convention to Combat Desertification in countries experiencing serious drought and/or desertification, particularly in Africa* (UNCCD) was adopted. Its objective is to combat desertification and mitigate the effects of drought in affected countries through effective action at all levels in order to support poverty reduction and environmental sustainability. All countries participating in DriDanube project have ratified UNCCD.

Countries identifying themselves as “affected” are implementing the Convention by developing and carrying out national, subregional, and regional action programmes (NAPs). The purpose of NAPs is to identify the factors contributing to desertification as well as identify practical measures necessary to combat desertification and mitigate the effects of drought. NAPs shall also specify the respective roles of government, local communities and land users and the resources available and needed.

Country	Date of UNCCD ratification	Approved NAP?	Additional information on NAP or stage of its preparation
<b>CZ</b>	25/01/'00	No	DMPs on regional and state levels do not exist yet, although the duty for their elaboration will follow from the amendments of Water Act (under preparation and is expected to be in force from 2020).
<b>SVK</b>	07/01/'02	No	<ul style="list-style-type: none"> <li>• <i>Drought Action Plan</i> is in final phase of preparation and its draft version, prepared based on IDMP <i>Guidelines</i> was submitted to the Cabinet for negotiations at the end of 2017.</li> <li>• The key objective of this document is to set priorities and a timetable for implementation of measures to minimize consequences of drought in a year of drought event.</li> </ul>
<b>AUT</b>	02/06/'97	No	Austria has not provided separate NAP. Drought management in Austria is addressed in the <i>National Action Plan for Adaptation to Climate Change</i> (see section 2.1).
<b>HU</b>	13/07/'99	No	Development of the Hungarian Drought and Water Scarcity Monitoring System has started in 2016 with its integration into the existing water damage control system (flood, excess water) as a basis of operative action to be done during drought events.

Country	Date of UNCCD ratification	Approved NAP?	Additional information on NAP or stage of its preparation
<b>SLO</b>	28/06/'01	No	In 2013, Slovenia prepared <i>Basis for the Slovenian NAP</i> in which the following topics are addressed: <ul style="list-style-type: none"> <li>- review of NAPs in countries of southern and eastern Europe, US and the UK,</li> <li>- review of documents related to drought policy in countries of southeastern Europe,</li> <li>- responsibilities within water resource management and drought management in Slovenia,</li> <li>- review of existing drought monitoring and drought early warning status,</li> <li>- process of drought monitoring in Slovenia,</li> <li>- legislative framework in Slovenia,</li> <li>- suggestions on improved drought policy and drought management scheme.</li> </ul>
<b>CRO</b>	06/10/'00	No	In 2005, <i>National Irrigation Plan for Croatia</i> was prepared. It includes agricultural and hydrological drought and provides current status of irrigation procedure in Croatia and a plan for its improvement (drought mitigation).
<b>BiH</b>	26/08/'02	Yes	Within the project “Support to Bosnia and Herzegovina for Development of Action Programmes in compliance with the UNCCD 10-Year Strategy and Reporting Process under UNCCD”, <i>National Action Programme to Combat Land Degradation and Mitigate the Effects of Drought in Bosnia and Herzegovina (NAP)</i> was prepared in which drought is included by observing two mandatory indicators for strategic objective.
<b>MNE</b>	04/06/'07	No	<ul style="list-style-type: none"> <li>• There is no NAP prepared specifically for drought events.</li> <li>• Preparation of NAP related to the climate change is planned to start in 2017 and be finalized at the end of 2019.</li> <li>• There is also <i>NAP to Combat Soil Degradation and Mitigate the Drought Impacts</i> as a compilation of the <i>Second National Communication of Montenegro to UNFCCC and CAMP</i>. It recognizes importance of drought monitoring being harmonized with DMCSEE and priorities of the country as one of its strategic goals. This activity recognizes the importance of drought data collection for planning irrigation measures, timely information to reduce damages and losses in agriculture and for improving life quality with the conservation of the soil.</li> </ul>
<b>SRB</b>	18/12/'07	No	Draft version of <i>National Action Plan to Combat Soil Degradation and Desertification (NAP CSDD)</i> is prepared, as well as NAP related to climate change. Activities on finalization of the NAP CSDD will continue in 2018.

Country	Date of UNCCD ratification	Approved NAP?	Additional information on NAP or stage of its preparation
<b>RO</b>	19/08/'98	Yes	<ul style="list-style-type: none"> <li>• After ratifying UNCCD, <i>National Strategy and Action Programme Concerning Desertification, Land Degradation and Drought Prevent and Control</i> was prepared in 2000.</li> <li>• <i>NAP on Climate Change 2016-2020</i> is being developed under the Agreement for Technical Assistance Services for "Romania: Climate Change and Low Economic Growth Program", signed between the Ministry of Environment, Waters and Forests and the International Bank for Reconstruction and Development.</li> </ul>

## 2.4 Drought Management Plans (DMPs)

Regarding water scarcity and drought in central and eastern Europe (CEE), the UNCCD found that the region suffers from “soil degradation and desertification”. Although both processes vary considerably from country to country, the vulnerability of the region to this hazard is evident and increasing. Unlike RBMPs and NAP which are an obligation to countries who adopted EU WFD and UNCCD respectively, there is no international document binding signatory states to prepare also drought management plans.

In 2013, GWP CEE with support of World Meteorological Organisation (WMO) prepared a handbook *Guidelines for preparation of the Drought Management Plans* to contribute to substantial progress in development of national Drought Management Plans under implementation of EU WFD along or within RBMPs. Of countries participating in the DriDanube project, separate handbooks based on GWP CEE’s *Guidelines...* with specific-country-related content were prepared also in Czech Republic, Hungary, Romania, Slovakia and Slovenia.

Country	Approved DMP?	Stage of DMP preparation
<b>CZ</b>	No	<ul style="list-style-type: none"> <li>• <i>National Action Plan for Drought Mitigation</i> is planned to be prepared after the amendment of Water Act.</li> <li>• Existing national plans and strategies of mitigation measures are related to adaptation to climate change development and their consequences, therefore they have broader extent.</li> </ul>
<b>SVK</b>	No	DMP is under preparation. So far, two rounds of National Dialogues on drought were organised by GWP Slovakia at the board of SHMU.
<b>AUT</b>	No	<i>No information currently available regarding the intention of establishing it.</i>
<b>HU</b>	No	Presently there is no plan to establish DMP.

Country	Approved DMP?	Stage of DMP preparation
<b>SLO</b>	No	<ul style="list-style-type: none"> <li>• A handbook “Pot k boljšemu upravljanju s sušo” (A Way to Better Drought Management in Slovenia, 2014) was prepared which gives a short overview of current state of drought management in Slovenia, lists few examples of good drought management practices in the world and provides suggestions for preparation of national drought management strategy.</li> <li>• Based on GWP CEE’s <i>Guidelines</i>, a country-specific handbook “Suša in vodna direktiva” (Drought and EU WFD, 2015) was prepared which gathers general information on national drought management policy for each of the steps of preparation of DMP as described in GWP’s <i>Guidelines</i>.</li> <li>• Currently, there is no on-going preparation of DMP. The two handbooks serve as a base for future preparation of national DMP.</li> </ul>
<b>CRO</b>	No	
<b>BiH</b>	No	<i>No information currently available on the stage of its preparation.</i>
<b>MNE</b>	No	
<b>SRB</b>	No	
<b>RO</b>	No	There is only a <i>Guidelines to Preparation of the DMP in the context of EU WFD</i> prepared so far, developed by GWP CEE in collaboration with WMO. It is oriented towards public bodies and authorities responsible for national planning on drought.

Additional country specifics:

**Croatia** – Drought management is partially covered in *National Irrigation Plan in the Republic of Croatia* as well as by ratification of UNCCD. Also, *The Strategy on Climate Change Adaptation of the Republic of Croatia for the period until 2040 with a view to 2070* should also contain drought management plan. A working version of the Strategy (*Green Book*) has been prepared and includes climate modelling results, analysis of climate change impacts and vulnerability for individual sectors as well as measures and activities for climate change adaptation.

**Serbia** – There is no DMP prepared yet. However, *National Risk Assessment of Natural Disasters and Other Accidents* (heavy precipitations, hail, wind storms, snow blizzards, snowdrifts and black ice, heat and cold waves, drought) is in process of preparation. Activities related to its preparation are coordinated and executed by RHMSS.

## 2.5 Laws, regulations and operating programmes regarding drought

In countries of the Danube region, missing existing national umbrella document targeting drought and drought management directly means drought issues are dealt with within several different documents addressing other environmental topics, hence covering drought only partially and insufficiently.

Country	Document title	Field	Parts of the document related to drought
CZ	<i>National Action Plan of Adaptation to Climate Change</i>	Climate change	<ul style="list-style-type: none"> <li>• An operative document through which the <i>Strategy on Adaptation to Climate Change in the Czech Republic</i> is implemented.</li> <li>• Addresses measures to mitigate consequences of agricultural drought (i.e. restrictive possibilities for certain uses of water).</li> <li>• Lists adaptation recommendations among which one addresses optimization of water infrastructure in case of extreme hydrological situations (drought included).</li> </ul>
	<i>Strategy on Adaptation to Climate Change in the Czech Republic</i>		Drought is considered one of the most significant weather events through which climate change are manifested.
	<i>Conception of protection against consequences of drought for the territory of the Czech Republic</i>	Drought management	It targets preparation of the realisation of Measures for Mitigation of Negative Consequences of Drought and Water Scarcity.
	<i>Water Act</i>	Water management	<ul style="list-style-type: none"> <li>• § 108 determines competences of the 4 ministries (in fields of agriculture, environment, traffic and defence) who share the responsibility of water resources and their assessment.</li> <li>• § 109 addresses the use of some restrictive possibilities for the limiting the abstraction of water from water resources.</li> <li>• <i>Act. Nr. 274/2001 Coll.</i> contains several articles (§ 15, § 21, § 22) which make possible for water services (i.e. water supply and sewerage systems under responsibility of Ministry of Agriculture) to introduce time-limited saving measures of drinking water. It also addresses duty for emergency supply of water for suppliers.</li> <li>• <i>Act. Nr. 240/2000 Coll.</i> on crisis management and <i>Act. Nr. 239/2000 Coll.</i> on integrated rescue systems become relevant in case severe socio-economic drought occurs.</li> </ul>
SVK	<i>Water Act</i>	Water management	Along with its implementing rules it forms the basic legislative framework addressing water.

Country	Document title	Field	Parts of the document related to drought
	<i>Concept of Revitalization of Hydromeliorative Systems in Slovakia</i>	Water management	The solution of drought issues in the agricultural sector is based on this conceptual material. The conclusions of the adopted Concept were reflected in the <i>Rural Development Programme for the period 2014-2020</i> .
	<i>Action Plan of the National Forest Programme of the Slovak Republic for 2015-2020</i>	Forestry	I.e. priority no. 4: "Mitigating Climate Impacts and Promoting Adaptation of Forests to the Climate Change".
AUT	<i>Water Act</i>	Water management	<ul style="list-style-type: none"> <li>• § 30 "Of sustainable management, in particular the protection and clean-up of waters" should contribute (inter alia) to a reduction of drought impacts,</li> <li>• § 55 (1),</li> <li>• § 55 (8),</li> <li>• § 66 (1).</li> </ul>
	<i>Flood Risk Management Plan</i>		
HU	<i>Act No LVII./1995 on water management</i>	Water management	It gives authorization to Minister of Interior to permanently order water scarcity state. In the official statement, the minister officially promulgates the beginning and the end of water scarcity period when use of water for irrigation, fish farming and rice culture is free of charge. This law defines drought as a water damage.
	<i>Act No. CLXVIII/2011 on handling weather-related and other natural risks affecting agricultural production</i>	Agriculture	This law regulates <i>Complex Agricultural Risk Management System</i> which determines how farmers can ask for a financial aid to mitigate damage due to drought or other weather-related damages.
SLO	<i>Waters Act</i>	Water management	<ul style="list-style-type: none"> <li>• It determines and regulates the management of the sea waters, inland waters and underground waters (hereinafter referred to as waters) as well as water lands and coastal lands.</li> <li>• It regulates also: <ul style="list-style-type: none"> <li>- public goods and public services in the field of water,</li> <li>- water facilities and installations,</li> <li>- other issues related to water.</li> </ul> </li> </ul>

Country	Document title	Field	Parts of the document related to drought
	<i>Resolution on the National Programme for Protection against Natural and Other Disasters 2016-2022</i>	Civil protection	<ul style="list-style-type: none"> <li>• It aims at achieving the general goal of protection against natural and other disasters.</li> <li>• The programme does not regulate permanent rehabilitation of the consequences of natural and other disasters but addresses municipalities to independently organise and maintain protection, rescue and relief in their area, assess the damage and eliminate the consequences of accidents.</li> </ul>
	<i>National Environment Protection Action Programme</i>	Environment protection	<ul style="list-style-type: none"> <li>• The main goal of the document is to have a better environment for living in Slovenia through general improvement of the environment, quality of life and the protection of natural resources.</li> <li>• It contains a set of environmental protection instruments focused on the current level of environmental degradation.</li> <li>• In <i>Resolution on National Environmental Action Plan 2005-2012</i>, the entire subsection 4.2 addresses objectives and measures related to climate change.</li> <li>• In <i>Report on the State of the Environment in Slovenia</i> [February 2017] section 14.6 acknowledges escalation of frequency and duration of drought events and their impacts.</li> <li>• In March 2017, preparation of <i>National Environmental Action Programme 2030</i> has begun.</li> </ul>
	<i>Rural Development Programme of the Republic of Slovenia 2014-2020 (RDP)</i>	Rural development	<ul style="list-style-type: none"> <li>• It focuses mainly on three priorities:               <ul style="list-style-type: none"> <li>- restoring, preserving and enhancing ecosystems related to agriculture and forestry;</li> <li>- competitiveness of agri-sector and sustainable forestry;</li> <li>- social inclusion and local development in rural areas.</li> </ul> </li> <li>• Drought-related problems are addressed in first on its priorities through aiming at improving biodiversity and status of water and soil.</li> </ul>
	<i>Plan for development of irrigation and water use for irrigation in agriculture by 2023 and Program of measures to implement the Plan</i>	Water management	<ul style="list-style-type: none"> <li>• It aims at preserving and improving the production potential and increasing the volume of agricultural land for food production.</li> <li>• Its purpose is to identify areas where irrigation of agricultural land is most meaningful and to identify key actions and activities that will enable the realization objectives of RDP.</li> </ul>

