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First Flood Risk Management Plans – Member State: Belgium
Accompanying the document
REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT
AND THE COUNCIL
on 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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Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

**on 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-Benefit Analysis
EEA	European Environment Agency
FD	Floods Directive
FHRM	Flood Hazard & 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 2013, 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 Belgium¹. 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 FRMPs² as per Articles 7 and 15 of the FD: this reporting provides an overview of the plans and details on their measures;
- Selected FRMPs: five of Belgium’s seven FRMPs were reviewed. The assessment identified at least one FRMP from each of Belgium’s three regions, as each region was expected to follow a different approach for its plans. The selection included the three FRMPs for the Scheldt/Schelde/Escaut³ international basin, to understand if there had been cooperation for this basin that crosses all three Belgian regions. The following FRMPs were chosen:
 - The only FRMP for the Brussels Region for the Scheldt/Schelde/Escaut Unit of Management (UoM) in Brussels
 - In Flanders, the FRMPs for Scheldt/Schelde UoM and for the Meuse/Maas⁴ UoM.
 - In the Walloon Region, the FRMPs for this region’s part of the Rhine UoM and the Scheldt/Escaut UoM.

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

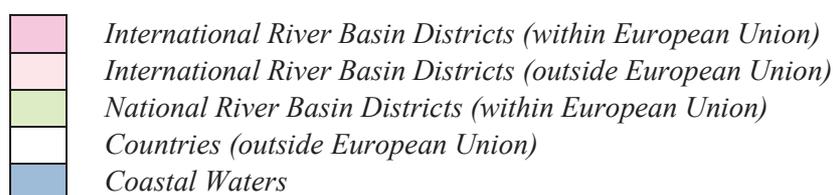
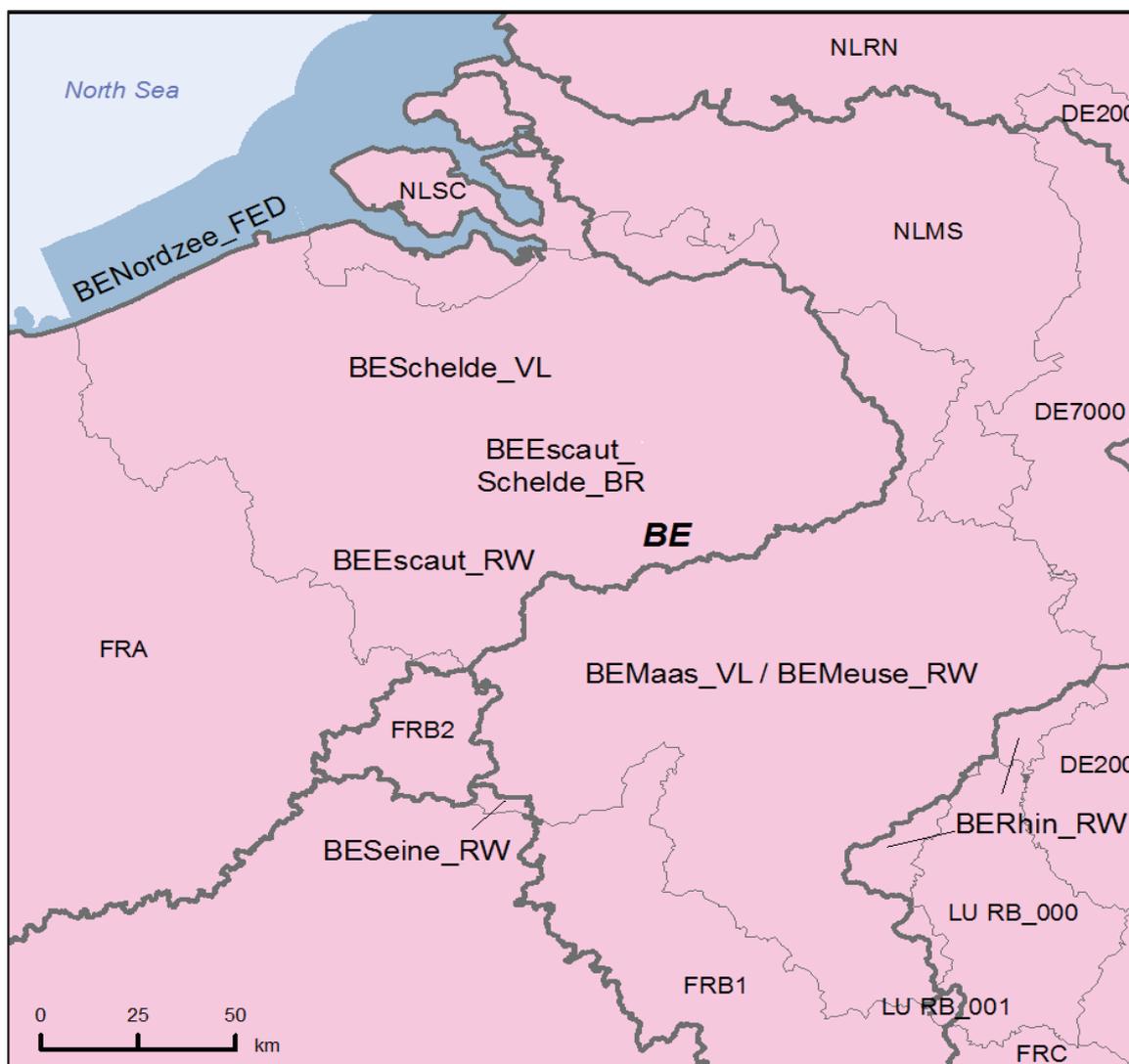
Whereas a key role of the Commission is to check compliance with EU legislation, the Commission also seeks information to allow it to determine whether existing policies are adequate. It also requires certain information to create a European-wide picture to inform the public.

³ This report uses the English spelling, Scheldt.

⁴ This report uses the English spelling, Meuse.

Overview

Figure 1 Map of Units of Management/River Basin Districts (RBDs)



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

Belgium has designated seven UoMs. These correspond to the seven of the eight RBDs designated under the Water Framework Directive (WFD). The eighth RBD is for Belgium's North Sea coastal waters; it does not cover the coastline itself and consequently it is not covered under the FD.

In Belgium, there is one FRMP for each UoM. Belgium has reported seven UoMs: there are three for the Scheldt River basin, one in the Brussels-Capital Region⁵ (BEEscaut_Schelde_BR), one in the Flanders Region (BESchelde_VL), and one in the Walloon Region (BEEscaut_RW); the Meuse River basin has UoMs, one in Flanders (BEMaas_VL) and one in Wallonia (BEMeuse_RW); there is one UoM for the Belgian part of the Rhine basin (BERhin_RW) and one for the Belgian part of the Seine (BESeine_RW). Consequently, there are three Belgian UoMs for the Scheldt international basin, one in each Belgian region, and two for the Meuse international basin, one each in the Flanders and Walloon Regions.

The FRMPs prepared in Flanders and the FRMP prepared for Brussels have been integrated into the corresponding RBMPs; each plan has a single Programme of Measures (PoM), covering both WFD and FD measures. Wallonia follows a different approach and the FRMPs and RBMPs are separate documents. In this report, the plans are referred to collectively as FRMPs, even though some are integrated with the RBMPs.

The FRMPs were adopted at regional level:

- In the Brussels Region, the Water Management Plan incorporating the FRMP was approved on 26 January 2017⁶.
- In the Flanders Region, all RBMPs (containing the FRMPs) were adopted on 18 December 2015 and published on 2 March 2016⁷.
- In the Walloon Region, the FRMPs were approved by the regional government on 10 March 2016⁸.

The table below gives an overview of all UoMs in Belgium, including the UoM code, the name, and the number of APSFRs reported (Belgium applied Art. 13(1)(b) of the FD and did not designate APSFRs – see Section 2 for further information). It also shows if all documents required for each UoM were submitted to European Environment Agency's (EEA) Water Information System for Europe (WISE)⁹ – the FRMP as a PDF and the reporting sheet as an XML.

⁵ For brevity, referred to as the Brussels Region or Brussels in this report.

⁶ Arrêté du Gouvernement de la Région de Bruxelles-Capitale approuvant le Plan de Gestion de l'eau pour la période 2016-2021:

http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=fr&la=F&cn=2017012638&table_name=loi

⁷ <http://www.integraalwaterbeleid.be/nl/stroomgebiedbeheerplannen/stroomgebiedbeheerplannen-2016-2021>

⁸ See: http://environnement.wallonie.be/inondations/inondations_plans_de_gestion_cycle1.htm

⁹ <http://rod.eionet.europa.eu/obligations/603/deliveries?id=603&tab=deliveries&d-4014547-p=1&d-4014547-o=2&d-4014547-s=3>

Table 1 *Overview of UoMs in Belgium*

UoM	Name	Number of APSFRs	XML reported	PDF Reported
BEEscout_RW	SCHELDT (Walloon Region)	No APSFRs assigned (Art. 13(1)(b) applied)	Yes	Yes
BEEscoutSchelde_BR	SCHELDT (Brussels Region)	No APSFRs assigned (Art. 13(1)(b) applied)	Yes	Yes
BEMAAS_VL	Meuse (Flanders Region)	No APSFRs assigned (Art. 13(1)(b) applied)	Yes	Yes
BEMeuse_RW	MEUSE (Walloon Region)	No APSFRs assigned (Art. 13(1)(b) applied)	Yes	Yes
BERhin_RW	Rhine (Walloon Region)	No APSFRs assigned (Art. 13(1)(b) applied)	Yes	Yes
BESchelde_VL	Scheldt (Flanders Region)	No APSFRs assigned (Art. 13(1)(b) applied)	Yes	Yes
BESeine_RW	Seine (Walloon Region)	No APSFRs assigned (Art. 13(1)(b) applied)	Yes	Yes

The FRMPs can be downloaded from the following web pages:

- Brussels-Capital Region: <https://leefmilieu.brussels/themas/water/waterbeheerplan>
- Flanders Region:
<http://www.integraalwaterbeleid.be/nl/stroomgebiedbeheerplannen/stroomgebiedbeheerplannen-2016-2021/stroomgebiedbeheerplannen-voor-schelde-en-maas-2016-2021>
- Wallonia Region:
http://environnement.wallonie.be/inondations/inondations_pgri_2016.htm

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
Flood risk management objectives have been established	Strong evidence	All five FRMPs assessed contain flood risk management objectives. The overall objectives are set at regional level.
Flood risk management objectives relate to...		
...the reduction of potential adverse consequences	Strong evidence	This is included as an objective in each of the five FRMPs assessed and consequently in all three regions. In Flanders, there is a general objective for the reduction of flood risk and damage; in Wallonia, there is a strategic objective to limit damage to persons and property; and in Brussels, reducing damage from floods is a strategic objective.
...to the reduction of the likelihood of flooding	Some evidence	In the Brussels Region the objectives refer to the reduction in the likelihood of flooding. In the Flanders Region, the overall objective calls for the reduction of flood risk, thus incorporating reduction of the likelihood of flooding. In the Walloon Region, the operational objectives for river bed and floodplain initiatives should reduce flood likelihood.
...to non-structural initiatives	Strong evidence	The FRMPs assessed in the Walloon Region include objectives related to crisis management and safety and post-flood management. The FRMPs assessed in the Flanders and Brussels Regions refer to non-structural objectives including non-structural preventive and preparedness measures.
Flood risk management objectives consider relevant potential adverse consequences to...		
...human health	Strong evidence	In the Brussels Region, reducing harm to inhabitants is included in the strategic objective. The Flanders Region refers to protection for people in its overarching objective. The strategic objective of the Walloon Region refers to reducing harm to persons.
...economic activity	Strong evidence	In Brussels, the FRMP refers to the prevention of harm to buildings and infrastructure. In Flanders, the FRMPs have a general objective for reduction of flood risk and damage to

