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First Flood Risk Management Plans - Member State: Slovakia

Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC)
Second River Basin Management Plans
First Flood Risk Management Plans

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Acronyms

APSFR	Areas of Potential Significant Flood Risk
CBA	Cost-Banefit Analysis
EEA	European Environment Agency
FD	Floods Directive
FHRM	Flood Hazard and Risk Map
FRMP	Flood Risk Management Plan
KTM	Key Types of Measures
NWRM	Natural Water Retention Measures
PFRA	Preliminary Flood Risk Assessments
RBD	River Basin District
RBMP	River Basin Management Plan
UoM	Unit of Management
WFD	Water Framework Directive
WISE	Water Information System for Europe

Introduction

The Floods Directive (FD) (2007/60/EC) requires each Member State to assess its territory for significant risk from flooding, to map the flood extent, identify the potential adverse consequences of future floods for human health, the environment, cultural heritage and economic activity in these areas, and to take adequate and coordinated measures to reduce this flood risk. By the end of 2011, Member States were to prepare Preliminary Flood Risk Assessments (PFRAs) to identify the river basins and coastal areas at risk of flooding (Areas of Potential Significant Flood Risk – APSFRs). By the end of 2013, Flood Hazard and Risk Maps (FHRMs) were to be drawn up for such areas. On this basis, Member States were to prepare Flood Risk Management Plans (FRMPs) by the end of 2015.

This report assesses the FRMPs for Slovakia[1]. Its structure follows a common assessment template used for all Member States. The report draws on two main sources:

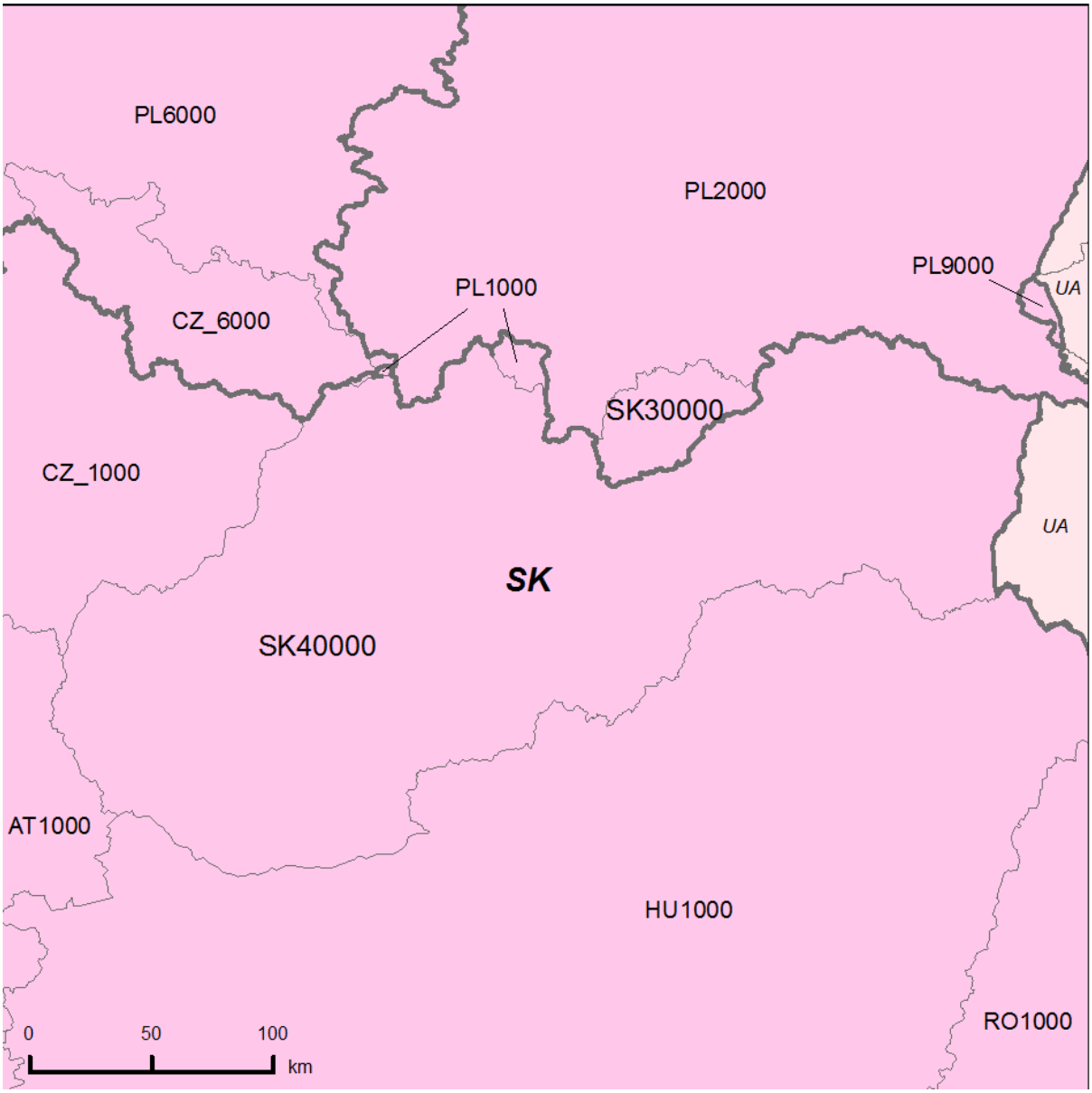
- Member State reporting to the European Commission on the FRMPs[2]: as per Articles 7 and 15 of the FD this reporting provides an overview of the plans and details on their measures.
- Selected FRMPs and sub-plans: Slovakia prepared FRMPs for nine sub-basins across its two units of management (UoMs). These plans have the same structure and very similar content, applying the same methods and approaches. The assessment looked in detail at two plans: the FRMP for the Hron sub-basin in the Danube Unit of Management (UoM), SK40000; and the FRMP for the Dunajec and Poprad sub-basin (the only FRMP in the Vistula UoM, SK30000). To confirm that the same methods and approaches were applied in other Danube River Basin District (RBD) sub-unit plans, the other seven sub-unit FRMPs in the Danube UoM were reviewed as well.

[1] The present Member State assessment reports reflect the situation as reported by each Member State to the Commission in 2016 or 2017 and with reference to FRMPs prepared earlier. The situation in the Member States may have altered since then.

[2] Referred to as "Reporting Sheets" throughout this report. Data must be reported in a clear and consistent way by all Member States. The format for reporting was jointly elaborated by the Member States and the Commission as part of a collaborative process called the "Common Implementation Strategy": http://ec.europa.eu/environment/water/water-framework/objectives/implementation_en.htm
Whereas a key role of the Commission is to check compliance with EU legislation, the Commission also seeks information to allow it to determine whether existing policies are adequate. It also requires certain information to create a European-wide picture to inform the public.

Overview

Figure 1 Map of Units of Management/River Basin Districts



International River Basin Districts (within European Union)
International River Basin Districts (outside European Union)
National River Basin Districts (within European Union)
Countries (outside European Union)
Coastal Waters

Source: Water Information System for Europe (WISE), Eurostat (country borders) as presented in the 2012 RBMP assessment reports

Slovakia has designated two units of management (UoMs) under the FD: SK30000 for the Vistula RBD and SK40000 for the Danube RBD. The territory of these two UoMs corresponds

to the territory of Slovakia's two RBDs, designated under the Water Framework Directive (WFD).

Slovakia has prepared its Flood Risk Management Plans (FRMPs) for sub-basins of its UoMs. The FRMP for the Vistula UoM/RBD (SK30000) consists of the Flood Risk Management Plan for the Dunajec and Poprad sub-Unit (SK30000RB1SB1), which is the only sub-unit designated in SK30000. For the Danube UoM/RBD (SK40000), eight plans covering eight of the nine sub-units[3] are designated for this RBD.

The FRMPs were approved by the Ministry of Environment in December 2015.

The table below gives an overview of the two UoMs in Slovakia, including the number of APSFRs reported. It also shows if the UoM reported all documents required to the European Environment Agency (EEA) WISE[4] – the FRMP as a PDF and the reporting sheet as an XML.

Table 1 Overview of UoMs in Slovakia

UoM	Name	Number of APSFRs[5]	XML Reported	PDF Reported
SK30000FD	VISTULA	31	Yes	Yes
SK40000FD	DANUBE	528	Yes	Yes
TOTAL		**559**		

Slovakia's FRMPs are available online via the following web page:

- http://www.minzp.sk/sekcie/temy-oblasti/voda/ochrana-pred-povodnami/manazment-povodnovych-rizik/plany-manazmentu-povodnoveho-rizika-2015.html

[3] No areas of potentially significant flood risks (APSFRs) were identified for the 9th sub-unit.
[4] http://rod.eionet.europa.eu/obligations/603/deliveries?id=603&tab=deliveries&d-4014547-p=1&d-4014547-o=2&d-4014547-s=3
[5] According to July 2016 reporting.

Overview of the assessment

The table below gives an overview of the evidence found during the assessment of the FRMPs. The following categorisation was used for the column concerning evidence:

- **Evidence to the contrary:** An explicit statement was found stating that the criterion was not met.
- **No evidence:** No information found to indicate that the criterion was met.
- **Some evidence:** Reference to the criterion is brief and vague, without a clear indication of the approach used for the criterion. Depending on the comment in the adjacent column, "some evidence" could also be construed as "weak evidence".
- **Strong evidence:** Clear information provided, describing an approach followed in the FRMP to address the criterion.

Table 2 Overview of the evidence found during the assessment of the FRMPs

Criterion	Evidence	Comments
FRM objectives have been established	Strong evidence	The objectives of the flood risk management plan are to reduce the likelihood of floods and to reduce the potential adverse consequences of flooding on human health, the environment, cultural heritage and economic activity.
FRM objectives relate to...		
...the reduction of potential adverse consequences	Some evidence	Slovakia's objectives are general, but the measures are concrete and measurable. Objectives have been established at the national level. There are no differences in objectives across Slovakia's UoMs and sub-basin plans.
...to the reduction of the likelihood of flooding	Some evidence	The objectives of the flood risk management plan include reduction of the likelihood of flood risk, but further detail is not provided.
...to non-structural initiatives	No evidence	
FRM objectives consider relevant potential adverse consequences to...		
...human health	Strong evidence	Cited in the objectives (see above)
...economic activity	Strong evidence	Cited in the objectives (see above)
...environment	Strong evidence	Cited in the objectives (see above)

Criterion	Evidence	Comments
...cultural heritage	Strong evidence	Cited in the objectives (see above)
Measures have been...		
...identified	Strong evidence	Slovakia has reported 1 381 individual measures and 32 aggregated measures. All the individual measures reported are protection measures, while the aggregated measures cover all four measure aspects.
...prioritised	Strong evidence	Slovakia identified three levels of priority for its measures, based on eight criteria.
Relevant aspects of Article 7 have been taken into account such as...		
...costs & benefits	Strong evidence	The Slovak CBA methodology was used in the prioritisation of measures. This approach is presented as a good practice case study in the first Danube Flood Risk Management Plan produced by the ICPDR.
...flood extent	Strong evidence	For each APSFR, an analysis of the impact of measures on achieving the FRMP objectives was carried out: in particular, the effects of protection measures on Qmax (peak flood discharge) was modelled for various mixes of measures.
...flood conveyance	Strong evidence	The preliminary flood risk assessment in Slovakia included an analysis of conveyance routes. Dewatering channels in urban and agricultural areas and water evacuation routes are addressed in the FRMPs (Chapter 4).
...water retention	Strong evidence	Slovakia's FRMPs (in Annex V of each plan) list measures aimed at water retention. For each APSFR, an analysis of the impact of these measures on the achievement of objectives was carried out. The possible effect of the protection measures on the Qmax (peak flood discharge) was modelled for various measure scenarios. Based on this modelling, sub-catchments were identified that have potential for improved natural water retention and reduction of Qmax using landscape and ecological measures in agricultural areas and forests.

