EUROPEAN
COMMISSION

Brussels, 26.2.2019
SWD(2019) 59 final

COMMISSION STAFF WORKING DOCUMENT

First Flood Risk Management Plans - Member State: Czech Republic

Accompanying the document

REPORT FROM THE COMMISSSION 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

{COM(2019) 95 final} - {SWD(2019) 30 final} - {SWD(2019) 31 final} - {SWD(2019) 32 final} - {SWD(2019) 33 final} - {SWD(2019) 34 final} - {SWD(2019) 35 final} - {SWD(2019) 36 final} - {SWD(2019) 37 final} - {SWD(2019) 38 final} - {SWD(2019) 39 final} - {SWD(2019) 40 final} - {SWD(2019) 41 final} - {SWD(2019) 42 final} - {SWD(2019) 43 final} - {SWD(2019) 44 final} - {SWD(2019) 45 final} - {SWD(2019) 46 final} - {SWD(2019) 47 final} - {SWD(2019) 48 final} - {SWD(2019) 49 final} - {SWD(2019) 50 final} - {SWD(2019) 51 final} - {SWD(2019) 52 final} - {SWD(2019) 53 final} - {SWD(2019) 54 final} - {SWD(2019) 55 final} - {SWD(2019) 56 final} - {SWD(2019) 57 final} - {SWD(2019) 58 final} - {SWD(2019) 60 final} - {SWD(2019) 61 final} - {SWD(2019) 62 final} - {SWD(2019) 63 final} - {SWD(2019) 64 final} - {SWD(2019) 65 final} - {SWD(2019) 66 final} - {SWD(2019) 67 final} - {SWD(2019) 68 final} - {SWD(2019) 69 final} - {SWD(2019) 70 final} - {SWD(2019) 71 final} - {SWD(2019) 72 final} - {SWD(2019) 73 final} - {SWD(2019) 74 final} - {SWD(2019) 75 final} - {SWD(2019) 76 final} - {SWD(2019) 77 final} - {SWD(2019) 78 final} - {SWD(2019) 79 final} - {SWD(2019) 80 final} - {SWD(2019) 81 final} - {SWD(2019) 82 final} - {SWD(2019) 83 final} - {SWD(2019) 84 final}

Table of contents

Acronyms 3
Introduction 4
Overview 5
Overview of the assessment 7
Good Practices 10
Areas for further development 11
Recommendations 11
1. Scope of the assessment and sources of information for the assessment 13
1.1 Reporting of the FRMPs 13
1.2 Assessment of the FRMPs 13
2. Integration of previously reported information 14
2.1 Conclusions drawn from the preliminary flood risk assessment 14
2.2 Presentation of Flood Hazard and Risk Maps (FHRMs) in the FRMPs 14
2.3 Changes to the APSFRs or other Flood Risk Areas 15
2.4 Areas for further development in the earlier assessment of the flood hazard and risk maps 16
2.5 Good practices and areas for further development in the FRMPs regarding integration of previously reported information 16
3. Setting of Objectives 17
3.1 Focus of objectives 17
3.2 Specific and measurable objectives 17
3.3 Objectives to reduce adverse consequences from floods 18
3.4 Objectives to address the reduction of the likelihood of flooding 18
3.5 Process for setting the objectives 18
3.6 Good practices and areas for further development regarding setting objectives 18
4. Planned measures for the achievement of objectives 19
4.1 Cost of measures 20
4.2 Funding of measures 20
4.3 Measurable and specific (including location) measures 21
4.4 Measures and objectives 21
4.5 Geographic coverage/scale of measures 21
4.6 Prioritisation of measures 22
4.7 Authorities responsible for implementation of measures 22
4.8 Progress of implementation of measures 22
4.9 Measures taken under other Community Acts 23
4.10 Specific groups of measures 23

4.11 Recovery from and resilience to flooding 23
4.12 Monitoring progress in implementing the FRMP 23
4.13 Coordination with the WFD 24
5. Consideration of climate change 26
5.1 Specific measures to address expected effects of climate change 26
5.2 Good practices and areas for further development concerning climate change 26
6. Cost-benefit analysis 27
6.1 Good practices and areas for further development concerning cost-benefit analysis 27
7. Governance including administrative arrangements, public information and consultation 28
7.1 Competent authorities 28
7.2 Public information and consultation 28
7.3 Active involvement of Stakeholders 29
7.4 Effects of consultation 31
7.5 Strategic Environmental Assessment 31
7.6 Good practices and areas for further development regarding Governance 31
Annex A: Supplementary tables and charts on measures 32
Background & method 32
Types of measures used in reporting 33
List of Annex A tables & figures 34
Measures overview 35
Measure details: cost 37
Measure details: name & location 38
Measure details: objectives 38
Measure details: authorities 40
Measure details: progress 42
Measure details: other 45
Annex B: Definitions of measure types 46
Catalogue of Natural Water Retention Measures (NWRM) 47

Acronyms

APSFR	Areas of Potential Significant Flood Risk
CBA	Cost-Benefit Analysis
EEA	European Environment Agency
FD	Floods Directive
FHRM	Flood Hazard and Risk Map
FRMP	Flood Risk Management Plan
NGO	Non-Governmental Organisation
NWRM	Natural Water Retention Measures
PFRA	Preliminary Flood Risk Assessments
PoM	Programme of Measures
RBD	River Basin District
RBMP	River Basin Management Plan
SEA	Strategic Environmental Assessment
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 20, Flood Hazard & 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 the Czech Republic[1]. Its structure follows a common assessment template used for all Member States. The report draws on two main sources:

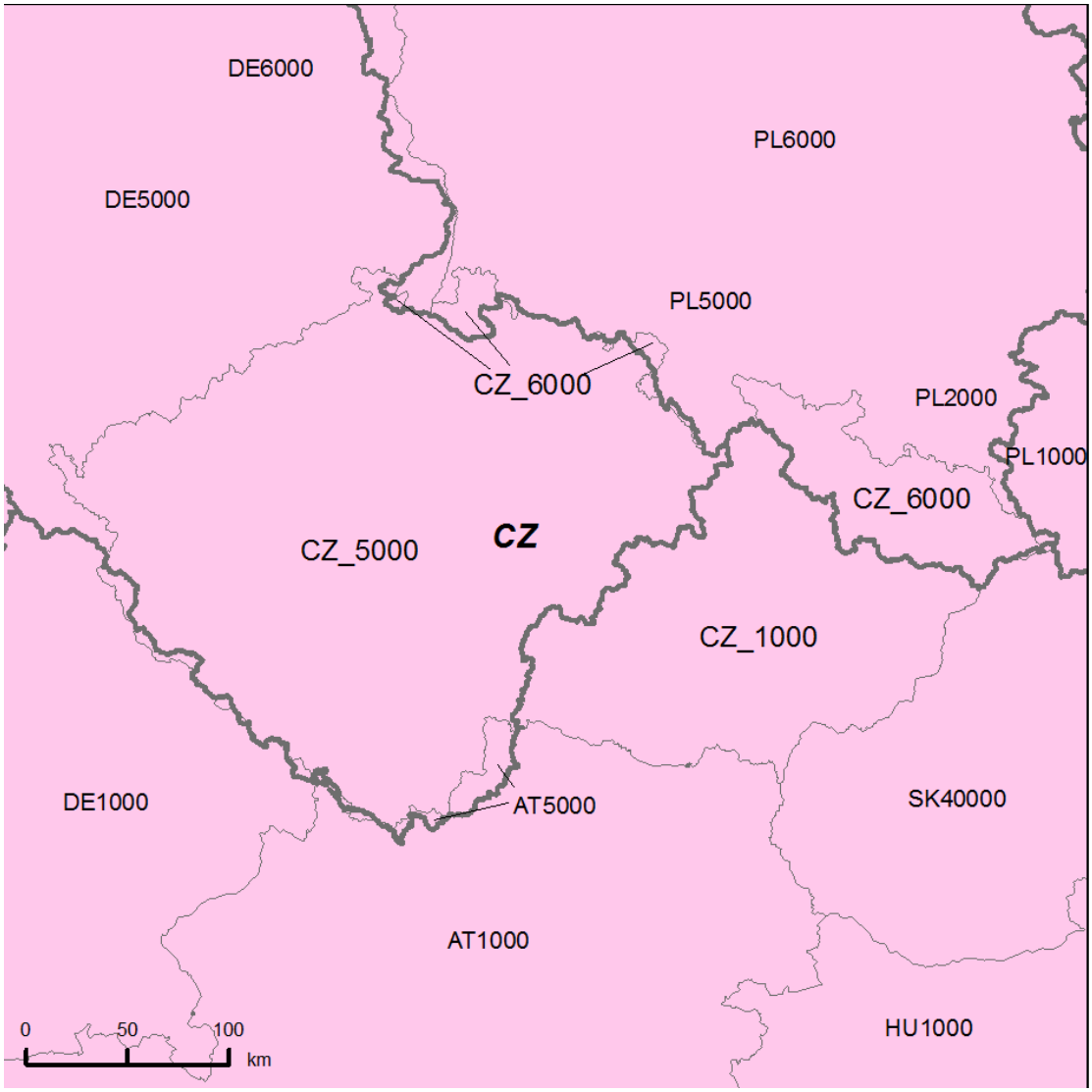
- Member State reporting to the European Commission on the FRMPs[2] as per Articles 7 and 15 of the FD: this reporting provides an overview of the plans and details on their measures
- The three FRMPs reported by the Czech Republic for its three Units of Management (UoMs).