Country	Document title	Field	Parts of the document related to drought
	<i>National Meteorological, Hydrological, Oceanographical and Seismological Service Act</i>		It aims at combining all state tasks related to meteorology, hydrology, oceanography and seismology fields which were previously governed by several different national laws. It unifies them in a concept of national service. It fully replaced <i>Meteorological Activities Act</i> .
<b>CRO</b>	<i>Water Act</i>	Water management	<ul style="list-style-type: none"> <li>• In this Act it is defined which institution is responsible for water resources management including the activities related to assessment and management of drought.</li> <li>• The Ministry of Agriculture is responsible for implementing the laws, regulations and programmes related to drought.</li> </ul>
<b>BiH</b>	<i>Preliminary assessment of flood risk</i>	Water management	Public institution "Water of Srpska" is responsible for implementation of these laws, regulations: <ul style="list-style-type: none"> <li>- Preliminary assessment of flood risk good coverage water management plan.</li> <li>- Decision on rates of special water charges,</li> <li>- Decision on Amendments to the Decision on Rates of Special Water Allowances,</li> <li>- Decree on classification of waters and categorization of watercourses,</li> <li>- Decree on the manner of public participation in water management,</li> <li>- Decree on the manner, procedure and deadlines for calculating and paying and deferring payment of special water fees.</li> </ul>
	<i>Water Law</i>		
<b>MNE</b>	<i>Water Law</i>	Water management	It represents an important document in combating drought and mitigating drought impacts. Among other things, it regulates the water management which is of great importance during longer dry periods.
<b>SRB</b>	<p><u>Laws</u> related to drought events:</p> <ol style="list-style-type: none"> <li>1. The Law on Ministries,</li> <li>2. The Law on Meteorological and Hydrological Activity,</li> <li>3. The Law on Incentives for Agriculture Production and Rural Development,</li> <li>4. Law on Reconstruction Following Natural and Other Hazards,</li> <li>5. Law on Emergency Situations.</li> </ol>		

Country	Document title	Field	Parts of the document related to drought
	<p><u>Programmes</u> related to drought events:</p> <ol style="list-style-type: none"> <li>1. National Disaster Risk Management Program and the Action Plan for Implementation of the National Disaster Risk Management Program (2016-2020),</li> <li>2. National Program for Agriculture and Rural Development for 2015-2020.</li> </ol> <hr/> <p><u>Other regulations</u> related to drought events:</p> <ol style="list-style-type: none"> <li>1. Regulation on the establishment of the Program for Meteorological and Hydrological Development and Research Activities for the period 2013-2017,</li> <li>2. Rulebook on Creating, Issuing and Delivering Extraordinary Meteorological and Hydrological Information and Alerts,</li> <li>3. National Action Plan to Combat Soil Degradation and Desertification (draft),</li> <li>4. Instruction on Methodology of Risk Assessment and Protection and Rescue Plans in Emergency Situation,</li> <li>5. Regulation on the distribution of incentives in agriculture and rural development,</li> <li>6. Rulebook on the requirements, procedure and form for input subsidy on the crop, fruit crop, permanent crop, nursery and animal insurance premiums.</li> </ol>		
RO	<i>The National Strategy for Preventing and Combating Effects of Drought, Land Degradation and Desertification</i>	Land degradation and desertification	

Additional country specifics:

**Hungary** – Governmental proposal for the document *Prevention of harmful water scarcity conditions and the rules for bearing its expenses*, it has not been adopted yet. It (will) contain:

- management tasks of the water sector concerning water shortages,
- preparation for defence,
- general rules of each alert level and damage control,
- tasks in each alert level,
- measures after defence,
- regional limitation of water use.

**Serbia** – *Law on Emergency Situations* recognizes drought as a natural disaster and declares implementation of measures for protection and rescuing and sets coordination of activities aiming to eliminate or mitigate consequences resulting due to natural and other disasters.

Basic components of *National Disaster Risk Management Program and the Action Plan for Implementation of the National Disaster Risk Management Program (2016-2020)* are the identification and monitoring of risks related to extreme weather events, and improvement of early warning system.

## 2.6 Other national or regional policy documents addressing drought

Country	Document title	Field	Main points of the document
<b>CZ</b>			//
<b>SVK</b>			//
<b>AUT</b>	<i>Annual Green Reports</i>	Agriculture	Drought is addressed in it mainly with respect to crop production impacts. The “Natural disaster relief fund” allocates money to damages due to drought impacts.
<b>HU</b>	<i>1<sup>st</sup> National Climate Change Strategy (NÉS)</i>	Climate change	<ul style="list-style-type: none"> <li>• It establishes action plan between 2008-2025 and <i>National Climate Change Program for 2009-2010</i>.</li> <li>• After reconsideration process of 1<sup>st</sup> NÉS, the 2<sup>nd</sup> NÉS was prepared in 2013 but the Government has not discussed it and the Parliament has not accepted it yet.</li> </ul>
	<i>National Water Strategy (Kvassay Jenő Plan)</i>	Water management	
<b>SLO</b>	<i>Alpine Convention</i>	Environment protection	It is an international treaty among Alpine countries and the EU for sustainable development and protection of the Alps. It addresses the following topics: nature protection, mountain farming, spatial planning, mountain forests, tourism, energy, soil protection, traffic and conflict solving.
	<i>Danube River Protection Convention</i>		The Convention forms the overall legal instrument for co-operation on transboundary water management in the Danube River Basin. Its main objective is to ensure that surface waters and groundwater within the Danube River Basin are managed and used sustainably and equitably.

Country	Document title	Field	Main points of the document
	<i>EU Strategy for Danube Region</i>	Environment protection	<p>It addresses a wide range of issues, divided in 12 priority areas. In one of them, Environmental Risks, drought appears directly in its targets:</p> <ul style="list-style-type: none"> <li>- to address the challenges of water scarcity and droughts in line with Danube RBMP, Report on Droughts in the Danube Basin and the ongoing work in the field of climate adaptation,</li> <li>- provide and enhance continuous support to the implementation of the Danube Flood Risk Management Plan,</li> <li>- to continuously update the existing database of accident risk spots (ARS Inventory), contaminated sites and sites used for the storage of dangerous substances.</li> </ul>
	<i>Framework Agreement on the Sava River Basin</i>		<p>The overall objective of the agreement is to support transboundary cooperation for sustainable development of the region. One of its particular goals is undertaking of measures to prevent or limit hazards, and reduce and eliminate adverse consequences, including those from floods, ice hazards, droughts and incidents involving substances hazardous to water.</p>
<b>CRO</b>	<i>Water Management Strategy</i>	Water management	In the document, drought is recognized as one of the risks.
	<i>Disaster Risk Assessment for the Republic of Croatia</i>	Civil protection	In the document, drought is recognized as one of the risks.
<b>BiH</b>	<i>Integrated Water Management Strategy of the Republic of Srpska 2015-2024</i>	Water management	
<b>MNE</b>	<i>Montenegro Spatial Plan until 2020</i>		
	<i>National Forest Policy 2014-2023</i>	Forestry	

Country	Document title	Field	Main points of the document
SRB	<i>National Sustainable Development Strategy and Action Plan for the Implementation of the National Sustainable Development Strategy for the period 2011-2017</i>		Chapter 3.2 “Risk factors for environment” of this strategy emphasizes the necessity for implementation of the <i>Program for Improvement of the Hydrometeorological Information System</i> as well as modernization of the RHMSS meteorological observation system as one of the components of the hydrometeorological early warning system.
	<i>National Strategy for Protection and Rescuing in Emergency Situations</i>	Civil protection	<ul style="list-style-type: none"> <li>- In its Strategic Area 2 (identify, evaluate and monitor risks and improve early warning), the Strategy points out the need to strengthen the capacity for estimating the risk of natural disasters, including meteorological hazards, as well as the need to improve hydrometeorological early warning system.</li> <li>- It also defines drought and assigns the responsibilities of the RHMSS for monitoring, forecasting and early warning of drought events.</li> </ul>
	<i>Strategy of Agriculture and Rural Development for the period 2014-2020</i>	Agriculture	It considers drought in the context of climate change and states that effects on crops are well known but that awareness of the consequences and systematic multidisciplinary research are present only in highly developed countries.
	<i>Forestry Development Strategy of the Republic of Serbia</i>	Forestry	
	<i>Biodiversity Strategy of the Republic of Serbia for the period 2011 – 2018</i>		
	<i>National Strategy for Sustainable Use of Natural Goods and Resources</i>	Environment protection	
	<i>Public Health Strategy of the Republic of Serbia</i>		
RO	//		

Additional country specifics:

**Hungary** - *Irrigation Development Strategy* is in process of preparation.

## 2.7 Weaknesses and gaps of national legislation. Suggestions for improvement.

Country	Weakness of national legislation	Field addressing
	Suggestions for improvement	
CZ	- Absence of the specific part on mitigation and management of water scarcity in the existing Water Act.	Legislation
	<p><i>Activities for improvement are undergoing:</i>            The existing Water Act is under amendment by the elaboration of the chapter “Mitigation of drought and Water Scarcity”. It will focus on:</p> <ul style="list-style-type: none"> <li>- duty to prepare <i>Plans fo mitigation of droughts and water scarcity</i> and to establish the Commissions (bodies) for mitigation of droughts and water scarcity on several levels of (i.e. national commission, regional commissions, even district commissions where possibility of occurrence of drought is high);</li> <li>- list of activities and duties for actions and possible decisions of state administration;</li> <li>- methodology for preparation of the above-mentioned <i>Plans for mitiation...</i></li> </ul>	
SVK	- Absence of a complex umbrella document related to drought. - Drought management is only partly and insufficiently included in different laws or regulations. - Missing unified definition of drought.	Main document
	- Weak cooperation among relevant sectors.	Inter-institutional cooperation
	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• To improve the national legislation with definition of drought and water scarcity (in similar way as for flood) and with integration of sectorial policy into integrated system,</li> <li>• To determine parts and steps of drought management and responsibilities of involved institutions.</li> </ul>	
AUT	- Drought is not yet officially addressed in national legislation. A specific drought directive (i.e. equivalent to flood directive) is not in place. - Missing unified definition of drought.	Main document
	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• "Climate change protection officials" (Klimaschutzbeauftragter), installed on a community level to close the link to stakeholders in implementing adaptation options, could also be trained, especially in drought prone regions, addressing specific drought management tasks.</li> <li>• We suggest sector-, impact- and region-specific drought definitions which, to our opinion, form the basis for working on drought phenomena and its impacts. Furthermore, drought should be identified as risk in national legislation.</li> <li>• Awareness on drought and its impacts should be promoted. A drought-sensitive culture can develop coping capacities that could help mitigate and manage drought impacts.</li> </ul>	

Country	Weakness of national legislation	Field addressing
	Suggestions for improvement	
HU	<ul style="list-style-type: none"> <li>- National legislation is elaborated in Agricultural Risk Management System only after the drought damage occurred.</li> <li>- Prevention procedure is not elaborated except when farmers ask for irrigation water free of charge.</li> </ul>	Proactive approach
	<ul style="list-style-type: none"> <li>- No integrated approach to wholesome drought management process.</li> <li>- Currently, the Minister of Interior has control over water management. The approach is soldierly and effective in the technological and organizational side. The drought or water scarcity is a new element in existing water damage control system which requires more cooperation between ministries.</li> </ul>	Inter-institutional cooperation
	<ul style="list-style-type: none"> <li>- Missing regulation which areas are affected by drought and which region can use more irrigation water.</li> <li>- There is no law or regulation that can ask/trigger action from Minister of Interior to prevent drought. In 2017, National Chamber of Agricultural ask the Minister to promulgate water scarcity period to whole country. After this action, farmers can use irrigation water free of charge. National Chamber of Agricultural to ask for action is both advantageous as disadvantageous.</li> </ul>	Measures
	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• To improve cooperation between ministries and stakeholders to prepare efficient national legislation to wholesome drought management process.</li> </ul>	
SLO	<ul style="list-style-type: none"> <li>- The field of prevention of consequences of drought is unregulated – there has been no strategic or legal basis elaborated yet that would regulate long-term and short-term objectives, determine power of the authorities and preventive measures.</li> <li>- No drought early warning system established.</li> </ul>	Proactive approach
	<ul style="list-style-type: none"> <li>- No institution has the authority to perform any professional soil-related tasks.</li> <li>- Drought related problems are solved in a diffuse way, both in content and institutionally; non-existent interdisciplinary approach.</li> </ul>	Inter-institutional cooperation

Country	Weakness of national legislation	Field addressing
	Suggestions for improvement	
	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• To establish legal framework and measures in the field of drought and land degradation.</li> <li>• To improve national drought management strategy through a binding document for cross-sector coordination of water use, inspection control regarding water use, simplifying of bureaucratic procedures for obtaining water permits for water use and construction of irrigation systems.</li> <li>• To amend the law defining the duration of water rights (to maximum 10 years).</li> <li>• To statutory define priority of water use and monitoring of available water resources in the country, to impose provisions on which areas are suitable for agriculture or for which crop cultures.</li> </ul>	
<b>CRO</b>	- There is no national legislation directly addressing drought and drought management.	Main document
	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• To prepare a common document on drought management plan which will provide the procedure on acting during drought event.</li> </ul>	
<b>BiH</b>	- Lack of developed national drought policy and drought management strategy. - No adopted DMP.	Main document
	- Lack of adequate legislation about drought, its impacts, mitigation measures (alternatives) and its harmonization with EU member states. - There is no integrated strategic approach to finding the solutions to mitigation measures regarding the drought and its negative impacts.	Measures
	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• To be more active on all levels to adopt main documents and then regulation papers.</li> </ul>	
<b>MNE</b>	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• To initiate improvement of national legislation related to soil and land use management.</li> </ul>	
<b>SRB</b>	- Inter-institutional communication could be improved. - Weak implementation of action plans and measures.	Inter-institutional cooperation

RO	<ul style="list-style-type: none"> <li>- National legislation on mitigating the effects of drought, preventing and combating soil degradation and desertification does not cover all existing problems.</li> <li>- Specific fields of drought management require special emphasis on their improvement.</li> <li>- Other fields of current legislation that require amendments:               <ul style="list-style-type: none"> <li>o water management;</li> <li>o soil protection and property blending to adapt to market economy conditions;</li> <li>o pastures and silvicultural meadows and landscapes;</li> <li>o drought risk insurance and other natural phenomena harmful to agricultural crops.</li> </ul> </li> </ul>	Main document
	<ul style="list-style-type: none"> <li>- Legal rules often remain on paper only, not being applied in practice either by lack of resources or by failing to adapt to the concrete conditions in the territory</li> </ul>	Inter-institutional cooperation
	<ul style="list-style-type: none"> <li>- The rural areas of Romania are characterised by the insufficient or lack of basic services, i.e. water supply.</li> <li>- Population without access to the centralised water supply network is dependent on the individual wells, whose groundwater layer is decreasing during dry periods.</li> </ul>	Measures
<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• To apply measures, strategies and plans in the agricultural field but also in water management to combat drought and desertification.</li> <li>• To improve degraded lands and correction of torrential phenomena.</li> <li>• Sustainable use of the forest fund.</li> <li>• To determine methodological norms regarding zootechnics.</li> </ul>		

