



*Strategic paper on the integration of the
TRBMP and TFRMP process in Tisza River
Basin*

For Deliverable 5.3.1

Final version, 27 May, 2019



Project co-funded by the European Union (ERDF, IPA funds)

Acknowledgements

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Abbreviations

APSFR	Areas with Potentially Significant Flood Risk
EC	European Commission
EEC	European Environmental Agency
FD	Flood Directive
FRMP	Flood Risk Management Plans
GEP	Good Environmental Potential
GES	Good Environmental Status
IPPC-IED	Integrated Pollution Prevention and Control - Industrial Emissions Directive
MARD	Ministry of Agriculture and Rural Development
MEWF	Ministry of Environment, Water and Forests
NALI	National Agency Landuse Improvement
NARW	National Administration "Romanian Waters"
NFA	National Forest Agency
NS	not started
OGC	on-going construction
POG	progress on-going
RBA	River Basin Authority
RBMP	River Basin Management Plans
TRBMP	Tisza River Basin Management Plan
TFRMP	Tisza Flood Risk Management Plan
WFD	Water Framework Directive

Interlinkage between the Flood Directive and Water Framework Directive

Legislation

In Romania the legislation that transposes the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (Flood Directive) and the Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Directive) is the following:

- *The Water Directive* - The Law nr. 112/2006 and Law nr. 310/2004 modifying and completing the Water Law nr. 107/1996 for establishing the essential trend for sustainable, unitary, balanced and complex water resources and aquatic ecosystems, as for wetlands protection.
- *The Flood Directive* - The Water Law nr. 107/1996 , modified by Governmental Decision nr. 948/1999, Law nr. 404/2003, Law nr. 310/2004, Law nr. 112/2006, Emergency Governmental Ordinance (EGO) nr. 130/2007, EGO nr. 3/2010 adopted through Law nr. 146/2010, EGO nr. 64/2011 , EGO nr. 71/2011 and Governmental Decision nr. 846/2010 approving the National Strategy of flood risk management on medium and long term.

The Flood Risk Management Plans have been approved through the Romanian Governmental Decision nr. 972 from 21 December 2016.

In Slovakia On 26 November 2007 it has entered into force Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (Flood Directive). Transposition of the Directive 2007/60/EC into the legal order of the Slovak Republic is the Act No. 7/2010 on the flood protection, which is in the force in the Slovak republic since February 1st 2010.

The purpose of the Directive 2007/60/EC is to establish a common framework for flood risk assessment and management, which aims to reduce the adverse consequences of floods for human health, environment, cultural heritage and economic activity.

In the Slovak Republic ensure an elaboration of flood hazard and flood risk maps the administrator of significant watercourses, which is the SLOVAK WATER MANAGEMENT ENTERPRISE, state enterprise, Banská Štiavnica.

Under Article 14 of the Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive – WFD), Member States shall promote the active involvement of all affected parties in the implementation of this Directive.

Considering with complicated and demanding WFD, the European Commission has developed a "Common Implementation Strategy - CIS", which was adopted as a binding document in May 2001 and constantly being updated. Its aim is to unify the practices of individual countries when implementing WFD into practice.

The main instruments for achieving WFD objectives are river basin district management plans. The planning process is realized in 6-year cycles, which consist of the preparation, implementation and revision phase. The first cycle consists of the following stages:

- analysis of the characteristics of the river basin district and assessment of influences and impacts of human activity,
- setting environmental objectives,
- propose and implement programmes of monitoring,
- propose and implement programmes of measures.

After the WFD entering into force, the EU Member States should have transposed the WFD into national legislation and to ensure its implementation to 22 December 2003. For the Slovak Republic as the accession country, it was on 1 May 2004, i.e. to date of its entry. The WFD was transposed into Slovak legislation into the Act No. 364/2004 Coll. on waters, amending Act No. 372/1990 Coll. of the Slovak National Council on offences, as amended by later regulations (Water Act) and into the executive regulations, subsequently. The latest amendment of the Water Act No. 364/2004 Coll. contains the transpositions of the Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration, partial transposition of the Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC and as well the corrections of incorrect or insufficient WFD transposition into the Act No. 364/2004 Coll.