[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: WISE, Eurostat (country borders) as presented in the 2012 RBMP assessment reports

The Czech Republic has designated three UoMs under the FD: these correspond to the river basin districts (RBDs) designated under the Water Framework Directive (WFD). All three UoMs are part of international UoMs/RBDs.

In the Czech Republic, there are three levels of flood risk management plans[3]: level A, international plans prepared by the international river basin commissions for the Elbe, Danube and Oder; level B, national plans for these three UoMs, prepared by the Ministry of Environment and the Ministry of Agriculture; and level C, sub-basin plans which consist of documents for APSFRs as annexes prepared by the river basin authorities in cooperation with regional authorities and with the two ministries. Three level B national plans have been developed for the APSFRs in line with the FD and these have been reported to WISE, as described below. The level C sub-basin plans deal with other flood risk areas which have not been assigned as APSFRs; moreover, the level C plans address both river basin management and flood risk management.

The three national plans (Elbe, Danube and Oder) have an identical structure, and the same methods and approaches were used for all three plans. The only differences are in terms of the number of APSFRs in each UoM and the number of measures applied.

The Government of the Czech Republic approved all three FRMPs by Resolution 1082 on 21 December 2015.

The table below gives an overview of all UoMs in the Czech Republic, including the UoM code, the name, and the number of APSFRs reported. It also shows if all documents required for each UoM were submitted to European Environment Agency's (EEA) Water Information System for Europe (WISE)[4] – the FRMP as a PDF and the reporting sheet as an XML.

Table 1 Overview of UoM in Czech Republic

UoM	Names	Number of APSFRs	XML Reported	PDF Reported
CZ1000	Danube	125	Yes	Yes
CZ5000	Elbe	123	Yes	Yes
CZ6000	Oder	21	Yes	Yes
TOTAL		269		

The FRMPs can be downloaded from the following web page:

- http://www.povis.cz/html/index.html?pzpr.htm

[3] The RBMPs also follow these three levels.

[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

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 strategic objectives of all three FRMPs are to reduce the likelihood of flood risk and to reduce the potential adverse consequences of flooding on human health, the environment, cultural heritage, infrastructure and economic activity. FRMPs also present three specific objectives: 1) avoiding new risks and reducing areas at unacceptable risk (through application of flood prevention in land use planning); 2) reducing flood dangers; and 3) raising preparedness of population and strengthening of resilience.
FRM objectives relate to...		
...the reduction of potential adverse consequences	Strong evidence	As noted above, one of the two strategic objectives of the three FRMPs is the reduction of the potential adverse consequences of flooding.
...to the reduction of the likelihood of flooding	Strong evidence	The other strategic objective of all three FRMPs is the reduction in the likelihood of flood risk.
...to non-structural initiatives	Strong evidence	The specific objectives include non-structural initiatives, in particular raising preparedness

Criterion	Evidence	Comments
		of population and strengthening of resilience (including through local flood action plans, sound contingency planning and flood forecasting and warning services).
FRM objectives consider relevant potential adverse consequences to...		
...human health	Strong evidence	As noted above, one of the two strategic objectives of all three FRMPs is the reduction of potential adverse consequences of flooding on human health, the environment, cultural heritage, infrastructure and economic activity.
...economic activity	Strong evidence	See above under human health.
...environment	Strong evidence	See above under human health.
...cultural heritage	Strong evidence	See above under human health.
Measures have been...		
...identified	Strong evidence	The Czech Republic has reported to WISE 6 individual and 55 aggregated measures, with a total of 61 measures. The Czech FRMPs refer instead to general and concrete measures (and provide a different total). Concrete measures are for the most part construction measures; general measures are non-structural measures.
...prioritised	Strong evidence	The Czech Republic indicated the priority of all 61 measures reported. The FRMPs state that the priority of concrete measures was set by expert judgment, but do not provide further information.
Relevant aspects of Article 7 have been taken into account such as...		
...costs & benefits	Some evidence	Limited information is provided about the use of cost benefit analysis[5].
...flood extent	Strong evidence	The preliminary flood risk assessment in the Czech Republic was based on a spatial analysis of floods with recurrence Q5, Q20 and Q100. The two aspects applied were (i) the number of permanent residents affected

[5] The Czech Republic subsequently informed that cost benefit analysis is one of the references considered under the national financing programme, Flood Prevention Programme III, before measures are agreed for financing.

Criterion	Evidence	Comments
		by the flood extent in floodplains and (ii) the value of property affected by the flood extent in floodplains for return periods of 5, 20 and 100 years.
...flood conveyance	Some evidence	Flood conveyance routes were used during flood hazard and risk mapping.
...water retention	Strong evidence	The three Czech FRMPs refer to natural water retention measures (NWRM): concrete measures include flood retention by polders and reservoirs.
...environmental objectives of the WFD	Strong evidence	Flood reduction measures are designed with the aim of respecting the environmental objectives of the WFD.
...spatial planning/land use	Strong evidence	FRMP specific objectives include avoiding new risks and reducing areas at unacceptable risk through application of flood prevention in land use planning. The general prevention measures reported in the three FRMPs include land use and spatial planning.
...nature conservation	No evidence	No information was found in the FRMPs or the reporting sheets.
...navigation/port infrastructure	No evidence	No information was found in the FRMPs or the reporting sheets.
...likely impact of climate change	Some evidence	The FRMPs report that studies of climate impacts indicate that climate change will not have a significant impact on future flood characteristics in the Czech Republic.
Coordination with other countries ensured in the RBD/UoM	Strong evidence	For all three Flood Risk Management Plans, international cooperation for implementation of the FD took place via international river basin commissions.
Coordination ensured with WFD	Strong evidence	The FRMPs include a description of the coordination process with the WFD. Flood reduction measures are designed with the aim of respecting the environmental objectives of the WFD.

Criterion	Evidence	Comments
Active involvement of interested parties	Some evidence	Supporting workshops addressing different elements of FRMPs were organized before publishing the draft FRMPs and further workshops took place in early 2015 after their publishing. Representatives of the Ministry of Environment, river basin authorities, regional authorities and experts attended.

Good Practices

The assessment identified the following good practices in the Czech FRMPs.

Table 3 Good practices in the Czech FRMPs

Topic area	Good practices identified
Integration of previously reported information in the FRMPs.	The level C sub-basin plans deal with other flood risk areas which have not been assigned as areas of potentially significant flood risk.
Setting of objectives for the management of flood risk.	FRMPs describe and build on the objectives for the management of flood risk in previous planning documents (Plan for major river basins approved by the Governmental resolution 562 in 2007 and Strategy for flood protection approved by the Governmental resolution 382 in 2000), which included natural water retention initiatives.
Planning/implementing of measures and their prioritization for the achievement of objectives.	The FRMPs provide information on the costs of "concrete" measures (overall budgets and information on the cost components – whether investment or operational costs are included is, however, not clarified). FRMPs provide information on the measures from the previous plans (river basin management plans- in 2009 contained flood risk management measures). To monitor the implementation of the FRMP measures, the effectiveness of the planned measures will be evaluated in all APSFRs through an analysis of FHR maps at the end of the flood risk management planning period, based on eight criteria.
Public consultation	The Czech Republic has prepared separate reports that provide an overview of the consultation process for each FRMP, indicating how each comment is addressed.
Flood risk governance	The level C sub-basin plans address both river basin management and flood risk management.

Areas for further development

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

Table 4 Areas for further development in the Czech FRMPs

Topic area	Areas identified for further development
Integration of previously reported information in the FRMPs.	Although all relevant sources of flood (fluvial, pluvial, groundwater, artificial water bearing structures) were assessed, the APSFR and FHR maps do not distinguish between flood sources. The national FRMPs provide little information on coordination with neighbouring Member States on the PFRA and FHRM stages (this information is instead available in the international FRMPs, and the international RBD commissions were a key forum for coordination).
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.	The Czech Republic did not report on the timetable of any of the measures. Few details are provided on nature based solutions (e.g. NWRMs) and no information is provided on how nature protection is addressed. The reporting of measures to the European Commission does not match information in the FRMPs: notably, the total number of measures differs.[6]
Consideration of climate change in the FRMPs assessed.	No apparent coordination with national climate change adaptation strategy.
Use of cost-benefit analysis (CBA) in the FRMPs assessed.	Limited information on cost benefit analysis was provided in national FRMPs.