### 3. Drought responsibilities – national institutions involved

#### 3.1 Drought monitoring

Country	Institution involved	Role, responsibilities related to drought monitoring
CZ	Czech Hydrometeorological Institute	<ul style="list-style-type: none"> <li>- Essential body for monitoring, assessment and forecast of meteorological and climate situation.</li> <li>- Provides specific “warning information service” in cases of expected extreme events.</li> </ul>
	River Boards	<ul style="list-style-type: none"> <li>- Continuously monitor flow rates, precipitation amount, water quality etc.</li> <li>- Documents the situation on water scarcity and the state of water resources, available at <a href="http://www.voda.gov.cz">www.voda.gov.cz</a> (information integrate all data collected by River Boards and Czech hydrometeorological Institute).</li> </ul>
	CzechGlobe	<ul style="list-style-type: none"> <li>- Monitors soil moisture deficit (as indicator of agricultural drought) and collects information from local individuals on state of vegetation.</li> </ul>
SVK	SHMU	<ul style="list-style-type: none"> <li>- monitors quantitative and qualitative parameters of the state of air and water,</li> <li>- collects, processes, archives and provides data and information on the state of air and water (including water use),</li> <li>- issues meteorological and hydrological forecasts and warnings,</li> <li>- regularly publishes year-books and reports from its measurements and evaluations,</li> <li>- publishes the Meteorological Journal,</li> <li>- provides meteorological, soil and hydrological drought monitoring</li> </ul>
	Technical University of Zvolen	<ul style="list-style-type: none"> <li>- contributes to partial monitoring network.</li> </ul>
AUT	The Austrian Meteorological Service	<ul style="list-style-type: none"> <li>- informs about anomalies, precipitation deficits, and climate variability on their website.</li> </ul>
	Agricultural chamber	<ul style="list-style-type: none"> <li>- carries out drought monitoring and forecast.</li> </ul>
HU	General Directorate of Water Management (and its 12 Regional Directorates)	<ul style="list-style-type: none"> <li>- responsible for implementation of RBMP,</li> <li>- established <i>Drought and Water Scarcity Management System</i>,</li> <li>- every month, The Lower Tisza Regional Directorate (ATIVIZIG) releases an integrated water balance, drought and water scarcity assessment report.</li> </ul>

Country	Institution involved	Role, responsibilities related to drought monitoring
	OMSZ	- provides regularly drought monitoring information on their webpage connected to climate monitoring service and agrometeorological service for farmers.
<b>SLO</b>	ARSO	- provides monitoring of meteorological and hydrological variables, - analyses remote sensing of vegetation indices, - runs IRRFIB model and provides information on recommended irrigation level based on it, - provides alerting on drought occurrence, - issues 10-day hydrometeorological bulletins during drought. - hosts DMCSEE.
	Public water utilities at municipality level	- monitoring of stream discharge and water level.
	Commercial premises (i.e. power plants)	
<b>CRO</b>	DHMZ	It responsible for meteorological and (partly for) hydrological drought monitoring.
	Croatian Waters	It provides hydrological drought monitoring.
	Hrvatska elektroprivreda (HEP Group)	There is regular (monthly and annual) data exchange regarding waters among these institutions and Croatian Waters.
	Croatian Environment Agency	
	Advisory Service for Agriculture	It provides recommendations to farmers on agrotechnical measures for plant protection from potential drought damages.
<b>BiH</b>	RHMZ RS	- Publishes daily meteorological bulletins (overview of current and 3-day forecast of meteo conditions) and hydrological bulletins (overview of water level data). - In emergency cases, earthquakes, floods and extreme weather events, special-issue newsletters are published. Their frequency depends on the intensity of the phenomenon or the degree of danger to people and material goods. - Regular 7-day, 10-day and monthly climatological and agrometeorological reports are prepared, which are printed in the final annual report with all other reports from the scope of work of the Institute.

Country	Institution involved	Role, responsibilities related to drought monitoring
<b>MNE</b>	Ministry of Agriculture and Rural Development	Its Directorate for Agriculture and Fisheries, Directorate for Water Management, Directorate for Forestry are involved in drought management.
	IHMS	It is responsible for monitoring and assessing drought, early warning.
	Biotechnical Faculty	
	Local administration	
<b>SRB</b>	RHMSS	<ul style="list-style-type: none"> <li>- performs professional and state administration activities related to systematic meteorological, climatological and hydrological measurements and observations,</li> <li>- provides monitoring, research, analysis and forecasting of weather, climate and water,</li> <li>- provides early warning and alerting on the occurrence of extreme meteorological, climate and hydrological events;</li> <li>- fulfilment of international commitments in the field of meteorology and hydrology;</li> <li>- provides multidisciplinary research of climate impacts, risk and vulnerability, and climate change adaptation options in certain economic sectors.</li> </ul>
<b>RO</b>	NMA	It is one of the three institutions that collaborate with the Technical Secretariat of the National Committee to Combat Drought.
	The National Institute of Research and Development for Environmental Protection	Implements activities in the fields of research, technological development, technical assistance/consulting, training, technological transfer, information and documentation services in the field of agriculture and the environment.
	National Institute of Hydrology and Water Management	
	National Agency for Environmental Protection	<ul style="list-style-type: none"> <li>- provides monitoring environmental factors,</li> <li>- reports to the European Environment Agency on the following areas: air quality, climate change, protected areas, soil contamination, water.</li> </ul>

### 3.2 Drought management

Country	Institution involved	Role, responsibilities related to drought management
CZ	Czech Hydrometeorological Institute	- essential role in drought assessment and forecast.
	River Boards	- manage existing water resources, namely operate the water volumes accumulated in dam reservoirs.
	Several research institutions	<p>Following institutions focus primarily on the prediction of climate change consequences on the environment, water resources, economical situation and life conditions of the inhabitants:</p> <ul style="list-style-type: none"> <li>• Global Change Research Institute – Czech Academy of Sciences (Czech Globe)</li> <li>• Water Research Institute of T. G. Masaryk, p. r. i., (=public research institution)</li> <li>• Research institute of Melioration and soil protection, p. r. i.,</li> <li>• Czech Agricultural University, Prague (several faculties)</li> <li>• Mendel University, Brno (several faculties)</li> <li>• Institute for Hydraulics, Czech Academy of Sciences, p. r. i.</li> <li>• Czech Technical University, Prague</li> <li>• Technical University, Brno.</li> <li>• South Bohemia University, České Budějovice</li> <li>• Mining University, Ostrava (several faculties)</li> <li>• University of Chemical Technology, Prague</li> <li>• Charles University, Prague (several faculties)</li> <li>• Masaryk University, Brno</li> <li>• Institute for Climate Research, Czech Academy of Sciences, p. r. i.</li> </ul> <p>Their results are used for formulation of appropriate strategies and for proposals of relevant measures/actions to efficiently decrease negative consequences of drought periods.</p>
SVK	SHMU	<ul style="list-style-type: none"> <li>- governance of the state hydrological monitoring network and the state meteorological network,</li> <li>- management of the database for water use and collection of the obligatory notified water use,</li> <li>- cooperation on the creation of water plans.</li> </ul>
	Water Management Resource Institute (WRI)	It coordinates the creation of Water plans.
	Slovak Water Management Enterprise	Implements water management measures on water courses.
	Water companies	Their role is to serve with regional water distribution to inhabitants.

Country	Institution involved	Role, responsibilities related to drought management
	Ministry of Transport	Provides information on waterways constrains due to drought.
	Ministry of Agriculture and Rural Development	It manages drought issues in agriculture sector, based on “Concept of revitalizing of hydromeliorative systems in Slovakia”, concretely in Measure No. 4.1 (support for investment in agricultural holdings, section: irrigation), and Measure No. 5.1 (support for investments in preventive measures for reduction of consequences of natural disasters, dangerous weather events and catastrophic events).
	Hydromeliorácie, State Enterprise	It manages irrigation technical service units, drainage pumping stations and channels once part of drainage structures.
<b>AUT</b>	BMLFUW	- develops drought policy, - implements measures to drought management in all sectors.
	EAA	It develops, reports, and implements measures and policy regulations with respect to droughts
	Austrian Ministry of Finance	It is responsible for supplying the “national disaster relief fund” in case of drought events (along with BMLFUW).
	Austrian Meteorological Service	It is responsible for warning, forecasting and pastcasting.
	Agricultural Chamber	It has an extension service and provides advice to farmers.
	Austrian Hail Insurance	It insures also damages caused by drought.
<b>HU</b>	The Hungarian State Treasury	They participate in Complex Agricultural Risk Management System.
	NÉBIH	
	National Chamber of Agricultural	
	General Directorate of Water management	It implements measures related to floods and other water damages.
<b>SLO</b>	ARSO	- it implements activities related to water management, - issues water permits; regulates water permits during drought event.

Country	Institution involved	Role, responsibilities related to drought management
	Ministry of the Environment and Spatial Planning	<ul style="list-style-type: none"> <li>- implements operational plans in relation to water management,</li> <li>- carries out communication on water level status with neighbour countries</li> </ul>
	Ministry of Agriculture, Forestry and Food	
	Public water utilities at municipality level	Implements measures related to water efficiency, water quality management and temporary reductions.
	Chamber of Agriculture and Forestry of Slovenia	Provides technical instructions to ensure water supply and instructions during drought event.
	URSZR	<ul style="list-style-type: none"> <li>- coordinates assessment of environmental impact based on monitoring,</li> <li>- coordinates drought damage financial aid procedure in line with decision on the use of the funds.</li> </ul>
<b>CRO</b>	Croatian Waters	It is responsible for water resources management (art. 185. Water Act), including the activities related to the assessment and management of droughts (art. 186. (3) Water Act).
	State Directorate on Rescue and Protection	It is responsible for supplying water on terrain in case of drought. Standard operative procedure is applied and using national 112 system.
	Advisory service for agriculture	It provides farmers with necessary advice.
<b>BiH</b>	Ministry of Agriculture, Forestry and Water Management Republic of Srpska	<ul style="list-style-type: none"> <li>- involved in drought management through legislation,</li> <li>- prepares reports and carries out activities prior to and after drought,</li> <li>- sets measures on short and long time scale.</li> </ul>
	Water of Srpska	
	RHMZ RS	
<b>MNE</b>	Ministry of Agriculture and Rural Development	
	IHMS	It provides drought monitoring and assessment.

Country	Institution involved	Role, responsibilities related to drought management
	Directorate for Emergency and Civil Protection	It takes specific measures in drought management.
	Institute of Public Health	It informs and advises the public on health conditions.
	Local fire service	
	Local administration	Provides information on drought impact.
<b>SRB</b>	The Ministry of Interior	<ul style="list-style-type: none"> <li>- leads the National Emergency Management Headquarters,</li> <li>- in charge of protection and rescue management activities,</li> <li>- in charge of mainstreaming of DRR policy in the country.</li> </ul>
	The Sector for Emergency Management	<ul style="list-style-type: none"> <li>- directly under the Minister of Interior,</li> <li>- its five directorates are responsible for civil protection, prevention, risk management, fire and rescue, as well as the National Training Center (NTC),</li> <li>- in charge of coordination of the activities of all relevant government institutions with regard to emergency and disaster management (as in line with the <i>Law on Emergencies</i>).</li> </ul>
<b>RO</b>	The Ministry of Agriculture and Rural Development	<ul style="list-style-type: none"> <li>- is the main body at national level responsible for development and implementation of policies on mitigating drought effects, preventing and combating land degradation and desertification and land degradation processes,</li> <li>- coordinates interdisciplinary National Committee to Combat Drought, Land Degradation and Desertification,</li> <li>- its main areas of competence, relevant to drought strategy, are:               <ul style="list-style-type: none"> <li>• sustainable use of soil resources (agriculture, viticulture, fruit, forestry),</li> <li>• rural, agricultural land register,</li> <li>• land reclamation.</li> </ul> </li> </ul>
	National Committee to Combat Drought, Land Degradation and Desertification	<ul style="list-style-type: none"> <li>- is a consultative body,</li> <li>- assists the Romanian Government on taking decisions on drought, land degradation and desertification issues.</li> </ul>
	Ministry of the Environment	
	Ministry of Waters and Forests	<ul style="list-style-type: none"> <li>- functions as a specialized body of the central public administration, with legal personality, subordinated to the Government,</li> </ul>

Country	Institution involved	Role, responsibilities related to drought management
		- Among other fields it operates also in strategic planning, water management and protection, conservation and restoration of natural capital in water and forests.
	National Administration "Romanian Waters" (ANAR)	It applies the national strategy and policy in the field of quantitative and qualitative management of water resources in order to ensure sustainable development, prevent the destructive effects of water, ecological reconstruction of watercourses, ensuring the hydrological and hydrogeological surveillance, implementing the provisions of the legislation harmonized with the EU Directives
	Agency for Rural Investment Financing	
	National Agency for Environmental Protection	- carries out strategic environmental planning, - manages authorization of activities with environmental impact, - implements environmental legislation and policies at national and local level.

### 3.3 Institutional interactions

Country	Interaction path	Activities implemented
CZ	River Boards → Czech Hydrometeorological Institution	<ul style="list-style-type: none"> <li>Exchange of data in order to integrate them into common information on current situation and forecast (usual protocol).</li> </ul>
	Czech Hydrometeorological Institution → neighbour countries	<ul style="list-style-type: none"> <li>Integrated information on current situation and forecast is provided in 6 languages on <a href="http://www.voda.gov.cz">www.voda.gov.cz</a> also for all neighbour countries where water from Czech territory outflows to.</li> </ul>
	State water management authority and municipality (for given watershed) ↓ River Boards ↓ Water services	<ul style="list-style-type: none"> <li>After State water management authority makes decision in case of necessity/needs (i.e. drought beyond average situation), River Boards change the operations from the usual protocol.</li> <li>Operation of water services follow the situation.</li> <li>On the base of decision of State water management authority and respective municipality, suppliers have to introduce restrictions for water uses.</li> <li>In case of water shortages, suppliers have to start emergency supply of drinking water for respective agglomeration.</li> </ul>

Country	Interaction path	Activities implemented
<b>SVK</b>	<p style="text-align: center;">SHMU ↓ forest management, water management; fire brigade ↓ town and village authorities</p>	<ul style="list-style-type: none"> <li>• Based on maps of forest fire risk prepared by SHMU, regional fire brigade would declare "Time of increased fire risk" if forest fire risk index is reaching level 4 (risk level: high).</li> <li>• In that time, town and village authorities may issue a generally binding regulation to limit the use of drinking water on the basis of a water company's measure.</li> </ul>
<b>AUT</b>	Interactions occur mainly sector-specific through all institutions, based on defined responsibilities (see Section 3.2).	
<b>HU</b>	//	
<b>SLO</b>	<p style="text-align: center;">Ministry of the Environment and Spatial Planning; Ministry of Agriculture, Forestry and Food; Slovenian Water Agency ↓ River controllers; fire brigades</p>	<ul style="list-style-type: none"> <li>- Both Ministries along with Slovenian Water Agency call for implementation of measures in the event of water shortage in water supply systems and the measures in the event of water shortage in the watercourse.</li> <li>- Slovenian Water Agency activates river controllers to verify any unauthorized water abstraction from watercourses.</li> </ul>
<b>CRO</b>	<p style="text-align: center;">Advisory service ↓ farmers</p>	Regarding agricultural drought, the Advisory service provides farmers with relevant information on drought status and gives suggestions for protection.
	<p style="text-align: center;">Ministry of Finance; Ministry of Agriculture ↓ State/County/City/Municipality Commissions for Assessment of Damages from Natural Disasters</p>	<ul style="list-style-type: none"> <li>• After drought event, Ministry of Finance is responsible for estimation of drought damage.</li> <li>• Ministry of Agriculture confirms the damage due to drought.</li> <li>• The procedure on damage estimation is organized and performed by the State/County/City/Municipality Commissions for Assessment of Damages from Natural Disasters.</li> </ul>
<b>BiH</b>	<p style="text-align: center;">RHMZ RS ↓ Ministry of Agriculture, Forestry and Water Management Republic of Srpska; stakeholders.</p>	RHMZ RS provides the Ministry with information on drought and issues report and bulletins on drought development to stakeholders through media.