The WFD Implementation Strategy in the Slovak Republic was approved by the Government Decree No. 46/2004. The aim of this document was to propose the optimal procedure for the complete WFD implementation in the Slovak Republic to eliminate the risk of its incorrect application. The strategy has been updated yearly with the plan of tasks in more detail for the next two years. This strategy fully respects the EU CIS and ICPDR Strategy.

WFD implementation at national level was divided into:

- 1st planning period (2010-2015) - As of December 2009, the Water Plan of the Slovak Republic and River Basin District Management Plans were drawn up.
- 2nd planning period (2016-2021) - Feedback materials and public consultation.

Ministry of the Environment of the Slovak Republic, as the competent authority for water management of the river basin, in accordance with §13 section 4 of the Water Act publishes a proposal of Objectives and Time schedule for the 2nd cycle of preparation of river basin management plans, including the communication plan, within six months from 22.12.2012 to 22.06.2013 for the purpose of submitting written comments and consultations to the public, water users, self-governing regions, municipalities and the relevant authorities of the state water administration.

Ministry of the Environment of the Slovak Republic, as the competent authority for water management of the river basin, in accordance with §13 section 4 of the Water Act publishes Preliminary overview of significant water management issues of the Danube River Basin District for the planning period 2015-2021 and Preliminary overview of significant water management issues of the Vistula River Basin District for the planning period 2015-2021 within six months from 22.12.2013 to 22.06.2014 for the purpose of submitting written comments and consultations to the public, water users, self-governing regions, municipalities and the relevant authorities of the state water administration.

Ministry of the Environment of the Slovak Republic, as the competent authority for water management of the river basin, in accordance with § 13 section 4 of the Water Act publishes Draft

Management Plan of the Danube River Basin District and Draft Management Plan of the Vistula River Basin District within six months from 22.12.2014 to 22.06.2015 for the purpose of submitting written comments and consultations to the public, water users, self-governing regions, municipalities and the relevant authorities of the state water administration.

- 3rd planning period (2022-2027) - Ministry of the Environment of the Slovak Republic, as the competent authority for water management of the river basin, in accordance with § 13 section 4 par. of the Water Act publishes the Objectives and Time schedule for the 3rd cycle of preparation of river basin management plans, including the communication plan, for a period of six months from 12.12.2018 to 12.06.2019 for the purpose of submitting written comments and consultations to the public, water users, self-governing regions, municipalities and the relevant authorities of the state water administration.

The Directive also says that Member States shall encourage active involvement of interested parties in the production, review and updating of the flood risk management plans.

In Hungary the Floods Directive has been implemented to the national law in the 178/2010 (V.13.) governmental decree. In the 10§ (2) section the legislation obligate the involvement of the Regional and National Water Management Committees for the development process. The 13.§(2) section instructs the designer to organize information exchange platforms and discussion forums for the affected population. It also emphasizes the need for the strong connection to the institutes that are dealing with the accomplishment of the Water Framework Directive. From the beginning of 2014 these task are also the responsibility of the Water Directorates, so the cooperation is fundamental. The national flood risk management plan has to be approved by the Government. The EU Flood Directive was implemented into the national legislation in 2010 by the 178/2010 (V.13.) governmental act. for the fulfilment of the requirements a national project started with a name "Flood risk mapping and development of strategic risk management plan (KEOP-2.5.0.B)", also called as 'ÁKK'. The flood inundation analyses are based on a GIS platform-based fully integrated water management tool, where the digital terrain model has a 10x10 m resolution as a raster, but the specific objects (e.g. Rivers, dikes, localization roads etc.) are presented as vectors. The probable failure points of the dikes were investigated and the specific flood curves were calculated from the available 80-120 years long data sets to the certain sections of the water outtake. Climate change effects were interpreted in the low probability events. The transport on the field was calculated with 2D numerical models for each floodplain. The hazard maps were exported to 50x50 meter raster layers for visualization, the boundaries were transformed to shape files. The mapping results were constructed in an aggregated form for the (national) Danube, Tisza, Balaton and Dráva sub-basins in line with the river basin management plans. The reporting format is a 1:2.000.000 scale map, but the appropriate view is 1:100.000. The scenarios for fluvial flooding were likely 30/100/1000 year return probability. The inundation contours represent the three events' maximum extents, the water depth categories are 0-0.5 m, 0.5-1 m, 1-2 m, 2-3 m, 3-5 m, >5 m. The velocities were quite low and considered not important in regard with the inundation hazard, so they were not indicated. The risk analysis is based on the water depth.