Recommendations

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

- To be able to assess progress, the objectives should be, to the extent possible, specific, measurable and linked to specific measures that can achieve the objectives.

[6] The Czech authorities clarified subsequently that measures which are planned for various localities in one sub-basin (e.g. construction of polders, streambed re-naturalization) were reported as one aggregated measure.

- Further study on the impacts of climate change on flood risks should be carried out. Coordination between the national climate change adaptation strategy and the FRMPs should be ensured or elaborated upon.
- Cost estimates for each measure (including non-structural) and an overall budget for all measures should be provided, indicating whether the budget covers both investment and operational costs.
- The FRMPs should present a planned timetable of measures.
- The method for the prioritisation of measures should be described. The FRMPs should provide clear information on the methods used to assess costs and benefits of measures.
- More details on planned nature based solutions should be provided.

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

1.1 Reporting of the FRMPs

The Czech Republic reported three national FRMPs: for the Czech portions of the Elbe (*Labe* in Czech, CZ5000), Danube (*Dunaj*, CZ1000) and Oder (*Odra*, CZ6000) UoMs. The three FRMPs have an identical structure and the same methods and approaches were used for all plans.

The Czech Republic did not make use of Article 13.3 of the FD, which allows Member States to make use of previous flood risk management plans (provided their content is equivalent to the requirements set out in the Directive).

Concerning the geographic coverage of the three FRMPs reported, there is one FRMP covering each entire UoM. In addition, other documents have been reported for some of the UoMs as annexes and/or background documents.

The Czech Republic refers to three levels of flood risk management, of which the three FRMPs reported are at the middle level. Level A refers to the international FRMPs prepared by the international river basin commissions (all three Czech UoMs – Elbe, Danube, and Oder – are part of international UoMs); level B, the three national plans reported; and level C, 10 sub-basin plans. The level C sub-basin plans, integrating flood risk management and river basin management, deal with other flood risk areas which have not been assigned as the APSFR.

1.2 Assessment of the FRMPs

The Czech Republic has prepared three FRMPs for its three UoMs:

Table 5 UoMs assessed in Czech Republic

UoM code	UoM Name
CZ1000	DANUBE
CZ5000	ELBE
CZ6000	ODER

The assessment covered the three national-level FRMPs (level B) for these UoMs: these FRMPs were reported to WISE. The assessment refers to the international (level A) FRMPs for some information; the sub-basin plans (level C) were not assessed.

2. Integration of previously reported information

2.1 Conclusions drawn from the preliminary flood risk assessment

The conclusions of the PFRA are presented in all three FRMPs as a textual description, map and a table listing all APSFRs[7]. All three Czech FRMPs provide a link to the Czech Flood Information System, POVIS (http://www.povis.cz), which contains river APSFR maps for all three UoMs[8].

The preliminary flood risk assessment in the Czech Republic was based on a spatial analysis of floods with recurrence Q5, Q20 and Q100 using the data from rivers in the inundation areas. The two aspects applied were (i) the number of permanent residents affected by the flood extent in floodplains and (ii) the value of property aggrieved by the flood extent in floodplains for return periods of 5, 20 and 100 years. The adverse consequences were assessed with regard to human health, environment, cultural heritage and economic activity[9].

An analysis of conveyance routes is included in the FRMPs in the form of flood extent maps for Q5, Q20, Q100 and Q500.

2.1.1 Coordination with neighbouring Member States on shared RBDs/UoMs

For all three Flood Risk Management Plans, international cooperation took place via the international river basin commissions, including the development of the PFRAs[10].

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

FHRMs were prepared for APSFRs. No further information is available in the FRMP[11].

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

The FRMPs contain examples of FHRMs with a descriptive text and they contain also tables with links to all FHRMs (presented at http://cds.chmi.cz) in their Annexes 8.2 and 8.3 (scalable river maps showing flood hazard and flood risk). The FHRMs do not distinguish among flood sources and there is no indication in the FRMPs which flood types were addressed[12]. However, according to the Czech PFRA report (available on the website of the Czech flood information

[7] Flood Risk Management Plans chapter 3.5, map 3.4 and Annex 8.1.
[8] FRMPs Chapter 7.1
[9] FRMPs Chapter 3.5.
[10] FRMPs Chapter 7.2.
[11] FRMPs Chapter 4.1.
[12] The Czech authorities clarified subsequently that the FHR maps represent fluvial flooding, since this is the most significant flood source in the Czech Republic. The maps are a combination of primarily two mechanisms (natural exceedance and defence exceedance). There is no defence or infrastructural failure included in the maps.

system), fluvial, pluvial and groundwater floods as well as floods from artificial water-bearing infrastructure (dams) were addressed in the assessment of the risk of flooding under Article 4 and therefore used for FHRM preparation[13].

2.2.1 Maps for shared flood risk areas

In all three FRMPls, international cooperation in FD implementation under international river basin commissions is mentioned. This includes preparation of basin-level reports on the PFRA. No further details are available in the Czech Republic's FRMPs, including on whether shared flood risk areas have been identified. Coordinated FHR maps for the Danube are available at the ICPDR website[14], those for the Elbe at the IKSE website[15] and a description of FHRMs is also available in the international Oder FRMP[16].

2.2.2 Conclusions drawn from the flood hazard and flood risk maps

In all the FRMPs, FHRMs have been used to develop the FRMPs. Based on the reporting sheets and the FRMPs:

- FHRMs were used to set priorities for flood risk management (e.g. locations, economic activities, assets);
- FHRMs were used as a tool in the public participation process;
- Specific objectives on flood risk reduction have been defined based on the FHRM;
- Measures have been defined based on the FHRM.

During their preparation, FHRMs were submitted to public consultation at over 15 workshops. The FRMPs state that FHRM data (potentially affected population, economic activities) were used for setting FRMP objectives. The setting of priorities for flood risk management and the design of measures used criteria which employed information from FHRMs (changes in affected area, in number of population at risk, in number of constructions at risk)[17].

2.3 Changes to the APSFRs or other Flood Risk Areas

The FRMP assessment looked for information on changes in the identification of APSFRs since December 2011, or in the FHRMs since December 2013, indicated in the FRMPs[18]. No changes are reported for either APSFRs, or FHRMs in the Czech FRMPs[19].

[13] FHRM Chapter 4 and Annexes 8.2 and 8.3.
[14] https://www.icpdr.org/main/publications/maps-danube-flood-risk-management-plan-2015
[15] http://geoportal.bafg.de/mapapps/resources/apps/MKOL_CZ/index.html?lang=en
[16] http://www.mkoo.pl/show.php?fid=4828&lang=CZ
[17] FRMPs Chapters 5.2, 6.4, 7.2.
[18] FRMPs Chapter 3.
[19] FRMPs Chapter 4.

2.4 Areas for further development in the earlier assessment of the flood hazard and risk maps

The FHRM assessment[20] identified the following areas for further development for the Czech Republic:

- All relevant sources of flood (fluvial, pluvial, groundwater, artificial water bearing structures) were assessed, but no distinction was made on maps among flood sources.

This area for further development has not been addressed in the time period between publication of the FHRMs and the assessment of the FRMPs, based on the information in the online FHRMs, nor in the Czech FRMPs[21].

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

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

- Although reportedly all relevant sources of flood (fluvial, pluvial, groundwater, artificial water bearing structures) were assessed, the FHRMs do not distinguish among flood sources.
- The national FRMPs provide little information on coordination with neighbouring Member States at the PFRA and FHRM stages (this information is instead available only in the international FRMPs).

[20] European Commission, Assessment of Flood Hazard and Flood Risk Maps – Member State Report: CZ – Czech Republic, December 2014. Available at: http://ec.europa.eu/environment/water/flood_risk/pdf/fhrm_reports/CZ%20FHRM%20Report.pdf

[21] FRMPs Chapter 4.

3. Setting of Objectives

3.1 Focus of objectives

The strategic objectives of the Czech Republic's Flood Risk Management Plans are to: reduce the likelihood of flood risk and reduce the potential adverse consequences of flooding on human health, the environment, cultural heritage, infrastructure and economic activity.

The three FRMPs all set out three specific objectives:

1. avoiding new risks and reducing areas at unacceptable risk (through application of flood prevention in land use planning);
2. reduction of flood danger (through implementation of measures aiming at flood retention, flood peak reduction, increase of natural water retention, implementation of good agricultural and forestry practices enabling water retention and proper rainwater management in urban areas); and
3. strengthening the preparedness of the population and strengthening resilience (through the preparation of local flood action plans, establishment of the necessary basis for sound contingency planning, further improvement of flood forecasting and warning services and contributions of building owners to their protection from floods and to prevention of the impacts from flooded buildings on the environment).