Criterion	Evidence	Comments
...environmental objectives of the WFD	Strong evidence	The FRMPs (in Chapter 8.5 of each), describe coordination of implementation with River Basin Management Plans (RBMPs). Moreover, the process for permitting or consenting of flood risk investments require prior consideration of the environmental objectives of the WFD. The design of the new and existing structural measures has been adapted to take into account the WFD's objectives. Each FRMP also cites the need to apply WFD Art 4(7) for measures.
...spatial planning/land use	Strong evidence	The FRMPs include detailed descriptions of measures: the FRMPs describe measures in forests, in agricultural land and in urban areas based on local zoning development plans. The FRMPs moreover provide information on flood risk measures presented in local spatial plans.
...nature conservation	Some evidence	The FRMP notes that measures are subject to impact assessment in line with the national Nature Conservation Law. For measures having impact on Natura 2000 areas, assessment under Art. 6 of the Habitats Directive is necessary. Specific measures that include nature conservation were not, however, identified.
...navigation/port infrastructure	No evidence	No reference was found in the FRMPs.
...likely impact of climate change	Some evidence	The FRMPs highlight afforestation measures and water retention measures, including construction of reservoirs, as appropriate tools for minimising the impacts of climate change on the likelihood and potential adverse consequences of flooding.
Coordination with other countries ensured in the RBD/UoM	Strong evidence	There is strong coordination in the Danube international RBD via the ICPDR, which is briefly described in the Danube FRMPs, as well as through bilateral coordination with neighbouring countries. The Vistula FRMP mentions bilateral coordination with Poland but does not provide details.

Criterion	Evidence	Comments
Coordination ensured with WFD	Strong evidence	FRMPs in Chapter 8.5 describe coordination of implementation of FRMPs and RBMPs. This coordination covered the development of FHRM, development of flood risk management plans and public information and consultation.
Active involvement of interested parties	Strong evidence	During the six-month period after the public release of the draft FRMPs, special seminars were organised throughout Slovakia by the national Ministry of Environment in cooperation with the Environmental Divisions of the District Authorities, to inform the public and to create space for discussion.

Good Practices

The assessment identified the following good practices in the Slovak FRMPs assessed.

Table 3 Good practices in the Slovak FRMPs

Topic area	Good practices identified
Integration of previously reported information in the FRMPs.	The preliminary flood risk assessment (PFRA) in Slovakia was based on an analysis of the causes, characteristics and consequences of floods which occurred between 1997 and 2010. It included assessment of adverse impacts on human health, environment, cultural heritage and economic activity as well as assessment of flood extent and conveyance routes. This supported the development of the FHRMs, which were used for setting FRMP objectives and priorities for flood risk management. PFRA and FHRM modelling has been used to assess the impact of measures on Qmax, to select sub-catchments where water retention has most potential and to prioritise measures based on CBA.

Topic area	Good practices identified
Planning/implementing of measures and their prioritisation for the achievement of objectives.	The FRMPs provide a detailed description of a high number of individual measures, including measures in forests, in agricultural land and in urban areas, and the FRMPs summarise all suggested protection measures in APSFRs. The FRMPs provide a comprehensive assessment of potential impacts of the existing and proposed protection measures on achieving the FRMP objectives. For each APSFR, a theoretical analysis of the impact of measures on the achievement of FRMP objectives has been carried out. Based on this modelling, sub-catchments have been identified having a potential for improved natural water retention and reduction of Qmax using appropriate landscape and ecological measures in agricultural areas and forests (Natural Water Retention Measures - NWRM). Slovakia's FRMPs identify at least 520 NWR), more than one-third of all measures. A comprehensive prioritisation system has been developed and applied.
Consideration of climate change in the FRMPs assessed.	The FRMPs highlight afforestation measures and water retention measures as tools for minimising the impacts of climate change flood risks.
Use of cost-benefit analysis (CBA) in the FRMPs assessed.	The Slovak CBA method, used to prioritise measures, has been presented as a good practice case study in the first international Danube Flood Risk Management Plan produced by the ICPDR.
Public participation.	Active public consultation was organised to inform the public about the content and the preparation process of flood risk management plans and on the proposed flood protection measures, creating opportunity for discussion. During the six-month public consultation period for the draft flood risk management plans, special seminars were organised throughout Slovakia to inform the public about the content and the preparation process of the plans, present their measures and to create opportunities for discussion.
International issues in flood risk management.	Slovakia cooperated with countries in the Danube Basin in the frame of ICPDR and also on a bilateral basis with neighbouring countries.

Areas for further development

The assessment identified the following areas for further development in the Slovak FRMPs assessed.

Table 4 Areas for further development in the Slovak FRMPs

Topic area	Areas identified for further development
Setting of objectives for the management of flood risk.	The objectives are not specific or measurable.
Planning/implementation of measures and their prioritization for the achievement of objectives.	In their Annexes, the FRMPs only provide details about protection measures. The presentation of measures is complex. An overall budget for the measures (i.e. extending beyond 2021) has not been clearly provided. As Slovakia's objectives are not stated in specific or measurable terms, it is not clear if the objectives will be achieved by the measures. No information was found if a baseline has been established against which progress in the implementation of measures will be monitored and assessed.
Consideration of climate change in the FRMPs assessed.	While the FRMPs mention the national climate change adaptation strategy, it is not analysed how this has been used for setting objectives and measures.
Public participation.	The effects of consultation are not described in the FRMPs.
International issues in flood risk management.	The description of international cooperation in the Vistula RBD is not detailed.

Recommendations

Based on the reported information and the FRMP assessed, the following recommendations are made to enhance flood risk management (not listed in any particular order):

- To be able to assess progress, the FRMP objectives should be specific and measurable, as well as links should be established that will demonstrate how the FRMP objectives will be achieved by the implementation of the measures. A baseline should be defined.
- More clarity when presenting the measures in the FRMP should be sought, including on measures with relevance to the WFD.
- It should be presented in more detail how the national climate change adaptation strategy in Slovakia has been used for setting FRMP objectives and identifying measures.
- The FRMP should include more detail on public consultation and stakeholder involvement.
- A more detailed description of international cooperation in the Vistula RBD should be provided.

1. Scope of the assessment and sources of information for the assessment

1.1 Reporting of the FRMPs

Slovakia has designated two UoMs: SK30000 for the Vistula River Basin District and SK40000 for the Danube RBD. The territories of these two UoMs correspond to Slovakia's two RBDs designated under the WFD, and their codes are the same.

Slovakia did not make use of Art. 13(3) of the FD, which allows Member States to use plans prepared before December 2010, and Slovakia prepared FRMPs for both UoMs.

The Flood Risk Management Plan for the Vistula River Basin District (SK30000) consists of the Flood Risk Management Plan for the Dunajec and Poprad Sub-Unit (SK30000RB1SB1) (344 pages plan + 193 pages annexes), the only sub-unit in SK3000. There is no single plan for the Danube RBD (SK40000), but there are eight plans for the following sub-units in the RBD:

- Bodrog (828 pages for the plan + 656 pages for its annexes),
- Bodva (193+52 pages),
- Hornad (613+474 pages),
- Ipel (225+90 pages),
- Morava (335+231 pages),
- Slana (316+211 pages),
- Vah (1122+779 pages) and
- Hron (440+293 pages).

The Flood Risk Management Plan for the ninth sub-unit in SK40000, called the Danube Sub-Unit, was not developed as no areas of potentially significant flood risks (APSFRs) were identified in this sub-unit.

1.2 Assessment of the FRMPs

All nine sub-basin plans prepared in Slovakia have the same structure and a very similar content. Across all Slovak FRMPs, the same methods and approaches were applied. The different page sizes of these plans reflect the number of locations (APSFRs) and measures addressed in each.

To assess the approaches used in the Danube RBD (SK40000), the FRMP for the Hron sub-basin was selected for a detailed review, as it presents both mountain and lowland river characteristics. However, to make sure that the same methods and approaches were applied in the other Danube RBD sub-units, all seven sub-unit FRMPs were reviewed as well. In parallel,

the Flood Risk Management Plan for the Dunajec and Poprad Sub-Unit (the only one sub-unit of the Vistula River Basin District) was reviewed and assessed in detail.

Table 5 UoM-level FRMPs assessed

UoM code	UoM Name
SK30000FD	VISTULA
SK40000FD	DANUBE

2. Integration of previously reported information

2.1. Conclusions drawn from the preliminary flood risk assessment

The conclusions of the PFRA are presented in the Flood Risk Management Plans in textual and map form.

All FRMPs provide the same link to the page on the web site of the Slovak Ministry of Environment providing maps of the APSFRs[6].

The preliminary flood risk assessment in Slovakia was based on an analysis of the causes, characteristics and consequences of floods which occurred between 1997 and 2010. It included assessment of adverse impacts on human health, environment, cultural heritage and economic activity as well as an assessment of flood extent and conveyance routes. In the PFRA stage, it was explored if the conveyance route capacity and the effect of structural measures are less than Q100max/Q50max or Q10max[7].

2.1.1 Coordination with neighbouring Member States on shared RBDs/UoMs

Slovakia's FRMPs (in their Chapter 1) indicate that the PFRA was coordinated with the neighbouring countries. Overall coordination in the international Danube RBD was undertaken in the frame of the ICPDR. In addition, detailed coordination was carried out with neighbouring countries, including the following sub-basins:

- for the Morava sub-basin, coordination was carried out with Austria and the Czech Republic;
- for the Vah, Hron and Ipel sub-basins, coordination was carried out with Hungary;
- For the Bodrog, Hornad, Bodva and Slana sub-basins, with Ukraine and Hungary.

The FRMP for the Dunajec and Poprad Sub-Unit of the Vistula RBD indicates that coordination in the international Vistula RBD was carried out through the bilateral commission between Slovakia and Poland[8].

It should be noted, however, that Slovakia has not identified any shared APSFRs with neighbouring countries[9].