In Hungary the basic planning units of the flood risk management plans are the embanked floodplains. These areas have the threat to be inundated by fluvial floods or by groundwater floods (inland excess water). The numbers of the designated areas are 151 and 90 respectively and they are stated in the legislation. These coverages overlap with municipality and county borders, institutional operational borders, furthermore in some cases the national border, but each of them is handled by only one Water Directorate. The Water Directorates are responsible for constructing

the plans, coordinate the local and regional discussions with contributing parties and the wider audience.

The Hungarian Government implemented the National Flood Risk Management Plan of Hungary in the 1146/2016 (III.25.) governmental decree, on the basis of Directive 2007/60/EC on the assessment and management of flood risks. The first review of flood risk management started in 2016.

Regarding WFD, although Hungary became member of the European Union only in 2004, the country had considered this as a fundamental basis for the practical implementation of sustainable water management, therefore decided to comply with the requirements of the directive since its publication.

In Hungary the RBM plans are prepared at three areal levels: country (93,030 km²), 4 sub-basins (River Danube– 34.730 km², River Tisza – 46.380 km², River Dráva – 6.145 km² and Lake Balaton – 5.775 km²) and 42 planning sub-units.

For the preparation of the RBMPs at the sub-unit level the regional water directorates are responsible who co-operate with the regional environmental inspectorates and the national park directorates. At the sub-basin level four appointed regional water directorates co-ordinate the planning, while at the national level the General Directorate of Water Management is the leading agency.

The national RBMP has been constructed according to the recently modified governmental decree 221/2004 (VII. 21.) on river basin management and available (in Hungarian) at www.vizeink.hu. The national RBMP has been unveiled on 22 December 2009, the Hungarian Government approved the river basin management plan on 5 May 2010 and the plan was published Act No. 1127/2010 (V.21).

Between 2010-2015 the national RBMP has been revised by the General Directorate of Water Management and the regional water directorates. The relevant stakeholder has been involved in the process of revision. The revised RBMP has been unveiled on 22 December 2015, the Hungarian Government approved the river basin management plan on 7 April 2016 and the plan was published Act No. 1155/2016 (V.21).

In Serbia the legislation that interlinkage between FD and DCA is water Law (Official Gazette of the Republic of Serbia, nos. 30/2010, 93/2012, 101/2016, 95/2018).

Despite Ukraine is no EU member, already significant steps towards the implementation of the EU water Directives have been made. In autumn 2016, Ukrainian Parliament has adopted the amendments to the Water Code, which came in force since February 2017. The core of the amendments is inclusion of the provisions of EU Water Framework Directive and EU Flood Directive such as need of development of River Basin and Flood Risk Management Plans.

Further to the amendments to the Water Code implementing the requirements of the Water Framework Directive, Flood Directive and Drinking Water Directive the number of the secondary acts are developed as following:

- Adoption of national legislation and designation of competent authority/ies in November 2016;
- Undertaking preliminary flood risk assessment (art. 4 and 5) in November 2018;
- Preparation of flood hazard maps and flood risk maps to be completed in November 2020;
- Establishment of flood risk management plans to be done in November 2022.

Competent authorities responsible with implementation

The competent authorities responsible for Directives implementation in Romania are: Water Inter-ministerial Committee; Ministry of Agriculture and Rural Development; Ministry of Regional Development and Public Administration; National Authority Regulating for Community Utilities of Public Services; Ministry of Internal Affairs; General Inspectorate for Emergency Situations; Ministry of Economy, Commerce and Business Environment; Ministry of Health; Ministry of Transportation; National Authority for Tourism; Ministry of Public Finance; Ministry of European Funds.