Country	Interaction path	Activities implemented
	Ministry of Agriculture, Forestry and Water Management ↓ Government of Republic of Srpska	<ul style="list-style-type: none"> <li>• The Ministry informs the Government of drought development after which the measures are taken. Ministry also provide data on drought damage.</li> <li>• Forestry department of the Ministry covers wild fires documentations.</li> </ul>
<b>MNE</b>	<i>No official scheme of institutional interactions and legal framework with mandate fraction.</i>	
<b>SRB</b>	//	
<b>RO</b>	Government Decision 897/2012 regarding the scheme of minimis aid for compensating the effect of the drought phenomenon in the agricultural year 2011-2012 on agricultural crops granted in agriculture, in the vegetal sector.	

### 3.4 Communication on drought before, during, after drought event

Czech Republic		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>• Close cooperation between Czech Hydrometeorological Institute and River Boards on data exchange.</li> <li>• Regular cooperation between River Boards and State water management authority on water management at all levels (governmental, regional, district)</li> <li>• Information given to providers of water services (mostly private drinking water suppliers) in case of specific conditions of drought development.</li> <li>• Through State water management authority or River Boards, municipalities can be specifically informed in case of expected problems of water shortages. Also Fire Brigades are informed on water scarcity and on limited availability of water resources.</li> <li>• Standard communication also at level of ministries: Ministry of Agriculture, Ministry of the Environment and Ministry of Traffic (for waterways situation).</li> <li>• In case of agricultural drought, equally strong link exists between Ministry of Agriculture and agricultural organisations, other stakeholders and Global Research Institute.</li> </ul>
	To public	Czech Hydrometeorological Institute regularly publishes and distributes data on main characteristics of the climate on internet and dissemination channels (newspapers, TV news, wireless programmes).

<b>During drought</b>	Inter-institutional	<i>Same as above except more frequent.</i>
	To public	<ul style="list-style-type: none"> <li>• General information on current state are available on usual dissemination channels (TV news, newspapers, online).</li> <li>• Specific information on restriction of drinking water use and/or necessity of emergency supply is distributed to public by municipalities and by drinking water suppliers at local and regional level.</li> <li>• Farmers obtain information on restriction of irrigation from State water management authority and, in more detail, from River Boards.</li> </ul>
<b>After drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>• The ministries (in field of agriculture, environment, traffic and other sectors such as economy) evaluate damages caused by drought.</li> <li>• Afterwards it can be decided on possibility of subsidies for the losses.</li> <li>• Appropriate methodology for drought damage in agriculture is developed by Global Change Research institute in collaboration with other bodies; Ministry of Agriculture has applied it for compensations of drought damages in 2014, 2015, 2017.</li> </ul>
	To public	<ul style="list-style-type: none"> <li>• Farmers are informed by Ministry of Agriculture and Agriculture Chambers about the inventory of drought damages, and is done with help of InterSucho application.</li> <li>• The public from areas where emergency supply of water was introduced are informed that restriction has now stopped.</li> <li>• Those municipalities then have to start activities for improvement of drinking water resources by connecting to the network with water resources of higher capacity. These activities are supported by subsidies provided by ministries of agriculture and of the environment.</li> </ul>

<b>Slovakia</b>		
Additional information		
There are no legislation-based responsibility of communication between institutions. Communication of SHMU with other institutions and providing them information is governed by Act no. 201/2009 (On State Hydrological Service and State Meteorological Service).		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	SHMU daily updates maps of forest fire risk, further used by fire brigade.
	To public	<ul style="list-style-type: none"> <li>• SHMU provides information on meteorological, soil and hydrological drought, freely available at SHMU's official website.</li> <li>• SHMU occasionally prepares reports on actual drought intensity and possible impacts.</li> </ul>
<b>During drought</b>	Inter-institutional	<i>Same as before drought</i>
	To public	<i>Same as before drought</i>

<b>After drought</b>	Inter-institutional	
	To public	SHMU has occasionally prepared reports on drought periods since drought monitoring was launched in 2015. They are published on SHMU official website as well as on SHMU Facebook account.

<b>Austria</b>		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	<i>Currently, no information is available.</i>
	To public	<ul style="list-style-type: none"> <li>• Austrian Meteorological Service is responsible for warning, forecasting and pastcasting.</li> <li>• The Agricultural Chamber has an extension service and advises farmers.</li> <li>• The Austrian Hail Insurance insures damages to drought impacts, next to damages due to hail (in that case, The Austrian Ministry of Finance and BMLFUW are responsible for supplying the “national disaster relief fund”)</li> <li>• Union of farmers provides actual information on their webpage and via a print journal.</li> <li>• Agricultural Chamber and Federal Districts Water Management Agencies are informing the public.</li> </ul>
<b>During drought</b>	Inter-institutional	<i>No information is currently available.</i>
	To public	According to the forestry branch of the BMLFUW, no communication takes place. There are prohibition guidelines for avoiding forest fires for tourists, hikers, and mountain bikers.
<b>After drought</b>	Inter-institutional	The BMLFUW and the Federal Ministry of Finance collaborate with respect to the disbursements of funds due to drought impact damages.
	To public	The Austrian Hail Insurance informs the public via press releases. Related to data from the Austrian Meteorological Service, drought monitoring takes place.

Hungary		
Additional information		
There is no direct contact between involved institutions before and during drought.		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	//
	To public	<ul style="list-style-type: none"> <li>The public is informed about drought warning from daily news. First news about drought impacts come from farmers. There is a monthly publication from authorities which verify it with data.</li> <li>The main communication channel is internet where drought monitoring on daily or monthly scale operates from OMSZ or from any water directorate.</li> </ul>
<b>During drought</b>	Inter-institutional	//
	To public	The main communication channel is internet and news agencies.
<b>After drought</b>	Inter-institutional	After OMSZ verifies the drought event has occurred, the official online process in the Complex Agricultural Risk Management System begins where farmers ask for financial compensation due to drought.
	To public	Some article or scientific publication might be prepared by researchers to describe the experienced long dry period and the impacts.

Slovenia		
Additional information		
There is no existing legislative scheme or protocol on inter-institutional communication.		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	Communication takes place at the level of Ministry of the Environment and Spatial Planning, ARSO, Slovenian Water Agency and Ministry of Agriculture, Forestry and Food along with municipalities and drinking water suppliers.
	To public	ARSO informs public on quantity of water in streams and about groundwater level (monitoring data). The information is published on the ARSO's website.

<b>During drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>- In case of drought event, civil protection services are activated. Communication takes places between ARSO and Slovenian Water Agency begins.</li> <li>- URSZR is informed and included to take action.</li> <li>- When the drought is recognized and confirmed, the inventory of damage due to drought begins. Forms are collected by municipalities.</li> </ul>
	To public	<ul style="list-style-type: none"> <li>- ARSO informs the public about the occurrence of drought.</li> <li>- Municipalities and drinking water suppliers inform public that the measure of water use restriction is going on.</li> <li>- Agricultural Advisory Service and municipalities inform farmers about the collection of data on drought damage.</li> </ul>
<b>After drought</b>	Inter-institutional	URSZR provides information about the damage caused by the drought to the Ministry of the Environment and Spatial Planning.
	To public	<ul style="list-style-type: none"> <li>- Municipalities inform farmers for an inventory of the damage caused by drought.</li> <li>- Municipalities and drinking water suppliers inform public that the measure of water use restriction no longer applies.</li> </ul>

<b>Croatia</b>		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>• DHMZ provides weather forecast.</li> <li>• Ministry for Agriculture, Croatian Waters, Advisory Service for agriculture and State Directorate on Rescue and Protection are responsible for preparing all needed measures and prevention steps to act in case of drought in Croatia.</li> <li>• HEP Group communicates with DHMZ and Croatian Waters regarding drought monitoring.</li> </ul>
	To public	<ul style="list-style-type: none"> <li>• Monthly bulletins on current state of precipitation and hydrological conditions are published online by DHMZ and sectoral institutions (Croatian Waters, HEP Group).</li> <li>• Agrometeorologists provide agrometeorological forecast on TV and other media services, providing explanation on drought developing and giving advices.</li> <li>• Advisory Service for agriculture has their branch offices in each municipality and their employees give advice to farmers on necessary actions due to drought conditions.</li> </ul>
<b>During drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>• DHMZ provides weather forecast to other sectoral institutions (State Directorate on Rescue and Protection, Croatian Waters, HEP Group).</li> <li>• Ministry of Agriculture and Ministry of Finance evaluate the damages in agriculture due to drought.</li> </ul>

	To public	<ul style="list-style-type: none"> <li>• DHMZ publishes online drought monitoring data (categorizing the intensity of drought), water levels, streamflow, air temperature and soil temperature. It is also responsible for providing weather forecast.</li> <li>• Croatian Waters provide online data on water levels and water flows.</li> <li>• During extremely dry conditions, media services provide lots of information on drought situation in affected regions.</li> </ul>
<b>After drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>• DHMZ provides climatological analysis on drought.</li> <li>• Ministry of Agriculture and Ministry of Finance evaluate yield and economic losses due to drought, respectively, and decide if the natural disaster will be proclaimed.</li> <li>• HEP Group prepares reports on the lack of electricity power production due to drought.</li> </ul>
	To public	The farmers ask their municipality Commissions for Assessment of Damages from Natural Disasters to undertake the necessary steps for proclaiming a disaster due to drought.

<b>Bosnia and Herzegovina</b>		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>• The Ministry of Agriculture, through expert advisory units, carries out education, provides information on necessary agri-environmental measures, plans the production and all other advisory activities. This also includes financial aid to farmers through subsidies to seed, fuel etc.</li> <li>• Farmers' Associations holds seminars and meetings with participation of experts from the ministry, the faculty and the agricultural institute. Through which shortcomings, the need for better sowing and harvest, and also about protection measures are expressed.</li> </ul>
	To public	The Ministry of Agriculture makes statements about the state of drought and measures being implemented with the recommendations.
<b>During drought</b>	Inter-institutional	<i>Same way as before drought except more frequently.</i> More frequent are also forecasts for upcoming days and for a longer period of time, the analysis of drought state conditions, and measures undertaken by advisory services of the ministries and farmers' associations.
	To public	<i>Same way as before drought except more frequently.</i>
<b>After drought</b>	Inter-institutional	//
	To public	<i>Same way as before drought except more frequently.</i>

<b>Montenegro</b>		
Additional information		
There is no official communication interactions before or during drought between involved institutions. Lack of response from involved institutions is evident except in case of extreme drought and forest fire when institutions relevant to take measures and advice are more active and interested.		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	//
	To public	There is no communication on drought to public as drought early warning does not exist.
<b>During drought</b>	Inter-institutional	In emergency case, IHMS provides information on drought conditions. Potentially involved: IHMS, Directorate of Emergency and Civil Protection, Directorates in the Ministry of Agriculture and Rural Development, Institute of Public Health. Communication between mentioned institutions are based on IHMS forecast and drought analysis.
	To public	It is carried out through newspapers, media and public round table.
<b>After drought</b>	Inter-institutional	It is mostly based on the requests for meteorological data (mainly information on precipitation and its analysis over the past).
	To public	Which institutions are responsible for communication to public depends on type of drought consequences.

<b>Serbia</b>		
Additional information		
RHMS regularly issues information, analyses and forecasts on the state of weather, climate and water, as well as special issues of meteorological and hydrological information, warnings and alerts in the period before, during and immediately after the end of meteorological and hydrological hazards, including drought.		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	RHMS carries out operational Hydrometeorological Early Warning System, issues warnings and alerts if needed and disseminates meteorological warnings to relevant institutions (in the field of environmental protection, agriculture, water management and forestry).
	To public	Warnings on drought are published in 7-day, 10-day and monthly bulletins on RHMS web-page and delivered to the media.
<b>During drought</b>	Inter-institutional	RHMS bulletins are disseminated to the authorities, interested organizations, research institutions and the media.
	To public	

<b>After drought</b>	Inter-institutional	Chamber of Commerce and Industry of Serbia, and The Institute of Agricultural Economics issue reports after each drought event with description of impacts and losses in agricultural sector. The reports after drought event on the local level are issued by Local Self-Governments.
	To public	If drought is declared as natural disaster, a local self-government unit invites the citizens to report the damage sustained.