Consequently, in the three Czech FRMPs[22]:

- The objectives aim to reduce the adverse consequences of floods;
- The objectives aim to reduce the likelihood of flooding[23];
- The objectives refer to measures that will be implemented;
- The objectives refer to non-structural measures[24].

3.2 Specific and measurable objectives

In the Czech Republic's FRMPs, objectives are neither specific nor measurable. The objectives are general but the measures which are based on these objectives are concrete and measurable.

[22] These categories are included in Art. 7 of the FD.

[23] 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.

[24] Non-structural measures include measures such as flood forecasting and raising awareness of flooding as well as land use planning, economic instruments and insurance.

3.3 Objectives to reduce adverse consequences from floods

One of the two strategic objectives calls for the reduction of adverse consequences of flooding on human health, the environment, cultural heritage, infrastructure and economic activity. This is further supported by the specific objectives, in particular the first and second specific objectives.

3.4 Objectives to address the reduction of the likelihood of flooding

The FRMPs set the reduction of the likelihood of flooding as one of the two strategic objectives. This is further addressed by the second specific objective, reduction of flood danger (through implementation of measures aiming at flood retention, flood peak reduction, increase of natural water retention, implementation of good agricultural and forestry practices enabling water retention and proper rainwater management in urban areas).

3.5 Process for setting the objectives

The FRMPs indicate that the development of the objectives was coordinated on the national and regional levels. The objectives were discussed with stakeholders within the public consultation on the FRMPs (see section 7). Further details are not provided, however.

While the FRMPs cite studies concerning the impacts of climate change on floods (and highlight high uncertainty of the results of these studies), they do not explain if or how climate change has been used for the setting of the objectives.

The FRMPs cite objectives for flood risk management in previous planning documents, before entry into force of the FD, such as the Czech Strategy for flood protection since the year 2000 and RBMPs: These objectives included natural water retention and the need for international cooperation, objectives that are further developed in the FRMPs.

3.6 Good practices and areas for further development regarding setting objectives

The following **good practice** was identified:

- FRMPs describe and build on objectives for the management of flood risk in previous planning documents before entry into force of the FD, which included natural water retention.

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

- The objectives are not specific or measurable.

4. Planned measures for the achievement of objectives

The Czech Republic reported six individual and 55 aggregated[25] measures, a total of 61 measures[26]. The FRMPs mention that there are individual and aggregated measures but details on how these categories were defined are not provided.

The aggregated measures are reported for all three UoMs; however, individual measures are only reported for the Oder UoM (CZ6000).

In terms of the breakdown across the four measure aspects, the Czech Republic reported: 15 prevention measures (one individual measure and 15 aggregated measures, representing 25 % of total measures); 31 protection measures (five individual and 26 aggregated, 50 % of all measures); and 15 preparedness measures (all aggregated measures, 25 % of all measures). The Czech Republic did not report measures for recovery & review or "other" measures. According to the FRMPs, this is because recovery and review measures are obligatory in national legislation and are implemented after each flood event in a standard way.

For further information on the breakdown of measures, please see Annex A for tables and charts of the measures reported.

The Czech FRMPs classify measures into “general” measures, which aim at fulfilling the general objectives of flood risk management, and “concrete” measures. All general measures are non-structural measures. All concrete measures in the Danube and Elbe UoM are construction measures identified as protection measures; for the Oder UoM, the concrete measures cover both protection and prevention.

The FRMPs identify 52 concrete measures in the Elbe UoM, 55 concrete measures in the Danube UoM, and 28 concrete measures in the Oder UoM. As can be seen, the total of general and concrete measures listed in the FRMPs is higher than the total number of measures reported by the Czech Republic to WISE. An explanation for the difference is not provided. In this section, some of the information available on measures comes from the reporting and other information from the FRMPs.

[25] 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.

[26] 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.

4.1 Cost of measures

Table 6 Estimated overall budget for the measures in the FRMPs

UoM	Estimated overall budget of planned "concrete" measures (2015-2021) in CZK
Danube (CZ1000)	14 347 400 000
Elbe (CZ5000)	7 174 900 000
Oder (CZ6000)	7 576 000 000

Source: FRMPs

The Czech Republic did not provide information in its reporting sheets on the costs of measures. Its FRMPs, however, provide a cost estimate for each concrete measure. Summing up all costs for planned concrete measures in the Danube CZK gives the total of 14 347.4 m (approximately €560 m); in the Elbe UoM, a total of CZK 7 174.9 m (approximately €280 m); in the Oder CZK, 7 576 m (approximately €300 m). The FRMPs do not indicate which cost components are included in the estimates (i.e. if they represent only investment costs or also include operational costs).

In contrast, no cost estimates are provided for general measures, which are non-structural measures.

4.2 Funding of measures

The FRMPs refer to several national funding schemes that support financing of flood risk management measures under the Ministry of Agriculture and the Ministry of Environment, but do not provide further detail.

Table 7 Funding of measures

	CZ1000	CZ5000	CZ6000
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			
EU CAP funds			
International funds			
Other			

Source: FRMPs

4.3 Measurable and specific (including location) measures

All FRMPs 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.

The general measures, which are non-structural measures, cover each sub-basin in the UoMs: for each measure, the number of APSFRs and municipalities in which they are going to be implemented is provided.

A list of all concrete measures is provided in each FRMP (in Annex 8.7). For each individual concrete measure, the respective water course, location, type, description of the measure, costs, priority and status of implementation are reported.

The following table lists the all the locations indicated for the Czech Republic's measures:

Table 8 Location of measures

	All UoMs
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

The FRMPs make clear how measures will contribute to the achievement of objectives and by how much they will contribute. It is not clear, however, whether the objectives will be achieved when all measures are completed (as noted in section 2, the objectives are not specific or measurable).

4.5 Geographic coverage/scale of measures

In its reporting sheets, the Czech Republic provided the location of all measures, however, this was an open question, and as such, the level of detail varied, and it was not practical to aggregate the information. The Czech Republic did not report information about the geographic coverage of any of the measures.

As noted above, the FRMPs also provide details on the location of all measures.

4.6 Prioritisation of measures

For the 61 measures reported, the Czech Republic indicated their priority:

- No measures have critical priority
- 35 measures have very high priority (seven prevention, 20 protection and eight preparedness measures), 57 % of all 61 measures reported;
- 16 measures have high priority (seven prevention, seven protection, two preparedness), 26 % of all measures;
- eight measures have moderate priority (one prevention, two protection, five preparedness), 13 % of all measures, and
- two measures have low priority (both are protection measures), 3 % of all measures.

According to the FRMPs, the level of priority of concrete measures was set by expert judgment. No further information was found[27] [28].

The Czech Republic did not report information about the timetable of any of the measures, and no information is provided in the FRMPs.

4.7 Authorities responsible for implementation of measures

The Czech Republic reported on the authorities responsible for the implementation of measures; however, it has not been feasible to aggregate the varied information provided. Nevertheless, the following types of responsible authorities are indicated: municipalities and regions (jointly), municipalities, property and facility owners, river basin managers and municipalities (jointly).

4.8 Progress of implementation of measures

The Czech Republic indicated the progress of implementation of the 61 measures reported:

- 42 measures are 'Not started' (all 15 prevention measures, all 15 preparedness measures and 12 protection measures), for 69 % of all measures
- eight protection measures are 'Progress ongoing', 13 % of all measures, and
- 11 protection measures are 'Completed', 18 % of all measures.

[27] FRMPs Chapter 6.4.

[28] The Czech authorities clarified subsequently that prioritisation was done by the River Board Authority depending on the maturity of the project (designs, other documents, permissions etc.) and the budget available. Non-structural measures were assigned high priority.

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: the Czech reporting sheets did not provide information, however. The Czech FRMPs refer to the WFD, but not to specific measures within the RBMPs. No explicit reference to the Seveso Directive was found in FRMPs.

4.10 Specific groups of measures

The four general prevention measures address **land use and spatial planning**: in particular, they seek to prevent the location of new or additional receptors in flood prone areas and to adapt receptors to reduce the adverse consequences in the event of a flood[29].

Some **NWRM** have been planned in all three Czech FRMPs, with limited detail. The concrete measures include flood retention by polders and reservoirs[30] and stream revitalisation[31]. The FRMPs also refer to NWRM prepared under the Czech RBMPs[32].

No information was found regarding measures which specifically consider **nature conservation**.

No information was found regarding measures related to **navigation and port infrastructure**. Specific information about **dredging** was not found, but there are measures to increase the river channel capacity (and these could potentially include dredging).

4.11 Recovery from and resilience to flooding

The role of insurance policies is not discussed in any of the Czech FRPMs.