The Ministry of the Environment of the Slovak Republic is responsible for the implementation of WFD and the Flood Directive in Slovakia. The Ministry of Interior is the responsible for the implementation of FD and WFD in Hungary.

The coordinating in Serbia authorities are Ministry of Agriculture, Forestry and Water Management - Water Directorate and Public Water Management Companies (PWMC) "Srbijavode" and "Vode Vojvodine", for Tisza River Basin: PWMC "Vode Vojvodine"

Coordination

The coordinating authorities responsible for both directives in Romania are: Ministry of Waters and Forests, General Water Direction – Flood Risk Management and Dam Safety Direction and Water Management Directions, <http://apepaduri.gov.ro> and National Administration „Romanian Waters” <http://www.rowater.ro>

The responsible authorities for coordinating implementation of the FD and WFD in Slovakia are the administrator of the water management significant watercourses (SLOVAK WATER MANAGEMENT ENTERPRISE, state enterprise), in cooperation with the administrators of the small watercourses, the Slovak Hydrometeorological Institute, the Water Research Institute, the State Nature Conservancy of Slovak Republic, the Slovak Environment Agency, the Self-governing regions and organizations their foundations and Municipalities.

The responsible authorities for coordinating implementation of FD and WFD in Hungary are The Ministry of Interior, General Water Directorate and Regional Water Directorates.

Ministry of Agriculture, Forestry and Water Management - Water Directorate is responsible for coordination in Serbia.

Units of management

The implementation of the Flood Directive and Water Directive are implemented by National Administration Romanian Waters branches (organized on river catchments) in Romania. For the Tisza basin they are: Somes-Tisa, Crisuri, Mures and Banat.

Implementation of the FD and WFD in Slovakia is performed by the relevant organizations in the Ministry of Environment of the Slovak Republic, the Ministry of Agriculture and Rural Development of the Slovak Republic, the Ministry of Interior of the Slovak Republic, the Ministry of Defence of the Slovak Republic, the Ministry of Economy of the Slovak Republic, the Ministry of Transport of the Slovak Republic, the Minister of Health of the Slovak Republic, the Ministry of Culture of the Slovak Republic, the administrators of the water management significant watercourses, the administrators of the small watercourses and the self-governing regions.

The Units of management implementation of FD and WFD is done in General Water Directorate and the 12 Regional Water Directorates. From Regional Water Directorate there are in the Tisza River Basin:

- Upper Tisza District Water Directorate,
- North Hungarian District Water Directorate,
- Trans-Tisza Region Water Directorate,
- Middle Tisza District Water Directorate,
- Lower Tisza District Water Directorate,
- Körös Valley Water Directorate.

In Serbia: Danube River Basin and River Basin Management Districts; Tisza is included in the Danube River Basin Management District.

Approach on the integration of TRBMP and TFRMP process

River Basin Management Plans (RBMP) and Flood Risk Management Plans (FRMP) are integrated river basin management elements and hence the importance of coordination between the two processes guided by Water Framework Directive and Flood Directive.

All those measures support the achievement of the environmental objectives of Directive 2000/60/EC, including: preserving the "good status" and "good condition" of water, achieving a "good state" of surface waters, achieving a "Good ecological potential" for artificial waters or with a heavily anthropic modified regime. The integrated or coordinated planning under the WFD and FD has the potential to identify win-win measures that can deliver on the objectives of both policies.

The selection of win –win measures it is based on following recommendations.

The catalogue for potential measures - In order to establish/define flood risk management measures at basin level, a catalogue of potential measures at national level has been developed. This catalogue was very useful defining the most relevant measures in a unitary way. Regarding the proposed types of measures, extensive bibliographic documentation has been carried out with reference to structural measures, but especially to non-structural ones (focusing on the promotion of green infrastructure works). The proposed measures follow the five areas of action, closely related to the flood risk management cycle: prevention; protection; public awareness; training; response and recovery, 23 types of measures being proposed;

Special attention is given to the non-structural measures type in line with EU guidelines, DG Environment and DG Regio recommendations. Thus, of the 23 types of measures, 22 are non or light structural (only one being pure structural - hard engineering works);

Regarding non-structural measures, it was recommended that they will be applied at the level of APSFRs, but for the significant improvement of flood risk management, it was recommended to apply them extensively at sub-basin/basin level.