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6 http://www.minzp.sk/sekcie/temy-oblasti/voda/ochrana-pred-povodnami/manazment-povodnovych-rizik/predbezne-hodnotenie-povodnoveho-rizika-2011.html

7 FRMP chapter 1.

8 Polish-Slovak Border Water Commission.

9 This is indicated in Slovakia's reporting sheets and also in the FHRM assessment for Slovakia (available at: http://ec.europa.eu/environment/water/flood_risk/pdf/fhrm_reports/SK%20FHRM%20Report.pdf)

2.1.2 Information how the PFRA was used in the development of the FHR maps

FHR maps were prepared for each APSFR. The FRMPs do not, however, provide further information how the PFRA was used in the development of these maps.

2.2 Presentation of Flood Hazard and Risk Maps (FHRMs) in the FRMPs

Flood hazard and flood risk maps at the scale of 1:50 000 are included in all the FRMPs[10]. All relevant sources of flood (fluvial, pluvial, groundwater) were assessed in total, no differentiation was made on maps between flood sources. Mapping of fluvial floods included areas where flooding is also caused by other sources (pluvial, groundwater)[11].

2.2.1 Maps for shared flood risk areas

Chapter 1 of the FRMPs provides information that PFRA has been coordinated with the neighbouring countries, and flood hazard and flood risk maps have been prepared for all shared flood risk areas, but further details were not found in the FRMPs. This sounds contradictory to Slovakia's reporting sheet where, as noted above, no transboundary APSFRs were identified.

2.2.2 Conclusions drawn from the flood hazard and flood risk maps

The FRMPs state that FHRM data (potentially affected population, economic activities) were used for setting specific objectives and priorities for flood risk management. Protected areas and cultural heritage data were also used but for these it was not specified if they were taken from FHRMs or from another source (FRMPs, Chapter 3.1).

The conclusions on flood risks derived from FHRMs are summarised in the FRMPs in Annex III (population affected, economic activities affected, impact on the environment). In addition, the FHRMs were used as a tool in the public participation process, in particular in presentations to public[12].

2.3 Changes to the APSFRs or other Flood Risk Areas

Any changes in the identification of APSFRs or other Flood Risk Areas since December 2011 should be reflected in the FRMP: for Slovakia none were reported. Also, no changes since December 2013 were described in the FRMPs regarding the Flood Hazard and Flood Risk Maps.

[10] Available at: http://mpomprsr.svp.sk
[11] FRMP Chapter 2, FRMP maps (see FRMP List of maps).
[12] FRMP chapters 3.1 and 7, FRMP Annex III.

2.4 Areas for further development in the earlier assessment of the FHRM

The FHRM assessment identified the following substantive areas for further development for Slovakia:

- All relevant sources of flooding (fluvial, pluvial, groundwater) were presented without distinction, i.e. no distinction was made on maps between flood sources.
- There was no reference found that mapping in the shared flood risk areas has been coordinated with neighbouring Member State(s)[13].

Based on information in the FRMPs, it appears that Slovakia has not explicitly addressed the first area for further development in the time period between publication of the FHRMs and the present assessment of the FRMPs: sources were still presented indistinctively.

The FRMPs report that FHRMs in shared flood risk areas have been coordinated with neighbouring Member States. At the same time, as noted above, Slovakia does not indicate specific shared flood risk areas with neighbouring Member States.

2.5 Good practices and areas for further development in the FRMPs regarding integration of previously reported information

The following **good practices** are identified:

- The preliminary flood risk assessment (PFRA) in Slovakia was based on an analysis of the causes, characteristics and consequences of floods which occurred between 1997 and 2010. It included assessment of adverse impacts on human health, environment, cultural heritage and economic activity as well as assessment of flood extent and conveyance routes. This supported the development of the FHRMs, which were used for setting FRMP objectives and priorities for flood risk management.
- PFRA and FHRM modelling has been used to assess the impact of retention measures on Qmax (peak flood discharge), to select sub-catchments where water retention has most potential and to prioritise measures based on CBA.

All relevant sources of flood (fluvial, pluvial, groundwater) were presented in a combined way: no distinction was made in the maps between flood sources. This practice should be reviewed for the second cycle.

[13] Slovakia subsequently noted that coordination with neighbouring countries consisted of an assessment of the effect of measures and that in previous reporting to the European Commission it was mentioned that no transboundary APSFRs have been identified.

3. Setting of Objectives

3.1 Focus of objectives

The objectives of the flood risk management plans are to reduce the likelihood of flood risk and to reduce the potential adverse consequences of flooding on human health, the environment, cultural heritage and economic activity. The objectives provide a general reference to measures that will be implemented, but not to specific measures. The objectives are the same across all FRMPs, and were established at national level.

Consequently, in the FRMPs assessed[14]:

- The objectives aim to reduce the adverse consequences of floods;
- The objectives aim to reduce the likelihood of flooding[15];
- The objectives refer to measures that will be implemented.

3.2 Specific and measurable objectives

The objectives are not specific and measurable – they are general (while the measures themselves are concrete and measurable – see section 4). There is no direct link between the general objectives and the detailed measures presented.

3.3 Objectives to reduce adverse consequences from floods

In the FRMPs assessed, objectives do not provide further specification of the type of adverse consequences that will be reduced, or the extent of reduction. As mentioned previously, the objectives are rather general and do not specify the targets to be achieved.

3.4 Objectives to address the reduction of the likelihood of flooding

The objectives focus on reducing the likelihood of flooding.

The FRMPs provide descriptions of the areas with the retention potential (natural retention areas) and of measures for local land use planning, but these points are not directly related to the objectives. The national climate change adaptation strategy is cited but it is not explicitly explained how this has been used for setting of objectives.

[14] These categories are included in Art. 7 of the Floods Directive.

[15] The assessment adopts the generally accepted definition of risk as a product of consequence times likelihood, thereby also in alignment with Art. 7(2) of the FD.

3.5 Process for setting the objectives

The objectives have been coordinated at the national level: as noted, there are the same general objectives for all FRMPs. The objectives were discussed with stakeholder in the public consultation for the FRMPs.

3.6 Good practices and areas for further development regarding objectives

The following **area for further development** was identified:

- The objectives are neither specific nor measurable.

4. Planned measures for the achievement of objectives

Slovakia has reported 1 381 individual measures and 32 aggregated[16] measures[17]. All the individual measures reported are protection measures, while the aggregated measures cover all four measure aspects (no "other" measures are reported). All the individual measures are located at APSFR level, while the aggregated measures are all located at either UoM or national levels. A definition of individual and aggregated measures was not found, however, in the FRMPs or the reporting sheets.

The great majority of measures – 1 303 of the individual protection measures – are located in the Danube UoM (SK40000FD). In contrast, the Vistula UoM (SK30000FD) contains only 78 protection measures.

Please see Annex A for supplementary tables and charts on measures for detailed information on this and subsequent sections.

4.1 Cost of measures

Table 6 Estimated overall budget for the measures in the assessed FRMPs

	Estimated overall budget of planned measures (2015-2021) in EUR
Hron sub-unit (Danube RBD SK40000)	72 300 000
Dunajec and Poprad sub-unit (Vistula RBD SK30000)	45 600 000

Source: FRMPs

The FRMPs indicate that in total, approximately EUR 400 m are planned for measures in Slovakia until 2021[18]. In addition, Annex IX of each FRMP provides the costs of each individual measure for implementation by 2021 in the sub-basin. Summing up the costs of all measures for implementation by 2021 in the Annex IX for the Hron FRMP (no total budget is provided) indicates that EUR 72.3 mil are planned for 12 measures; for the Dunajec and Poprad sub-unit, EUR 45.6 mil are planned for 12 measures.

[16] The Reporting Guidance mentions "Measures can be reported as individual measures (recommended for major projects) or aggregated measures,…" and also notes that measures may be comprised of "many individual projects". European Commission, Guidance for Reporting under the FD (2007/60/EC), 2013, pp. 54-58.

[17] The information reported to WISE was the starting point for the assessment in this section. The majority of the statistics presented are based on processing of information reported to WISE. Assuming that the Member States accurately transferred the information contained in their FRMPs to the reporting sheets (the sheets are the same for all Member States and are not customisable) and barring any undetected errors in the transfer of this information to WISE arising from the use of interfacing electronic tools, these statistics should reflect the content of the FRMPs.

[18] The information is provided in Chapter 6.2 of each FRMP.

The FRMPs indicate that a far larger amount – EUR 1 060 m – are planned for measures in Slovakia after 2021. Annex IX of each FRMP also indicates the costs of each measure for implementation after 2021. Summing up the costs of all measures for implementation after 2021 indicates that:

- EUR 135 m are planned in the Hron sub-unit for 42 measures,
- EUR 282 m are planned for Vah sub-unit for 158 measures,
- EUR 156 m are planned for Slana sub-unit for 29 measures,
- EUR 85 m are planned for Morava sub-unit for 46 measures,
- EUR 10.9 m are planned for Ipel sub-unit for nine measures,
- EUR 5.4 m are planned for Bodva sub-unit for one measure,
- EUR 282 m are planned for Vah sub-unit for 158 measures,
- EUR 85 m are planned for Bodrog sub-unit for 115 measures and
- EUR 19.3 m for 19 measures in the Dunajec and Poprad sub-unit.

The information in the FRMPs' Annex IX does not include a breakdown of cost components specifying which elements are included in the calculation of costs (e.g. if operational costs are included or only investment costs) or if there are any differences in cost calculation methods across different measure aspects.

4.2 Funding of measures

The FRMPs provide an indication of the funding sources for measures. These include national, regional and local budgets. Almost all measures in the FRMPs to be completed by 2021 are going to be co-funded by EU funds (Structural & Cohesion). Further details, such as the share of financing from each source, are not provided[19].

Table 7 Funding of measures

	SK 40000	SK30000
Distribution of costs among those groups affected by flooding		
Use of public budget (national level)	✓	✓
Use of public budget (regional level)	✓	✓
Use of public budget (local level)	✓	✓
Private investment		
EU funds (generic)		
EU Structural funds	✓	✓
EU Solidarity Fund		
EU Cohesion funds	✓	✓

[19] FRMP Chapter 8.

EU CAP funds		
International funds		

Source: FRMPs

4.3 Measurable and specific measures

All FRMPs assessed include a clear and explicit description of the measures with regard to:

- What they are trying to achieve,
- Where they are to be achieved,
- How they are to be achieved, and
- By when they are expected to be achieved.

For each measure, location, river chainage and APSFR code are given. For each APSFR, a theoretical analysis of the impact of measures on the achievement of FRMP objectives has been carried out. The possible effect of the protection measures on Qmax (peak flood discharge) was modelled for various measure scenarios (the scenarios cover: the current situation; all areas, except municipal and industrial areas, afforested; optimised use). Based on this modelling, sub-catchments were identified that have a potential for improved natural water retention and reduction of Qmax using appropriate landscape and ecological measures in agricultural areas and forests (NWRM)[20].