Criterion	Evidence	Comments
		economic activity. In Wallonia, the strategic objective includes the reduction of impacts on economic activity.
...environment	Some evidence	The overarching objective for the Flanders FRMPs refers to protection of the ecology. The FRMPs in Flanders also include a separate sub-objective on preventing flood risk and damage to the ecology. The strategic objective for the FRMPs in Wallonia refers to limiting harm to the environment; an operational objective takes into consideration natural habitats in their objectives related to river beds and floodplains. References to the environment are not found in the objectives for Brussels.
...cultural heritage	Some evidence	In Flanders, protecting cultural heritage is cited in the overarching objective. In Wallonia, the strategic objective refers to the reduction of negative impacts on cultural heritage. Cultural heritage is not explicitly mentioned in the objectives of the FRMP of Brussels.
Measures have been...		
...identified	Strong evidence	Belgium has reported measures for all of its UoMs, and the FRMPs assessed provide information on their measures. The number of measures reported varies across the three regions: 25 measures are reported for the one UoM in Brussels, 23 for the two UoMs in Flanders, and 620 for the four UoMs in Wallonia. (Measures reported for the Flanders region represent aggregated activities which are further specified in the plans via individual actions.)
...prioritised	Strong evidence	Belgium has indicated priorities for all 668 measures reported. All five FRMPs assessed provide information on the criteria used for prioritisation and refer to a process for the prioritisation of measures.
Relevant aspects of Article 7 have been taken into account such as...		
...costs & benefits	Some evidence	There are references in the assessed FRMPs indicating that a cost-benefit analysis (CBA) has

Criterion	Evidence	Comments
		been done, except for Brussels ¹⁰ , but details are limited in the FRMPs or in background documents on the methodology and outcomes. In Wallonia, the CBA corresponds to the second criterion of the multi-criteria analysis included in the FRMPs.
...flood extent	Strong evidence	Maps showing flood extent are available for all FRMPs assessed, and the plans indicate that this information was considered in the preparation of the FRMPs.
...flood conveyance	No evidence	No references to flood conveyance were found in any of the FRMPs assessed.
...water retention	Strong evidence	All five FRMPs assessed include natural water retention measures (NWRM). Examples include river restoration (found in FRMPs in all three regions), soil conservation measures in agriculture (found in the FRMPs assessed in the Walloon Region) and aquifer restoration (found in the FRMP for the Brussels Region).
...environmental objectives of the WFD	Strong evidence	As noted above, in the Flanders and Brussels Regions, the FRMPs and RBMPs are combined in common plans. Moreover, all five FRMPs assessed indicate that there was coordination with the environmental objectives of the WFD.
...spatial planning/land use	Strong evidence	All five FRMPs assessed include measures to address spatial planning and land use. In all three regions, the FRMPs set out measures to restrict building in areas subject to flooding.
...nature conservation	Some evidence	While each of the five plans assessed indicate that the objectives and measures take into consideration aspects of nature conservation (e.g. Natura 2000 areas), few details are provided.
...navigation/port infrastructure	Strong evidence	In Flanders, reduction of risk and damage to inland navigation is included in the objectives. For the Brussels and Walloon Regions, the FRMPs state that shipping has been taken into

¹⁰ Belgium clarified subsequently that the Brussels region did not carry out a cost-benefit analysis, as it is not considered mandatory under the Flood Directive.

Criterion	Evidence	Comments
		consideration, although specific details are not provided.
...likely impact of climate change	Strong evidence	All five FRMPs assessed indicate that climate change impacts were taken into account, though the extent of information varies. The FRMP for the Brussels Scheldt UoM identifies potential impacts of climate change and indicates that this was considered in the design of some measures.
Coordination with other countries ensured in the RBD/UoM	Strong evidence	All five FRMPs refer to coordination within international commissions for the Meuse, Scheldt and Rhine, depending on the specific UoM, though details on coordination activities were not provided.
Coordination ensured with WFD	Strong evidence	In Flanders and Brussels regions, the FRMPs are integrated within the RBMPs as a single plan. Across all five FRMPs assessed, coordination was seen, including joint consultation and reference to objectives.
Active involvement of interested parties	Strong evidence	Interested parties were actively involved via a range of mechanisms, including workshops, technical meetings and advisory meetings.

Good Practices

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

Table 3 Good practices in the Belgian FRMPs

Topic area	Good practices identified
Integration of previously reported information in the FRMPs.	The plan for the Brussels Scheldt UoM includes an overview of historical data on flood damage and flood events. In Brussels, the online FHRMs were updated. In Flanders, there were updates to the online FHRMs in 2014 and 2017 with the inclusion of new information on flood events. In Wallonia, a new version of the FHRM was published, integrating remarks related to public inquiry and more recent data.
Setting of objectives for the management of flood risk.	The strategic objective for the Brussels Scheldt UoM is elaborated in detailed operational objectives; these in turn are linked to sub-actions, each of them is explained in specific terms: who, what and where.
Planning/implementing of measures and their	For the FRMPs in the Walloon Region, ranges of cost estimates have been elaborated for all measures in the FRMPs assessed.

Topic area	Good practices identified
prioritisation for the achievement of objectives.	All the FRMPs assessed contain land use and spatial planning measures and all include natural water retention measures. All five FRMPs assessed provided an overview of the method for monitoring progress of measures. For the regions of Flanders and Brussels-Capital, monitoring is carried out on a yearly basis ¹¹ .
Consideration of climate change in the FRMPs assessed.	The FRMP for the Brussels Scheldt UoM provides an analysis of climate change forecasts and their implications for water management, based upon a detailed background study.
Cost benefit analysis	The Flanders and Walloon FRMPs assessed included cost and benefit aspects among the criteria for the prioritisation of measures.
Public consultation.	In Flanders and Wallonia, stakeholders were involved via advisory groups.
Flood risk governance.	The integration of the FRMP and RBMP into one report in Flanders and Brussels aligns flood risk governance with other aspects of water management.

Areas for further development

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

Table 4 Areas for further development in the Belgian FRMPs

Topic area	Areas for further development identified
Planning/implementation of measures and their prioritisation for the achievement of objectives.	The Brussels Scheldt FRMP does not provide information on the costs of flood measures; the FRMPs for the Walloon Region present ranges rather than specific cost levels ¹² . The Brussels Scheldt FRMP does not provide information on funding sources for measures.
Use of CBA in the FRMPs assessed.	The Brussels Scheldt plan does not refer to the use of CBA. ¹³
Consideration of climate change in the FRMPs assessed.	The Flemish FRMPs do contain a reference to the regional Flemish Adaptation Plan. There is no apparent coordination with the national climate change adaptation strategy. ¹⁴

¹¹ Belgium informed subsequently that also in Wallonia each measure is evaluated at least once a year via “computerised monitoring”.

¹² Belgium subsequently noted that for Flanders, this information was available on the region’s web pages (<http://www.integraalwaterbeleid.be/nl/geoloket/overzicht-acties>). This information includes a total overview of all actions (i.e. specific, detailed measures) in the Programme of Measures (PoM). The PoM contains detailed information for almost all actions, including cost estimates and funding sources.

¹³ Belgium subsequently noted that a cost/benefit analysis is not a requirement of the FD.

Topic area	Areas for further development identified
International issues in flood risk management.	The FRMPs assessed provide limited information on coordination via international river basin commissions and bilaterally with neighbouring Member States.
Flood risk governance	There is only summary information available in the FRMPs on coordination in Belgium ¹⁵ , for example on objectives ¹⁶ and measures, between regions or at national level in shared river basins (i.e. the Scheldt ¹⁷ and Meuse). ¹⁸

¹⁴ Belgium subsequently noted that considering climate change impacts is not a requirement of the FD for the 1st FRMPs.

¹⁵ Belgium subsequently recalled that it is a federal state with exclusive competence for the regions with regard to water policy. This means that the regions have competences similar to Member States. To support the coordination between the regions, cooperation agreements have been set up. The Coordination Committee for International Environmental Policy (CCIEP) deals mainly with the coordination of Belgian comments, positions or delegations on policy matters and with reporting to international organisations. The Steering Group on Water of the CCIEP operates according to the general mandates of the CCIEP and is used for the coordination of the implementation of the WFD and the FD. Thus, the CCIEP provides the appropriate administrative arrangements (art. 3 §2) for the coordination of the implementation, while fully recognizing four competent authorities. Taking into account the exclusive competence of the regions, the cooperation between the regions and the federal state envisages a coordinated implementation of the WFD and the FD, which in itself does not require a “harmonized” implementation.

¹⁶ Belgium noted subsequently that all three regions have shared their methodologies, but for various reasons it was decided that each region should make the best use of the information available to it instead of applying a least common denominator approach. For example, in the Brussels Region, floods caused by sewers (or pluvial floods) was the most important source of flooding (far more than fluvial floods) and it was decided to apply a methodology that could cope with this source of flooding.

¹⁷ Belgium subsequently noted that, for the Scheldt UoMs, coordination took place in the context of the International Scheldt Commission, for example in the working group PA7 – CIE. This is described in “*Overkoepelend deel van het overstromingsrisicobeheerplan voor het internationale scheldestroomgebiedsdistrict / Partie faîtière du plan de gestion des risque d’inondation du district hydrographique international de l’Escaut*”, available at:

http://www.isc-cie.org/images/Documents/ODB1-PFPG1_ROR-DRI_def.pdf

¹⁸ Belgium also noted that, in addition to multilateral coordination, bilateral coordination meetings are also held between the regions, for example on water quantity management in the Interregional Consultation group on Inland Waterways.

Recommendations

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

- The FRMPs should provide an overview of the costs of their measures and the expected funding sources.
- The second FRMPs should provide a more detailed description of the expected impacts of climate change on the occurrence of floods, based on the available studies. Coordination with the national climate change adaptation strategy should be ensured or elaborated upon in the FRMPs.
- Where relevant, the FRMPs should incorporate CBA for the prioritisation of measures that lend themselves to it and provide a clear description of the methodology used.
- The FRMPs should clearly describe the actions taken for international cooperation.
- The FRMPs should provide further information on coordination carried out within Belgium, in particular within the common river basins of the Meuse and the Scheldt, to ensure synergies in their objectives and measures.

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

1.1 Reporting of the FRMPs

Belgium has reported seven UoMs and seven FRMPs: there are three for the Scheldt international UoM, one in the Brussels Region (for the BEEscaut_Schelde_BR UoM), one in the Flanders Region (BESchelde_VL UoM), and one in the Walloon Region (BEEscaut_RW UoM); there are two FRMPs for the Meuse international UoM, one in Flanders (BEMaas_VL) and one in Wallonia (BEMeuse_RW); there is one FRMP for the Belgian part of the Rhine, found in the Walloon Region (BERhin_RW); and one for the Belgian part of the Seine, also in the Walloon Region (BESeine_RW).

Belgium did not make use of Article 13.3 of the FD, which allowed Member States to make use of previous FRMPs for the first cycle (provided their content is equivalent to the requirements set out in the Directive).

1.2 Assessment of the FRMPs

The selection of the FRMPs for assessment included plans from each of the three regions of Belgium: the Brussels-Capital region¹⁹, Flanders and Wallonia. This was because each region was expected to follow a slightly different approach. The Scheldt basin FRMPs in all three regions were included to allow a comparison of approaches to flood risks.

The following UoMs and FRMPs were chosen for review:

Table 5 UoMs and FRMPs assessed in Belgium

UoM code	UoM Name
BEEscautSchelde_BR	SCHELDT (Brussels region)
BEMaas_VL	MEUSE (Flanders region)
BESchelde_VL	SCHELDT (Flanders region)
BERhin_RW	RHINE (Walloon region)
BEEscaut_RW	SCHELDT (Walloon region)

¹⁹ For brevity, referred to as the Brussels Region or Brussels in this report.

2. Integration of previously reported information

2.1 Conclusions drawn from the preliminary flood risk assessment

All three regions in Belgium applied Art. 13(1)(b) and decided not to perform a PFRA under the FD and include instead their whole territory in the maps and plans as Areas of Potentially Significant Flood Risk (APSFRs).