<b>Romania</b>		
Additional information		
The inter-institutional communication path mostly goes in a way of NMA → Ministry of Agriculture and Rural Development → County Agricultural Directorates. Communication also takes place locally, regionally or nationally, depending on the intensity of the drought and the affected area.		
Timing	Level	Drought communication activities
<b>Before drought</b>	Inter-institutional	Every agricultural year, County Agricultural Directorates and Community Council receives recommendations for farmers from the Ministry of Agriculture and Rural Development.
	To public	<ul style="list-style-type: none"> <li>• NMA carries out early warning system. Before drought event, people can be warned through the media or the internet to take certain measures and to be aware of the danger they will expose.</li> <li>• County Agricultural Directorates and Community Council provides farmers with recommendations received, included into a protocol named Recommended measures to mitigate the effects of drought.</li> </ul>
<b>During drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>• Depending on the severity of the drought, the bulletin released by NMA is provided to the Ministry of Agriculture and Rural Development who informs the County Agricultural Directorates about the appearance of drought and make recommendations.</li> <li>• The Ministry of Water and Forests informs the General Inspectorate for Emergency Situations in case of the hydrological drought.</li> <li>• At community level, a Mayor MANUAL of Emergency Management in case of floods and hydrological drought exists and specifies measures in case of hydrological drought.</li> </ul>
	To public	<ul style="list-style-type: none"> <li>• The County Agricultural Directorates announces local councils and farmers when agricultural crops are affected.</li> <li>• The Ministry of Agriculture and Rural Development informs the County Agricultural Directorates about the appearance of drought and makes recommendations (a set of measures that should be applied to limit the effects of drought) for farmers at county level each time the drought situation it is updated with new information received from NMA.</li> </ul>

<b>After drought</b>	Inter-institutional	<ul style="list-style-type: none"> <li>• The Ministry of Agriculture and Rural Development demand that the County Agricultural Directorates investigate the surfaces affected by the drought phenomena.</li> <li>• Based on reports of all County Agricultural Directorates, the Ministry of Agriculture and Rural Development makes a national evaluation of agricultural fields affected by drought and informs the Government about the current situation of drought in agriculture at national level.</li> <li>• The Government along with the Ministry of Agriculture and Rural Development establishes the opportunities of interventions with financial compensation.</li> <li>• Several documents related to good practices in agriculture and improving adaptation options for farmers are elaborated by competent institutions.</li> </ul>
	To public	<ul style="list-style-type: none"> <li>• The Ministry of Agriculture and Rural Development releases to the general and specialised media the evaluation of drought at national level, along with the measures applied regarding this situation.</li> <li>• The media has an important role in publishing articles in specialized magazines or broadcasting interviews to inform the public about the current state.</li> </ul>

### 3.5 Procedures undertaken during specific drought events

Country	Specific drought event characteristics (duration, impact)
	Institutional activities carried out during the drought event
<b>CZ</b>	//
	<ul style="list-style-type: none"> <li>• Not much experience with severe droughts up to recent years (2014).</li> <li>• There are general procedures which can be used for implementation of limits of water abstraction from water resources under stress due to water scarcity.</li> <li>• Duty for drinking water suppliers (Act on Water Supply and Sewerage Systems, Nr. 274/2001 Coll.) obliges them to ensure availability of drinking water to inhabitants using the transfer from the drinking water resource that is involved in the emergency plan for the respective agglomeration. The agglomerations with limited capacity of drinking water resources can apply for subsidies for connection of the system with the sufficient water resource.</li> </ul>
<b>SVK</b>	<p>Drought event 2017:</p> <ul style="list-style-type: none"> <li>- winter drought from mid-December 2016 till February 2017 over most of Slovakia, in W Slovakia in continued also from late spring till the end of summer,</li> <li>- resulting in 20-30% yield losses and hydrological drought in W Slovakia in August.</li> </ul>

Country	Specific drought event characteristics (duration, impact) Institutional activities carried out during the drought event
	<ul style="list-style-type: none"> <li>• SHMU performed drought monitoring and informed general public about drought development.</li> <li>• No steps were undertaken at national level as there is no action mechanism based on these information. Decisions were up to private persons or companies.</li> <li>• Some municipalities in W Slovakia issued generally binding regulations to limit the use of drinking water for gardening, washing cars and some other activities to ensure enough drinking water for public.</li> <li>• The only legal framework (described in previous section) was applied during this period.</li> </ul>
<b>AUT</b>	<i>Particular procedures undertaken during a specific drought event could not be identified as up to now, Austria has not provided a separate National Action Plan.</i>
<b>HU</b>	<p style="text-align: center;">//</p> <p>Currently, there are two possible procedures undertaken during drought events:</p> <ol style="list-style-type: none"> <li>1. The Minister of Interior as leader of Hungarian Water Management officially promulgates (through official statement) the beginning and the end of water scarcity period when water is used free of charge for irrigation, fish farming and rice culture. In 2017, the National Chamber of Agricultural asked the Minister of Interior to promulgate state of the permanent water scarcity period to secure food production safety of Hungary.</li> <li>2. When damage due to weather occurs (i.e. drought) farmers can ask for compensation aid from Complex Agricultural Risk Management System if they participate in the system. One of them is if farmer’s cultivated area is big or is under insurance. Farmers can control online whether defined drought event occurred in their county or own area. If yes, they can declare it online and the control authority gives a certification about it. Later, after harvest, they can ask for financial support to mitigate damage or reduce losses due to drought.</li> </ol>
<b>SLO</b>	<p>Drought event 2017:</p> <ul style="list-style-type: none"> <li>- spring drought between February and late April across the country except for its NW part. It paused over May but intensified during summer months (June to late August).</li> <li>- characterized by 4 intense heat waves and only 40-50% of average precipitation which also came only as local thunderstorms in between the heat waves.</li> <li>- resulted in reduced crops yield, hydrological drought in August. Damage costs estimated to 120 mio EUR.</li> </ul>

Country	Specific drought event characteristics (duration, impact) Institutional activities carried out during the drought event
	<ul style="list-style-type: none"> <li>• First warning to farmers was sent in March when Chamber of Agriculture and Forestry issued <i>Technology Recommendations To Mitigate The Consequences Of Spring Drought</i>.</li> <li>• In July, URSZR, Agricultural Advisory Service and municipalities informed farmers about the collection of data on drought damage: on the basis of the preliminary assessment of the damage in current agricultural production, recognized crops and the criteria of the Regional Commission, the collection of damage claims had begun for farmers who have suffered damage due to the effects of the drought of 2017 in the affected areas of cadastral municipalities and the most affected crops, (corn, oil pumpkin, late potato ...).</li> <li>• In August, OKP Rogaška Slatina d.o.o. informed consumers of drinking water that, owing to the increased lack of drinking water in the wider area of the municipalities of UE Šmarje pri Jelšah, which is a result of a long drought period, it is absolutely necessary to save drinking water in all areas that are supplied by drinking water through a public company: Rogaška Slatina, Rogatec, Šmarje pri Jelšah, Podčetrtek, Kozje, Bistrica ob Sotli, Poljčane and Slovenska Bistrica -KS Laporje).</li> </ul>
<b>CRO</b>	<p>Drought event 2011/12:</p> <ul style="list-style-type: none"> <li>- started in February 2011 with no wet month till the end of the year, extremely dry were also November 2011, March 2012 and August 2012,</li> <li>- resulted in majority of crops destroyed and yield reduces, minimum river levels recorded and 140 mil EU of economic losses.</li> </ul> <p>In practice, depending on drought influence, regions managed drought in a different way:</p> <ul style="list-style-type: none"> <li>• Istria County Prefect reached a decision establishing level 1 water-saving measures throughout the County in the period 23 July – 24 September 2012.</li> <li>• In Zadar County, the ship water carrier constantly supplied islands with water during winter drought.</li> <li>• Many Counties announced measures on drought protection: e.g. streets cleaning and sealing the football or similar terrains were prohibited.</li> <li>• During summer 2012, tap water had to be paid in touristic objects on the islands. In the continental regions it was recommended to save the usage of water.</li> <li>• At the Adriatic islands the headquarters for natural disasters were organized. The actions for fish stock protections were undertaken.</li> <li>• In Slavonia, the local fire brigades supplied households with water.</li> <li>• due to unfavourable hydrological conditions in 2011 and 2012, hydroelectric power plants produced less electricity power than it was planned; thus more electricity was imported.</li> </ul>
<b>BiH</b>	<p>Drought event 2017:</p> <ul style="list-style-type: none"> <li>- several heat waves from early June till late August,</li> <li>- no rain for almost two months in S Bosnia and Herzegovina,</li> <li>- occasional precipitation came as local thunderstorms (surface runoff)</li> <li>- resulted in forest fires, general drying of all vegetation, reduced crops yield for 30-90%.</li> </ul>

Country	Specific drought event characteristics (duration, impact)
	Institutional activities carried out during the drought event
	<ul style="list-style-type: none"> <li>• No early warning system existing but RHMZRS was alerting on drought through bulletins and information firstly to the Ministry, and also the media.</li> <li>• The ministries have transmitted this information through their advisory services and bodies to different groups of users: farmers, fruit growers, etc.</li> <li>• Ministries also communicated at all levels to find best measures against drought. About the Global Solution and Assistance to Damage Rehabilitation, The Ministry went to the Government of the Republic of Srpska.</li> </ul>
<b>MNE</b>	Drought event 2011/12: <ul style="list-style-type: none"> <li>- socioeconomic extent of drought across the entire country,</li> <li>- lowest water levels of the record in November and December 201,</li> <li>- resulted in reduced yield of 30-60%, forest fires affecting 7% of country's territory, milk production ranked second worst of the record, heavily affected livestock breeding and human deaths reported during forest fires period.</li> </ul>
	Agriculture Union of Montenegro sought urgent measures such as: <ul style="list-style-type: none"> <li>• subsidies for the import of cattle food necessary for production of milk,</li> <li>• addressing Government with strong need for support for milk production.</li> </ul>
<b>SRB</b>	Drought event 2012: <ul style="list-style-type: none"> <li>- started in mid-June in W Serbia, covered entire country by the end of July and lasted till mid-October,</li> <li>- only 25-50% of average precipitation over summer months, several long-lasting heat waves and new record of number of tropical days and nights,</li> <li>- resulting in heavily reduced yield, 6000 forest and open-air fires.</li> </ul>
	RHMSS drought early warning system issued warning and informed all relevant national institutions.
<b>RO</b>	//

Country	Specific drought event characteristics (duration, impact)
	Institutional activities carried out during the drought event
	<p>Main stages of activities during drought event are the following:</p> <ul style="list-style-type: none"> <li>• Before drought event occurs, a warning is given about the possibility of pedological drought, informing the local communities;</li> <li>• Then president of County Committees for Emergency Situations (CJSU) is informed about the situation and convenes CJSU extraordinary meeting (if the situation requires so);</li> <li>• Operational situation and implementation of the plan of measures in case of pedological drought is analysed;</li> <li>• Public at the specific area is warned on imminence of pedological drought (if the situation requires so);</li> <li>• Cooperation between the alarm cell leaders involved in the operational response: setting up and maintaining pumping stations to provide water for irrigation, monitoring the evolution of emergency situations;</li> <li>• Operative reports are transmitted by the alarm cells at the event site and Local Committees for Emergency Situations (CLSU).</li> <li>• Transmission to CLSU the data subject to public disclosure and warning people about other types of risk which may occur as a result of the drought;</li> <li>• Maintaining cooperation with CLSU as well as between all CJSU components with attributions in the management of this risk;</li> <li>• Centralizing data and periodically informing the president of CJSU and the Ministry of Internal Affairs's management, at the time stipulated by the regulations in force and whenever necessary;</li> <li>• Preparing briefings and press releases for the public;</li> <li>• Requesting and centralizing information and of the operative reports provided by CLSU, private emergency service, voluntary emergency services.</li> </ul>

### 3.6 Weaknesses and gaps

#### 3.6.1 Of drought monitoring

Country	Weaknesses of national drought monitoring. Suggestions for improvement
<b>CZ</b>	<ul style="list-style-type: none"> <li>- absence of more specific forecast of drought occurrence and possible relations to the water resources situation, situation in agriculture etc.</li> <li>- absence of development and introduction of the advanced model tool for assessment of water balance in particular watersheds (decision on enlargement of accumulation of water on Czech territory presents the priority of the state policy).</li> </ul>
<b>SVK</b>	<ul style="list-style-type: none"> <li>- absence of early warning system,</li> <li>- drought monitoring is sufficient but it is not inter-connected and no complex and integrated drought management is based on its outputs,</li> <li>- missing national scheme of drought monitoring and management including clear responsibilities to take action under specific conditions.</li> </ul>

Country	Weaknesses of national drought monitoring. Suggestions for improvement
<b>AUT</b>	No specific national drought monitoring service could be identified.
<b>HU</b>	<ul style="list-style-type: none"> <li>- existing drought monitoring does not have effective connection to decision-maker (providing effective input), who could then start elaborating drought management process and initiate other actions to prevent drought.</li> <li>- drought monitoring is not part of early warning systems of OMSZ or Weather Warning System of EUMETNET (meteoalarm.eu).</li> <li>- There is no control data that use (Hungarian) drought indices. Missing verification of satellite-based data in Hungary too.</li> </ul>
<b>SLO</b>	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• to establish an operational national water balance modelling system that will enable monitoring and quantitative forecasting of all water balance components in metrological, agrometeorological, hydrological and hydrogeological monitoring in a manageable satisfactory time and space resolution,</li> <li>• to timely inform public prior to drought if it is considered to occur, provide clear and specific guidance on behaviour in case of drought event for institutions as well as the public, and provide support to professional agricultural advisory service providers,</li> <li>• to impose on major water users the obligation of continuous measurements of the level of surface accumulations or groundwater and water consumption, and of storing (hourly) values in the database.</li> </ul>
<b>CRO</b>	<ul style="list-style-type: none"> <li>- No legal framework on institutional interaction on actions before and during drought.</li> <li>- no national protocol regarding drought monitoring. Institutions (DHMZ, Croatia Waters) and universities measure and use different indices for drought monitoring.</li> <li>- There is no institution responsible for agricultural drought monitoring.</li> <li>- The consensus and inter-institutional communication should also be improved.</li> </ul> <p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• There is a need for implementing some other indices for drought monitoring which include temperature and evapotranspiration data (e.g. SPEI), beside precipitation amount data. It would provide more relevant information on meteorological drought especially for farmers who are paying drought insurance.</li> </ul>
<b>BiH</b>	<ul style="list-style-type: none"> <li>- Sometimes measurements and advise do not reach final users (all farmers).</li> <li>- Drought is mostly being dealt with when it has already caused damage. Passive approach to dealing with this issues (not proactive).</li> <li>- gaps in alerting system for drought risk.</li> <li>- No developed indicators of drought (risk, etc.).</li> <li>- there is no national monitoring for early drought forecasting (early warning system), prevention and adaptation.</li> </ul>
<b>MNE</b>	Lack of methodology and tools to monitor drought impact on forests.
<b>SRB</b>	//
<b>RO</b>	//

### 3.6.2 Of drought management

Country	Weaknesses of national drought management. Suggestions for improvement
<b>CZ</b>	<ul style="list-style-type: none"> <li>- absence of decision makers at the state administration for situations of drought. This is expected to be covered with establishment of “drought commissions” within amendments to Water Act.</li> <li>- no integrated drought management system and clear setting of responsibilities in case of longer drought periods.</li> </ul>
<b>SVK</b>	<ul style="list-style-type: none"> <li>- weak cooperation among relevant sectors.</li> <li>- No unified concern on drought among meteorologists, hydrologists and soil, crop and forestry scientists.</li> <li>- Most sectors show great interest in drought-related topics only when they are strongly affected by it. Evident “out of sight, out of mind” approach of most stakeholders.</li> <li>- land users should be aware of very high probability of drought occurrence in advance, especially during most important spring-to-summer period (seasonal forecasting).</li> <li>- use of irrigation systems in Slovakia is an expensive option for farmers, accompanied by complicated administrative processes.</li> <li>- no complex drought management tool defining competencies and responsibilities for drought monitoring, early warning and actions in the case of drought.</li> <li>- Drought impact data are gathered separately on sectoral level and they are not freely available at websites.</li> </ul> <p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• United and clear strategy on drought management is needed.</li> <li>• Much higher effort has to be given to create awareness of the raising campaigns. Natural hazards (also drought) are an issue, which deserve a regular public attention. The public have to be informed well by relevant information on every-day basis.</li> </ul>
<b>AUT</b>	No tailored action and management plan focused on drought and sector specific aspects.
<b>HU</b>	<ul style="list-style-type: none"> <li>- Drought management prior to and during drought is not efficient.</li> <li>- Missing direct input from meteorological base drought monitoring and weather forecast to start official national drought management process before the drought.</li> <li>- Missing drought risk map for Hungary, comparable with other countries. The map of drought risk need to give base to elaborate drought management plan for Hungary.</li> <li>- Missing good cooperation at high political levels and with stakeholders to solve drought problem with one common successful program.</li> </ul>