Table 8 Location of measures

	All UoMs assessed
International	
National	
RBD/UoM	✓
Sub-basin	✓
APSFR or other specific risk area	✓
Water body level	
More detailed than water body	

Source: FRMPs

4.4 Measures and objectives

It is clear how and by how much the measures will contribute to the achievement of the objectives. It is not clear, however, whether the objectives will be achieved when all the measures are completed, as the objectives are not stated in a specific and measurable way.

[20] FRMP Annex V and Annex VII.

The FRMP Annexes provide details mainly about the individual protection measures (M31 – M35)[21]. A comprehensive assessment of the potential impact of the existing and suggested protection measures on achieving objectives is provided in Annex VII of each FRMP. For each APSFR, the potential impact of the protection measures on the peak flow was modelled.

4.5 Geographic coverage/scale of measures

All of Slovakia's aggregated measures are located at UoM level and all individual measures, at APSFR level (see Table A5 in Annex A of this document).

In Slovakia's reporting sheet no information on geographic coverage of the expected effects of the measures was provided.

4.6 Prioritisation of measures

The FRMPs (in Chapter 6.2) refer to three priority levels for APSFRs for the implementation of measures (high, medium, low): a prioritisation method based on eight criteria has been applied and the results are presented in Annex IX of each FRMP. The eight criteria (listed in Chapter 6.2) are:

1. Number of people affected by Q100,
2. the number of economic objects in the flood plain area at Q100,
3. the number of IPPC and SEVESO objects, environmental loads and other objects that could cause extreme water quality deterioration or flood risk at Q100,
4. number of sites of cultural heritage, such as monuments and landmarks, in the floodplain area of Q100,
5. the number of measures from River Basin Management Plans proposed for implementation in the frame of FRMP measures,
6. prevented damages in EUR,
7. total cost of implementing flood risk management measures in EUR,
8. cost benefit of flood risk management measures.

Timetable

The timetable for the implementation of measures is set in two phases: until 2021 and after 2021. The timetable is set based on the prioritisation described above. The results are shown in Annex IX of each plan. It seems that the division line is the approximately EUR 400 m that are planned for the FRM measures in Slovakia until 2021 (i.e. measures with high ranking up to

[21] These are called "preventive" measures according to the Slovak Law 7/2010 Z. z., but are protection measures according to the EU catalogue of measures.

EUR 400 m will be implemented by 2021, the rest of the measures after 2021, even if highly ranked).

In the Hron sub-unit, 12 measures (mostly protection measures but also natural flood management and runoff and catchment management measures and measures to reduce the flow into natural or artificial drainage systems) have priority 1 and are planned to 2021. 16 measures with priority 2 and 26 measures with priority 3 are planned after 2021.

In the Dunajec and Poprad sub-unit, 12 measures (protection measures and also natural flood management and runoff and catchment management measures and measures to reduce the flow into natural or artificial drainage systems) have priority 1 and are planned until 2021. One measure with priority 1 and 18 measures with priority 2 are planned after 2021.

In its reporting sheets, Slovakia, did not, however, provide information regarding the prioritisation of measures. Moreover, according to the timetable information reported, Slovakia reported measures for implementation in the period up to 2021 (covering the first FRMP).

4.7 Authorities responsible for implementation of measures

According to Slovakia's reporting sheets, the Ministry of Environment is responsible for the great majority of measures, though other national ministries and other bodies also have responsibility for measures. According to this information, which is provided for all FRMPs in Slovakia:

- Ministry of Agriculture and Rural Development is responsible for two preparedness, eight protection and two recovery measures;
- Ministry of Defence is responsible for two preparedness, 10 protection and four recovery measures;
- Ministry of Environment is responsible for six preparedness, six prevention, 1 385 protection and six recovery measures;
- Ministry of Health is responsible for four recovery measures;
- Ministry of Transport, Constructions and Regional Development is responsible for two preparedness, six protection and two recovery measures;
- Ministry of Interior is responsible for four preparedness, two prevention and six recovery measures;
- the academic sector is responsible for two prevention measures;
- governmental bodies (not specified) are responsible for two preparedness and four prevention measures;
- municipalities are responsible for four preparedness, two prevention, 14 protection and four recovery measures;

- Non-Governmental Organisations are responsible for six protection measures;
- associations of physical or legal persons are responsible for six protection measures.

Consequently, the Ministry of Environment has responsibility for 99 % of the 1 413 measures reported for Slovakia. The other national ministries cited above each have responsibility for about 1 % of the measures, and municipalities have responsibility for 2 % of the measures. The shares for the academic sector, Non-Governmental Organisations and associations are less than 1 % each. It should be noted that many measures have more than one responsible authority.

4.8 Progress of implementation of measures

According to Slovakia's reporting sheets, 1 270 measures (about 90 % of the total) were reported as "Not started", 95 measures (7 %) are "Progress ongoing", 40 measures (3%) are "Completed" and eight measures (under 1 %) are "On-going construction".

The great majority of measures are categorised as protection, and 91% of these (1 268 out of 1 395) have not yet started. In contrast, all the recovery and review measures (six) are ongoing and four of the six preparedness measures are ongoing, with the other two completed. See Tables A7 and A8 and Figures A5 and A6 in Annex A of this document for further details.

4.9 Measures taken under other Community Acts

Member States have been asked to report on other Community Acts under which each measure has been implemented; however, Slovakia did not provide this information in its reporting sheets.

Slovakia's FRMPs (in Chapter 6) describes protection measures in terms of the requirements of the EU WFD environmental objectives. The issue of reducing pollution risks in flood prone zones is mentioned in the FRMPs, specifically when listing existing installations identified under the Seveso Directive; however, further details are not provided.

4.10 Specific groups of measures

With regard to **spatial planning/land use measures**, the following types of measures are included in all the Slovak FRMPs: for flood protection in urban areas, the key precautionary measure is to avoid construction activities in flood risk areas. Where the potentially affected area is already in use, the FRMPs[22] state that social pressure needs to be exerted to move vulnerable objects and assets out of such area. The FRMPs moreover indicate that avoiding construction activities in flood risk areas is a measure contained in spatial plans for urban

[22] Chapter 4.1.2.1.3 in each plan.

areas[23]; spatial plans also include general flood protection and prevention measures such as river revitalisation and river channel capacity maintenance, construction of polders and dikes.

For **NWRM**, the FRMPs list areas suitable for natural and artificial transformation of the flood wave, and Annex V of each FRMPs lists measures aiming to retention of water in a landscape and to the natural accumulation of water. Slovakia reported a total of 520 type M31 measures[24], about 37 % of all measures.

With regard to **measures that specifically consider nature conservation**, all FRMPs state that assessments will consider and address potential impacts on nature conservation areas: All measures are subject to impact assessment in line with §28 of the national Nature Conservation Law (543/2002 Z.z.), and for measures having an impact on Natura 2000 areas, an assessment according to Art. 6 of the Habitats Directive will be ensured.

The FRMPs in Slovakia do not refer to **navigation and port infrastructure**. Detailed information about **dredging** was not found, but there are measures to maintain the river channel capacity with the aim of flood protection (river bed cleaning, vegetation removal)[25].

4.11 Recovery from and resilience to flooding

The role of insurance policies with regard to recovery from flooding or to preparedness and resilience is not discussed in the FRMPs assessed[26]. No information was found with regard to the type of insurance available or to be developed for potential flooding areas. Moreover, no information was found with regard to flood insurance for properties in flood risk areas, and in particular in high flood risk areas. Equally, there is no information provided in the FRMPs whether ecosystem services are considered in costs and benefits, nor restoration costs in cases where potentially polluting sites and installations may be flooded. Nonetheless, in Slovakia's reporting sheets, insurance companies are listed among the authorities responsible for certain measures. No further information is provided, however.

4.12 Monitoring progress in implementing the FRMP

FRMPs contain a general description of the monitoring of the progress of measures implementation. Monitoring is based on provisions of the Law on Public Works and includes monitoring of the preparatory phase, construction phase and finalisation phase and production

[23] FRMPs chapter 3.8.

[24] Protection Natural flood management / runoff and catchment management, Measures to reduce the flow into natural or artificial drainage systems, such as overland flow interceptors and / or storage, enhancement of infiltration, etc. and including in-channel, floodplain works and the reforestation of banks, that restore natural systems to help slow flow and store water.

[25] FRMP Annex VIII.

[26] Slovakia subsequently noted that according to the national Flood Protection Act, insurance policy is not a flood protection measure.

of testing plan and final building approval. In case of the use of EU funds, special indicators are applied[27].

No information was found in the FRMPs regarding a baseline for measuring the progress of implementation of the measures.

4.13 Coordination with the Water Framework Directive

The table below shows how the development of the FRMP has been coordinated with the development of the second River Basin Management Plan of the WFD. In addition, the reporting sheets specifically identify KTM codes (Key Types of Measures) under the WFD KTM23[28], KTM24[29], and KTM17[30] as relevant.

Table 9 Coordination of the development of the FRMPs with the development of the second River Basin Management Plans of the WFD

	All UoMs assessed
Integration of FRMP and RBMP into a single plan	
Joint consultation of draft FRMP and RBMP	✓
Coordination between authorities responsible for developing FRMP and	✓
Coordination with the environmental objectives in Art. 4 of the WFD	
The objectives of the FD were considered in the preparation of the RBMPs [a]	✓
Planning of win-win and no-regret measures in the FRMP	
The RBMP Programme of Measures included win-win measures in terms of achieving the objectives of the WFD and FD, drought management and	
Permitting or consenting of flood risk activities (e.g. dredging, flood defence maintenance or construction) requires prior consideration of WFD objectives and RBMPs	✓
Natural water retention and green infrastructure measures have been included	✓
Consistent and compliant application of WFD Article 4(7) and designation of heavily modified water bodies with measures taken under the FD, e.g. flood defence infrastructure	✓
The design of new and existing structural measures, such as flood defences, storage dams and tidal barriers, have been adapted to take into account WFD Environmental Objectives [a]	✓
The use of sustainable drainage systems, such as the construction of wetland and porous pavements, have been considered to reduce urban flooding and also to contribute to the achievement of WFD Environmental Objectives	

[27] FRMP Chapter 8.
[28] Natural water retention measures.
[29] Adaptation to climate change.
[30] Measures to reduce sediment from soil erosion and surface run-off.

Notes: [a] based on reporting under the WFD

Slovak Act no. 7/2010 Coll. has transposed the FD and provides that the first flood risk management plans and their updates will become part of the river basin management plans (RBMPs) for the respective sub-basins and the river basin districts. At present, however, there are two separate plans.

In the FRMPs, Chapter 8.5 describes coordination of implementation of FRMPs and RBMPs. In particular, they refer to coordination for the development of FHRM, development of flood risk management plans and to public information and consultation. The aspects of permitting or consenting of flood risk activities requiring prior consideration of WFD environmental objectives are addressed in the FRMPs (in Chapter 6.1, which summarises all suggested protection measures). The design of structural measures has been adapted to take into account WFD Environmental Objectives. Chapter 6.1 clearly describes the requirements related to the application of the WFD Art. 4(7) for each measure[31]. The results of an environmental impact assessment should be provided for each measure.