Conclusions

Romania, Slovakia, Hungary and Serbia elaborated River Basin Management Plans (RBMP) and Flood Risk Management Plans (FRMP) separately. Linkages between two Directives (FD and WD) have been mentioned in both plans.

Ukrainian measures in the table 2 are based on the following documents:

- Current plans of the Tisza basin authority;

- The National Targeted Program for Water Management Development and the *Environmental Rehabilitation of the Dnipro River Basin* for the period till 2021 (№ 4836-VI)¹ (chapter “Comprehensive flood control scheme in the Tisza river basin in Zakarpatska oblast”);
- Resolution of the Cabinet of Ministers of Ukraine of 25 February 2015 №132 "On approval of developed by the State Emergency Service of Ukraine plans to implement some legislative acts of the EU"² and *amendments to it*.

These documents do not mention the prioritization of the measures. At present the prioritization methodology is in the process of development, as a part of the approximation to the EU Flood Directive.

The integrated or coordinated planning under the WFD and FD has the potential to identify win-win measures that can deliver on the objectives of both policies. The relationship between the two directives also appears in the case of investment/construction projects, where it is always necessary to examine how the planned investment affects the FD and WFD directives and how the objectives appear in the projects. The general approach is to retain from the catalogue of measures only the specific ones from Protection field that could better serve to common integrated RBMPs objectives.

The definition of the non-structural measures (potential win-win measures, among other international categories/types of measures, eg.: Natural Water Retention Measures – NWRM’s, building with nature, Room for the River, green measures, etc.) should be at the level of APSFRs or at a specific location and for a significant improvement of flood risk management, to apply them extensively at sub-basin/basin level.

The EC has published in 2013 the typical examples of the way in which the flood risk reduction measures may positively interact with the environmental objectives of the WFD include:

- *Use of measures that are aimed at “making room for water” and increasing natural retention and storage capacity e.g. via reconnection of the floodplain to the river, increasing the retention capacity of floodplains;*
- *Adaptation of the design of new and existing structural measures such as flood defences, storage dams and tidal barriers to take into account WFD objectives and obligations, in particular those related to better environmental options (WFD articles 4.3b and 4.7d);*
- *Reducing urban flooding via increasing storm drain capacities and using SuDS such as construction wetlands and porous pavements.*

As it is envisaged above was considered clear measures, that containing core measures (TISZA_M04, TISZA_M05, TISZA_M06, TISZA_M07 and TISZA_M08), which regardless of the names used — NWRMs, building with nature, Room for the River, green measures, etc. — will maximise the common goals and objectives of water management, economic development, nature conservation and ecosystem services, main win-win measures in the Tisza River Basin targeted on A.P.S.F.R. level. The countries from the Tisza River Basin proposed other potential measures associated to flood risk management that might lead to achieving the strategic objectives of WFD in the Tisza River Basin, with a wide level of application - national/regional/basin. Altogether are in the table below.

¹ <http://zakon3.rada.gov.ua/laws/show/4836-17/page>

² http://www.kmu.gov.ua/document/247983992/Dir_2007_60.pdf

The identified win-win potential measures associated to flood risk management that might lead to achieving the strategic objectives of WFD in the Tisza River Basin