Country	Weaknesses of national drought management. Suggestions for improvement
<b>SLO</b>	<p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• to link drought management with flood management instead of solving them separately. The same reservoirs can serve both for flood and drought prevention if properly conceived,</li> <li>• to establish drought early warning system and statutory determine procedures when any of drought thresholds is exceeded,</li> <li>• to plan measures to mitigate the effects of drought in agriculture separately in the context of agricultural policy, and not in the wider context of natural disasters,</li> <li>• to set clearly measurable and time-bound objectives that the state wants to achieve in the field of prevention and elimination of the effects of drought,</li> <li>• to prepare provisions that would ensure the quality of water in case of drought event,</li> <li>• to establish tighter control over the implementation of all restrictions.</li> </ul>
<b>CRO</b>	<ul style="list-style-type: none"> <li>- consensus and inter-institutional communication should be improved.</li> <li>- Actions in water management in terms of additional control or restriction of water abstraction (exploitation) during drought events should be regulated in order to ensure good water status is achieved and maintained.</li> </ul>
<b>BiH</b>	<ul style="list-style-type: none"> <li>- Inadequate communication and coordination between different levels of decision making.</li> <li>- Lack of investment plan in irrigation systems, creation of accumulation. Lack of money greatly affects it.</li> <li>- Lack of developed drought early warning system.</li> </ul>
<b>MNE</b>	<ul style="list-style-type: none"> <li>- Lack of drought assessment and plans to adequately manage drought risks on national and local levels.</li> </ul> <p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• need for skills in drought management both on individual and institutional levels,</li> <li>• establishment of drought authority and organized drought management,</li> <li>• implementation of irrigation scheduling system (e.g. WINISAREG which was applied in IPA DMCSEE resulted in Montenegro as an efficient and very precise tool in agricultural water management).</li> </ul>
<b>SRB</b>	//
<b>RO</b>	<p>No effective performance management system to determine to what extent the Romanian agricultural administration fulfils its institutional objectives and how it contributes to the achievement of sector objectives (mandatory audits required by the EU are not enough to meet the requirements of a performance management system within the ADR administration. However, this objective is largely perceived as an obligation to report to the EU and not as a starting point for performance assessment).</p>

### 3.6.3 Of drought communication

Country	Level	Weaknesses of drought communications. Suggestions for improvement
CZ	Inter-insitutional	No frame of regular transfer of information on droughts.
	To public	<ul style="list-style-type: none"> <li>- Weak understanding of public to possible occurrence of droughts, namely weak awareness connected to problems of water supply and water availability (i.e. the understanding also for a need to increase water resources amount well in advance, before drought event begins).</li> <li>- Need also for increasing education of public on drought and the fact that national water balance is under danger of water scarcity in the future.</li> </ul>
SVK	Inter-insitutional	Weak communication between institutions before, during and after drought event.
	To public	Missing information system of communication to public, focused on specific target groups such as farmers.
AUT	Inter-insitutional	<i>Currently no information is available.</i>
	To public	<i>Currently no information is available.</i>
HU	Inter-insitutional	No direct communication interact between involved institutions.
	To public	Very few scientific article and other public information regarding drought are released to public.
SLO	Inter-insitutional	<ul style="list-style-type: none"> <li>- No communication plan established for communicating in the frame of drought management,</li> <li>- one the reasons such protocol does not exist yet without the support of the strategy lies in the fact that there is no cross-sectoral consistency/agreement in water consumption (it is only agreed that drinking water is a priority but the rest of priorities are not harmonized/agreed among the sectors).</li> </ul>
	To public	<ul style="list-style-type: none"> <li>- the main problem of inefficient water use is in general non-perception of water as natural goods;</li> <li>- the public is only informed of development of drought but given no accompanied recommendations for measures to reduce drought impact,</li> <li>- negative tone of communication on drought to public, i.e.: all emphasis is only on impacts in agriculture and financial damage in this sector.</li> </ul> <p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• people's awareness of drought related problems can be improved through good communication with stakeholders and the general public before, during and after drought. At the same time, good communication would also contribute to keeping public properly and timely informed.</li> <li>• It is necessary to carry out communication through a positive connotation (i.e. from "water consumption limitation" to "adjustment of activity" etc).</li> </ul>

Country	Level	Weaknesses of drought communications. Suggestions for improvement
<b>CRO</b>	Inter-insitutional	<ul style="list-style-type: none"> <li>- lack of systematic monitoring of drought impacts.</li> <li>- lack of inter-institutional communication during and after an extreme drought event.</li> <li>- no legal framework on procedures to be undertaken during drought event.</li> </ul>
	To public	//
<b>BiH</b>	Inter-insitutional	<ul style="list-style-type: none"> <li>- Experience has shown that communication is good while the effects of this communication need to be improved. Every segment feels a lack of money.</li> <li>- Lack of efficient enough links between the institutions which are collecting the data about drought and processing them (RHMZ RS, Agricultural institute of RS (MAFWMRS), Agricultural faculty - Institute of agroecology and soil science) and other relevant institutions at entity, state level, and local levels.</li> </ul> <p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• In recovery period after drought, the main role is that the ministry should properly assess and propose to the government short-term and long-term recovery measures.</li> </ul>
	To public	//
<b>MNE</b>	Inter-insitutional	<ul style="list-style-type: none"> <li>- Lack of cooperation among institutions and research organizations.</li> <li>- Weak communication and cooperation between Governmental Institutions and Stakeholders (farmers, environmentalists, water companies, industry, fishermen).</li> </ul>
	To public	<ul style="list-style-type: none"> <li>- Results of dissemination activities during and after DMCSEE project showed that drought monitoring in Montenegro should be more integrated and coordinated between final beneficiaries and IHMS, focusing on mutual teamwork as well.</li> </ul>
<b>SRB</b>	Inter-insitutional	//
	To public	//
<b>RO</b>	Inter-insitutional	In the case of written communication, there may be a misunderstanding of the clarity of the information transmitted.
	To public	//

## 4. Process of drought evaluation

### 4.1 Collecting data. Recent and past drought events.

Country	Ways of collecting drought impacts data
<b>CZ</b>	<ul style="list-style-type: none"> <li>- Data on damage costs due to natural disasters has been collected since 1997.</li> <li>- Drought damages are evaluated primarily for losses in agriculture (no specific indicator in National Statistical Office). However, through InterSucho and DriDanube project, reports on drought damage from 1981 have been collected.</li> <li>- Several high-impact studies has been published that focus on analysing recent as well as historical events (mapped in details from 1500’s).</li> <li>- Drought impact reports on water resources are collected in the <i>Reports on Water Management in the Czech Republic</i> (edited by ministry of Agriculture in cooperation with Ministry of the Environment) and the <i>Hydrological Year books</i> (edited by Czech Hydrometeorological Institute), both issued annually. Similarly, impacts of drought in agriculture and on situation of forests are published in the annual reports prepared by Ministry of Agriculture.</li> </ul>
<b>SVK</b>	<p>Data are not gathered systematically on state level but are evaluated decentralized per sectors:</p> <ul style="list-style-type: none"> <li>- sufficient water level for navigation - Ministry of transport</li> <li>- development of disposable water sources for energy including water for cooling (nuclear power, etc.) - Slovak Water Management Enterprise</li> <li>- development of disposable water sources for industry - Slovak Water Management Enterprise</li> <li>- soil moisture, trees growth - National Forestry Centre</li> <li>- soil moisture and crops - National Agriculture and Food Centre</li> <li>- past meteorological and hydrological drought events – publications of SHMU</li> </ul>
<b>AUT</b>	<ul style="list-style-type: none"> <li>- BMLFUW, BOKU: collect impact data on energy production, transportation, water use.</li> <li>- The “green report” reports annually about losses in agriculture due to drought).</li> <li>- The hail insurance reports in regular press releases about agricultural damages also due to drought.</li> </ul>
<b>HU</b>	<p>Drought impact archive was first created based on archive of News Agency of Hungary (MTI) during the project DMCSEE.</p> <p><i>Agriculture:</i> In Hungary, the Complex Agricultural Risk Management System can provide detailed information about damages in agriculture due to drought. Every year since 2012, a report about the operation of this system is prepared by Research Institute of Agricultural Economics. The drought risk participates in “A type” contract so they can evaluate which counties ask financial support, how many areas were affected and which plant culture was impacted due to drought. Disadvantages are that insured culture is very low in Hungary.</p> <p><i>Forestry:</i> NÉBIH Forestry Authority operates detailed online forest monitoring system and every year prepares a summary report about damages on forests (also due to drought).The forest monitoring system works since 2012. There is an own forest fire monitoring program since 2012 which collect data about affected forest area due to fire and provide data to European Forest Fire Information System – EFFIS from Hungary.</p>

Country	Ways of collecting drought impacts data
<b>SLO</b>	<ul style="list-style-type: none"> <li>- In Slovenia, information on damages due to natural disasters had been collected since 2000 and up to 2006 by Statistical Office of the Republic of Slovenia. In 2006, system called AJDA was established by URZSR. Impacts data are collected by AJDA if weather phenomena (drought included) is declared natural disaster, meaning damage upon (drought) event exceed 0,3 ‰ GDP.</li> <li>- In the frame of DriDanube project, project partners collected reports on drought damage from newspapers and journals published since 1981 and prepared a database on drought impact reports for their respective country (Slovenia too).</li> </ul>
<b>CRO</b>	<ul style="list-style-type: none"> <li>- For drought impacts data on agriculture, Ministry of Agriculture is responsible. Damage estimates are conducted by municipality, town and country commissions with final approval by the Ministry of Agriculture and the State Commission of Damages Caused by Natural Disasters (SCDCND; Ministry of Finance). Request for state budget aid for mitigating the consequences of damages are delivered to the SCDCND within legally prescribed deadlines through the Damage Register established in 2014.</li> <li>- For drought impacts data on energy production, a national energy company Hrvatska elektroprivreda (HEP Group) is responsible.</li> <li>- For drought impacts data on water use (e.g. influence on water quality), Croatian Waters are responsible.</li> </ul>
<b>BiH</b>	<ul style="list-style-type: none"> <li>- No systematically data available.</li> <li>- Some institutions (RHMZ RS, Agricultural Institute of RS (MAFWMRS), Agricultural faculty - Institute of agroecology and soil science) collect the data about drought, about recent and past drought events.</li> <li>- Lack of web-based drought information platform on drought, its negative impacts, collected data about recent and past drought economic and environmental (ecological) harms, to raise public awareness and public participation.</li> </ul>
<b>MNE</b>	<ul style="list-style-type: none"> <li>- There is no (systematic) archive on the damages particularly related to drought as drought was not monitored and analysed regularly until 2010. Drought impact archive was created during the project DMCSEE.</li> <li>- The information collected are based on the newspapers and media reports, reports of the agricultural producer and production of electricity.</li> <li>- Based on electronic archive of newspapers, web sites of state institutions, local governments (municipalities), enterprises as well as statistical yearbooks (MONSTAT), data on drought effects from the 2000 were classified per years and selected in three categories: economic, environmental and social, with emphasis on those which according to available material most frequently affected the population.</li> </ul>

Country	Ways of collecting drought impacts data
<b>SRB</b>	<ul style="list-style-type: none"> <li>- Statistical Office of the Republic of Serbia collects some data on agricultural production, forestry and tourism. Data on drought impacts on agriculture, forestry and water is collected also by Ministry of Agriculture, Forestry and Water Management and its Directorates, and State Enterprises (e.g. JP “Srbijasume”, JP “Srbijavode”).</li> <li>- In February 2013, United Nation Office for Disaster Risk Reduction (UNISDR) and UNDP/SEESAC started a joint pilot project "Establishing a database on disaster-caused losses in the Republic of Serbia" with the aim of establishing The Disaster Information Management System (DesInventar database), serving for systematic collection, documentation and analysis of data about losses caused by disasters associated with natural hazards. Data are collected by Sector for Emergency Management (Ministry of Interior); Red cross Serbia; Ministry of Agriculture, Forestry and Water Management; JP “Srbijavode”; Ministry of Construction, Transport and Infrastructure.</li> </ul>
<b>RO</b>	<ul style="list-style-type: none"> <li>- Sectors for which drought impact data are collected are agriculture, forestry and water use.</li> <li>- Within Early warning drought and risk management systems, also a historical climate data archive can be provided, especially an archive on climate impacts in vulnerable sectors on water scarcity and droughts.</li> <li>- Data on hydrological drought are collected by the National Institute of Hydrology and Water Management and information on drought in the forest area is registered by the National Forestry Registry. In general, all this data is collected at the Ministry of Environment or the Ministry of Agriculture and Sustainable Development, depending on the type of drought and the sector of activity. Certain useful information can also be found at the National Institute of Statistics on agricultural production or others.</li> </ul>

## 4.2 Socioeconomic evaluation of drought effects (GDP)

Country	Process of drought damage costs evaluation
<b>CZ</b>	Socio-economic drought did not cause damages in any economic sector (yet).
<b>SVK</b>	<i>No specific definition of socioeconomic drought in Slovakia which would be applied.</i>
<b>AUT</b>	<ul style="list-style-type: none"> <li>- A document describing a protocol on the evaluation of drought damage costs for several years could not be identified.</li> <li>- However, there is a disaster relief fund report for 2014 and 2015 by the Austrian federal Ministry of Finance, and a report for 2017 drought damage costs in agriculture by the Austrian hail insurance.</li> </ul>
<b>HU</b>	<ul style="list-style-type: none"> <li>- Presently there is no protocol for evaluation of drought damage costs in Hungary.</li> <li>- In media, we can find roughly estimations of damage costs without any scientific base.</li> <li>- In the Complex Agricultural Risk Management System, an authority (NÉBIH) estimate that the losses due to drought can reach 30% yield losses to a reference yield of special crops.</li> </ul>

Country	Process of drought damage costs evaluation
<b>SLO</b>	<p>Existing protocol of evaluating natural disaster damage costs consists of 7 steps:</p> <ol style="list-style-type: none"> <li>1. affected municipality informs competent URSZR branch of the natural disaster within 3 days,</li> <li>2. competent URSZR branch informs headquarters of URSZR headquarters which then issues a decision on the start of damage assessment,</li> <li>3. municipality invites the injured parties to report the damage on objects and/or agricultural crops to municipal commission and enters data into “AJDA”, an electronic system intended for centralization of applications of parties’ affected by natural disaster,</li> <li>4. injured parties report the damage on prescribed forms, separately for damage to agricultural land, damage to agricultural products, damage to the destroyed building, partial damage to the building and damage to construction and civil engineering objects,</li> <li>5. regional commissions check the reported damage and the State Commission prepares the final assessment of the damage to agricultural products and the final assessment of damage to the stratified state and sends them to the government,</li> <li>6. the government confirms the final assessment of damage to agricultural products and the final assessment of damage to objects if it exceeds 0,3 ‰ GDP. This is when weather phenomena is declared as natural disaster. The government instructs ministry responsible for agriculture and ministry responsible for the environment to prepare programmes for elimination of the consequences of damage,</li> <li>7a. once ministry responsible for agriculture prepares programme for elimination of the consequences of damage to agricultural products and the government approves it, Agency for Agricultural Markets and Rural Development issues decision on allocation funds and makes payment to injured parties,</li> <li>7b. once ministry responsible for the environment prepares programme for elimination of the consequences of damage to objects and the government approves it, ministry responsible for the environment issues decision on allocation funds and makes payment to injured parties.</li> </ol>
<b>CRO</b>	<ul style="list-style-type: none"> <li>- Methodology for Damage Assessment from natural disasters was created in 1998 by the Government.</li> <li>- Commission for Damage Assessments in Republic of Croatia was established (placed in the Ministry of Finance) and from each municipality/town/county a representative is nominated.</li> <li>- The natural disaster is proclaimed when direct damage is ascertain. Direct damage is the damage directly caused to the asset or goods and it is determined for the following groups: buildings, equipment, land, long-term plantations, forests, livestock, other assets and goods. To acquire financial assistance from the National Budget, it is necessary that the magnitude, extent and consequences exceed the ability of local government to cope with them.</li> <li>- Regarding droughts, the natural disaster is proclaimed if the yields are reduced by more than 30% per ha with respect to the three-year average. Furthermore, the total value of damages must be larger than 20% of the local-government budget for the previous year and that the damage values are evaluated and confirmed from the CDA.</li> </ul>
<b>BiH</b>	<p>In Republika Srpska, the Ministry of Agriculture, Forestry and Water Management is in charge of monitoring droughts, reporting, proposing measures to the Government of the Republic Srpska in reducing the effects of drought and execution of measures.</p>