FRMPs Annex V lists all measures aiming at the retention of water in a landscape and to the natural accumulation of water.

NWRM have been included under both RBMPs and FRMPs. FRMPs in Annex V list all measures aiming at retention of water in a landscape and at the natural accumulation of water. Annex 1 lists 520 M31 measures in Slovakia. The FRMPs (in Chapter 6) also describe protection measures in terms of the WFD's objectives.

4.14 Good practices and areas for further development with regard to measures

The following **good practices** were identified:

- The FRMPs provide a detailed description of a high number of individual measures, including measures in forests, in agricultural land and in urban areas, and the FRMPs summarise all suggested protection measures in APSFRs.
- The FRMPs provide a comprehensive assessment of potential impacts of the existing and proposed protection measures on achieving the FRMP objectives.

[31] In particular, that all practicable steps have to be taken to mitigate the adverse impact on the status of the body of water; that the reasons for those modifications or alterations have to be specifically set out and explained in the river basin management plan and the objectives will be reviewed every six years; that the reasons for those modifications or alterations are of overriding public interest; and the beneficial objectives served by those modifications or alterations of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option.

- The possible effect of the protection measures on the Qmax (peak flood discharge) was modelled for various mixes of measures. Based on this modelling, sub-catchments could be identified having a potential for improved natural water retention and reduction of Qmax using appropriate landscape and ecological measures in agricultural areas and forests.
- Slovakia's FRMPs identify at least 520 NWRMs, more than one-third of all measures.
- A comprehensive system to prioritise measures has been developed and applied.

The following **areas for further development** were identified:

- In their Annexes, Slovakia's FRMPs only provide details on protection measures.
- As Slovakia's objectives are not stated in specific or measurable terms, it is not clear to what extent they will be achieved by the measures.
- No information was found if a baseline has been established against which progress in the implementation of measures will be monitored and assessed.

5. Consideration of climate change

Slovakia's FRMPs cite the national Climate Change Adaptation Strategy, published in 2014[32]. They explain that the Strategy calls for adaptation measures in the water management sector such as water retention (by afforestation, floodplain revitalisation, application of proper agricultural methods, reduction of non-permeable surfaces in urban areas), construction of reservoirs and polders, proper urban zoning (avoiding new construction in flood risk areas), effective water management (effective reservoir management), prevention of water pollution, research (quantification of climate change impact on river hydrology). The FRMPs, however, do not explain how the Strategy has been used in preparing the plans, including in setting objectives or identifying measures[33], though they do include some of the measures it suggests.

The FRMPs note that climate change will lead to a more irregular precipitation pattern that will cause both drought and flood (especially flash flood) events. Greater extremes in the hydrological regime are expected as well. No information was found in the reporting sheets or in the FRMPs with regard to whether the main sources of flooding are expected to change under the long-term climate change scenarios.

5.1 Specific types of measures to mitigate expected effects of climate change

The FRMPs highlight afforestation measures and water retention measures, including construction of reservoirs, as appropriate tools for minimizing the impacts of climate change on the likelihood and potential adverse consequences of flooding[34].

5.2 Good practices and areas for further development concerning climate change

The following **good practice** was identified:

- The FRMPs highlight afforestation measures and water retention measures as tools for minimising the impacts of climate change flood risks.

The following **area for further development** was identified:

- While the FRMPs mention the national climate change adaptation strategy in Slovakia, it is not explicitly explained how it has been used for setting the FRMPs' objectives and measures.

[32] Ministry of Environment, Adaptation Strategy of the Slovak Republic on Adverse Impacts of Climate Change, December 2014.
[33] FRMPs Chapter 1.
[34] FRMPs Chapter 4.

6. Cost-benefit analysis

All the FRMPs assessed refer to cost benefit as a criterion for the establishment of priorities for the selection of measures. CBA was used for all measures.

The FRMPs note that CBA had already been applied for specific flood protection measures and projects in Slovakia. According to national legislation, flood damage to assets is defined through an estimation of restoration costs based on prices in the affected region.

For the purpose of the prioritisation of measures in the Flood Risk Management Plans, a national methodology for the evaluation of flood damages, for use in the analysis of flood protection measures and their economic benefits, was prepared by the national Working Group on Economics and then amended and adopted by the national Working Group on Floods in January 2014. The ranking of measures is based inter alia on their efficiency indices, which are calculated as the ratio between the estimated avoided potential flood damages and the estimated overall costs (for preparation, land purchase, implementation, operation and maintenance) of a given measure during its lifetime. The lifetime period of the flood protection measures/structures equals 100 years in Slovakia.

Multi-benefits were considered in all the FRMPs. The efficiency index was used as one out of several criteria in the process of prioritization of measures. Prioritisation of flood protection measures to achieve the objectives of the Flood Risk Management Plan up to 2021 was mainly according to the urgency of their implementation and has been carried out on the basis of eight criteria (also listed in section 4):

1. Number of people affected by Q100,
2. the number of economic objects in the flood plain area at Q100,
3. the number of IPPC and SEVESO objects, environmental loads and other objects that could cause extreme water quality deterioration or flood risk at Q100,
4. number of objects of cultural heritage, resp. Cultural monuments and landmarks in the floodplain area of Q100,
5. the number measures from river basin management plans proposed for implementation in the frame of FRMP measures,
6. Prevented damages in EUR,
7. total cost of implementing flood risk management measures in EUR,
8. cost benefit of flood risk management measures.

Based on these criteria, the prioritisation of measures was carried out. Each of the criteria was assessed individually and the cumulative effect of flood protection measures protecting more

than one geographical area was taken into account. The assessment of the eight criteria assigned a score to each proposed measure.

Based on the results of prioritisation process, the measures to be implemented up to 2021 were identified. Next, the technical feasibility of completion of the proposed measures up to 2021 was assessed. If it is technically unfeasible, then the measure is proposed for realisation after 2021. The results of prioritisation are presented in FRMPs, in Annex IX[35].

Slovakia's reporting sheet states that no transboundary APSFRs were identified and no measures with transboundary impact were identified. Therefore, to assess measures with transnational effects was not relevant for the first FRMP.

6.1 Good practices and areas for further development

The following **good practice** was identified:

- The Slovak CBA method is presented as a good practice case study in the first Danube Flood Risk Management Plan produced by the ICPDR. This method was used to prioritise measures.

[35] The Slovak CBA is described in Annex 5 of the international Danube Flood Risk Management Plan published by the ICPDR.

7. Governance including administrative arrangements, public information and consultation

7.1 Competent authorities

The FRMPs and Slovakia's reporting sheets indicate that the Competent Authorities and the Units of Management previously identified for the FD have not changed. No documents have been submitted to the European Commission regarding the matter since the initial reporting in 2010.

7.2 Public information and consultation

The table below shows how the public and interested parties were **informed** in the UoMs assessed concerning the draft FRMPs. Information on how the consultation was actually carried out and which stakeholders participated is presented in the rest of the section:

Table 10 Methods used to inform the public and interested parties of the FRMPs

	All UoMs assessed
Media (papers, TV, radio)	✓
Internet	✓
Digital social networking	
Printed material	
Direct mailing	
Invitations to stakeholders	✓
Local Authorities	✓
Meetings	✓
TV documentary	✓

Source: FRMPs

Slovakia's FRMPs were developed in coordination with the updates of the River Basin Management Plans under the WFD (as per Act No. 7/2010 Coll. on Flood Protection, Art. 9.4). These two strategic documents were jointly submitted for strategic environmental assessment (under Act No. 24/2006 Coll. on Environmental Impact Assessment) and for the public consultation, for written comments.

During the six-month consultation period for the draft FRMPs, special seminars were organised throughout Slovakia by the Ministry of Environment in cooperation with the Environmental Divisions of the District Authorities. The scope of the seminars was to inform the public about the content and the preparation process of the plans and on their proposed flood protection measures, and to create opportunities for discussion.

The participants in these seminars included[36]:

- mayors of municipalities or representatives of communities united in micro-regions;
- officials in self-governing bodies who work on protection against floods (e.g. employees of regional road administration, etc.);
- officials of the Divisions of crisis management of District Authorities;
- officials of the Environmental Divisions of the District Authorities.

Members of the broader public also participated.

The table below shows how the actual **consultation** was carried out:

Table 11 Methods used for the actual consultation

	All UoMs assessed
Via Internet	✓
Digital social networking	
Direct invitation	✓
Exhibitions	
Workshops, seminars or conferences	✓
Telephone surveys	
Direct involvement in drafting FRMP	

Source: FRMPs

The consultation was carried out via Internet, via direct invitation to stakeholders and also via the special seminars described above.

The table below shows how the **documents** for the consultation were provided:

Table 12 Methods used to provide the documents for the consultation

	All UoMs assessed
Downloadable	✓
Direct mailing (e-mail)	
Direct mailing (post)	
Paper copies distributed at exhibitions	
Paper copies available in municipal buildings (town hall, library etc.)	✓

Source: FRMPs

For all the UoMs assessed, documents for the consultation were available for download from the Internet, and paper copies were available in all municipalities. There were no differences

[36] FRMP Chapter 8.2 DFRMP.

between FRMPs in terms of their structure and table of contents, the approaches and methods used, or the text phrases describing the major principles followed between the plans. As noted in section 1, the FRMPs did differ in terms of length, due among other reasons to the number of information provided on specific conditions and measures.

7.3 Active involvement of Stakeholders

The table below shows the groups of **stakeholders** that were actively involved in the development of the FRMPs assessed (further details are provided above):

Table 13 Groups of stakeholders

	All UoMs assessed
Civil Protection Authorities such as Government Departments responsible for emergency planning and coordination of response actions	✓
Flood Warning / Defence Authorities	✓
Drainage Authorities	
Emergency services	
Water supply and sanitation	
Agriculture / farmers	
Energy / hydropower	
Navigation / ports	
Fisheries / aquaculture	
Private business (Industry, Commerce, Services)	
Non-Governmental Organisations including nature protection, social issues (e.g. children, housing)	
Consumer Groups	
Local / Regional authorities	✓
Academia / Research Institutions	✓
General public (via online questionnaires)	

Source: FRMPs

The table below shows the **mechanisms** used to ensure the active involvement of stakeholders:

Table 14 Mechanisms used to ensure the active involvement of stakeholders

	All UoMs assessed
Regular exhibitions	✓
Establishment of advisory groups	✓
Involvement in drafting	
Workshops and technical meetings	✓

Formation of alliances	
Information days	

Source: FRMPs

The main mechanisms for active involvement by stakeholders were the formation of advisory groups as well as holding regular exhibitions and the organisation of the special seminars described above.

7.4 Effects of consultation

The effects were not mentioned in the FRMPs.

7.5 Strategic Environmental Assessment

Both FRMPs and RBMPs underwent a Strategic Environmental Assessment procedure[37].