The methodology to delineate flood risk areas is described in the FRMPs assessed²⁰. In Brussels, the delineation of flood risk areas was based upon historical information on flood events (point locations): these data were used as a starting point for calculations of areas of flood risk based on topography, soil, hardened surfaces and other factors. In Flanders, the flood hazard and flood risk maps were developed based upon a hydraulic model using a base map of the hydrographical network with a selection of water courses that pose a potentially significant flood risk. These potential risks were derived from the database with flood events from the Flanders Disaster Fund. In Wallonia, flood risk areas were designated using information from the field and hydraulic modelling.

Due to applying Art. 13(1)(b), the five FRMPs assessed did not physically include summary maps showing individual APSFRs or other flood risk areas. For the same reason, none of the FRMPs assessed included a textual description or tables listing any APSFRs.

All five FRMPs assessed contain links to online map portals showing flood risk areas.²¹ The two FRMPs assessed in Flanders include a link to maps of flood risk areas, which are: natural inundation areas (NOG), recently inundated areas (ROG) and inundation areas based upon models (MOG)²². The FRMPs assessed in Wallonia include links to maps of flood areas and maps of flood risks²³. The Brussels-Capital FRMP includes a link to maps of flood areas and flood risks^{24 25}.

No reference to conveyance routes was found in the FRMPs assessed.²⁶

2.1.1 Coordination with neighbouring Member States on shared RBDs/UoMs

All five FRMPs assessed refer to coordination with neighbouring Member States on shared RBDs/UoMs.²⁷ The FRMPs state that this was organised within the respective international

²⁰ See, for example Flanders-Scheldt FRMP: p.103, Brussels-Scheldt: p.193.

²¹ FRMP BESchelde_VL, chapter 2.1.4, p101; FRMP BEEscaut_RW, chapter 1, p63 and FRMP BEEscaut_Schelde_BR: “Overstromingsgevaarkaart”, chapter 2.5.2.

²² <https://www.waterinfo.be/default.aspx?path=NL/Loketten/geoloket>. Belgium subsequently explained that these maps are pre-existing that the online portal combines all information on floods, including all existing flood maps and the FHRMs for the FD.

²³ <http://geoportail.wallonie.be/home.html>

²⁴ http://geoportal.ibgebim.be/webgis/Overstroming_kaart.phtml

²⁵ RBMP BESchelde_VL, p103;FRMP BERhin_RW, p.23 and RBMP BESchelde_VL, p.189.

²⁶ RBMP BESchelde_VL; RBMP BEMaas_RW; FRMP BERhin_RW; FRMP BEEscautSchelde_BR.

commissions for the Meuse, Scheldt and Rhine river basins. For the Scheldt, coordination took place with France and the Netherlands. For the Meuse, coordination took place with France, Germany, Luxembourg and the Netherlands. However, no specific information was found in the FRMPs on how coordination activities were organised. None of the five FRMPs assessed mention APSFRs shared with neighbouring Member States.

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

As mentioned earlier, a PFRA under the FD was not performed in Belgium. The FRMP for the Brussels Scheldt UoM reports that the FHR maps developed in 2013 used data from earlier assessments, including a rough localisation of flood damage in built-up areas. The 2013 FHR map was more accurate than the previous ones and included non-built areas as well.²⁸

In Wallonia a flood hazard map which covers the entire territory has already existed since 2007. The development of the FHRMs was therefore based on these maps²⁹.

No information was found in the reporting sheets or the FRMPs assessed for Flanders on the use of a preliminary flood risk analysis for the FHRMs.

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

The Belgian FRMPs provide links to flood hazard and flood risk maps developed at regional level³⁰. These links are:

- Brussels: <http://www.leefmilieu.brussels/https://environnement.brussels/thematiques/eau/leau-bruxelles/eau-de-pluie-et-inondation/cartes-inondations-pour-la-region>
- Flanders: <http://www.waterinfo.be/default.aspx?path=NL/Loketten/geoloket>
The information provided via this link includes information on inundated areas, water depth, coastal currents and rise velocity.
- Wallonia: <http://geoportail.wallonie.be>

The FRMP for the Brussels Scheldt UoM contains a map with historical inundation data and the FHRMs³¹. The FRMPs assessed in Wallonia and Flanders do not contain FHRMs.

²⁷ Belgium noted subsequently that the regular and systematic internal Belgian coordination for environmental policy, takes place within the Coordination Committee for International Environmental Policy (CCIEP). The CCIEP Working Group on Water coordinates the WFD (and related Directives) and the FD. In addition to multilateral coordination, bilateral coordination meetings are also held between the regions, for example on water quantity management in the Interregional Consultation group on Inland Waterways.

²⁸ FRMP BEEscoutSchelde_BR, figure 2.64: “Methode gebruikt voor de opstelling van de overstromingsgevaarkaarten”, p.289.

²⁹ E.g. Carte d’aléa d’inondation) (p.81-Ch 2-§3.2. Aléa d’inondation– PGRI_ESCAUT_20160304.pdf

³⁰ FRMP BESchelde_VL, 2.1.4.2 “Overstromingsgevaarkaarten”, p104; FRMP BEEscout_RW, 6.1 “Référencement des cartes et accès en ligne”, p.100.

2.2.1 Maps for shared flood risk areas

As noted above, none of the FRMPs assessed identify flood risk areas shared with other Member States.

2.2.2 Conclusions drawn from the flood hazard and flood risk maps

All five FRMPs assessed state that the FHRMs have been used in the development of the plans. Based on the reporting sheets and the FRMPs assessed, for all UoMs:

- FHRMs were used to set priorities for flood risk management (e.g. locations, economic activities, assets)
- Measures were defined based on the FHRMs.

For the Flanders FRMPs assessed, the FHRMs provide details on locations at risk (e.g. number of inhabitants at risk): this information was included in the multicriteria analysis to identify priority measures. For the Brussels FRMP, the indicative number of potentially affected inhabitants is included in the FHRM with, for each flood category (high, medium, low or non-existent risk), a presentation of the indicative number of potentially affected inhabitants by district. This number is represented in different pie charts on the map. Nonetheless, the FRMPs do not describe the link between the FHRMs and the setting of objectives.

The FRMP for the Flanders Scheldt UoM (BEScheldt_VL) includes Belgium's coastline and considers flooding from the sea in the coastal area.

2.3 Changes to the APSFRs or other Flood Risk Areas

The assessment looked for information on changes in the identification of APSFRs since December 2011, or in the FHRMs since December 2013.

The FRMPs did not indicate any changes to the APSFRs.³² The online FHRMs for Flanders, Brussels and Wallonia³³ have nonetheless been regularly updated: for example, in Flanders, there were updates of the online maps in 2014 and 2017 with the inclusion of new information on flood events. In Brussels, the most recent map included data and information that had a finer resolution and was more accurate in the identification of extent of flood events.

³¹ FRMP Brussels, p.19 on: maps 2.20, 2.21, 2.22, 2.23

³² FRMP BESchelde_VL; FRMP BEMaas_VL; FRMP BERhin_RW; FRMP BEEscout_RW; BEEscoutSchelde_BR.

³³ Online maps have been updated in 2016 on the Geoportal of Wallonia:
<http://geoportail.wallonie.be/catalogue/89e93887-bc8c-4409-809d-ec53a0986023.html>

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

The prior FHRM assessment³⁴ identified the following areas for further development for Belgium:

- According to Article 6(3) of the FD, flood hazard maps should cover the geographical areas which could be flooded according to the following scenarios: low probability, medium probability (likely return period 100 years or more) and high probability, where appropriate. It appears that Brussels used 25-50 years as medium probability scenario.
- There is no clear distinction among flood sources in the FHRMs of Brussels and Flanders.
- For the Brussels Scheldt UoM, according to the FHRM assessment, the flood risk and hazard maps did not show water depth or level, nor the number of inhabitants which could be potentially affected³⁵, and climate change was not been included in the analysis.

Two of these areas for further development have been partially addressed within the FRMPs assessed:

- In all the FRMPs, maps with low, medium and high probability have been provided either in the document itself or as separate annexes (e.g. for the Flanders Scheldt UoM, BESchelde_VL, as a separate Annex to the plan) or as a links. Wallonia amended the medium probability scenario to 100 years, in line with the Directive.
- For the Brussels Scheldt UoM (BEEscoutSchelde_BR), the flood risk and hazard maps now indicate the number of inhabitants that could be potentially affected by the flood.

Nonetheless, as of April 2018, the FHRMs for Brussels and Flanders did not make a clear distinction among flood sources³⁶; and the FHRMs for the Brussels Scheldt UoM did not show water depth or level. The FHRMs for the region of Brussels-Capital still consider 25-50 years for the medium probability scenario³⁷.

³⁴ European Commission, Assessment of Flood Hazard and Flood Risk Maps – Member State Report: BE – Belgium, December 2014. Available at:

http://ec.europa.eu/environment/water/flood_risk/pdf/fhrm_reports/BE%20FHRM%20Report.pdf

³⁵ Belgium informed subsequently that for the Brussels Scheldt UoM, the indicative number of potentially affected inhabitants was included already from December 2013. For each flood category (high, medium, low or non-existent risk), an indicative number of potentially affected inhabitants is presented by district. This number is represented in different pie charts on the map. The number of inhabitants was also reported in WISE.

³⁶ Belgium noted subsequently that this will be changed for Flanders in the next cycle of implementation.

³⁷ Belgium subsequently recalled that for the Brussels region the most important source of flooding is pluvial floods (e.g. sewers flooding cellars). It is believed that the medium probability for pluvial floods should correspond to a return period of less than 100 years, which is more applicable for fluvial floods.

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

The following **good practices** were identified:

- The plan for the Brussels Scheldt UoM includes an overview of historical data on flood damage and flood events.
- In Flanders, there were updates to the online FHRMs in 2014 and 2017 with the inclusion of new information on flood events. Online maps have been updated in 2016 on the Geoportal of Wallonia³⁸. In Brussels as well, the online FHRMs were updated.

³⁸ <http://geoportail.wallonie.be/catalogue/89e93887-bc8c-4409-809d-ec53a0986023.html>

3. Setting of Objectives

3.1 Focus of objectives

In Belgium, FRMP objectives are set at regional level.

The Region of Flanders has set an overarching objective³⁹ for the “Sustainable reduction of flood risk with sufficient protection for people, economic activity, ecology and cultural heritage”. Flanders moreover aims to reduce flood risks in the following sub-objective areas:

- inland navigation;
- ecology;
- water supply;
- water management and safety.

The Region of Wallonia has set a strategic objective to limit to the maximum degree harm to persons and property, reducing negative impacts on human health, the environment, cultural heritage and economic activity. The Region moreover has set six strategic objectives⁴⁰:

1. Improve knowledge of flood risk;
2. Decrease and slow down water runoff on watersheds;
3. Develop river beds and floodplains while respecting and promoting natural habitats which guarantee stability;
4. Decrease vulnerability to flooding in flood-prone areas;
5. Develop emergency plans and improve crisis management in case of flood.
6. Mitigate the societal and financial burden of damage

The FRMP for the Escaut UoM then set specific objectives for its sub-basins. These include, for example, for the Dendre River basin: limiting overflows, in particular in the town of Lessines; and promoting coordination with the Flanders Region.

The region of Brussels-Capital set one strategic objective, to reduce harm to inhabitants, buildings and infrastructure. This strategic objective is further specified in four sub-objectives.

1. Reduce the occurrence and extent of flooding in the region (O.S.5.1)
2. Reduce the vulnerability of buildings or infrastructures located in flood risk areas (prevention) (O.S.5.2)

³⁹ Overarching objective: “Sustainable reduction of flood risk in Flanders with sufficient protection for people, economic activity, ecology and cultural heritage”. This can be done by reducing the flood risks determined by likelihood and damage. In doing so, An optimal combination of protective, preventive and preparedness measures is taken into account, so that the residual risk is reduced to a socially acceptable level. In doing so, at least the effects of autonomous development resulting from climate change and land use change shall be addressed through measures aimed at maximising cost-efficiency, taking into account benefits for people, economic activities, ecology and cultural heritage.”

⁴⁰ p.107 Chap3§1 objectif généraux – PGRI_ESCAUT_20160304.pdf

3. Ensure crisis management and promote safeguard measures (O.S.5.3)
4. Ensure post-crisis management and return to normal state (O.S.5.4).