No.	Field of action ¹	Measure Category	Code Type as E.C. ²	Code Type as Tisza River Basin	Type of measure	Code of Measure	Measures	Responsible Authority ³	Level of application ⁴	
1	Prevention	Organizational measures (legislative, institutional...)	M24	TISZA_M01	The definition of a legislative, organizational and technical framework for Floods Directive implementation	TISZA_RS_M01-2	Preparation of flood hazard and flood risk maps	Central authorities	Areas with potentially significant flood risk	
2						TISZA_RS_M02-7	Update/preparation of documentation for fluvial flood, excess inland water and ice defence	Central authorities	River Basin Authority	
3						TISZA_RS_M02-8	Update/preparation of documentation for the use and management of the regime of reservoir operation (including the flood water evacuation regime)	Central authorities	River Basin Authority	
4					TISZA_M02	Reviewing and updating plans for flood risk management	TISZA_RS_M02-9	Update/preparation of technical documentation for the legalization of structures for flood protection, erosion and torrents control and for drainage	Central authorities	River Basin Authority
5						TISZA_RS_M02-11	Update/preparation of the cadaster of hydraulic structures	Central authorities	River Basin Authority	
6						TISZA_RS_M02-12	Maintenance and improvement of the Water Information System by establishing connection with other information systems	Central authorities	National	
7				M21	TISZA_M03	Coordination of territorial planning strategies (plans for development of planning at national, county and regional and urban plans (Regional/Urban/Zonal/Plans) with plans for flood risk management	TISZA_SK_M03-1	Incorporation of delineated flood prone areas into spatial planning	Ministry of Environment of the Slovak Republic, Ministry of Interior of the Slovak Republic, Self-government	National/basin/ A.P.S.F.R.
8							TISZA_RS_M03-5	Entering the boundaries of real and potential flood areas into spatial plans when defining the rules for	Local authorities	Local

No.	Field of action ¹	Measure Category	Code Type as E.C. ²	Code Type as Tisza River Basin	Type of measure	Code of Measure	Measures	Responsible Authority ³	Level of application ⁴
							constructing objects and using floodplains		
9						TISZA_RS_M03-6	Delineation of water land	Central authorities	National, River Basin Authority
10						TISZA_HU_M03-4	Flood river bed management plans (the action plans in the riverbed management plans are implemented after the law enforcement, which action is not depends on the water sector.)	General Directorate of Water Management	National/Basin
11						TISZA_RS_M03-7	Registering water land in the land register	Local authorities	Local
12						TISZA_RS_M03-8	Entering boundaries of water land into spatial plans	Local authorities	Local
13						TISZA_RO_M04-1	Creating new wetlands	M.E.W.F./ N.A.R.W. / R.B.A.	A.P.S.F.R.:4, 16
14						TISZA_RO_M04-2	Floodplain reconnection and restoration	M.E.W.F./ N.A.R.W. / R.B.A.	A.P.S.F.R.:4
15						TISZA_RO_M04-3	Renaturation of river banks (vegetative protection)	M.E.W.F./ N.A.R.W. / R.B.A.	A.P.S.F.R.:4, 7, 16
16	Protection	Natural water retention measures - associated to watercourses, wetlands, natural lakes, in accordance with Directive 2000/60 /EC	M31	TISZA_M04	Measures to restore retention areas (flood plains, wetlands etc.)	TISZA_SK_M04-4	Measures to reduce (decelerate) run-off from river basin into the water courses, to increase retention capability of river basin or to support natural accumulation of water in the suitable areas – measures at agricultural soils, in forests and urban areas operational erosion control measures (organization of land with respect to erosion control, agro-technical erosion control measures,	Ministry of Environment of the Slovak Republic - water sector, Ministry of Environment of the Slovak Republic - nature protection sector, Ministry of Agriculture and Rural Development of the Slovak Republic, Ministry of Defence of the Slovak Republic, Self-government, Non-governmental organization	National/basin/ A.P.S.F.R.: 186 pcs

No.	Field of action ¹	Measure Category	Code Type as E.C. ²	Code Type as Tisza River Basin	Type of measure	Code of Measure	Measures	Responsible Authority ³	Level of application ⁴
							biological erosion control measures), technical erosion control measures (erosion control trenches, terraces at hillslopes), technical forestry measures to influence interception and transpiration of forest vegetation, improvement of infiltration properties of forest soils, measures to decrease storm water runoff, measures to control runoff and decrease water pollution (trenches and ditches, detention and retention ponds and reservoirs, retention soil filters, underground retention reservoirs)		
17						TISZA_HU_M04-5	Natural rehabilitation of Takta channel between Kesznyéten and Tiszalúc.	General Directorate of Water Management/ North-Hungarian Water Conservancy Directorate	regional
18						TISZA_RS_M04-3	Planning and application of measures for erosion control and natural water retention	Central authorities	River Basin Authority
19		Change or adapt land use practices (partial recovery of ecosystem functions or structures modified by changing or	M31	TISZA_M07	Natural water retention measures by changing or adapting land use practices in forest management	TISZA_RO_M07-1	Improving forest management in floodplains	Forest Guard, N.F.A. - Romsilva	A.P.S.F.R.:16
20	TISZA_RO_M07-2					Maintaining the forests area in catchments of A.P.S.F.R.	Forest Guard, N.F.A. - Romsilva	A.P.S.F.R.:16	
21	TISZA_RO_M07-3					Maintaining and expanding forests in perimeter zones of reservoirs	Forest Guard, N.F.A. - Romsilva	A.P.S.F.R.:17	