7.6 Good practices and areas for further development regarding Governance

The following **good practices** were identified:

- Active public consultation was organised to inform the public about the content and the preparation process of flood risk management plans, and on the proposed flood protection measures, creating sufficient space for discussion.
- During the six-month public consultation period for the draft flood risk management plans, special seminars were organised throughout Slovakia to inform the public about the content and the preparation process of the plans, present their measures and to create opportunities for discussion.

The following **area for further development** was identified:

- The effects of the consultations are not described in the FRMPs.

[37] Reporting sheet: Summary of the Development.

Annex A: Supplementary tables and charts on measures

This Annex gives an overview of the data on measures provided by Slovakia in its reporting sheets. These tables and charts were used for the preparation of section 4 on the planned measures.

Background & method

This document was produced as part of the assessment of the Flood Risk Management Plans (FRMPs). The tables and charts below are a summary of the data reported on measures by the Member States and were used by the Member State assessor to complete the questions on the Flood measures. The data are extracted from the XMLs (reporting sheets) reported by Member States for each FRMP, and are split into the following sections:

- **Measures overview** – Tabulates the number of measures for each UoM
- **Measure details: cost –** Cost & Cost explanation
- **Measures details: name & location** – Location & geographic coverage
- **Measure details: authorities** – Name of responsible authority & level of responsibility
- **Measure details: objectives** – Objectives, Category of priority & Timetable
- **Measure details: progress** – Progress of implementation & Progress description
- **Measure details: other** – Other Community Acts

On the basis of the reporting guidance (which in turn is based on the FD)[38], not all fields are mandatory, and, as such, not all Member States reported information for all fields.

Some of the fields in the XMLs could be filled in using standardised answers – for example, progress is measured via the categories set out in the Reporting Guidance. This means that producing comprehensive tables and charts required little effort. For many fields, however, a free data format was used. For some Member States, this resulted in thousands of different answers, or answers given in the national language.

In such situations, tables and charts were developed using the following steps:

- A first filter is done to identify how many different answers were given. If a high number of different answers are given, Member States assessors were asked to refer to the raw data when conducting the assessment, and this Annex does not reflect these observations.
- If a manageable number of answers are given, obvious categories are identified, and raw data sorted.

[38] http://icm.eionet.europa.eu/schemas/dir200760ec/resources

- Measures missing information may be assigned categories based on other fields (for example, if the level of Responsibility Authority is missing, the information may be obvious from the field "name of Responsible Authority").
- Measures where obvious categories cannot be defined based on other available information (as in the example above on the name of the Responsible Authority), are categorised as "no information".

Types of measures used in reporting

The following table[39] is used in the reporting on the types of measures. Each type of measures is coded as an M-number. Measures are grouped in an 'aspect'.

NO ACTION M11: No Action	**PREPAREDNESS** M41: Flood Forecasting & Warning M42: Emergency response planning M43: Public Awareness M44: Other preparedness
PREVENTION M21: Avoidance M22: Removal or relocation M23: Reduction M24: Other prevention	**RECOVERY & REVIEW** M51: Clean-up, restoration & personal recovery M52: Environmental recovery M53: Other recovery
PROTECTION M31: Natural flood management M32: Flow regulation M33: Coastal and floodplain works M34: Surface Water Management M35: other protection	**OTHER MEASURES** M61: Other measures

[39] Guidance for Reporting under the Floods Directive (2007/60/EC): https://circabc.europa.eu/w/browse/a3c92123-1013-47ff-b832-16e1caaafc9a

List of Annex A tables & figures

Measures overview

Table A1 - Total number of measures

Number of individual measures	1 381
Number of individual measures including measures which have been allocated to more than one measure type	1 381
Number of aggregated measures	32
Number of aggregated measures including measures which have been allocated to more than one measure type	32
Total number of measures	1 413
Total number of measures including measures which have been allocated to more than one measure type	1 413
Range of number of measures between UoMs including measures which have been allocated to more than one measure type (Min-Max)	94 - 1 319
Average number of measures across UoMs including measures which have been allocated to more than one measure type	707

Table A2 - Number of individual measures per measure type and UoM

	Prevention	Protection					Preparedness	Recovery & Review	Other	Grand Total
		M31	M32	M33	M34	M35				
SK30000FD		31	9	25		13				78
SK40000FD		489	101	373	13	327				1 303
Grand Total	**0**	**520**	**110**	**398**	**13**	**340**	**0**	**0**	**0**	**1 381**
Average per UoM	**0**	**260**	**55**	**199**	**7**	**170**	**0**	**0**	**0**	**691**

Notes: All individual measures reported by Slovakia are Protection measures.

Table A3 - Number of aggregated measures per measure type and UoM

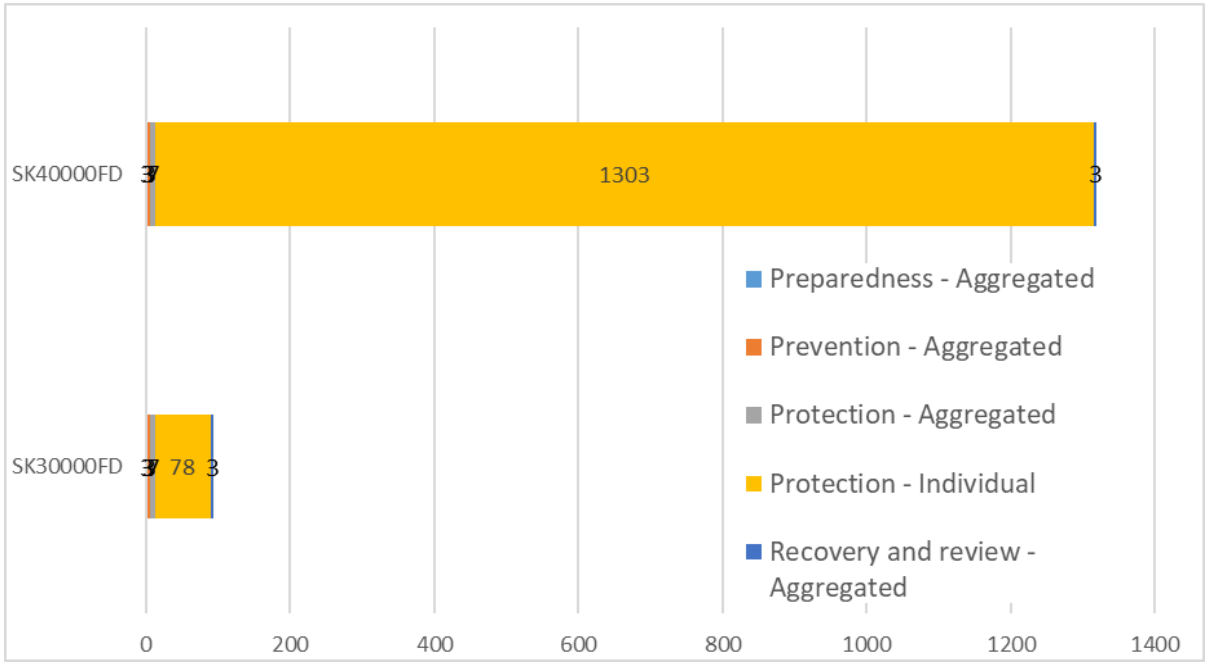
	Prevention			Protection					Preparedness			Recovery & review			Other	Grand Total
	M21	M23	M24	M31	M32	M33	M34	M35	M41	M42	M43	M51	M52	M53		
SK30000FD	1	1	1	3	1	1	1	1	1	1	1	1	1	1		16
SK40000FD	1	1	1	3	1	1	1	1	1	1	1	1	1	1		16
Grand Total	**2**	**2**	**2**	**6**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**0**	**32**
Average per	**1**	**1**	**1**	**3**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**16**

Table A4 - Total number of measures (aggregated and individual) per measure aspect and UoM

	Prevention		Total	Protection		Total	Preparedness		Total	Recovery & review		Total	Other	Grand Total
	Aggregate	Individual		Aggregate	Individual		Aggregate	Individual		Aggregate	Individual			
SK30000FD	3		3	7	78	85	3		3	3		3		94
SK40000FD	3		3	7	1 303	1 310	3		3	3		3		1 319
Grand Total	**6**	**0**	**6**	**14**	**1 381**	**1 395**	**6**	**0**	**6**	**6**	**0**	**6**	**0**	**1 413**
Average per UoM	**3**	**0**	**3**	**7**	**691**	**698**	**3**	**0**	**3**	**3**	**0**	**3**	**0**	**707**

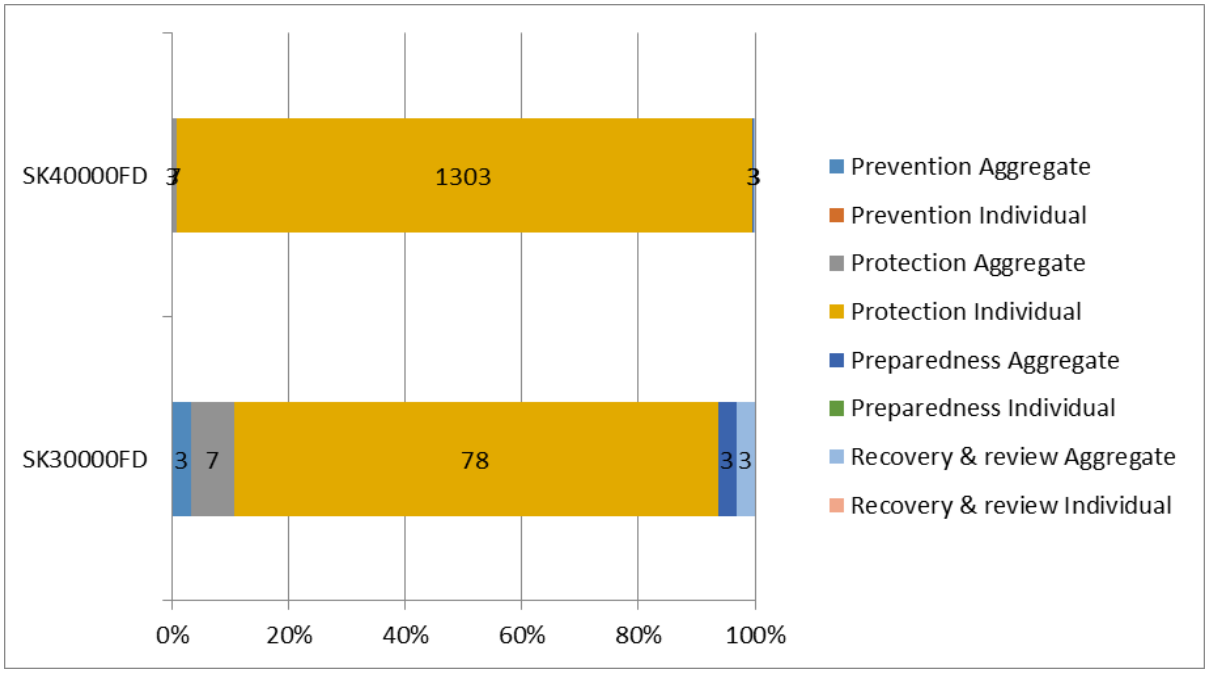
The information in Table A4 is visualised in Figures A1 and A2 below:

Figure A1 - Number of total measures (individual and aggregate) by measure aspect



Note that the majority of measures (>90%) in SK are individual protection measures, which makes the other types of measures less visible.