Consequently, in the FRMPs assessed⁴¹:

- In all three regions (and all five FRMPs assessed), the objectives aim to reduce the adverse consequences of floods;
- In the Brussels Region, the objectives refer directly to the reduction in the likelihood of flooding⁴²; this theme is addressed indirectly in the objectives of the Flanders Region (which calls for the reduction of flood risk overall) and the Walloon Region (which calls for river bed and floodplain initiatives that should reduce flood likelihood);
- In two of the five FRMPs assessed, those for the Walloon Region and the Brussels region, the objectives refer to non-structural initiatives (crisis management and post-flooding management).

3.2 Specific and measurable objectives

In Flanders, there is a framework for flood risk assessment that allows an estimation of the flood risk based on the severity of the consequences in relation to the likelihood of flooding. This framework allows a link with the sub-objectives, which are measurable and specific; indicators are identified for the sub-objectives. For example, in the FRMP Scheldt⁴³, the sub-objective for water management and safety is to achieve a sustainable or sustained reduction in the number of people affected and in the economic risks resulting from floods; it is linked to indicators for the number of people affected by floods and the damages caused by floods. Targets for the sub-objectives, however, are not set out in the FRMPs, but are found in the sub-basin plans.

In the Brussels Region, more detailed operational objectives are set (these operational objectives are reported in the overview of the PoM, not in the description of the objective itself). The operational objectives are in turn linked to sub-actions, which set out specific information (who will undertake what activities and where).

In the Walloon Region, the FRMPs include specific objectives, which can refer to actions to be taken at local level: many of these are specific and measurable.

3.3 Objectives to reduce adverse consequences from floods

In the FRMPs assessed and in all three Belgian regions, objectives call for the reduction of adverse consequences from floods.

⁴¹ These categories are included in Art. 7 of the FD.

⁴² 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.

⁴³ FRMP Scheldt, section 3.1.6.2.

3.4 Objectives to address the reduction of the likelihood of flooding

In the Brussels Region, as noted above, the objectives refer directly to the reduction in the likelihood of flooding.

In the Flanders Region the overall objective calls for a sustainable reduction of flood risk determined by likelihood and damage, thus incorporating reduction of the likelihood of flooding⁴⁴.

In the Walloon Region, the operational objectives for river beds and floodplains should reduce flood likelihoods.

3.5 Process for setting the objectives

As noted, the objectives were coordinated and set at regional level. In the Flanders Region, coordination among government departments took place within the regional Coordination Committee on Integrated Water Policy (*Coördinatiecommissie Integraal Waterbeheer*), which brings together regional bodies as well as the associations of Flemish provinces and municipalities.

Although there are coordination mechanisms in place among the three regions, including at national level within the national coordination platform on water (*overlegplatform water*), the FRMPs do not indicate if inter-regional coordination took place on the setting of objectives (based on the objectives themselves, it does not appear so)⁴⁵. It is reported in the Flanders FRMPs that this coordination will be strengthened and deepened in the next reporting cycle; moreover, there are also references to greater coordination in the Walloon FRMPs – for example, as noted above, a specific objective in one sub-basin of the Walloon Escaut UoM calls for greater inter-regional coordination.

According to the FRMPs assessed, potential effects of climate change on floods were taken into account but this is not explicitly described nor set out in the objectives themselves.

⁴⁴ Belgium subsequently informed that in the Flanders Region the overarching objective is the sustainable reduction of flood risk in Flanders with sufficient protection for people, economic activity, ecology and cultural heritage. This can be done by reducing the flood risks determined by likelihood and damage. In doing so, an optimal combination of protective, preventive and preparedness measures is taken into account, so that the residual risk is reduced to a socially acceptable level.

⁴⁵ Belgium noted subsequently that all three regions have shared their methodologies, but for various reasons it was decided that each region should make the best use of the information available to it instead of applying a least common denominator approach. For example, in the Brussels Region, floods caused by sewers (or pluvial floods) was the most important source of flooding (far more than fluvial floods) and it was decided to apply a methodology that could cope with this source of flooding.

In all three regions, proposed objectives were discussed with stakeholders (see section 7). In Wallonia, specific objectives by sub-basin have been defined in the Technical Committees with water stakeholders⁴⁶.

3.6 Good practices and areas for further development regarding setting objectives

The following **good practice** was identified:

- The strategic objective for the Brussels Scheldt UoM is elaborated via detailed operational objectives; these in turn are linked to sub-actions, each of them is explained in specific terms: who, what, where.

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

- The FRMPs should better describe coordination⁴⁷ among Belgium's three regions on objectives, particularly in shared river basins such as the Scheldt, which crosses all three regions.

⁴⁶ FRMP Escaut, p. 109.

⁴⁷ Belgium subsequently informed that there was, for example in the case of the Scheldt river basin, coordination at the level of the International Scheldt Commission as indicated in the document "*Overkoepelend deel van het overstromingsrisicobeheerplan voor het internationale scheldestroomgebiedsdistrict / Partie faitière du plan de gestion des risque d'inondation du district hydrographique international de l'Escaut*" http://www.isc-cie.org/images/Documents/ODB1-PFPG1_ROR-DRI_def.pdf.

4. Planned measures for the achievement of objectives

Belgium has reported a total of 668 measures, of which 184 are aggregated⁴⁸ measures and 484 are individual measures⁴⁹.

For the Brussels Regions, 25 measures were reported for the one UoM. For the Flanders Region, 23 measures were reported in two UoMs (13 in the Scheldt FRMP and 10 in the Meuse FRMP). For the Walloon Region, 620 measures were reported across four UoMs. While the FRMPs do not explain the large difference in the number of measures across the three regions, it can be noted that the measures in the Flanders region represent aggregated activities which are further specified in the plans via individual actions⁵⁰. Consequently, the number of measures cannot be compared across regions.

For all three regions, both aggregated and individual measures are reported. None of the five FRMPs assessed, however, provided a definition of aggregated or individual measures. Nonetheless, for the FRMPs in Brussels and Walloon Regions, the aggregated measures are overarching actions that cover a whole UoM. The aggregated measures for Flanders generally fall into the categories of prevention and preparedness and are applied on a regional basis; in contrast, the individual measures are generally protection measures and are location-specific, typically on the scale of single water bodies.

Across the five FRMPs assessed, the measures cover all four aspects of flood risk management as well as “other” and “no action” measures⁵¹. The share of measures varies across the five FRMPs assessed: in four of the five, protection measures represent the largest share, but in the Walloon Rhine FRMP, prevention measures have the largest share. For all five FRMPs, recovery and review measures represent the smallest shares.

- Brussels Scheldt FRMP (BEEscoutSchelde_BR): seven prevention measures (28 %); 10 protection (40 %); three preparedness and three recovery and review (12 % each); two no action (8 %)

⁴⁸ 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.

⁴⁹ 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.

⁵⁰ Belgium subsequently noted that, following the Regional competences, different approaches have been used by the Regions to set up the PoM.

⁵¹ See Annex B for a definition of measure types and measure aspects.

- Flanders Scheldt FRMP (BESchelde_VL): three prevention measures (21 %); six protection measures (46 %); two preparedness measures (15 %); one recovery and review measure and one other measure (8 % each)
- Flanders Meuse FRMP (BEMaas_VL): three prevention measures (30 %); four protection measures (40 %); two preparedness measures (20 %); one other (10 %)
- Walloon Rhine FRMP (BERhin_RW): 33 prevention measures (55 %); 14 protection (23 %); 10 preparedness (17 %); three recovery and review (5%)
- Walloon Scheldt FRMP (BEEscout_RW): 62 prevention measures (31 %); 122 protection (60 %); 16 preparedness (8 %); three recovery and review (1 %)

4.1 Cost of measures

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

UoM code	Estimated overall budget of planned measures (2015-2021) in EUR
BERhin_RW	150.000 to 400.000
BEEscout_RW	40 m (+/- 30%)

Source: Reporting sheet and FRMPs

The FRMPs assessed in the Walloon and Brussels regions contain the following budget information (see also the table above):

- For the Walloon Scheldt UoM (BEEscout_RW), an overall budget of €40 m is estimated with an uncertainty of 30 %. This estimate includes investment costs but does not include operational costs.
- For the Walloon Rhine UoM (BERhin_RW), the overall budget is an even wider estimate (€150.000 to €400.000). This estimate also includes investment costs but does not include the operational costs.
- For the Brussels Scheldt UoM (BEEscout_Schelde_BR), a cost estimate for a maximum and efficient scenario for all measures (i.e. both RBMP and FRMP measures) is presented, however, a separate estimate of costs for FRMP measures has not been found.
- For Flanders, cost information is available in separate fact sheets, available online, for each measure⁵². The FRMPs for the Flanders Region, which are combined with the RBMPs, contain overall budget figures for water management on a regional scale, however, a separate overview of the costs of flood measures is not provided.

4.2 Funding of measures

The plans for Brussels contain an analysis of the different users of water and cost recovery systems for the 2010 to 2015 cycle (i.e. the first RBMP cycle). Beyond this generic

⁵² <http://www.integraalwaterbeleid.be/nl/geoloket/overzicht-acties>

information, the FRMPs do not provide further information available on recovery of costs for flood measures⁵³. For Flanders, separate fact sheets indicate the specific financing sources for each measure. The two Walloon FRMPs assessed state that implementation of measures will depend on available funds at the regional, provincial and town level (the FRMPs also refer to other sources of funding without specifying what these may be).

In sum, the following information is provided on the funding of measures⁵⁴:

Table 7 Funding of measures

	BEMaas_VL	BESchelde_VL	BERhin_RW	BEEscaut_RW	BEEscaut_Schelde_BR
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					

Source: FRMPs

4.3 Measurable and specific (including location) measures

The FRMPs assessed for the regions of Flanders⁵⁵ and Brussels-Capital do not 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.

⁵³ Belgium subsequently informed that for Flanders, this information can be found on a separate webpage: <http://www.integraalwaterbeleid.be/nl/geoloket/overzicht-acties>.

⁵⁴ RBMP BESchelde_VL; RBMP BEMaas_VL; FRMP BERhin_RW, p.157; FRMP BEEscaut_RW, p.157; RBMP BEEscautSchelde_BR.

⁵⁵ Flanders subsequently indicated that this information is available for all detailed actions on the following web page: <http://www.integraalwaterbeleid.be/nl/geoloket/overzicht-acties>.

The FRMPS for Wallonia do include the first three of these elements; however, there is not a clear description of when the measures are expected to be achieved in the FRMPs assessed.

All five FRMPs across the three regions provide an overview of the locations indicated for the measures:

Table 8 *Location of measures*

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

Source: FRMPs

4.4 Measures and objectives

Across all five FRMPs assessed, it is not clear how measures will contribute to the achievement of objectives, nor clear by how much they will contribute. It is also not clear whether the objectives will be achieved when all measures are completed.⁵⁶

In Flanders, the FRMPs set out sub-objectives that are specific and measurable and are linked to indicators and an assessment framework (see section 3). The link between the objectives, measures and the assessment framework is not described in the FRMP.

As noted in section 3, the objectives of the Walloon and Brussels FRMPs are neither specific nor measurable. In the plan for the Brussels Scheldt UoM, however, the general objective is further detailed in terms of operational objectives and sub-actions, and measures are linked to these.

4.5 Geographic coverage/scale of measures

Belgium reported the location of implementation of measures for all measures and the geographic coverage of the impact of measures for around half of the measures.

Nonetheless, in all three regions, the location of the measures is either regional (for general measures) or localised (a specific location within an UoM).

⁵⁶ FRMP BE_Rhin_RW; RBMP BE_EscautSchelde_BR, FRMP BE_Schelde_VL; FRMP_Maas.

In parallel, the measures have either a regional geographic coverage (for general measures implemented at the regional level and exerting an effect on the regional level) or their coverage is a water body itself (for localised, specific measures).