No.	Field of action ¹	Measure Category	Code Type as E.C. ²	Code Type as Tisza River Basin	Type of measure	Code of Measure	Measures	Responsible Authority ³	Level of application ⁴
		adapting land use practices) for forest management							
22		Other water retention measures	M33	TISZA_M08	Other measures to reduce water levels	TISZA_RS_M05 -1	Construction of new and reconstruction of existing hydraulic structures for protection from fluvial floods	Central authorities	River Basin Authority
23	TISZA_RO_M08-3					Dykes relocation	M.E.W.F., / N.A.R.W. / R.B.A.	A.P.S.F.R.:4, 1**	
24	TISZA_RS_M08-8					Rehabilitation works on flood protection structures, river training works and high water channel	Central authorities	River Basin Authority	
25	TISZA_HU_M08-5					Vasarhelyi Plan: Development of floodplain in the Middle-Tisza. Target area: Szolnok-Csongrád Tisza river section. (in progress) - (KEHOP-1.4.0-15-2016-00014)	General Directorate of Water Management/Middle-Tisza District Water Directorate	regional	
26	TISZA_HU_M08-6					Tisza floodplain: Improving the capacity of the riverbed in Middle-Tisza between Szolnok and Kisköre. KEHOP-1.4.0-15-2016-00017)	General Directorate of Water Management/Middle-Tisza District Water Directorate	regional	
27	TISZA_SK_M09-1					Measures which reduce flood peak discharge – construction, maintenance, repair or reconstruction of water structures: - dams and reservoirs, - dry or semi-dry reservoirs, polders, - bypass canals. Optimization of operational rules with respect to flood control and other purposes of reservoirs utilization	Ministry of Environment of the Slovak Republic, Ministry of Defence of the Slovak Republic, Ministry of Transport, Construction and Regional Development of the Slovak Republic, Self-government	National/basin/ A.P.S.F.R.: 53 pcs	
28	TISZA_RS_M09-5					Planning to preserve and expand existing and establish	Central authorities	River Basin Authority	

No.	Field of action ¹	Measure Category	Code Type as E.C. ²	Code Type as Tisza River Basin	Type of measure	Code of Measure	Measures	Responsible Authority ³	Level of application ⁴
29						TISZA_UA_M09-8	new retention areas Construction of 6 retention reservoirs at rivers Chorna Tisza, Lazeschina, Bila Tisza, Kisva, Rypynka and Irshava. Total volume in condition of 0,5% probability – 60,8 mln. m3	SAWR/Tisza BUVR ³	River basin
30						TISZA_UA_M09-9	Construction of 19 retention reservoirs at rivers Tereblya, Tereshur, Bystra, Golyatinka, Chehovets, Mala Osava, Metova, Goverla, Bogradn, Khustystya, Latorica, Dusina, Svalyavka, Stara, Dryk, Velya, Tsygan, Ublya and Turystya. Total volume in conditions of 0,5% probability – 139,4 mln. m3	SAWR/Tisza BUVR	River basin
31						TISZA_UA_M09-10	Construction of 3 polders near Vary village, Beregivsky rayon, Vilok village Vynogradiv rayon and Shalanky village, Vynogradiv rayon. Total area – 2988 ha	SAWR/Tisza BUVR	River basin
32						Inspection measures and maintenance of watercourses and of the hydraulic flood defence infrastructure	M35	TISZA_M13	Surveillance, behavior monitoring, expertise, strengthening interventions, rehabilitation and maintenance of watercourses and hydraulic flood defence infrastructure
33	Public awareness	Measures to increase community awareness	M43	TISZA_M15	Activities regarding adequate public information and promotion of the public participation	TISZA_RS_M15 -3	Public availability of flood hazard maps through Water Information System	Central authorities	River Basin Authorities
34						TISZA_RS_M15 -4	Media campaigns and promotion	Central authorities	National