Country	Process of drought damage costs evaluation
<b>MNE</b>	<i>There is lack of information regarding this topic as there is no archive on drought damage.</i>
<b>SRB</b>	<p>Process of drought damage costs evaluation is regulated by “Law on Reconstruction Following Natural and Other Hazards”*:</p> <ol style="list-style-type: none"> <li>1. without delay and no later than within 15 days following the declaration of a natural and other hazard, a local self-government unit invites the citizens to report the damage sustained within the period of minimum 15 to maximum 60 days following the invitation announcement. Sometimes, if a citizen is not able to report the damage within 60 days, they are allowed to do it no later than 6 months following the invitation announcement and after which the procedure for aid allocation shall commence following the damage reporting.</li> <li>2. A local self-government unit shall establish, without delay, the required number of committees to assess the damage caused to citizens' assets following a natural and other hazard, in line with the act on a single methodology for assessing damage from a natural and other hazard, passed by the Government. A local self-government unit shall ensure uniform and coordinated implementation of the act on a single methodology for assessing damage from a natural and other hazard.</li> <li>3. Local self-governments will conduct the damage assessment based on the instructions from the Government. At the moment, the Guidelines on unique methodology for damage assessment adopted in 1987 are still valid.</li> </ol> <p><i>*The procedure to establish aid eligibility is managed in line with the provisions of the General Administrative Procedure Law, unless otherwise stipulated by this Law.</i></p>
<b>RO</b>	<p>Agricultural drought damage costs evaluation:</p> <ol style="list-style-type: none"> <li>1. farmers who want to benefit from damages caused by drought that affects the agricultural production, have to submit applications to the mayoralties within 1 year in which they are domiciled. The procedure requires farmers to specify the area affected by the drought, the type of crop and the damage suffered. According to representatives of the Ministry of Agriculture and Rural Development (MADR), this measure is necessary to carry out a first assessment of the damages by the commissions set up specifically for this purpose.</li> <li>2. Subsequent to the submission of the application, the local commissions, specially set up in collaboration with the Agricultural Directorates, will go on-site to verify the extent of the declared area and the extent to which the crop was affected, as well as to assess the value of the damages.</li> <li>3. After confirming and validating the data, the County Emergency Commissions will draw up documents that will be presented and centralized at the ministry level. The final estimate of the areas affected by the drought and the total amount of compensation to be granted will be made at the end of the harvesting campaign.</li> </ol> <p>According to the statements of the representatives of the Association of Agricultural Producers' Associations in Romania (LAPAR), farmers who hold agricultural areas equipped with functional irrigation systems will be excluded from paying compensation.</p>

### 4.3 Recovering from drought

Country	Post-drought-event actions (technological measures, subsidies, briefings, etc.)
<b>CZ</b>	The subsidies are given to farmers from the Ministry of Agriculture on the base of assessment and the evaluation according to the approved methodology which is valid for damages of floods, frosts etc.
<b>SVK</b>	No process of recovering from drought exists in Slovakia. The measures are undertaken ad-hoc after the assessment of each drought period.
<b>AUT</b>	<i>No information is currently available.</i>
<b>HU</b>	//
<b>SLO</b>	<p>If damage exceeds 0,3 ‰ of annual GDP, the national government initiates the procedures and orders Ministry of the Environment and Spatial Planning and Ministry of Agriculture, Forestry and Food to prepare drought consequences release programmes (see section 4.2):</p> <ul style="list-style-type: none"> <li>- On the basis of these programmes, the amount of the grants is provided which farmers receive for compensation of lost crops or other losses. In the affected areas, also a reduction of the cadastral income of farms is usually provided.</li> <li>- In these programmes, also technological instructions for faster recovery of agricultural land are provided. In practice, these measures are transferred to farmers in the field by agricultural advisors of the Chamber of agriculture and forestry of Slovenia which advises farmers about the optimal time of harvest crops, possible cultivar improvements, measures for faster regeneration of grassland and measures in livestock management.</li> </ul>
<b>CRO</b>	There is no specific process of recovering from drought. However, Advisory service for agriculture provides necessary suggestions for agrotechnical measures to reduce damage in agriculture. Farmers demand the cost damages to be refunded. They also provide farmers with information on climate change in order to be prepared on frequent extreme events, such as drought.
<b>BiH</b>	<ul style="list-style-type: none"> <li>- We do not have a recovery system from the effects of drought. The only activity that is being implemented in RS are those irrigation projects that are in progress.</li> <li>- After drought, on behalf of the RS Government, the Ministry of Agriculture, Forestry and Water Management prepares some measures to help farmers who have suffered damage from drought (direct subsidies, subsidies for the irrigation systems, etc.).</li> </ul>
<b>MNE</b>	The process of recovering is mostly based on subsidies.
<b>SRB</b>	In case of severe and extreme drought the Government of Republic of Serbia declares a state of natural disaster and proposes mitigation measures.

Country	Post-drought-event actions (technological measures, subsidies, briefings, etc.)
<b>RO</b>	<p>In case of drought, the Romanian state (The Government along with the Ministry of Agriculture and Rural Development) is compensating the affected for their crops through:</p> <ul style="list-style-type: none"> <li>- the scheme of minimis aid for compensating the effect of the drought phenomenon regarding agricultural crops granted in agriculture, in the vegetal sector</li> <li>- the minimis aid scheme for support to micro-enterprises and small enterprises in the rural area for the establishment and development of non-agricultural economic activities.</li> </ul> <p>Minimis aid description: Beneficiaries of the de minimis scheme are farmer individuals who exploit arable land and set up crops. The aid is granted both to the farmers registered with APIA for payment on surfaces, as well as to the farmers who have less than 1 ha of land and are not in this system. The estimated number of beneficiaries of de minimis aid is 558,000 farmers, with an area of about 2 million hectares of arable land of 9 million ha at national level. The maximum amount of de minimis aid may be 7,500 eur / farm.</p>

#### 4.4 Weaknesses and gaps

Country	Weaknesses of existing drought impact evaluation. Suggestions for improvement.
<b>CZ</b>	<ul style="list-style-type: none"> <li>- No integrated report on drought consequences and damages in all sectors of the national economy prepared and published yet.</li> <li>- The evaluation of drought damages is not unified for all economy sectors and municipalities (with exception of drought damages in agriculture).</li> <li>- No guidelines or methodologies at the state level yet for reporting of drought damages and rules for their general assessment.</li> </ul>
<b>SVK</b>	<ul style="list-style-type: none"> <li>- drought impact data are rarely collected; even if so, they are collected indirectly, e.g. in agriculture by assessment of crop yields every year but it is hard to determine what part of it was damaged due to drought.</li> <li>- no drought reports are prepared after drought events.</li> </ul> <p><i>Suggestions for improvement:</i></p> <ul style="list-style-type: none"> <li>• Regular gathering and assessment of drought impact data could lead to better understanding of consequences and a better conception of measures.</li> </ul>
<b>AUT</b>	<i>No information is currently available.</i>
<b>HU</b>	- missing elaborated drought impact evaluation.

Country	Weaknesses of existing drought impact evaluation. Suggestions for improvement.
<b>SLO</b>	<ul style="list-style-type: none"> <li>- nonintegrated system of information on drought damage at the level of municipalities. In practice, it often occurs that the municipality does not inform the URSZR about drought damage on its territory, consequently farmers from municipalities that have not reported damage are then not eligible for national aid and cannot claim a reduction of the cadastral income.</li> <li>- The assessment of the municipal commissions often exceeds the final damage assessment which has been confirmed by control visits to regional commissions in the field.</li> <li>- Procedures of national grants for drought-caused damage are very long and in practice last at least 1 year which is very unpleasant for most affected farmers.</li> <li>- There is no post-drought-event briefings held to evaluate monitoring, reviewing of institutional response, communication flow etc. to sum up positives and negatives of procedures undertaken in practice and take notes for future cases.</li> </ul>
<b>CRO</b>	<ul style="list-style-type: none"> <li>- data on drought yield losses and drought impacts should be more easily available.</li> <li>- no data on drought impact on tourism sector, e.g. water shortage of drinking water during the touristic season. Ministry of Tourism does not collect such data but they are interested in improving it within the DriDanube.</li> </ul>
<b>BiH</b>	<ul style="list-style-type: none"> <li>- lack of existing drought database on a single site, leading to all the other drawbacks, the number of droughts, intensity and damage caused by droughts.</li> <li>- Lack of mobile-based data collection about the drought.</li> </ul>
<b>MNE</b>	<ul style="list-style-type: none"> <li>- Lack of data on the drought damages and costs classified per each affected sector of economy;</li> <li>- Lack of responsibility on institutional level to collect the data related to the drought.</li> </ul>
<b>SRB</b>	//
<b>RO</b>	//

## 5. Looking ahead – development of programmes

### 5.1 Research and science programmes

Country	Research/scientific programmes that could contribute to better understanding of drought
<b>CZ</b>	<ul style="list-style-type: none"> <li>National Agency for Agriculture Research (Ministry of Agriculture) recently supported 8 projects.</li> <li>Technological Agency of the Czech Republic (there are several programmes named by the Greek alphabet – alfa, beta, eta etc.). These programmes have to have practical outputs implemented to the real application.</li> <li>Grant Agency of the Czech republic (Czech Academy of Science, focused to basic scientific research).</li> </ul> <p>Most of the running projects focus on increasing the knowledge of climate change development, on more detailed applications of different scenarios and on description of expected consequences for conditions of weather and for life conditions in the Czech Republic.</p>
<b>SVK</b>	<p>There exists no research or science programme focused specifically on drought. Research institutions have a possibility to submit their project proposals under opened calls of different funds/agencies such as Slovak Research and Development Agency, H2020, Operational programmes in the period 2014 – 2020.</p>
<b>AUT</b>	<ul style="list-style-type: none"> <li>ADA project - Agro Drought Austria (2013-2016), funded by the Austrian Climate Research Program, created drought indices for Austria on an 0.5 km grid. A follow-up project is ARIS, a drought monitoring and prediction system.</li> <li>Austrian climate protection initiative</li> <li>Climate and Energy Fund</li> <li>Austrian Research Promotion Agency (FFG)</li> <li>Austrian climate Research Programme (ACRP)</li> <li>Project COIN (Appendix 2.1.1b, page 77)</li> </ul>
<b>HU</b>	<p>National Water Research Programme was launched in 2016 by The Hungarian Academy of Sciences to provide the scientific evidence base for implementing the strategic targets of the National Water Strategy. However, drought is not getting priority in this research program.</p>

Country	Research/scientific programmes that could contribute to better understanding of drought
SLO	<ul style="list-style-type: none"> <li>• <i>DMCSEE</i> project (closed project)            The mission of the proposed DMCSEE was to coordinate and facilitate the development, assessment and application of drought risk management tools and policies in South-Eastern Europe with the goal of improving drought preparedness and reducing drought impacts. Therefore, DMCSEE focused its work on monitoring and assessing drought and assessing risks and vulnerability connected to drought.</li>   <li>• <i>Climate variability of Slovenia</i> (closed project)            Based on controlled and homogenized climatic series, climate change in our country have been analysed on datasets from 1961 onwards. With the help of longer strings that date back to the middle of the 19th century, additional information was obtained on the climate changeability of Slovenia in the past.</li>   <li>• <i>Assessment of climate change by the end of 21<sup>st</sup> century</i> (on-going)            In the framework of the internal project "Climate variability of Slovenia", the previous climate variability in Slovenia was further elaborated in both the average situation and the aspect of extraordinary phenomena. This project is now focusing on assessment of climate change over Slovenia for the future and its impact on extreme weather such as heat waves, droughts, extreme precipitation, frost, high water conditions/floods, etc.</li>   <li>• <i>Specific targeted research project TRIN</i> (on-going)            It targets accuracy of irrigation water demand forecasting. Project's objectives are 1) legislation of united ground-data collecting system, 2) preparation of irrigation forecasting model for each of the main cultures, 3) evaluation of impacts of optimal irrigation, 4) evaluation of impacts of deficit irrigation at professional level, 5) evaluation of impacts of deficit irrigation at economic level and 6) preparation of reports on optimal and correct process of irrigation.</li>   <li>• <i>LIFE project VivaCCAdapt</i> (on-going)            Adapting to the impacts of climate change in the Vipava valley, the project aims at developing measures for avoiding economic effects of climate change. Anticipated project result is development of a climate change adaptation strategy, piloting and assessment of irrigation decision support system and establishment and evaluation of green windbreaks.</li> </ul> <p>In addition, the following on-going research programmes are also related to drought or climate change:</p> <ul style="list-style-type: none"> <li>• The effects of weather conditions and drought stress on quality and sensory properties of olive oil by monitoring the photosynthesis metabolites and secondary metabolites,</li> <li>• Heat-shield: Integrated inter-sector framework to increase the thermal resilience of European workers in the context of global warming,</li> <li>• Interactive Soil Quality Assessment in Europe and China,</li> <li>• Assessment of water perspectives in Slovenia and possibilities of water use in agricultural production. Measures to reduce the vulnerability of plant production to drought.</li> </ul>
CRO	<ul style="list-style-type: none"> <li>• AGRO-DROUGHT-ADAPT - adaptability assessment of maize and soybean cultivars of Croatia in the function of breeding for drought tolerance.</li> <li>• VITCLIC - Viticulture and climate change in Croatia.</li> </ul>

Country	Research/scientific programmes that could contribute to better understanding of drought
<b>BiH</b>	<p>At this moment we have no such research programs.</p> <p>Only some scientific and professional work is on-going with the aim of processing of meteorological data to indicate the occurrence of drought and its negative effects and proposals for measures to combat drought, which are announced at the scientific and expert meetings of agronomists and published in collections of works (proceedings) or journals.</p>
<b>MNE</b>	//
<b>SRB</b>	//
<b>RO</b>	<p>There are training courses within the institutions across the country for good resource management and a good adaptation of processes to climate change. It also exchanges experience and best practices with other countries through projects to implement measures that yield returns in our country (i.e. national and international projects).</p>