4.12 Monitoring progress in implementing the FRMP

To monitor the implementation progress of the FRMP measures, the effectiveness of the planned measures will be evaluated in all APSFRs through an analysis of FHR maps at the end of the flood risk management planning period. This analysis will be based on the following criteria: 1) change in areas at unacceptable risk, 2) change of the number of population at unacceptable risk, 3) change of the number of constructions (objects) at unacceptable risk, 4) individual assessment of vulnerable objects, 5) change of the number of updated municipal flood action plans, 6) change of the number of local urban plans (or change in their quality), 7)

[29] FRMPs Chapter 6.3.
[30] This appears to match NWRM measure type U11, Retention Ponds: see Annex B for the list of NWRM measure types.
[31] This appears to match NWRM measure type N05, Stream bed re-naturalization: see Annex B.
[32] FRMPs Chapter 7.2

change in the number of flood warning sites, 8) change of the number of the municipalities with flood warning systems.

The baseline is set by the FHR maps elaborated in 2013[33].

4.13 Coordination with the WFD

The table below shows how the development of the FRMP has been coordinated with the development of the second River Basina management Plan (RBMP) of the WFD.

Table 9 Coordination of the development of the FRMP with the development of the second RBMP of the WFD

	All UoMs
Integration of FRMP and RBMP in a single plan	*
Joint consultation of draft FRMP and RBMP	✓
Coordination between authorities responsible for developing FRMP and RBMP	✓
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 (PoM) includes win-win measures in terms of achieving the objectives of the WFD and FD, drought management and NWRM [a]	✓
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	✓
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	

Notes: * integrated plans cover river basin and flood risk management at sub-basin level (C-level plans). [a] based on reporting under the WFD.

Full integration of FRM and RBM plans is on the level C, as the sub-basin plans deal with both river basin management and flood risk management (level C plans deal with other areas which

[33] FRMPs Chapter 6.4.

have not been assigned as the areas of potential significant flood risk but all APSFRs, Flood Hazard Risk maps and flood risk management planning for levels B and A are also initially prepared for sub-basins). The measures for RBM plans are designed with the aim of having positive effects on reducing flood risks (natural water retention). Flood reduction measures are designed with the aim of respecting the environmental objectives of WFD[34].

Good practices and areas for further development with regard to measures

The following **good practices** were identified:

- The FRMPs provide information on the costs of "concrete" measures.
- FRMPs provide information on the measures from the previous plans (river basin management plans in 2009 contained flood risk management measures).
- To monitor the implementation of the FRMP measures, the effectiveness of the planned measures will be evaluated in all APSFRs through an analysis of FHR maps at the end of the flood risk management planning period, based on eight criteria.

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

- While cost information is provided, the FRMPs do not include overall budgets and information on whether both investment and operational costs are included[35].
- Few details are provided on nature based solutions (e.g. NWRMs) and no information is provided on how nature protection is addressed.

[34] FRMPs Chapter 7.2.
[35] The Czech authorities clarified subsequently that it is investment costs of structural measures that are included in the FRMPs.

5. Consideration of climate change

The three FRMPs refer to Czech studies investigating impacts of climate change on floods, and they highlight the high level of uncertainty in the results of these studies. In summarising the studies, the FRMPs present a conclusion that climate change will not impact future flood characteristics in the Czech Republic significantly. Chapter 3.3. contains references to the shift in occurrence of extreme events and changes in numerical recurrence times. While winter precipitation is projected to increase and summer precipitation to decrease, as noted above, no major changes in the occurrence of extreme events are predicted.

The FRMPs do not provide references to the Czech Climate Change Adaptation Strategy[36].

5.1 Specific measures to address expected effects of climate change

There is no information in the FRMPs regarding specific measures to address expected effects of climate change.

5.2 Good practices and areas for further development concerning climate change

Because of the conclusion that climate change will not significantly impact future flood characteristics in the Czech Republic, the absence in the FRMPs of any reference to climate change related measures is not considered to be a weakness for the current FRMPs. However, due to the uncertainty of how the climate change phenomenon will develop, it is expected that the Czech Republic will adopt a precautionary approach and keep studying climate change and include relevant findings (incl. responses) in the second cycle of the FD. Also, coordination between the national climate change adaptation strategy and the FRMPs should be ensured.

[36]The national Adaptation Strategy was adopted in 2015, replacing a previous policy document. See: https://www.mzp.cz/en/strategy_adaptation_climate_change

6. Cost-benefit analysis

Only limited information on cost benefit analysis was provided in FRMPs stating that the assessment of construction measures is based on the assessment of their costs and benefits using risk analysis of potential flood damages[37]. The Czech reporting sheets do not provide any information on CBA.

The international plan for the Danube River Basin District states that:

> "No cost benefit analysis in flood risk management was applied in CZ as there was no methodology available for the evaluation of the benefit of the flood risk protection measures mentioned in the Czech national Flood risk management plan for the Danube River Basin District. For the purpose of evaluation of particular flood protection measures by strategic experts the efficiency ratio is calculated using the expected flood damages and the costs of the measures."

Taking into account this information, it appears that a full CBA was not used, though an expert assessment of costs and benefits was carried out for at least a set of measures.

6.1 Good practices and areas for further development concerning cost-benefit analysis

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

- The Czech FRMPs provide limited information on the use of CBA, and, taking into account information from the international Danube FRMP, it appears that a full-fledged CBA was not used.

[37] Chapter 6.1 of the FRMPs.

7. Governance including administrative arrangements, public information and consultation

7.1 Competent authorities

Based on the FRMPs and the information provided in the reported sheets, the Competent Authorities and the UoAs identified for the FD have not changed. No changes have been notified in Czech reporting on Competent Authorities since the last update in 2012.

7.2 Public information and consultation

The table below shows how the public and interested parties were **informed** in the three UoMs 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[38]:

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

	CZ1000	CZ5000	CZ6000
Media (papers, TV, radio)			
Internet	✓	✓	✓
Digital social networking			
Printed material			
Direct mailing			
Invitations to stakeholders			
Local Authorities	✓	✓	✓
Meetings	✓	✓	✓

Source: FRMPs

Supporting workshops addressing different elements of the FRMPs were organised before publishing draft FRMPs. Draft FRMPs were uploaded on 22 December 2014 on the website of the Czech flood information system (POVIS)[39] and on website of river basin authorities. Workshops took place in early 2015 at which representatives of Ministry of Environment, river basin authorities, regional authorities and experts discussed the draft FRMP[40].

[38] The Czech Republic subsequently informed that public consultation for the FRMPs followed national requirements, including provisions in the Water Act and other laws. While few details were mentioned in the FRMPs, information was published in publicly available documents as per national legislation. Information about the public consultation is available in the Flood information system, POVIS. A document is provided for each FRMP:

- Elbe FRMP: http://www.povis.cz/pdf/PZPR_Labe_vyhodnoceni_pripominek.pdf
- Oder FRMP: http://www.povis.cz/pdf/PZPR_Odra_vyhodnoceni_pripominek.pdf
- Danube FRMP: http://www.povis.cz/pdf/PZPR_Dunaj_vyhodnoceni_pripominek.pdf

[39] http://www.povis.cz

[40] FRMPs Chapter 7.1.

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

Table 11 Methods used for the actual consultation

	CZ1000	CZ5000	CZ6000
Via Internet	✓	✓	✓
Via digital social networking			
Direct invitation	✓	✓	✓
Exhibitions			
Workshops, seminars or conferences	✓	✓	✓
Telephone surveys			
Direct involvement in drafting FRMP			
Postal written comments	✓	✓	✓

Source: FRMPs

As noted above, workshops were organized before publishing draft FRMPs and in early 2015. Stakeholders could submit comments via the Internet or via post to the competent authorities.

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
Downloadable	✓
Direct mailing (e-mail)	
Direct mailing (post)	
Paper copies distributed at exhibitions	
Paper copies available in municipal buildings (town hall, library etc.)	
Paper copies at the main office of the competent authority	✓

Source: FRMPs

The documents for the consultation were available for download from the Internet. There were no differences between the FRMPs.

7.3 Active involvement of Stakeholders

The table below shows the groups of **stakeholders** that have been actively involved in the development of the three FRMPs:

Table 13 Groups of stakeholders

	All UoMs
Civil Protection Authorities such as Government Departments responsible for emergency planning and coordination of response actions	✓

	All UoMs
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)	
NGOs including nature protection, social (e.g. children, housing)	
Consumer Groups	
Local / Regional authorities	✓
Academia / Research Institutions	✓

Source: FRMPs

According to the FRMPs, the stakeholders who participated in special events organised to provide information about the first draft Flood Risk Management Plans were: representatives of Civil Protection Authorities and Flood Warning / Defence Authorities, experts from research institutions and the representatives of local authorities.

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
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 of stakeholders were the formation of advisory groups and the organisation of workshops. The FRMPs do not provide details on these mechanisms, however.