³ BUVR – Tisza river basin authority (ASP)

No.	Field of action ¹	Measure Category	Code Type as E.C. ²	Code Type as Tisza River Basin	Type of measure	Code of Measure	Measures	Responsible Authority ³	Level of application ⁴				
35						TISZA_SK_M15-1	Awareness-raising about flood risk, possible flood protection measures, general public input into increasing flood protection at local level	Ministry of Environment of the Slovak Republic, Self-government, Ministry of Defence of the Slovak Republic, Ministry of Agriculture and Rural Development of the Slovak Republic, Ministry of Transport, Construction and Regional Development of the Slovak Republic, Ministry of Interior of the Slovak Republic	National/basin/ A.P.S.F.R.				
36						M43	TISZA_M16		Education / training activities of the population	TISZA_SK_M16-1	Presentation of flood hazard and flood risk maps, flood management plans. Raising public awareness. Training campaigns focused at flood preparedness among municipalities	National/basin/ A.P.S.F.R.	
37										TISZA_RS_M16-3	Introduction of flood related issues into schools	Central authorities	National
38										TISZA_RS_M16-4	Education of population on protection of watercourses from pollution	Central authorities	National
39	Preparedness	Preparedness measures /Improvement preparedness to reduce the adverse effects of floods	M44	TISZA_M20	Providing the human, financial and materials needed in emergency situation and stimulating the voluntary	TISZA_RS_M20-2	Preparation of the Flood Defence Plans	Central authorities	National				
40								TISZA_RS_M20-5	Bilateral cooperation	Central authorities	National		
41								TISZA_RS_M20-8	Regional cooperation	Central authorities	National, River Basin authorities		

Note: * Downstream cumulative effects of retentions along the Tisza in Hungary should be evaluated in the frame of bilateral cooperation between Hungary and Serbia.

¹ Filed of action represent the areas of action closely linked to the flood risk management cycle

² Codes of measures proposed by the European Union, *Technical support in relation to the implementation of the floods directive (2007/60/EC) – A user guide to the floods reporting schemas*, version 5.1, December 20133

³ Central authorities (ministries), county council, local authorities, with coordinating/subordinating authorities or under their authority

⁴ National/River Basin Authority/Areas with potentially significant flood risk level

4; 7; 16; 17 APSFR number represents the current number of the APSFR in Romania, presented in Annex III.9 of *Flood issues and climate changes Integrated Report for Tisza River Basin*

1** APSFR number represents the APSFR river Fizeş – downstream locality Doclin, which is a supplementary APSFR according to the list presented in Annex III.9 of *Flood issues and climate changes Integrated Report for Tisza River Basin*, selected in this stage due to the effect that measure proposed have on downstream

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Project co-funded by the European Union (ERDF, IPA funds)

Partners: General Directorate of Water Management, Hungary | Global Water Partnership Central and Eastern Europe, Slovakia | International Commission for the Protection of the Danube River | Ministry of Water and Forests, Romania | Ministry of Foreign Affairs and Trade, Hungary | National Administration "Romanian Waters", Romania | National Institute of Hydrology and Water Management, Romania | Public Water Management Company "Vode Vojvodine", Serbia | Regional Environmental Center for Central and Eastern Europe, Hungary | The Jaroslav Černi Institute for the Development of Water Resources, Serbia | Water Research Institute, Slovakia | World Wide Fund for Nature Hungary

Associated Partners: Interior Ministry, Hungary | Republic of Serbia Ministry of Agriculture and Environmental Protection – Water Directorate | Secretariat of the Carpathian Convention (SCC), Austria | State Agency of Water Resources of Ukraine | Tisza River Basin Water Resources Directorate, Ukraine