For Flanders, the measures reported for the Meuse and Scheldt FRMPs can be categorised as follows in terms of geographical coverage:

- There are general measures relevant for the whole region or for Meuse and Scheldt UoMs as a whole;
- For the Flanders Scheldt FRMP, there are measures located in the coastal zone and along water bodies under tidal influence (Scheldt estuary and tributaries of the Scheldt – these are part of the prior Sigma Plan to protect the Scheldt estuary from seawater flooding);
- There are measures for non-tidal water bodies.

Wallonia applied a simple distribution of its measures with: global measures (at the level of Wallonia); general measures at provincial or municipal level (or another localised part of the territory); and local measures whose location is identified precisely in terms of territorial coordinates⁵⁷.

4.6 Prioritisation of measures

All three Belgian regions prioritised their measures – however, the breakdown of priorities varies across the three:

- In Brussels, seven measures were categorised as very high priority (28 %), five as high priority (20 %), six as moderate priority (24 %) and seven as low priority (28 %).
- In the two UoMs of the Flanders Region, 20 measures are categorised as high priority (87 %) and three as moderate priority (13 %)⁵⁸.
- In the four UoMs of the Walloon Region, 183 out of 620 measures were identified as critical priority (30 %), 189 as very high priority (30 %) and another 189 as low priority (30 %), with no information provided for the remaining 59 measures (10 %)⁵⁹.

According to the FRMPs assessed in Flanders, measures in this region were prioritised using multi-criteria analysis. The criteria considered include: cost-effectiveness, feasibility, social acceptance, coherence with other actions, including those under the WFD, and urgency.

⁵⁷ See p.126 Chap4§1.3– PGRI_ESCAUT_20160304.pdf

⁵⁸ Flanders subsequently informed that prioritisation is done at the level of individual actions. The measures are an aggregation of these actions. Because almost every aggregated measure has several high priority actions, almost all measures are assigned a high priority. The priorities given to the individual actions show a much larger diversity. For the Scheldt UoM: 128 high, 120 moderate and 42 low priority actions. For the Meuse UoM: 14 high, 8 moderate and 10 low priority actions.

⁵⁹ Belgium subsequently clarified that these measures are studies to improve knowledge.

For the FRMPs in Wallonia, measures were prioritised in three steps: first, a multicriteria analysis of the measures; second, an analysis of the results of this prioritisation and, eventually, adaptation by stakeholders within technical committees by sub-basin; and third, validation of prioritisation by the coordination team, the Transversal Floods Group (GTI)” (*Groupe Transversal Inondations*⁶⁰). The multicriteria analysis took into consideration the following criteria:

- human health (number of people affected);
- economic activities at risks;
- synergies identified with other water management plans, including the RBMPs and plans for economic activities, e.g. transport on water and related infrastructure;
- environmental aspects (synergies or conflicts of interest);
- cultural aspects.

In the Brussels Region, the FRMP reports that measures were prioritised on the basis of the criteria of protection, prevention and preparedness; however, further information is not provided.

For the Flanders and Wallonia FRMPs assessed, the timetable for the implementation of the measures is not provided within the FRMPs. The Brussels FRMP includes an overall timetable of measures⁶¹ linked to their priority: Priority 1 measures should be implemented in the first years of the Plan (2016-2017); Priority 2 measures in 2018-2019; and the implementation of Priority 3 measures should start by 2021 (2020-2021).

4.7 Authorities responsible for implementation of measures

For both the regions of Flanders and Wallonia, water management is organised depending on the category of the water. Accordingly, there are five levels:

- authorities responsible for navigable waters (regional bodies);
- regional authorities;
- provinces;
- towns
- unclassified watercourses, managed by local residents.

Belgium reported on the responsible authorities for all of its measures. In all three regions, regional bodies are responsible for a large share of measures:

⁶⁰ Details (p.113 Chap4§1.1– PGRI_ESCAUT_20160304.pdf

⁶¹ Details on p.435 of the RMBP.

- In Brussels, regional bodies are responsible for 22 of the 25 measures (88 %) and municipal authorities for five measures (20 %) ⁶².
- For the two UoMs in Flanders, regional authorities are indicated for 10 measures of the 23 measures (43 %), multiple authorities for 12 (52 %) and other authorities for one measure (4 %).
- For the four UoMs in Wallonia, regional authorities are responsible for 320 of the 620 measures reported (52 %), provincial authorities for 81 (13 %), municipal authorities for 192 (31 %), sub-RBD authorities for 23 (4%) and other authorities for four measures (1 %).

See tables A11 and A12 and Figures A9 and A10 in Annex A for further details.

4.8 Progress of implementation of measures

Belgium has reported on the process of implementation of all its measures. There are differences among the three regions, with the majority of measures in Flanders ongoing and the majority of those in Brussels and Wallonia not started.

- In Brussels, three of the 25 measures are reported as ongoing construction (12 %), seven as process ongoing (28 %) and 15 not started (60 %);
- For the two UoMs in Flanders, 12 of the 23 measures are reported as ongoing construction (52 %), nine as process ongoing (39 %) and two as not started (9 %);
- For the four UoMs in Wallonia, 195 of 620 measures are reported as ongoing construction (31 %) and 425 as not started (69 %).

4.9 Measures taken under other Community Acts

Member States were asked to report on other Community Acts under which each measure has been implemented: Belgium did not report on this (though it did provide information under ‘any other information’ – see Annex A).

For Flanders, the FRMPs and RBMPs for the Scheldt UoM (BE_Schelde_VL) and the Meuse UoM (BE_Maas_VL) are included in one document and coordinated. The PoM for the FRMP and the RBMP is provided as a single list, with the measures under the FRMP being grouped under a specific group ⁶³.

None of the five FRMPs assessed contain references to measures taken under the Seveso or the EIA Directives.

⁶² It appears that both regional and municipal authorities are indicated for two of the 25 measures in Brussels.

⁶³ Groep (Group) 6: *overstromingen*, floods.

4.10 Specific groups of measures

With regard to **spatial planning/land use measures**, all five FRMPs assessed include measures under type 21 to prevent new development in flood prone areas⁶⁴.

Both FRMPs assessed in Flanders and the Wallonia Scheldt FRMP each contained one measure under type 22 to remove receptors from flood prone areas⁶⁵.

Among the specific measures, the Brussels Scheldt FRMP includes a measure to avoid building in flood sensitive areas. The Flanders FRMPs assessed include the following measure: avoiding new flood risk sensitive developments, to keep flood areas free from buildings and to build, where appropriate, buildings that are resistant to flooding. In Wallonia, there are measures related to building permits: obligatory advice from regional and provincial authorities for parcels of land subject to flooding.

NWRM have been planned in all five FRMPs assessed.

Among the measures identified:

- In the Brussels Scheldt FRMP (BEEscoutSchelde_BR), measures include: restoration of rivers⁶⁶, restoration of floodplains⁶⁷, aquifer restoration⁶⁸ and urban measures including permeable surfaces, retention basins and ponds and infiltration basins⁶⁹.
- For the Flanders Scheldt FRMP (BESchelde_VL): Buffer strips⁷⁰, restoration of wetlands⁷¹ and the restoration of rivers⁷².
- The two Walloon FRMPs assessed (BERhin_RW and BEEscout_RW) included urban measures, for example to take into consideration rain water retention in development projects, agriculture measures such as soil conservation and river restoration and floodplain restoration. (Due to the brief descriptions of the measures it has not been possible to link the measures to specific NWRM codes.)

Measures that specifically consider nature conservation. All five FRMPs assessed take into account nature conservation (for example, citing Natura 2000 areas), but in the Brussels and Flanders FRMPs assessed, an explicit link to nature conservation in the flood risk measures

⁶⁴ Specifically: Prevention, Avoidance, Measure to prevent the location of new or additional receptors in flood prone areas, such as land use planning policies or regulation.

⁶⁵ Specifically: 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.

⁶⁶ NWRM measure types: N04 Re-meandering, N05 Stream bed re-naturalisation.

⁶⁷ NWRM measure type N03 Floodplain restoration and management.

⁶⁸ NWRM measure type N13 Restoration of natural infiltration to groundwater.

⁶⁹ Including NWRM measure types U03 Permeable surfaces, U06 Filter Strips, U10 Detention Basins, U11 Retention Ponds and U12 Infiltration basins.

⁷⁰ Corresponding to NWRM measure type A02, Buffer strips and hedges.

⁷¹ Corresponding to NWRM measure type N02 Wetland restoration and management.

⁷² NWRM measure types: N04 Re-meandering, N05 Stream bed re-naturalisation, N06 Restoration and reconnection of seasonal streams, N07 Reconnection of oxbow lakes and similar features.

themselves is not provided^{73, 74}. The Walloon Meuse FRMP (BEMeuse_RW) contains a flood risk measure where nature conservation is clearly cited (a measure for river restoration).

Four of the five FRMPs assessed make a brief reference that they shall take into consideration **navigation and port infrastructure**. In Wallonia, for example, the FRMP for the Scheldt UoM states that shipping on this river is taken into consideration. The plan for the Brussels Scheldt UoM does not refer to shipping; however, at least one measure is indirectly related to it (optimising the shipping canal in Brussels for receiving run-off water)⁷⁵.

The five FRMPs assessed include planning of **dredging** to increase the river channel capacity and its ability to convey water for flood alleviation purposes.

4.11 Recovery from and resilience to flooding

The FRMPs state that properties in flood risk areas will not be covered by insurance. The Flanders FRMPs assessed refer to the 2014 revision of a 2006 national law on insurance that gives insurance companies the right to refuse coverage for properties in flood risk zones. In this regard, the flood risk maps for Wallonia and Flanders⁷⁶ have legal value in terms of designating flood risk zones; the FRMP for Flanders explains that insurers have the right not to insure new homes located in flood risk zones against flooding. This is not the case yet for the Brussels region, where maps only have an indicative value; however, the Brussels Scheldt UoM includes a measure to prepare a map that will identify risk zones under the 2014 national legislation⁷⁷.

For the Walloon FRMPs assessed, insurance is mentioned in the discussion of objectives – one of the operational objectives calls for the promotion of the insurability of properties – and may be related to a measure on sharing flood costs (*Mutualiser les coûts liés aux inondations*).

The FRMPs do not provide information whether insurance is conditional on making at-risk properties (domestic, industrial) as flood resilient as possible, nor if environmental liability insurance cover the restoration costs arising from flooding of potentially polluting sites and installations.

⁷³ BESchelde_VL and BEMaas_VL, Chpt Summary of the Objectives; BEEscautSchelde_BR: summary document, e.g. Chpt: Summary of the Development; BERhin_RW and BEEscaut_RW: summary document, e.g. Chpt. Summary of objectives.

⁷⁴ Belgium subsequently indicated that further information for the detailed actions in Flanders is available on the following webpage: <http://www.integraalwaterbeleid.be/nl/geoloket/overzicht-acties>. There, a total overview of all actions (i.e. specific, detailed measures) in the PoM can be found. This contains detailed information for (almost) all actions, including those located within protected areas.

⁷⁵ Belgium subsequently informed that for this measure in the Brussels FRMP, shipping itself is not relevant; however this action requires discussion with the Port Authority to assess what is relevant and possible.

⁷⁶ Belgium informed subsequently that insurance is a federal competence. The Flemish map delineating flood risk areas with regards to the insurance law is a pre-existing flood map, not an FHRM under the FD; however, there is coordination between the two maps to ensure consistency.

⁷⁷ Measure 5.15: p. 448 of the FRMP

4.12 Monitoring progress in implementing the FRMP

The FRMPs assessed in all three regions provide information on the process for monitoring progress.

The FRMPs applicable to the region of Wallonia state that each authority is responsible for monitoring progress. A set of parameters needs to be tracked, including progress (not started, in progress, finished, not implemented). The progress will be monitored twice during the six-year cycle: 2017 and 2019⁷⁸. The assembled data on progress will be examined by the technical committees in each sub-basin.

For the region of Flanders, the *Water Uitvoerings Programma* (Water Execution Programme) is a monitoring programme that is executed on a yearly basis. It assembles the input provided by the authorities responsible for monitoring, planning and amendments to their work plans. It is not indicated in the reporting sheets which parameters on the measures will be monitored⁷⁹.