7.4 Effects of consultation

Information about the effects of public consultation on the FRMPs is available in the national Flood information system (POVIS)[41]. There is a document for each FRMP:

- Elbe FRMP: http://www.povis.cz/pdf/PZPR_Labe_vyhodnoceni_pripominek.pdf;
- Oder FRMP: http://www.povis.cz/pdf/PZPR_Odra_vyhodnoceni_pripominek.pdf;
- Danube FRMP http://www.povis.cz/pdf/PZPR_Dunaj_vyhodnoceni_pripominek.pdf.

In these documents, each comment is presented, and the action taken is indicated for each (i.e. if the comment is accepted, not accepted, or clarified).

7.5 Strategic Environmental Assessment

According to the Czech Republic's reporting sheets, all three FRMPs underwent a Strategic Environmental Assessment procedure. The FRMPs, however, do not refer to the SEA.

7.6 Good practices and areas for further development regarding Governance

The following **good practice** was identified:

- The Czech Republic has prepared reports that provide an overview of the consultation process for each FRMP, indicating for example how each comment was addressed.

[41] See: http://www.povis.cz, under *Plány pro zvládání povodňových rizik.*

Annex A: Supplementary tables and charts on measures

This Annex gives an overview of the data on measures provided by the Czech Republic in the reporting sheets. These tables and charts were used for the preparation of section 4 on 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)[42], 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 applied 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.

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

- If a manageable number of answers are given, obvious categories are identified, and raw data sorted.
- 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[43] 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

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

List of Annex A tables & figures

Figure A1 - Number of total measures (individual and aggregate) by measure aspect 37
Figure A2 - Share of total measures (aggregated and individual) by measure aspect 37
Figure A3 - Visualisation of Table A5: Category of priority by measure aspect 39
Figure A4 - Visualisation of Table A6: Category of priority by UoM 40
Figure A5 - Visualisation of Table A7: Level of responsibility by measure aspect 41
Figure A6 - Visualisation of Table A8: Level of responsibility by UoM 42
Figure A7 - Visualisation of Table A9: Progress of implementation by measure aspect 43
Figure A8 - Visualisation of Table A10: Progress of implementation by UoM 43

Table A1 - Total number of measures 35
Table A2 - Number of individual measures per measure aspect and UoM 35
Table A3 - Number of aggregated measures per measure type and UoM 36
Table A4 - Total number of measures (aggregated and individual) per measure type and UoM, including duplicates 36
Table A5 - Category of priority by measure aspect 39
Table A6 - Category of priority by UoM 39
Table A7 - Level of responsibility by measure aspect 41
Table A8 - Level of responsibility by UoM 41
Table A9 – Progress of implementation by measure aspect 42
Table A10 – Progress of implementation by UoM 43

Measures overview

Table A1 - Total number of measures

Number of individual measures	6
Number of individual measures including measures which have been allocated to more than one measure type	6
Number of aggregated measures	55
Number of aggregated measures including measures which have been allocated to more than one measure type	55
Total number of measures	61
Total number of measures including measures which have been allocated to more than one measure type	61
Range of number of measures between UoMs (Min-Max)	17 – 26
Average number of measures across UoMs including measures which have been allocated to more than one measure type	20

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

	Prevention	**Protection**	**Preparedness**	**Recovery & Review**	**Other**	**Grand Total**
	M24	**M32**				
CZ6000	1	5				6
Grand Total	**1**	**5**				**6**
Average per UoM	**1**	**5**	**0**	**0**	**0**	**6**

Note: Individual measures were reported only for CZ6000 and only for prevention and protection aspects.

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

	Prevention				Protection			Preparedness				Recovery & Review	Other	Grand Total
	M21	**M22**	**M23**	**M24**	**M31**	**M32**	**M33**	**M41**	**M42**	**M43**	**M44**			
CZ_1000	2		2	1	4	2	3	1	2					17
CZ_5000	2		2			5	5	2	2					18
CZ_6000	2	1	2			2	5	3	2	1	2			20
Grand Total	**6**	**1**	**6**	**1**	**4**	**9**	**13**	**6**	**6**	**1**	**2**	**0**	**0**	**55**
Average per UoM	**2**	**<1**	**2**	**<1**	**1**	**3**	**4**	**2**	**2**	**<1**	**1**	**0**	**0**	**18**

Note: Aggregated measures were reported only for prevention, protection and preparedness aspects.

Table A4 - Total number of measures (aggregated and individual) per measure type and UoM, including duplicates

	Prevention		Prevention	Protection		Protection	Preparedness	Preparedness	Recovery & Review	Other	Grand Total
	Aggregate	**Individual**	**Total**	**Aggregate**	**Individual**	**Total**	**Aggregate**	**Total**			
CZ6000	5	1	6	7	5	12	8	8			26
CZ5000	4		4	10		10	4	4			18
CZ1000	5		5	9		9	3	3			17
Grand Total	**14**	**1**	**15**	**26**	**5**	**31**	**15**	**15**	**0**	**0**	**61**
Average per UoM	**5**	**<1**	**5**	**9**	**2**	**10**	**5**	**5**	**0**	**0**	**20**

Notes: Aggregated measures were reported only for prevention, protection and preparedness aspects.

Individual measures were reported only for CZ6000 and only for prevention and protection aspects.

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

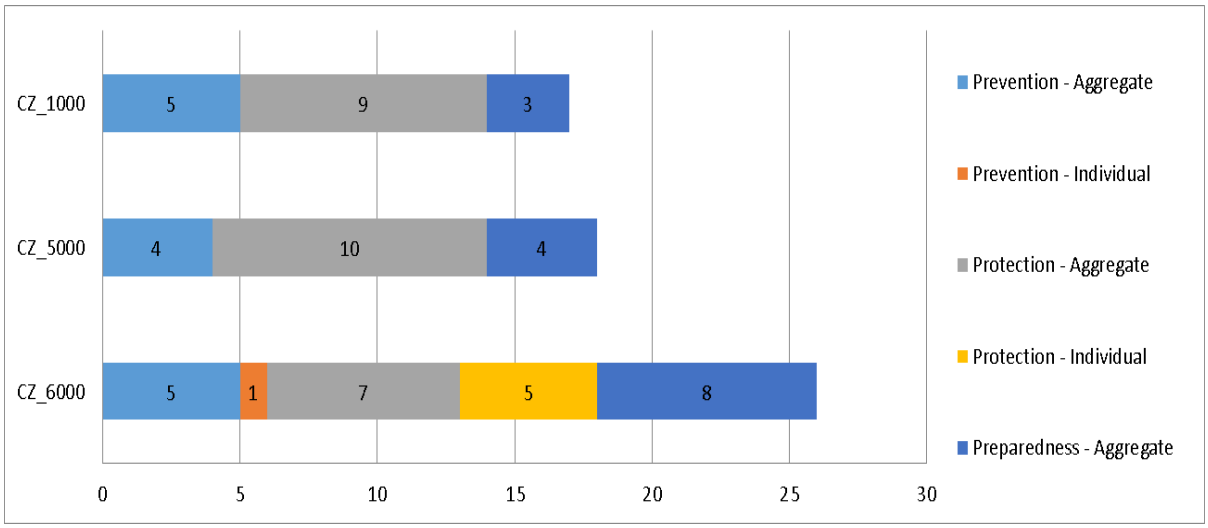
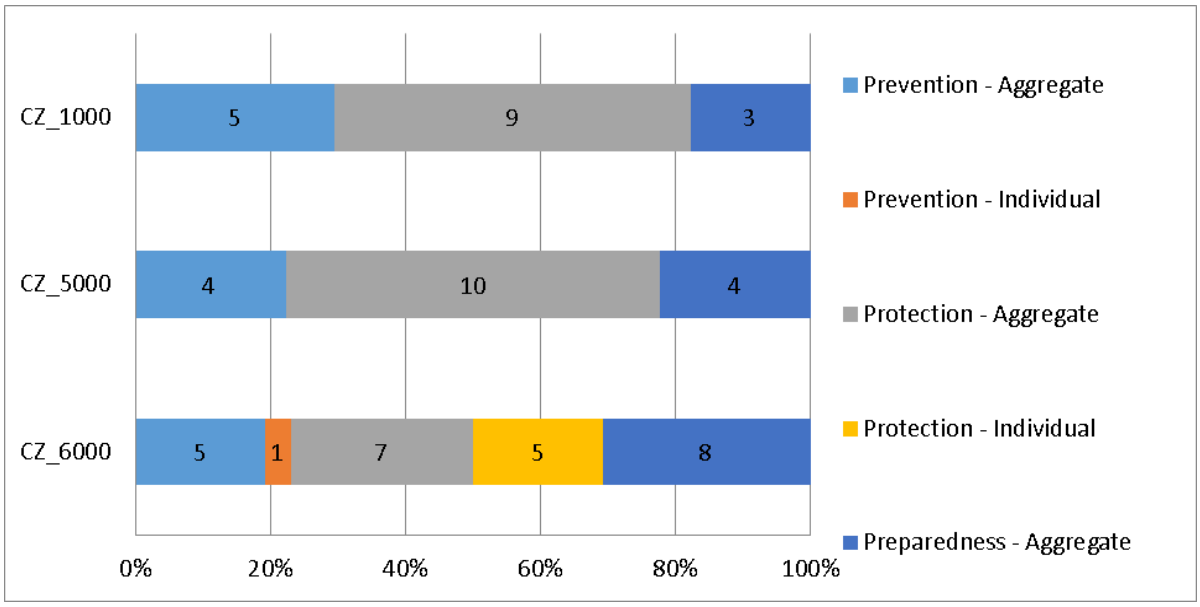


Figure A2 - Share of total measures (aggregated and individual) by measure aspect



Measure details: cost

Member States were requested to report information on:

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

The Czech Republic did not provide information about costs or cost explanations for any of the measures in the reporting sheets.