## 5.2 Educational programmes addressing drought

Country	Educational programmes that could contribute to better understanding of drought
<b>CZ</b>	<p>The education programmes are recently under development and their financial support is granted by the Technological Agency of the Czech Republic, by the Ministry of the Environment and by the Ministry of Agriculture with support of the Association of Water Management.</p>
<b>SVK</b>	<ul style="list-style-type: none"> <li>- There exist no particular educational programmes focused on drought in the Slovak republic. But Slovak Environment Agency and Ministry of Education, Science, Research and Sport of the Slovak Republic are leading educational programmes according actual demand and themes.</li> <li>- Several Universities (Faculties) offers courses, which include also lectures about drought. Among such universities are:               <ul style="list-style-type: none"> <li>• Faculty of Natural Sciences, Comenius University in Bratislava,</li> <li>• Faculty of Physics, Mathematics and Informatics, Comenius University in Bratislava,</li> <li>• Slovak Technical University,</li> <li>• Technical University in Zvolen,</li> <li>• Slovak Agricultural University.</li> </ul> </li> </ul>
<b>AUT</b>	<ul style="list-style-type: none"> <li>- There are no specific educational or training programmes beyond the contents in diverse university study programmes.</li> <li>- However, drought is sometimes part of irregular educational or training activities to the public/schools/teachers in context of climate change.</li> </ul>

Country	Educational programmes that could contribute to better understanding of drought
<b>HU</b>	<p>There are many universities (14) in Hungary that educate subjects of water management on BSc, MSc and Ph.D. level. The main area where is water management is in the educational program:</p> <ul style="list-style-type: none"> <li>• Agricultural aspects: Faculty of Agricultural Sciences (University of Szent István, Gödöllő; University of Debrecen, Debrecen; Pannon University, Keszthely)</li> <li>• Technological aspects: Budapest University of Technology and Economics Faculty of Civil Engineering Department of Hydraulic and Water Resources Engineering</li> <li>• Meteorological aspects: Eötvös Lóránt University, Faculty of Science, Budapest</li> <li>• Bsc in Earth sciences, MSc in Meteorology, Geography etc.</li> </ul>
<b>SLO</b>	<p>Undergraduate programmes (Bachelors level):</p> <ul style="list-style-type: none"> <li>• Agronomy (Biotechnical Faculty, UNI Ljubljana),</li> <li>• Physics – meteorology (Faculty of Mathematics and Physics, UNI Ljubljana),</li> <li>• Biology and Ecology with Natural Conservation (Faculty of Natural Sciences and Mathematics, UNI Maribor),</li> <li>• Environment (School of Environmental Sciences, UNI Nova Gorica).</li> </ul> <p>Postgraduate programmes (Masters level):</p> <ul style="list-style-type: none"> <li>• Agronomy (Biotechnical Faculty, UNI Ljubljana),</li> <li>• Physics – meteorology (Faculty of Mathematics and Physics, UNI Ljubljana),</li> <li>• Biology and Ecology with Natural Conservation (Faculty of Natural Sciences and Mathematics, UNI Maribor),</li> <li>• Environment (School of Environmental Sciences, UNI Nova Gorica),</li> <li>• Conservation of nature and natural heritage (Biotechnical Faculty, UNI Ljubljana),</li> <li>• Nature conservation (Faculty of Mathematics, Natural Sciences and Information Technologies, UNI Primorska).</li> </ul> <p>Doctoral studies:</p> <ul style="list-style-type: none"> <li>• Interdisciplinary Doctoral Studies of Environmental Protection (UNI Ljubljana).</li> </ul>
<b>CRO</b>	<p>Agrometeorological Society regularly organizes workshops regarding the climate change impact on agriculture and drought monitoring is commonly educated.</p>
<b>BiH</b>	<p>Agricultural faculties in Republic of Srpska hold some subjects (at the undergraduate and postgraduate studies) that address drought and some measures to combat drought: agrometeorology; land reclamation including irrigation; irrigation of agricultural crops,...</p> <p>The Faculty of Forestry, UNI Banja Luka:</p> <ul style="list-style-type: none"> <li>• Forestry Study Program at the first cycle,</li> <li>• Sustainable Natural Resources Management on the second cycle (it includes the Forest and Climate Change course)</li> </ul> <p>The Faculty of Sciences, UNI Banja Luka:</p> <ul style="list-style-type: none"> <li>• some subjects exist related to drought (meteorology, ...)</li> </ul>
<b>MNE</b>	//
<b>SRB</b>	//

Country	Educational programmes that could contribute to better understanding of drought
<b>RO</b>	University of Bucharest - Faculty of Geography, study modules: <ul style="list-style-type: none"> <li>• Climatology,</li> <li>• Meteorology,</li> <li>• Agrometeorology,</li> <li>• Meteorology and Measurements;</li> </ul> University of Agronomic Sciences and Veterinary Medicine: <ul style="list-style-type: none"> <li>• specialty Engineering and Environmental Protection (at the Master's program is a special course of Climate Change – Causes and effects);</li> <li>• study module of Agrometeorology at the Faculty of Agriculture.</li> </ul>

### 5.3 Weaknesses and gaps

Country	Weaknesses of scheme of programmes addressing drought
<b>CZ</b>	<ul style="list-style-type: none"> <li>- there is limited number of educational programmes, namely for the school children. The only such thing are contest for pupils (on the occasion of World Water Day, prepared by Ministry of Agriculture and Association of Water Management where pictures, stories, poems, handmade artefacts are made, and similarly by ICPDR for the Danube Day).</li> <li>- More efforts needed to increase knowledge on importance of water for daily life and to increase awareness of negative consequences of hydrological extremes. Necessity to enlarge basic education at schools, namely related to climate change development.</li> </ul>
<b>SVK</b>	- Lectures on drought are often one-track focused and wider concept of understanding the processes leading to drought, or measures mitigating drought impacts is missing.
<b>AUT</b>	<i>No information is currently available.</i>
<b>HU</b>	- Missing an educational program which specifically addresses drought.
<b>SLO</b>	<ul style="list-style-type: none"> <li>- content of education programmes needs modernization of old curricula at lower levels of education system as well as professional upgrading/supplementation at higher levels,</li> <li>- study programmes at faculties linked to agriculture should be reorganized to move from industrial agriculture to self-care, reviving old knowledge in agriculture on territory of Slovenia,</li> <li>- little or no workshops or trainings to improve knowledge of the advisory services on measures to reduce the effects of drought.</li> </ul>
<b>CRO</b>	//
<b>BiH</b>	<ul style="list-style-type: none"> <li>- Lack of money for research programs and projects regarding drought and its negative impacts, mitigation alternatives, etc.</li> <li>- No educational and study programmes which focus on concrete drought problems.</li> </ul>
<b>MNE</b>	- Lack of educational programmes that specifically address drought and measures associated with the needs of specific groups affected by the drought.
<b>SRB</b>	//
<b>RO</b>	//

## 5.4 Past and on-going programmes and projects related to water management which could contribute to EUSDR

Country	Projects related to water management which could contribute to EUSDR
<b>CZ</b>	<ul style="list-style-type: none"> <li>• Národní plan povodí Moravy – in Czech only – <a href="http://www.eAgri.cz">www.eAgri.cz</a>,</li> <li>• Generel vodního hospodářství krajiny České republiky – Etapa I. Státní pozemkový úřad, M. Trnka (ed.), Mendelova universita a Czech Globe, Brno (2015),</li> <li>• Bilanční hodnocení zdrojů a potřeb vody s ohledem na závlahové systémy. Státní pozemkový úřad, M. Trnka (ed.), Mendelova universita a Czech Globe, Brno (2017).</li> </ul>
<b>SVK</b>	<p>On-going:</p> <ul style="list-style-type: none"> <li>• <i>DriDanube</i>,</li> <li>• <i>SANDANUBE</i>,</li> <li>• <i>JoinTisza</i>.</li> </ul> <p>Past project:</p> <ul style="list-style-type: none"> <li>• <i>IDMP</i>,</li> <li>• <i>SEE RIVER</i> (Sustainable Integrated Management of International River Corridors in SEE countries),</li> <li>• <i>SEERisk</i> (Joint Disaster Management risk assessment and preparedness in the Danube macro-region).</li> </ul>
<b>AUT</b>	<ul style="list-style-type: none"> <li>• <i>Danubesediment - Danube Sediment Management - Restoration of the Sediment Balance in the Danube River:</i> The project focuses on the transport of sediments as a natural process in river systems focusing on the sediment management in the Danube River Basin. The goal of the project is the improvement of water and sediment management as well as the morphology of the Danube River with the focus on (1) closing knowledge gaps and (2) strengthening governance by a Danube Sediment Management Guidance” (DSMG).</li> <li>• <i>ResInfra@DR - Facilitating macro-regional scope and link up to socioeconomic actors of Research Infrastructure in the Danube Region:</i> The project focuses on research infrastructures in the Danube macro-region and it offers mutual learning opportunities for policy makers and the policy delivery organisations involved in the financing, and parent organisations arranging the operation of research infrastructures. It aims at contributing to the efforts both to establish new research infrastructures (RIs) as well as to requested processes for the upgrading of the existing RIs and to reassess their functionality i.e. by the development of methodologies which adequately reflect the specific situation in the Danube macro-region.</li> <li>• <i>CAMARO-D – Cooperating towards advanced management routines for land use impacts on the water regime in the Danube river basin:</i> For the sustainable protection of water resources and improved flood risk prevention a strategic policy for the implementation of an innovative transnational catchment-based “Land Use Development Plan” for the Danube River Basin will be developed.</li> </ul>
<b>HU</b>	<ul style="list-style-type: none"> <li>• <i>DriDanube</i>,</li> <li>• <i>Camaro-D</i>,</li> <li>• <i>JoinTISZA</i>,</li> <li>• <i>DanubeSediment</i>.</li> </ul>

Country	Projects related to water management which could contribute to EUSDR
<b>SLO</b>	<ul style="list-style-type: none"> <li>• <i>GROWA-SI</i> A cooperation project between the Slovenian Environmental Agency and Research Centre Jülich aims at quantifying groundwater recharge for the entire territory of Slovenia using GROWA model. To reach this goal, the project is carried out in five tasks: 1) to set-up a uniform and consistent nationwide GIS input data base consisting of climate, soil, geology, topography, land use data etc., 2) to carry out a nationwide water balance study with aim of quantifying renewable water resources (total runoff), 3) to separate total runoff into the runoff components: direct runoff and groundwater recharge, 4) to calibrate the model and validate its results by using national database of measured runoff from gauging stations, and 5) to assess options for further model development.</li> <li>• <i>mGROWA</i> At Slovenian Environmental Agency, a regional water balance model GROWA-SI of 100m x 100m resolution is currently operating. By the end of the year 2017, an upgraded version of GROWA-SI called mGROWA-SI model system will be operating, making modelling of all water balance components possible on monthly as well as daily timescale. This way its products/outcomes will be additionally supporting drought management.</li> </ul>
<b>CRO</b>	<p>The Ministry of Environment and Energy (Water Management Sector) is in charge of monitoring and participation in the work of groups for EUSDR Priority Area PA4 - to restore and maintain the quality of waters, and EUSDR Priority Area PA5 - to manage environmental risks within the European Strategy of the Danube Region.</p>
<b>BiH</b>	<ul style="list-style-type: none"> <li>• The Irrigation Development Project (IDP) – funded by Delegation of the EU to BiH.</li> </ul>
<b>MNE</b>	<p>Projects:</p> <ul style="list-style-type: none"> <li>• <i>Montenegro Institutional Development and Agricultural Strengthening (MIDAS)</i>: to improve delivery of government assistance for sustainable agriculture and rural development in a manner consistent with the EU's pre-accession requirements.</li> </ul> <p>Programmes:</p> <ul style="list-style-type: none"> <li>• <i>Danube water programme – Water and Wastewater Services in the Danube Region</i> - This work is a product of the staff of The World Bank.</li> </ul>
<b>SRB</b>	<p>On-going projects:</p> <ul style="list-style-type: none"> <li>• <i>JointTisza</i>,</li> <li>• <i>CAMARO-D</i>,</li> <li>• INTERREG IPA CBC Serbia-Hungary: Improvement of drought and excess water monitoring for supporting water management and mitigation of risks related to extreme weather conditions (<i>WATERatRISK</i>).</li> </ul> <p>Past projects:</p> <ul style="list-style-type: none"> <li>• <i>SEERISK</i>,</li> <li>• <i>DMCSEE</i>.</li> </ul> <p>Water management commissions active in Republic of Serbia:</p> <ul style="list-style-type: none"> <li>- <i>ICPDR</i>,</li> <li>- <i>Sava commission</i>.</li> </ul>

Country	Projects related to water management which could contribute to EUSDR
RO	<p>On-going projects:</p> <ul style="list-style-type: none"> <li>• <i>Water CoRe</i> project</li> <li>• <i>CAMARO-D</i>: cooperating towards Advanced Management Routines for land use impacts on the water regime in the Danube river basin.</li> <li>• <i>The Climate Change Adaptation Guide</i>,</li> <li>• INTERREG III-B: “<i>Agriculture and Climate Change: How to alleviate effects and threats</i>” It is delivering as particular outcome the “Attitude Code towards mitigating the climate change impact in agriculture”.</li> <li>• <i>The National Climate Change Strategy (2013-2020)</i>                      It addresses two main components: the reduction in the concentration of greenhouse gases (Mitigation) and the adaptation to climate change (Adaptation), which is under approval by Romanian Government. On the Adaptation component were identified 13 sectors vulnerable to climate change. In this context, the integration of the adaptation in the sectoral strategies will help to have a comprehensive approach and select appropriate measures for the direct and indirect effects of climate change (including drought and floods). At the same time, local authorities will develop action plans on climate change.</li> </ul> <p>Past projects:</p> <ul style="list-style-type: none"> <li>• “<i>Water scarcity and drought: coordinated actions at EU regional level</i>” (2012-2013), INTERREG IV-C.</li> <li>• <i>MIDMURES – Mitigation Drought in Vulnerable Area of the Mureş Basin</i> (2011-2012).                      The main goal of the this project was to contribute to improving agricultural water saving and drought forecasting in the Mureş pilot area through the combination of various technical approaches. The expected results refers to: modelling long-term agro-climatic data in order to establish the risk factors, to spot the areas with high vulnerability and provide timely drought forecasts; assessing the impact of climate changes on soil water availability for crops cultivated in the most vulnerable area of the Mureş River basin to drought and water scarcity, rainwater conservation in soil for optimizing water availability according to the plant needs throughout the growing season and in the period with high deficit.</li> <li>• “<i>CLIMHYDEX – Changes in climate extremes developments and associated impacts to hydrological events</i>” (2012 – 2015)                      Its aim was quantifying and assessing the impact of extreme climate events to hydrological regime and drought conditions.</li> </ul>

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