In the Brussels Region, each body responsible for one or more measures should monitor progress. The Brussels Institute for Environmental Management coordinates and monitors overall progress on the FRMP on a yearly basis. The monitored parameters are qualitative and quantitative and includes two criteria:

- progress (in %): effective days and total number of days foreseen for the project;
- financial progress (%). In addition, progress is indicated as not started, in progress, finished and abandoned.

There is no information available in any of the FRMPs assessed whether a baseline has been established against which progress will be monitored and assessed in all five FRMPs assessed.

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 Basin Management Plan (RBMP) of the WFD.

Table 9 *Coordination of the development of the FRMPs with the development of the second RBMP of the WFD*

	BEMaas_VL	BESchelde_VL	BERhin_RW	BEEscaut_RW	BEEscaut-Schelde_BR
Integration of FRMP and RBMP in a single plan	✓	✓			✓

⁷⁸ Wallonia informed subsequently that three monitoring actions of the progress of measures have been carried out and two Technical Committee meetings have already been held since the approval of the plans in 2016 (first meeting in October 2017, second meeting in May 2018).

⁷⁹ Flanders subsequently clarified that it monitors progress qualitatively (not started, on-going,...), quantitatively (if possible) and financially.

	BEMaas_VL	BESchelde_VL	BERhin_RW	BEEscaut_RW	BEEscaut-Schelde_BR
Joint consultation of draft FRMP and RBMP	✓	✓	✓	✓	✓
Coordination between authorities responsible for developing FRMPs and RBMPs	✓	✓	✓	✓	✓
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 PoM includes win-win measures in terms of achieving the objectives of the WFD and FD, drought management and NWRMs ^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 ^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	✓	✓	✓	✓	✓

Notes: ^a based on reporting under the WFD

The FRMPs do not associate the reported FD measures to WFD measures in a formal way. However, although WFD and FD measures are not associated formally, and considering the

close coordination of the WFD and FD reporting in the regions of Flanders, Wallonia and Brussels-Capital, and examining into detail the measures in each of the plans, it can be concluded that many of the measures taken under the FD (e.g. NWRM measures, floodplain and river restoration) are also contributing to the WFD objectives.

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

The following **good practices** were identified:

- For the FRMPs in the Walloon Region, cost estimates have been elaborated for all measures in the FRMPs assessed;
- All the FRMPs assessed contain land use and spatial planning measures and all include NWRM.
- All five FRMPs assessed provided an overview of the method for monitoring progress of measures. For the regions of Flanders and Brussels-Capital, monitoring is carried out on a yearly basis.

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

- The Brussels Scheldt FRMP does not provide information on the costs of flood measures; the FRMPs for the Walloon Region present wide ranges rather than specific costs⁸⁰.
- The Brussels Scheldt FRMP does not provide information on funding sources for measures.

⁸⁰ Belgium subsequently informed that Flanders provides the costs of actions and funding sources on a separate webpage and not in the FRMP itself.

5. Consideration of climate change

The five FRMPs assessed all addressed climate change; however, none of them refer to Belgium's 2010 National Climate Change Adaptation Strategy⁸¹. The Flemish FRMPs do contain a reference to the regional Flemish Adaptation Plan (*Vlaams Adaptatieplan*⁸²).

All five FRMPs assessed provide some information on the potential impacts of climate change and all five state that these have been taken into consideration. The Flanders and Walloon FRMPs assessed state, for example, that increased risks due to climate change are taken into consideration in calculations of the design of measures related to flood protection infrastructures.

The Brussels Scheldt plan provides an overview of climate impacts, based on a detailed background study⁸³: projected impacts include more intensive summer rains and more prolonged periods of rain in winter. The FRMP for Wallonia's Scheldt UoM mentions indications of increased occurrence of extreme rainfall but states that a statistically significant change has not been detected yet. The reporting sheets for the two Flanders FRMPs mention an increased occurrence of flooding (both from heavy rainfall as well as from rivers).

The Brussels plan indicates that the timeframes of the climate change scenarios considered are 2030, 2050 and 2085. No information was found in the FRMPs assessed from the Flanders and Walloon Regions on the timeframes of climate scenarios.

The FRMPs do not refer specifically to expected changes in main sources of flooding.

5.1 Specific measures to address expected effects of climate change

With regard to measures to reduce pollution risk in flood prone zones, climate change is mentioned explicitly in some but not all FRMPs assessed. The FRMP for the Brussels Scheldt UoM indicates that climate change was considered in the design of some measures, including measures to address pollution risks in flood risk zones (e.g. AP 5.9: *Poursuivre le programme pluriannuel d'installation de bassins d'orage*, which include addressing pollution risks). A similar observation is made for the region of Wallonia (e.g. measure 7 on storm basins). (The measures in the Flanders FRMPs assessed, which as noted in section 4 represent aggregated activities, do not provide similar details.)

⁸¹ Belgium subsequently informed that this national adaptation plan is the sum of the regional adaptation plans, which contain all relevant regional information on the topic. The national plan also includes measures at national level and coordination between regions.

See: https://www.cnc-nkc.be/sites/default/files/report/file/be_nas_2010_1.pdf

⁸² See: <https://www.lne.be/vlaams-adaptatieplan>

⁸³ "De aanpassing aan de klimaatverandering in het Brussels Hoofdstedelijk Gewest: Uitvoering van een studie voorafgaand aan de opstelling van een gewestelijk aanpassingsplan", Eindverslag - © FACTOR X – ECORES - TEC-, 2012, p. 61.

Climate change is mentioned in the description of non-structural measures for some, but not all FRMPs assessed. The FRMPs applicable to the region of Brussels-Capital include some general measures that relate to management of flood plains, for example to strengthen enforcement of rules in these areas (e.g. *Renforcer la réglementation et le suivi des infractions en zone inondable*).

5.2 Good practices and areas for further development concerning climate change

The following **good practice** was identified:

- The plan for the Brussels Scheldt UoM provides a detailed analysis of climate change forecasts and their implications for water management.

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

- Strengthen coordination with the National Climate Change Adaption Strategy.

6. Cost-benefit analysis

Some, but not all FRMPs assessed refer to costs and benefits as a criterion for the establishment of priorities for the selection of measures.

Each region takes a different approach. The region of Wallonia bases the prioritisation of measures upon a multi-criteria analysis, including economic aspects (costs and benefits), but it is unclear from the information if this was done in a qualitative or quantitative way. The region of Flanders prioritises measures also based upon a multi-criteria analysis, including a cost-effectiveness analysis. The Flanders FRMPs do not provide information on the methodology; however, they include a specific measure on the acquisition of additional knowledge and further development of the methodology for CBA of measure in general. The FRMP for the region of Brussels-Capital does not indicate that CBA was applied.

The FRMPs assessed do not provide information if the CBA was used to assess measures with transnational effects (nor if any such measures were identified).

6.1 Good practices and areas for further development

The following **good practice** was identified:

- The Flanders and Walloon FRMPs assessed included cost and benefit aspects among the criteria for the prioritisation of measures

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

- The use of CBA should be considered for the Brussels Scheldt Plan.

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 Units of Management identified for the FD have not changed. Belgium has not reported new information to WISE 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 five 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*

	BEMaas _VL	BESchelde_ VL	BERhin_ RW	BEEscout_ RW	BEEscout_ Schelde_BR
Media (papers, TV, radio) ⁸⁴	✓	✓			
Internet	✓	✓	✓	✓	✓
Digital Social networking					
Printed material	✓	✓	✓	✓	✓
Direct mailing	✓	✓	✓	✓	✓
Invitations to stakeholders	✓	✓	✓	✓	✓
Local Authorities	✓	✓	✓	✓	✓
Meetings ⁸⁵	✓	✓			✓

Source: FRMPs

The three regions used somewhat different communication methods for the public consultation. In Wallonia, public consultation was focused on direct communication of the documents with stakeholders and authorities. In Flanders, an array of channels was applied for the consultation, including Internet, printed materials and a media campaign, ‘*Vol van Water*’ (full of water), which includes a web site⁸⁶ and sponsored advertisements in magazines during the consultation period. In the Brussels and Flanders regions, special information sessions were organised to introduce the FRMPs and invite interested citizens in the public consultation: the FRMPs report one in Brussels and five in Flanders. For all five FRMPs assessed, printed

⁸⁴ Belgium subsequently indicated that in Wallonia, municipalities published information in their local newspapers; in Brussels, information was provided via radio spots and newspapers.

⁸⁵ Belgium subsequently indicated that in Wallonia, there were meetings in some municipalities on request to inform people and the local land-use planning commission.

⁸⁶ www.volvanwater.be

material was produced to describe the plans: for example, Wallonia⁸⁷ and the Brussels Region produced a brief, non-technical summary for the broad public.

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

Table 11 Methods used for the actual consultation

	BEMaas_VL	BESchelde_VL	BERhin_RW	BEEscout_RW	BEEscout_Schelde_BR
Via Internet	✓	✓	✓	✓	✓
Via digital social networking					
Direct invitation	✓	✓	✓	✓	✓
Exhibitions					
Workshops, seminars or conferences	✓	✓			✓
Telephone surveys					
Direct involvement in drafting FRMP					
Postal written comments	✓	✓	✓	✓	
Other*	✓	✓			✓

Note: * The FRMPs in the Brussels and Flanders were integrated into the RBMPs and thus were part of the consultations on those plans.

In all three regions, the consultation included written comments which could be provided via Internet. In Brussels and Flanders, the FRMP consultation was organised with that of the RBMP, as the FRMPs were integrated into the RBMPs. In Brussels and Flanders, meetings provided an opportunity for discussion on the plans. In Wallonia, following the public consultation, 167 letters were recorded either by post or by mail.

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

Table 12 Methods used to provide the documents for the consultation

	BEMaas_VL	BESchelde_VL	BERhin_RW	BEEscout_RW	BEEscout_Schelde_BR
Downloadable	✓	✓	✓	✓	✓
Direct mailing (e-mail)	✓	✓	✓	✓	✓
Direct mailing (post)	✓	✓	✓	✓	✓
Paper copies distributed at exhibitions					

⁸⁷ Belgium subsequently indicated an example from the Walloon Region: a brochure was prepared on the FRMP and RBMP for the public consultation:
http://environnement.wallonie.be/inondations/files/pgri/FR_brochure_EP_20150511.pdf

Paper copies available in municipal buildings (town hall, library etc.)	✓	✓	✓	✓	✓
Paper copies at the main office of the competent authority					
Other *	✓	✓			✓

Note: * In Brussels and Flanders, documents were available at information session

The documents of the FRMPs in Belgium were made available electronically and in printed format in the different regions, for the relevant FRMPs. In Brussels and Flanders, documents were available at town halls. Wallonia has sent a paper copy to each municipality to make it available to the public.

7.3 Active involvement of Stakeholders

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

Table 13 Groups of stakeholders

	BEMaas_V L	BESchelde _VL	BERhin_R W	BEEsca ut_RW	BEEscaut_ Schelde_BR
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)	✓	✓			
NGOs including nature protection, social issues (e.g. children, housing)	✓	✓	✓	✓	
Consumer Groups					
Local / Regional authorities	✓	✓	✓	✓	✓
Academia / Research Institutions ⁸⁸			✓	✓	

Source: FRMPs

⁸⁸ Wallonia subsequently clarified that universities are involved in the Flood Transversal Group (GTI).

A range of stakeholders were consulted on the plans. In Brussels, the water actors and operators (Vivaqua, SBGE, the Port Authority) were actively involved in the development of the Brussels FRMP. In Wallonia, amongst others, emergency actors, the ‘*Wateringues*’ and port authorities were involved in the Technical Committee. The Walloon Federation of Farmers participated in *tables rondes*. In Wallonia, universities are involved in the Flood Transversal Group (GTI).

In addition, neighbouring countries have been involved via the international river basin commissions of Scheldt and Meuse via exchange of documents and multilateral meetings. Relevant stakeholder groups and commissions on nature and water management were informed about the draft FRMPs prior to the public consultation.