Figure A2 - Share of total measures (aggregated and individual) by measure aspect



Note that the majority of measures (>90%) in SK are individual protection measures, which makes the other types of measures less visible.

Measure details: cost

Member States were requested to report information on:

- Cost (optional field);
- Cost explanation (optional field).

Slovakia has provided no information about the costs of measures in the reporting sheets.

Measure details: name & location

Member States were requested to report information on:

- Location of implementation of measures (mandatory field)
- Geographic coverage of the impact of measures (optional field)

Location of measures

For Slovakia, it has been possible to identify the location of all measures, as the free format answers are clearly either UoM codes or APSFR codes.

Table A5 - Location of implementation by measure aspect

	UoM	APSFR	Grand Total
Prevention	6		6
Protection	14	1 381	1 395
Preparedness	6		6
Recovery & review	6		6
Grand Total	**32**	**1 381**	**1 413**

Figure A3 - Visualisation of Table A5: Location of implementation by measure aspect

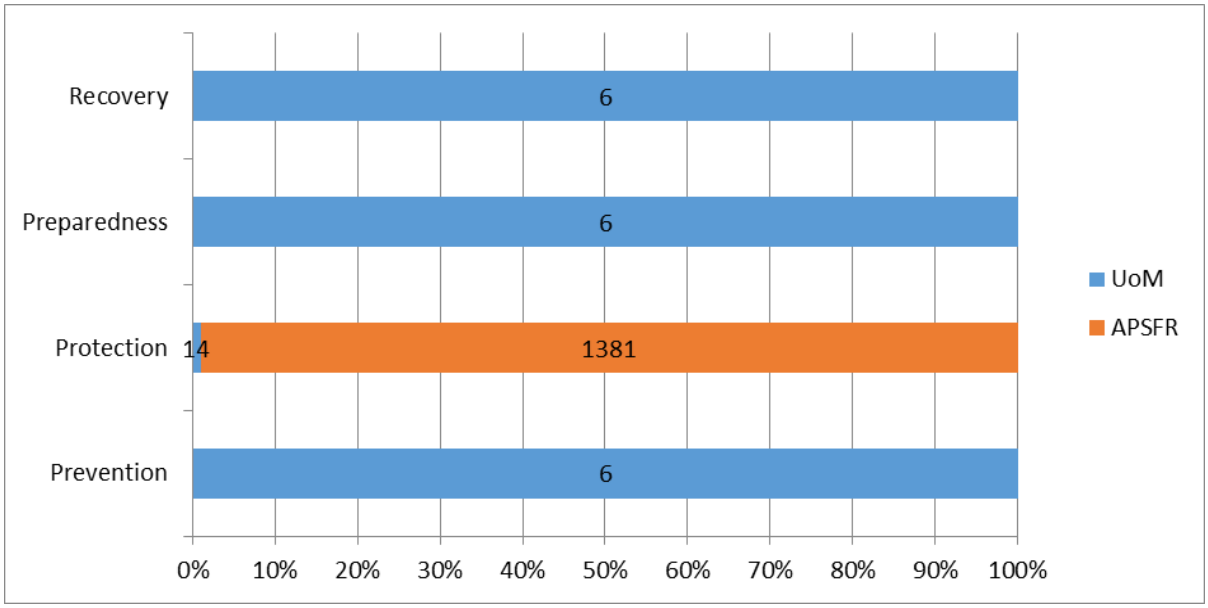
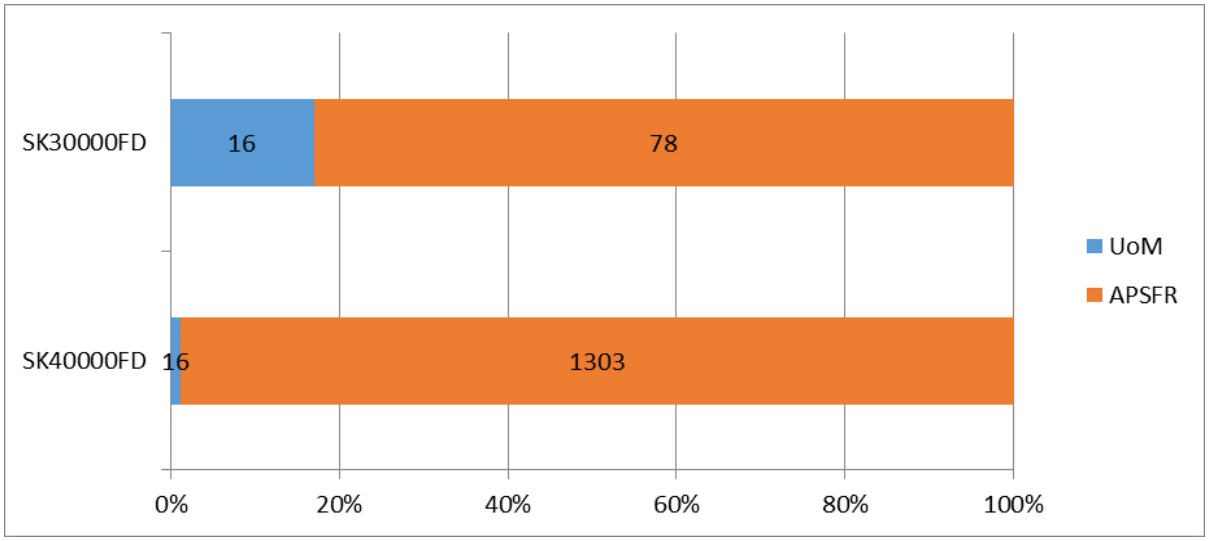


Table A6 - Location of implementation by UoM

	UoM	APSFR	Grand Total
SK30000FD	16	78	94
SK40000FD	16	1 303	1 319
Grand Total	**32**	**1 381**	**1 413**
Average per UoM	**16**	**691**	**707**

Figure A4 - Visualisation of Table A6: Location of implementation by UoM



Geographic coverage

Slovakia did not report information about the geographic coverage of the effects of measures in the reporting sheets.

Measure details: objectives

Member States were requested to report information on:

- Objectives linked to measures (optional field, complementary to the summary provided in the textual part of the XML).
- Category of priority (Conditional, reporting on either 'category of priority' or 'timetable' is required).
- Timetable (Conditional, reporting on either 'category of priority' or 'timetable' is required).

Objectives

Slovakia has provided no information for objectives in the reporting sheets.

Category of priority

Slovakia has provided no information for priority of the measures in the reporting sheets.

Timetable

In the reporting sheets, Slovakia has provided "do roku 2021" for every measure, i.e. by 2021 (the next cycle of the FRMP).

Measure details: authorities

Member States were requested to report information on:

- Name of the responsible authority;
- Level of responsibility.

Slovakia reported that many measures have more than one responsible authority, creating some double counting and making the aggregation of the data difficult. Overall, most measures reported national ministries and municipalities as the responsible authorities, some measures reported also other responsible authorities from e.g. the academic sector, associations, Non-Governmental Organisations, insurance companies or other government bodies.

Measure details: progress

Member States were requested to report information on:

- Progress of implementation of measures (mandatory field) – this is a closed question whose responses are analysed below;
- Progress description of the implementation of measures (optional field) – this is an open text question whose answers are not analysed here.

Slovakia reported the progress of all measures. The progress of implementation was reported as[40]:

- COM (completed);
- OGC (ongoing construction);
- POG (progress ongoing);
- NS (not started).

A full definition of these terms can be found at the end of this section.

Table A7 - Progress of implementation by measure aspect

	Completed	Ongoing construction	Progress ongoing	Not started	Grand Total
Prevention			4	2	6
Protection	38	8	81	1 268	1 395
Preparedness	2		4		6
Recovery & review			6		6
Grand Total	**40**	**8**	**95**	**1 270**	**1 413**

[40] Guidance for Reporting under the Floods Directive (2007/60/EC): https://circabc.europa.eu/w/browse/a3c92123-1013-47ff-b832-16e1caaafc9a

Figure A5: Visualisation of Table A7: Progress of implementation by measure aspect

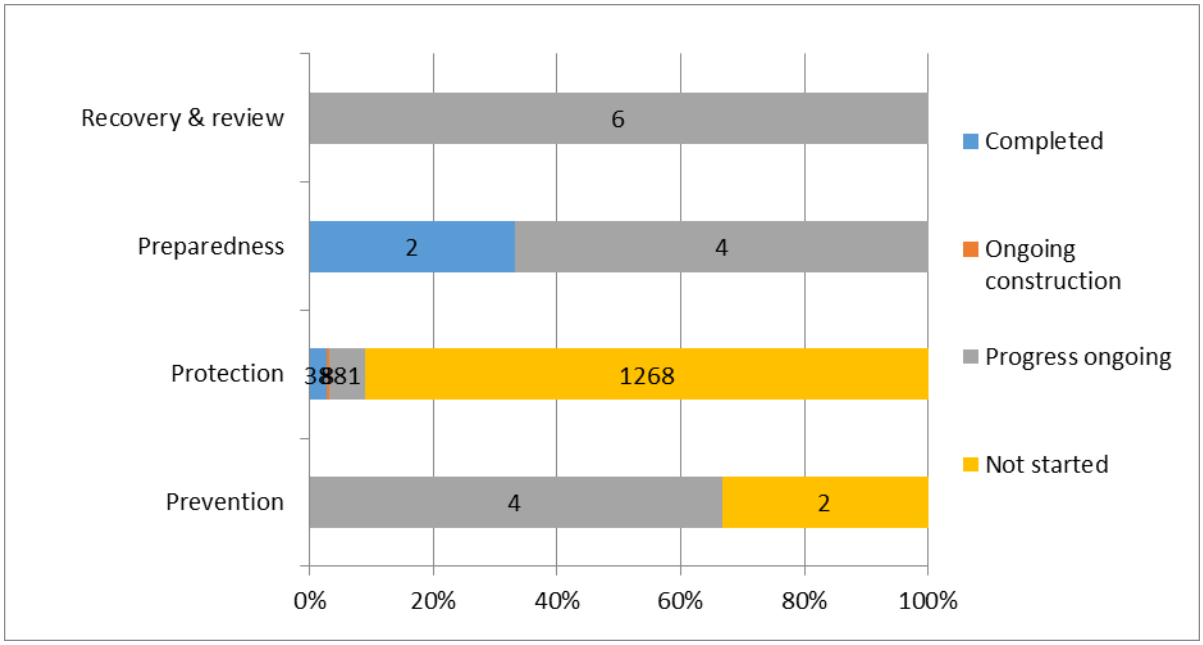
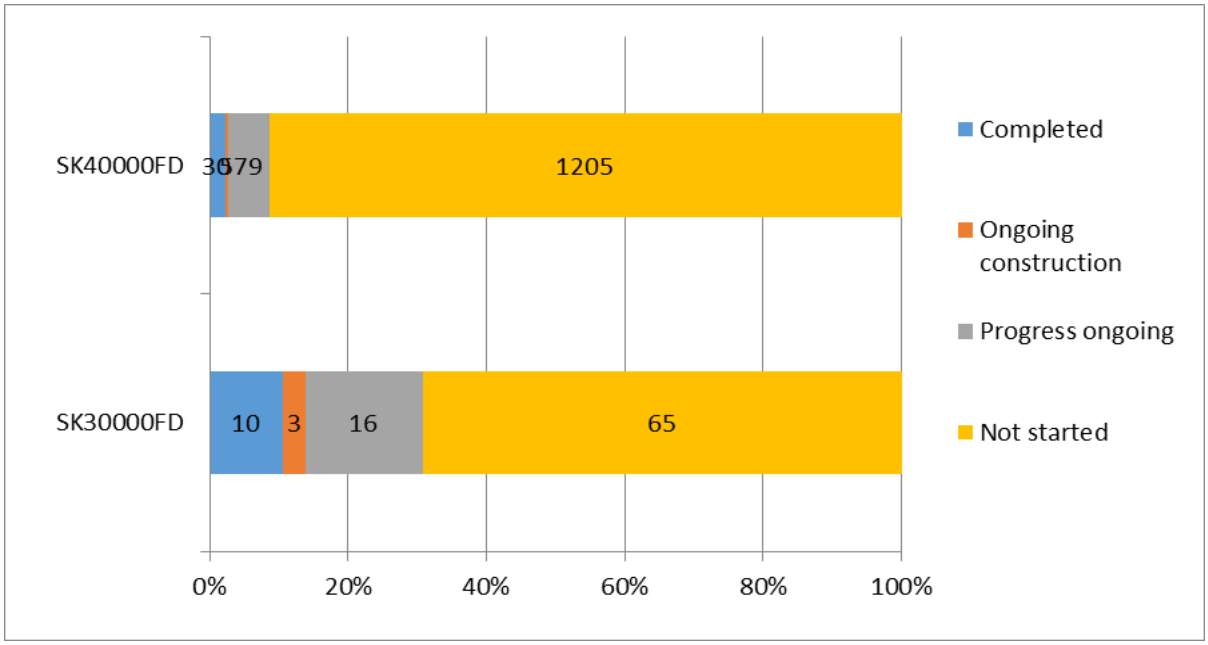