Measure details: name & location

Member States were requested to report information on the following:

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

Location of measures

The Czech Republic reported on the location of all measures, however, this was an open question, and as such, the level of detail varied, and it was not practical to aggregate the information. Please refer to the reporting sheets for a full list of the location of measures.

Geographic coverage

No information was reported 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

The Czech Republic did not provide information about the geographic coverage of any of the measures in the reporting sheets.

Category of priority

The Czech Republic reported the priority for all measures under the following categories:

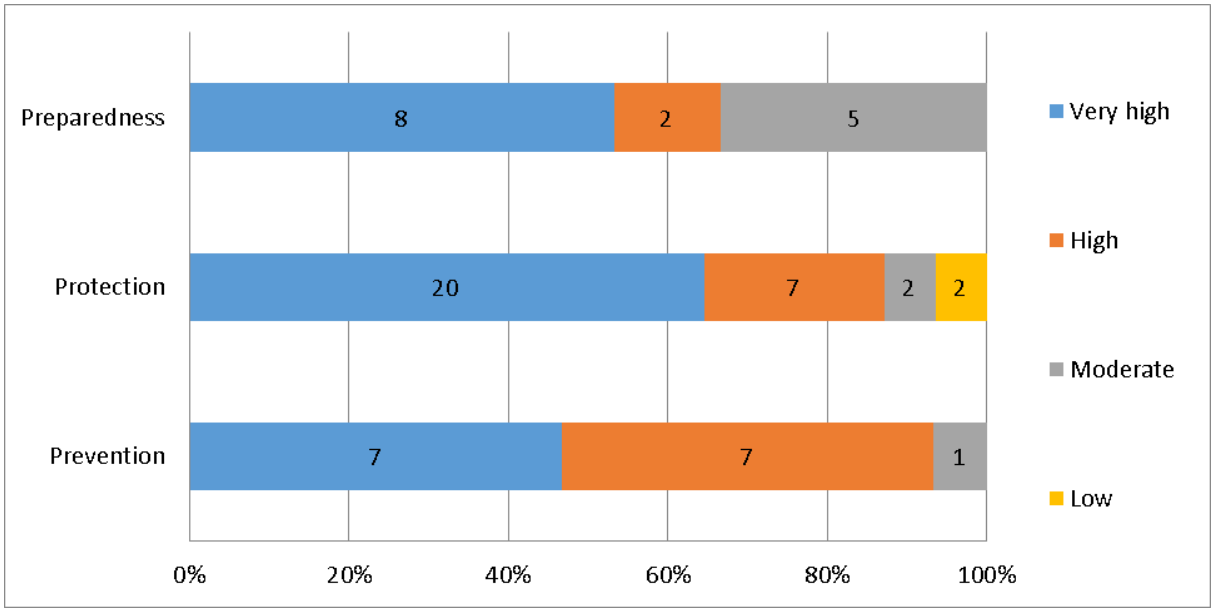
- Critical
- Very high

- High
- Moderate
- Low.

Table A5 - Category of priority by measure aspect

	Very high	High	Moderate	Low	Grand Total
Prevention	7	7	1		15
Protection	20	7	2	2	31
Preparedness	8	2	5		15
Grand Total	**35**	**16**	**8**	**2**	**61**

Figure A3 - Visualisation of Table A5: Category of priority by measure aspect

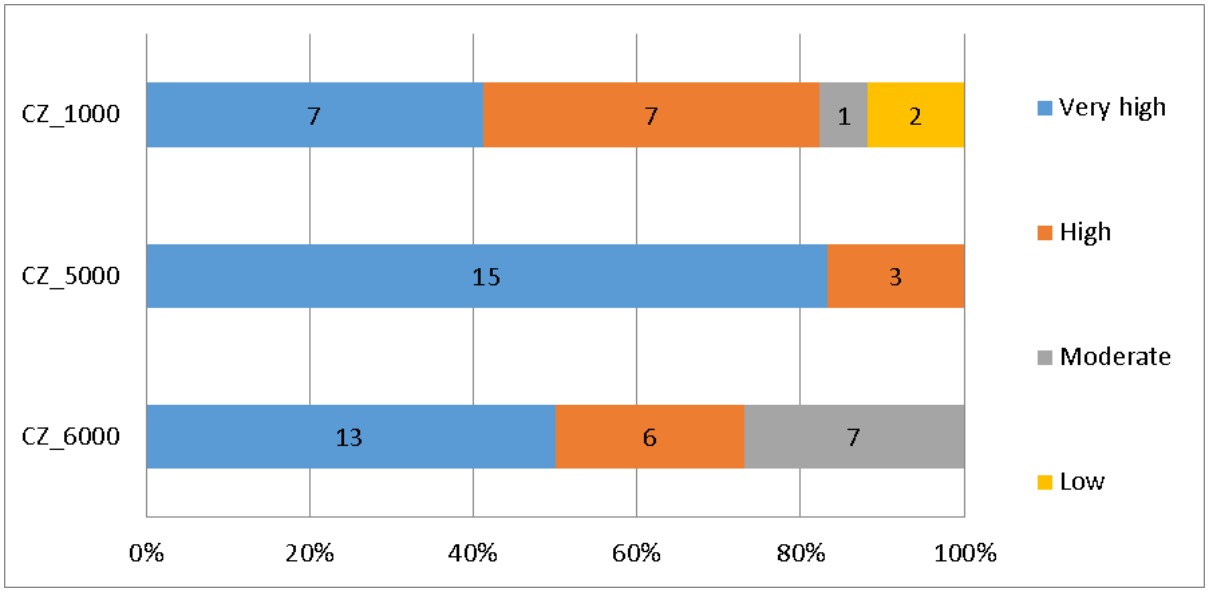


Notes: No measures were categorised as critical.

Table A6 - Category of priority by UoM

	Very high	High	Moderate	Low	Grand Total
CZ_6000	13	6	7		26
CZ_5000	15	3			18
CZ_1000	7	7	1	2	17
Grand Total	**35**	**16**	**8**	**2**	**61**
Average per UoM	**12**	**5**	**3**	**1**	**20**

Figure A4 - Visualisation of Table A6: Category of priority by UoM



Notes: No measures were categorised as critical.

Timetable

The Czech Republic did not provide information about the timetable of any of the measures.

Measure details: authorities

Member States were requested to report information on:

- Name of the responsible authority (optional if 'level of responsibility' is reported);
- Level of responsibility (optional if 'name of the responsible authority' is reported).

Overall, the Czech Republic did not consistently provide information for these two topics. The information about name of the responsible authority is diverse, making it impractical to aggregate. Nevertheless, the information about level of responsibility was categorised as follows:

- Municipalities and regions;
- Municipality;
- Owner – refers to owner of the property or facility;
- RB manager, municipality – refers to River Basin manager and municipality;
- Other.