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

	BEMaas_V L	BESchelde _VL	BERhin_R W	BEEscau t_RW	BEEscout_ Schelde_BR
Regular exhibitions					
Establishment of advisory groups					
Involvement in drafting					
Workshops and technical meetings	✓	✓	✓	✓	✓
Formation of alliances					
Information days	✓	✓			✓

Source: FRMPs

In Brussels, municipalities, stakeholders and other actors provided feedback on the plan, including via a regional information session was organised for this purpose.

In Flanders, the Coordination Commission for Integrated Water Management is responsible for the development of the plans: this Commission brings together a range of government bodies, and it organised a meeting with sub-UoM-level advisory groups (*bekkenraden*) for information and consultation on the drafting and content of the FRMPs: these groups include representatives of environmental organisations; various economic sectors including agriculture, industry, commerce, energy, fisheries, transport and tourism; and local governments. Draft versions of the plans were reviewed by local water management authorities.

As noted in section 4, preparation of the FRMPs in Wallonia included a government coordination body, the Transversal Floods Group (*Groupe Transversal Inondations*), which brings together water managers, operational water management services, technical services and provinces, water operators and water commissions and universities.

7.4 Effects of consultation

The table below shows the **effects** of consultation:

	BEMaas_V L	BESchelde_ VL	BERhin_R W	BEEscout_ RW	BEEscout_ Schelde_BR
Changes to selection of measures					
Adjustment to specific measures ⁸⁹	✓	✓	✓	✓	
Addition of new information	✓	✓	✓	✓	
Changes to the methodology used					
Commitment to further research					
Commitment to action in the next FRMP cycle					
Comments and results of the consultation "were considered in the formulation of the plan"					
Suggestions for other/additional measures, additions to texts and further clarifications ⁹⁰	✓	✓	✓	✓	

Source: FRMPs

According to the FRMPs assessed, the feedback received from the public consultation in the regions of Flanders and Wallonia mainly resulted in adjustments to measures proposed, addition of new information, further clarifications and suggestion for additional measures. Detailed information on feedback from the public consultation in the region of Brussels-Capital could not be found in the assessed documents (for this region, a total of 37 comments were received from organisations and authorities and an equal number of comments from the public). No further information was included on the content and nature of these comments in the assessed documents⁹¹.

7.5 Strategic Environmental Assessment (SEA)

All the FRMPs assessed underwent SEA procedures.

7.6 Good practices and areas for further development regarding Governance

The following **good practice** was identified:

⁸⁹ Belgium subsequently informed that this was the case also for the Brussels FRMP/RBMP.

⁹⁰ Belgium subsequently informed that this was also the case for the Brussels FRMP/RBMP.

⁹¹ Belgium subsequently clarified that this information was included and cited in the Decision of the Government of the Brussels-Capital Region adopting the FRMP/RBMP for the period 2016-2021 of 26 January 2017: www.ejustice.just.fgov.be/eli/bsluit/2017/01/26/2017010521/justel

- Across all three regions, a range of activities were undertaken for public consultation and the active involvement of stakeholders. In Flanders and Wallonia, stakeholders were involved via advisory groups.

Annex A: Supplementary tables and charts on measures

This Annex gives an overview of the data on measures provided by Belgium 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 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)⁹², 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

⁹² <http://icm.eionet.europa.eu/schemas/dir200760ec/resources>

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.
- 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 table⁹³ 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’.

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

⁹³ Guidance for Reporting under the FD (2007/60/EC):
<https://circabc.europa.eu/w/browse/a3c92123-1013-47ff-b832-16e1caaafc9a>

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Measures overview

Table A1 - Total number of measures

Number of individual measures	484
Number of individual measures including measures which have been allocated to more than one measure type	484
Number of aggregated measures	184
Number of aggregated measures including measures which have been allocated to more than one measure type	184
Total number of measures	668
Total number of measures including measures which have been allocated to more than one measure type	668
Range of number of measures between UoMs including measures which have been allocated to more than one measure type (Min-Max)	2 – 282
Average number of measures across UoMs including measures which have been allocated to more than one measure type	69

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

	Prevention				Protection					Preparedness				Recovery & review			No Action	Grand Total
	M21	M22	M23	M24	M31	M32	M33	M34	M35	M41	M42	M43	M44	M51	M52	M53	M11	
BEEscout_RW	0	1	5	34	41	59	8	5	2	0	1	3	2	0	0	0	0	161
BEEscoutSchelde_BR	3	0	4	0	2	1	0	3	4	1	1	1	0	1	1	1	2	25
BEMaas_VL	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	4
BEMeuse_RW	1	0	4	24	41	70	111	9	5	0	2	9	1	2	1	2	0	282
BERhin_RW	0	0	0	0	1	1	4	0	1	0	0	0	0	0	0	0	0	7
BESchelde_VL	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
BESeine_RW	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	4	2	0	60	85	131	124	17	12	3	4	15	3	3	2	3	2	484

Notes: The codes for measure types are explained in section 2 of this document.

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	M34	M41	M42	M43	M44	M51	M52	M53	M61	
BEEscout_RW	4	0	0	18	5	1	1	0	2	2	2	4	1	0	2	0	42
BEMaas_VL	1	1	0	0	1	1	0	1	0	0	0	0	0	0	0	1	5
BEMeuse_RW	4	0	0	18	5	1	1	0	2	2	2	4	1	0	1	0	42
BERhin_RW	4	0	0	18	5	1	1	0	2	2	2	4	1	0	1	0	42
BESchelde_VL	1	0	1	0	1	1	2	2	0	0	2	0	0	0	1	1	10
BESeine_RW	4	0	0	18	5	1	1	0	2	2	2	4	1	0	2	0	42
Grand Total	18	1	1	72	22	6	6	3	8	8	8	16	4	0	9	2	184

Notes: The codes used are explained in section B of this document. The Brussels Scheldt UoM (BEEscoutSchelde_BR) does not have aggregated measures and thus is not represented in this table.

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

	No action	No action	Prevention		Prevention	Protection		Protection	Preparedness		Prepared-	Recovery and		Recovery	Other	Other	Grand Total
	Individual	Total	Aggre- gated	Indivi- dual	Total	Aggre- gated	Indivi- dual	Total	Aggre- gated	Indivi- dual	ness Total	Aggre- gated	Indivi- dual	Total	Aggre- gated	Total	
BEEscout_RW			22	40	62	7	115	122	10	6	16	3		3			203
BEESCAUT_SCHEL DE_BR	2	2		7	7		10	10		3	3		3	3			25
BEMAAS_VL			2	1	3	3	1	4		2	2				1	1	10
BEMeuse_RW			22	29	51	7	236	243	10	12	22	3	5	8			324
BERhin_RW			22		22	7	7	14	10		10	3		3			49
BESCHELDE_VL			2	1	3	6		6		2	2	1		1	1	1	13
BESeine_RW			22	2	24	7		7	10		10	3		3			44
Grand Total	2	2	92	80	172	37	369	406	40	25	65	13	8	21	2	2	668
Average per UoM	<1	<1	13	11	25	5	53	58	6	4	9	2	1	3	<1	<1	95

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

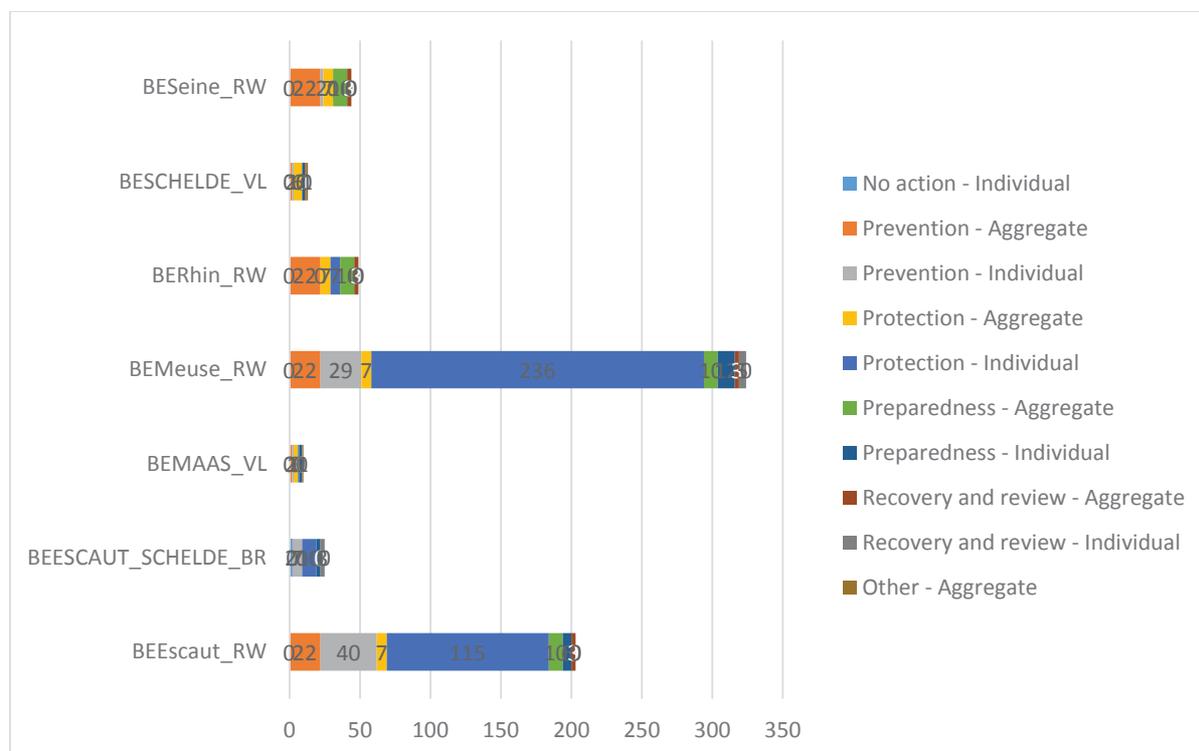
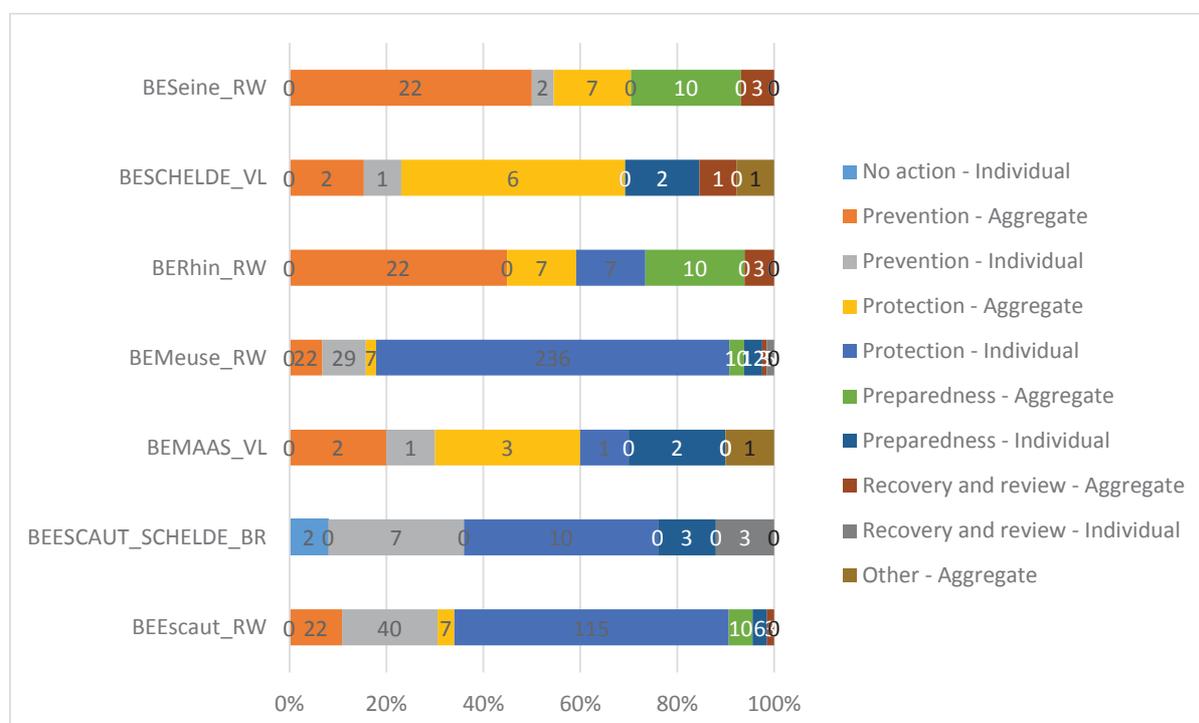


Figure A2 - Share of total measures (aggregated and individual) by measure aspect



Measure details: cost

Member States were requested to report information on:

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

Explanation for the cost was not provided in the reporting sheets for any of the measures. Nevertheless, the majority of the measures contain information about their estimated costs, which is summarised in the following tables.