Table A8 - Progress of implementation by UoM

	Completed	Ongoing construction	Progress ongoing	Not started	Grand Total
SK30000FD	10	3	16	65	94
SK40000FD	30	5	79	1 205	1 319
Grand Total	**40**	**8**	**95**	**1 270**	**1 413**
Average per UoM	**20**	**4**	**48**	**635**	**707**

Figure A6 - Visualisation of Table A8: Progress of implementation by UoM



The categories describing the progress of measures are defined in the EU Reporting Guidance Document on the FD.

For **measures involving construction or building works** (e.g. a waste water treatment plant, a fish pass, a river restoration project, etc.):

- Not started (NS) means the technical and/or administrative procedures necessary for starting the construction or building works have not started.
- Progress on-going (POG) means that administrative procedures necessary for starting the construction or building works have started but are not finalised. The simple inclusion in the RBMPs is not considered planning in this context.
- On-going construction (OGC) means the construction or building works have started but are not finalized.
- Completed (COM) means the works have been finalised and the facilities are operational (maybe only in testing period in case e.g. a waste water treatment plant).

For **measures involving advisory services** (e.g. training for farmers):

- Not started (NS) means the advisory services are not yet operational and have not provided any advisory session yet.
- Progress on-going (POG) means the advisory services are operational and are being used. This is expected to be the situation for all multi- annual long/mid-term advisory services that are expected to be operational during the whole or most of RBMP cycle.
- On-going construction (OGC): Not applicable
- Completed (COM) means an advisory service that has been implemented and has been finalised, i.e. is no longer operational. This is expected only for advisory services that are relatively short term or one-off, and which duration is time limited in relation to the whole RBMP cycle.

For **measures involving research, investigation or studies**:

- Not started (NS) means the research, investigation or study has not started, i.e. contract has not been signed or there has not been any progress.
- Progress on-going (POG) means the research, investigation or study has been contracted or started and is being developed at the moment.
- On-going construction (OGC): Not applicable
- Completed (COM) means the research, investigation or study has been finalised and has been delivered, i.e. the results or deliverables are available (report, model, etc.).

For measures involving administrative acts (e.g. licenses, permits, regulations, instructions, etc.):

- Not started (NS) means the administrative file has not been opened and there has not been any administrative action as regards the measure.
- Progress on-going (POG) means an administrative file has been opened and at least a first administrative action has been taken (e.g. requirement to an operator to provide information to renew the licensing, request of a permit by an operator, internal consultation of draft regulations, etc.). If the measure involves more than one file, the opening of one would mean already "ongoing".
- On-going construction (OGC): Not applicable
- Completed (COM) means the administrative act has been concluded (e.g. the license or permit has been issued; the regulation has been adopted, etc.). If the measure involves more than one administrative act, "completed" is achieved only when all of them have been concluded.

Measure details: other

Member States were requested to report information on:

- Other Community Acts associated to the measures reported (optional field);
- Any other information reported (optional field).

Slovakia has provided no information about this in the reporting sheets.

Annex B: Definitions of measure types

Table B1 Types of flood risk management measures[41]

	No Action
M11	No Action, No measure is proposed to reduce the flood risk in the APSFR or other defined area,
	Prevention
M21	Prevention, Avoidance, Measure to prevent the location of new or additional receptors in flood prone areas, such as land use planning policies or regulation
M22	Prevention, Removal or relocation, Measure to remove receptors from flood prone areas, or to relocate receptors to areas of lower probability of flooding and/or of lower hazard
M23	Prevention, Reduction, Measure to adapt receptors to reduce the adverse consequences in the event of a flood actions on buildings, public networks, etc...
M24	Prevention, Other prevention, Other measure to enhance flood risk prevention (may include, flood risk modelling and assessment, flood vulnerability assessment, maintenance programmes or policies etc...)
	Protection
M31	Protection Natural flood management / runoff and catchment management, Measures to reduce the flow into natural or artificial drainage systems, such as overland flow interceptors and / or storage, enhancement of infiltration, etc and including in-channel , floodplain works and the reforestation of banks, that restore natural systems to help slow flow and store water.
M32	Protection, Water flow regulation, Measures involving physical interventions to regulate flows, such as the construction, modification or removal of water retaining structures (e.g., dams or other on-line storage areas or development of existing flow regulation rules), and which have a significant impact on the hydrological regime.
M33	Protection, Channel, Coastal and Floodplain Works, Measures involving physical interventions in freshwater channels, mountain streams, estuaries, coastal waters and flood-prone areas of land, such as the construction, modification or removal of structures or the alteration of channels, sediment dynamics management, dykes, etc.
M34	Protection, Surface Water Management, Measures involving physical interventions to reduce surface water flooding, typically, but not exclusively, in an urban environment, such as enhancing artificial drainage capacities or though sustainable drainage systems (SuDS).
M35	Protection, Other Protection, Other measure to enhance protection against flooding, which may include flood defence asset maintenance programmes or policies
	Preparedness
M41	Preparedness, Flood Forecasting and Warning, Measure to establish or enhance a flood forecasting or warning system
M42	Preparedness, Emergency Event Response Planning / Contingency planning, Measure to establish or enhance flood event institutional emergency response planning
M43	Preparedness, Public Awareness and Preparedness, Measure to establish or enhance the public awareness or preparedness for flood events
M44	Preparedness, Other preparedness, Other measure to establish or enhance preparedness for flood events to reduce adverse consequences
	Recovery & Review

[41] Guidance for Reporting under the Floods Directive (2007/60/EC): https://circabc.europa.eu/w/browse/a3c92123-1013-47ff-b832-16e1caaafc9a

M51	Recovery and Review (Planning for the recovery and review phase is in principle part of preparedness), Individual and societal recovery, Clean-up and restoration activities (buildings, infrastructure, etc), Health and mental health supporting actions, incl. managing stress Disaster financial assistance (grants, tax), incl. disaster legal assistance, disaster unemployment assistance, Temporary or permanent relocation , Other
M52	Recovery and Review, Environmental recovery, Clean-up and restoration activities (with several sub-topics as mould protection, well-water safety and securing hazardous materials containers)
M53	Recovery and Review, Other, Other recovery and review Lessons learnt from flood events Insurance policies
	Other
M61	Other

Catalogue of Natural Water Retention Measures

NWRM cover a wide range of actions and land use types. Many different measures can act as NWRM, by encouraging the retention of water within a catchment and, through that, enhancing the natural functioning of the catchment. The catalogue developed in the NWRM project represents a comprehensive but non prescriptive wide range of measures, and other measures, or similar measures called by a different name, could also be classified as NWRM.

To ease access to measures, the catalogue of measures hereunder is sorted by the primary land use in which it was implemented: Agriculture; Forest; Hydromorphology; Urban. Most of the measures however can be applied to more than one land use type.

Table B2 List of NWRMs

Agriculture	Forest	Hydro Morphology	Urban
A01 Meadows and pastures	F01 Forest riparian buffers	N01 Basins and ponds	U01 Green Roofs
A02 Buffer strips and hedges	F02 Maintenance of forest cover in headwater areas	N02 Wetland restoration and management	U02 Rainwater Harvesting
A03 Crop rotation	F03 Afforestation of reservoir catchments	N03 Floodplain restoration and management	U03 Permeable surfaces
A04 Strip cropping along contours	F04 Targeted planting for 'catching' precipitation	N04 Re-meandering	U04 Swales
A05 Intercropping	F05 Land use conversion	N05 Stream bed re-naturalization	U05 Channels and rills
A06 No till agriculture	F06 Continuous cover forestry	N06 Restoration and reconnection of seasonal streams	U06 Filter Strips
A07 Low till agriculture	F07 'Water sensitive' driving	N07 Reconnection of oxbow lakes and similar features	U07 Soakaways

Agriculture	Forest	Hydro Morphology	Urban
A08 Green cover	F08 Appropriate design of roads and stream crossings	N08 Riverbed material renaturalisation	U08 Infiltration Trenches
A09 Early sowing	F09 Sediment capture ponds	N09 Removal of dams and other longitudinal barriers	U09 Rain Gardens
A10 Traditional terracing	F10 Coarse woody debris	N10 Natural bank stabilisation	U10 Detention Basins
A11 Controlled traffic farming	F11 Urban forest parks	N11 Elimination of riverbank protection	U11 Retention Ponds
A12 Reduced stocking density	F12 Trees in Urban areas	N12 Lake restoration	U12 Infiltration basins
A13 Mulching	F13 Peak flow control structures	N13 Restoration of natural infiltration to groundwater	
	F14 Overland flow areas in peatland forests	N14 Re-naturalisation of polder areas	

Source: www.nwrm.eu