Table A7 - Level of responsibility by measure aspect

	Municipalities and regions	Municipality	Owner	RB manager, municipality	Other	No information	Grand Total
Prevention		6	7			2	15
Protection		1		4	2	24	31
Preparedness	7	1	3			4	15
Grand Total	**7**	**8**	**10**	**4**	**2**	**30**	**61**

Figure A5 - Visualisation of Table A7: Level of responsibility by measure aspect

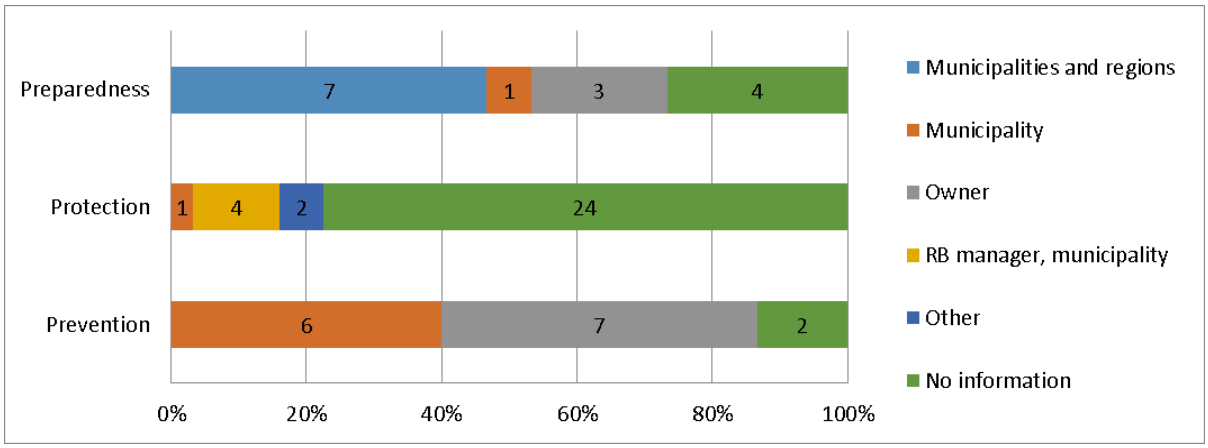
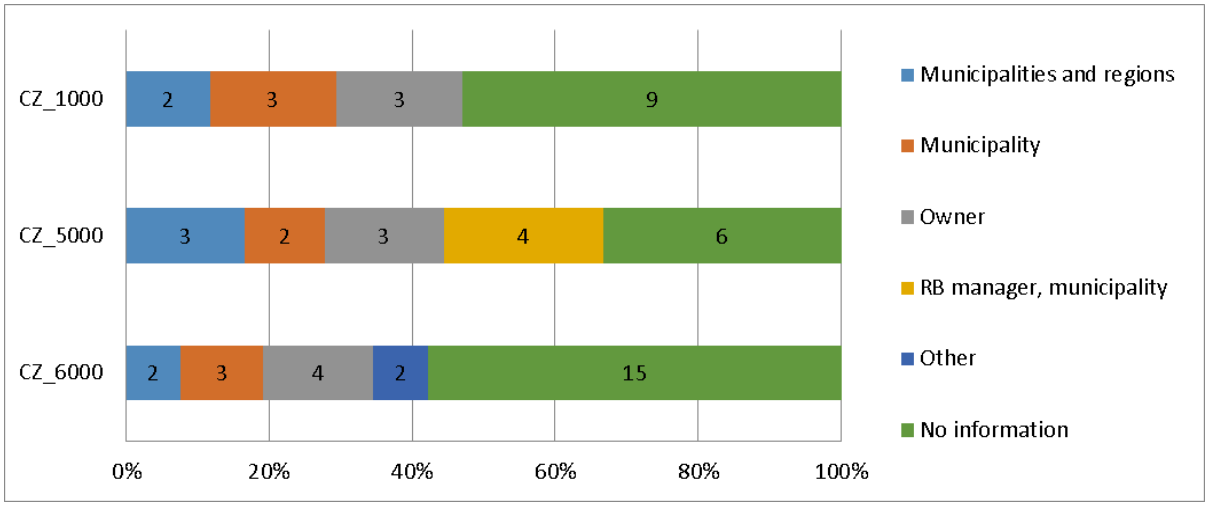


Table A8 - Level of responsibility by UoM

	Municipalities and regions	Municipality	Owner	RB manager, municipality	Other	No information	Grand Total
CZ_6000	2	3	4		2	15	26
CZ_5000	3	2	3	4		6	18
CZ_1000	2	3	3			9	17
Grand Total	**7**	**8**	**10**	**4**	**2**	**30**	**61**
Average per UoM	**2**	**3**	**3**	**1**	**1**	**10**	**20**

Figure A6 - Visualisation of Table A8: Level of responsibility by UoM



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 for which not all Member States reported and whose answers are not analysed here.

The Czech Republic reported information about the progress of implementation of the measures. The Progress of implementation was reported as[44]:

- 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 A9 – Progress of implementation by measure aspect

	Completed	Progress ongoing	Not started	Grand Total
Prevention			15	15
Protection	11	8	12	31
Preparedness			15	15
Grand Total	**11**	**8**	**42**	**61**

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

Figure A7 - Visualisation of Table A9: Progress of implementation by measure aspect

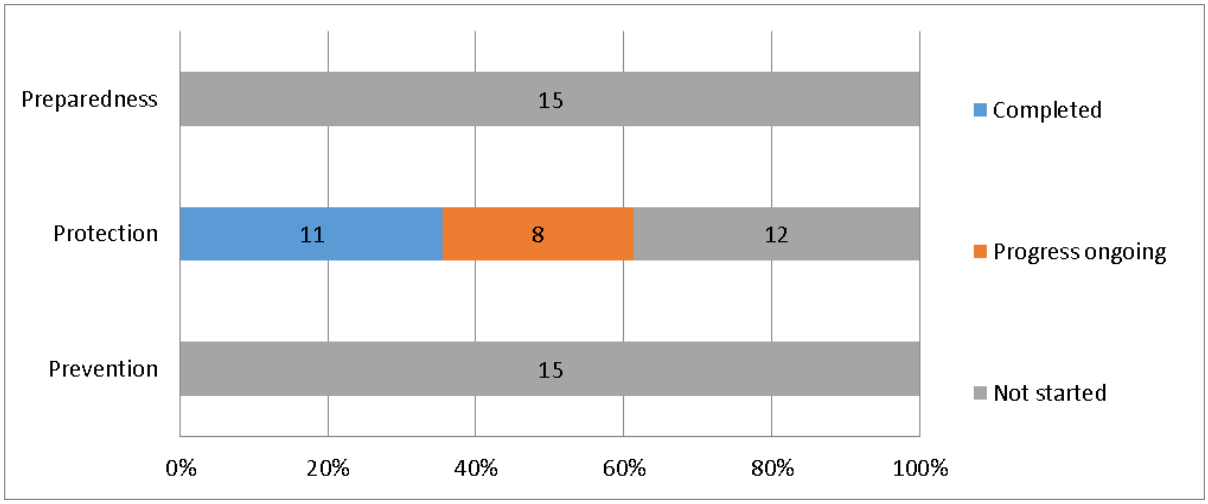
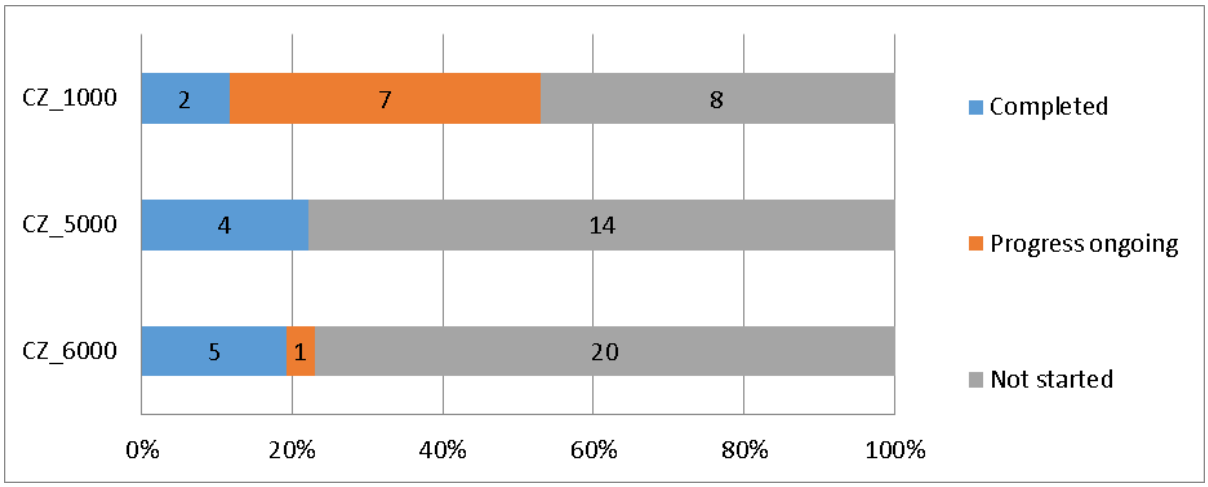


Table A10 – Progress of implementation by UoM

	Completed	Progress ongoing	Not started	Grand Total
CZ_6000	5	1	20	26
CZ_5000	4		14	18
CZ_1000	2	7	8	17
Grand Total	**11**	**8**	**42**	**61**
Average per UoM	**4**	**3**	**14**	**20**

Figure A8 - Visualisation of Table A10: 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 provide information on:

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

No information was provided in the reporting sheets for these sections.

Annex B: Definitions of measure types

Table B1 Types of flood risk management measures[45]

	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

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

	Recovery & Review
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)

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; other measures, or similar measures called by a different name, that 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 NWRM

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

Agriculture	Forest	Hydro Morphology	Urban
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
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