Table A5: Cost by measure aspect (EUR)

	No cost	0-50k	50-100k	100-200k	200-500k	500k-1M	1-5M	Over 5M	Unknown	No info.	Grand Total
No action										2	2
Prevention	18	10	14	13	3	3	3		7	101	172
Protection	13	126	45	48	38	19	27	1	41	48	406
Preparedness	7	6							5	47	65
Recovery & review	4		1							16	21
Other										2	2
Grand Total	42	142	60	61	41	22	30	1	53	216	668

Figure A3 - Visualisation of Table A5: Cost by measure aspect (EUR)

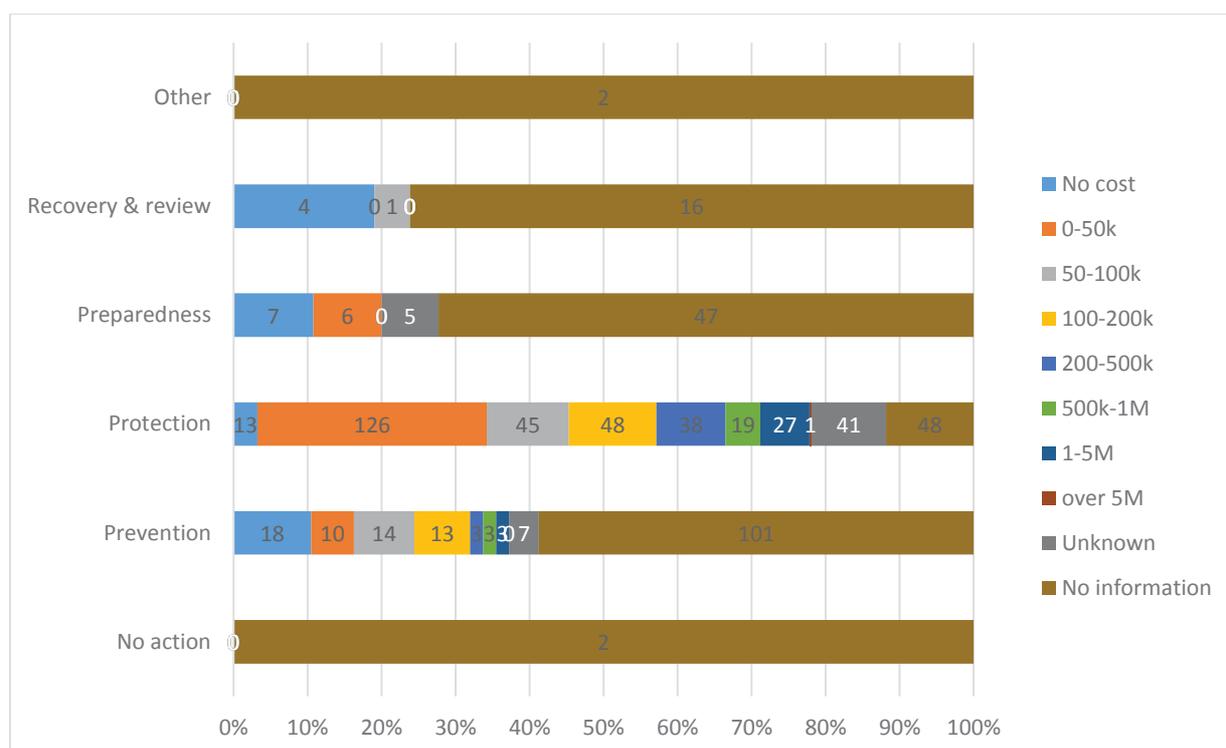
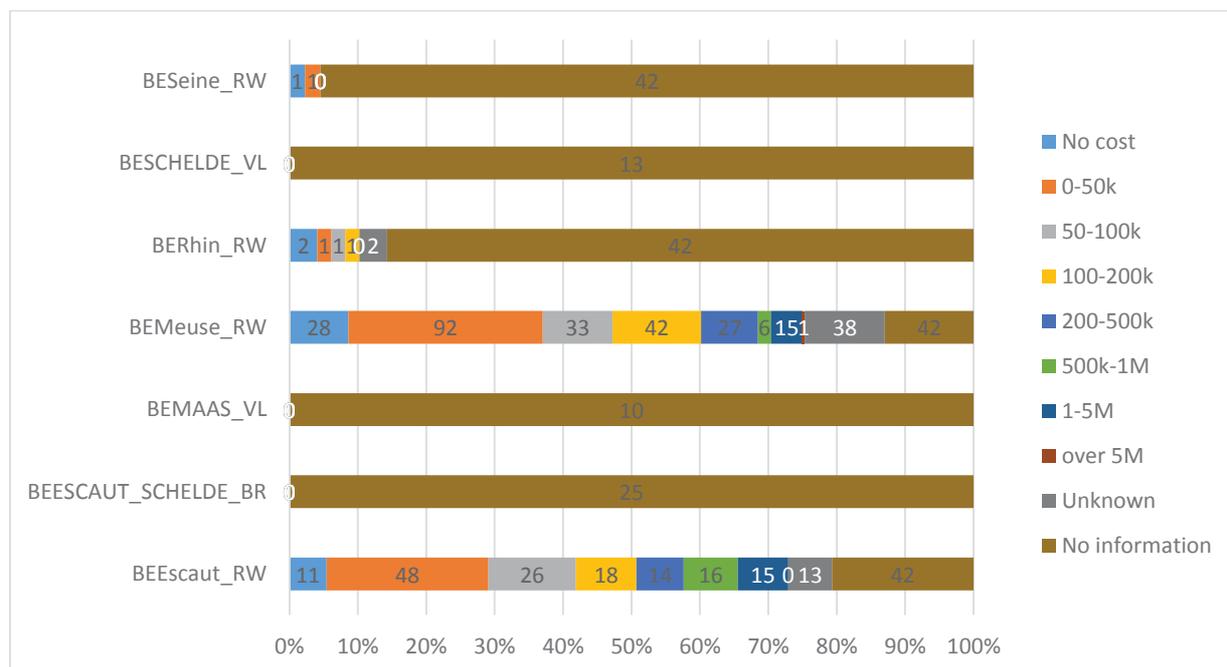


Table A6: Cost by UoM (EUR)

	No cost	0-50k	50-100k	100-200k	200-500k	500k-1M	1-5M	Over 5M	Un-known	No info.	Grand Total
BEEscaut_RW	11	48	26	18	14	16	15		13	42	203
BEESCAUT_SC HELDE_BR										25	25
BEMAAS_VL										10	10
BEMeuse_RW	28	92	33	42	27	6	15	1	38	42	324
BERhin_RW	2	1	1	1					2	42	49
BESCHELDE_VL										13	13
BESeine_RW	1	1								42	44
Grand Total	42	142	60	61	41	22	30	1	53	216	668
Average per UoM	6	20	9	9	6	3	4	<1	8	31	95

Figure A4: Visualisation of Table A6: Cost by UoM (EUR)



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

Location of implementation of measures was reported for all measures. However, due to the large number of different locations mentioned, aggregation of the data was not possible.

Geographic coverage

Geographic coverage of the impact of measures was reported for around half of the measures. However, due to the large number of different types of geographic coverage mentioned, aggregation of the data was not possible.

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 reporting sheet);
- 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

Information about objectives was not provided in the reporting sheets for any measures.

Category of priority

Belgium provided information for the priority of almost all measures. The following categories are used in the reporting sheet:

- Critical;
- Very high;
- High;
- Moderate;
- Low.

Table A7 - Category of priority by measure aspect

	Critical	Very high	High	Moderate	Low	No information	Grand Total
No action		1	1				2
Prevention	42	46	8	3	43	30	172
Protection	116	129	8	5	119	29	406
Preparedness	21	16	6		22		65

Recovery & review	4	4		1	12		21
Other			2				2
Grand Total	183	196	25	9	196	59	668

Figure A5 - Visualisation of Table A7: Category of priority by measure aspect

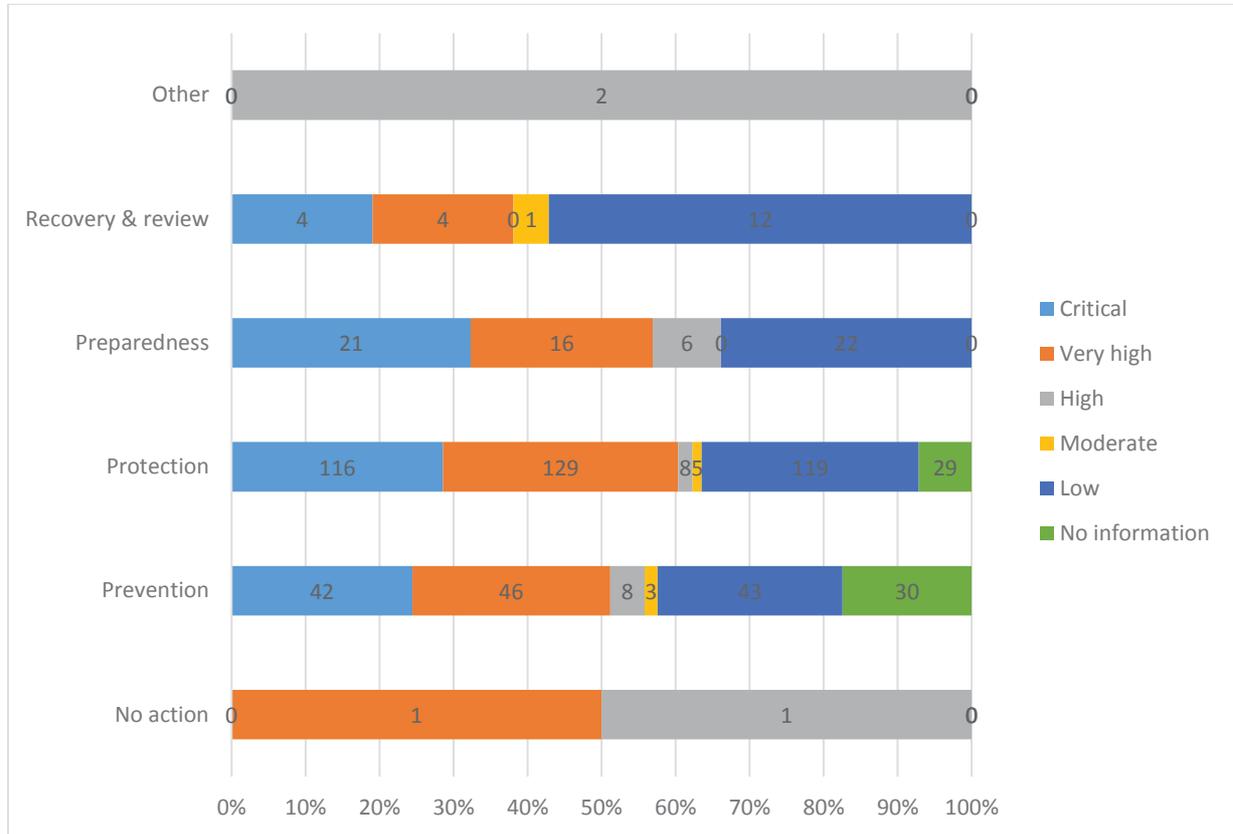
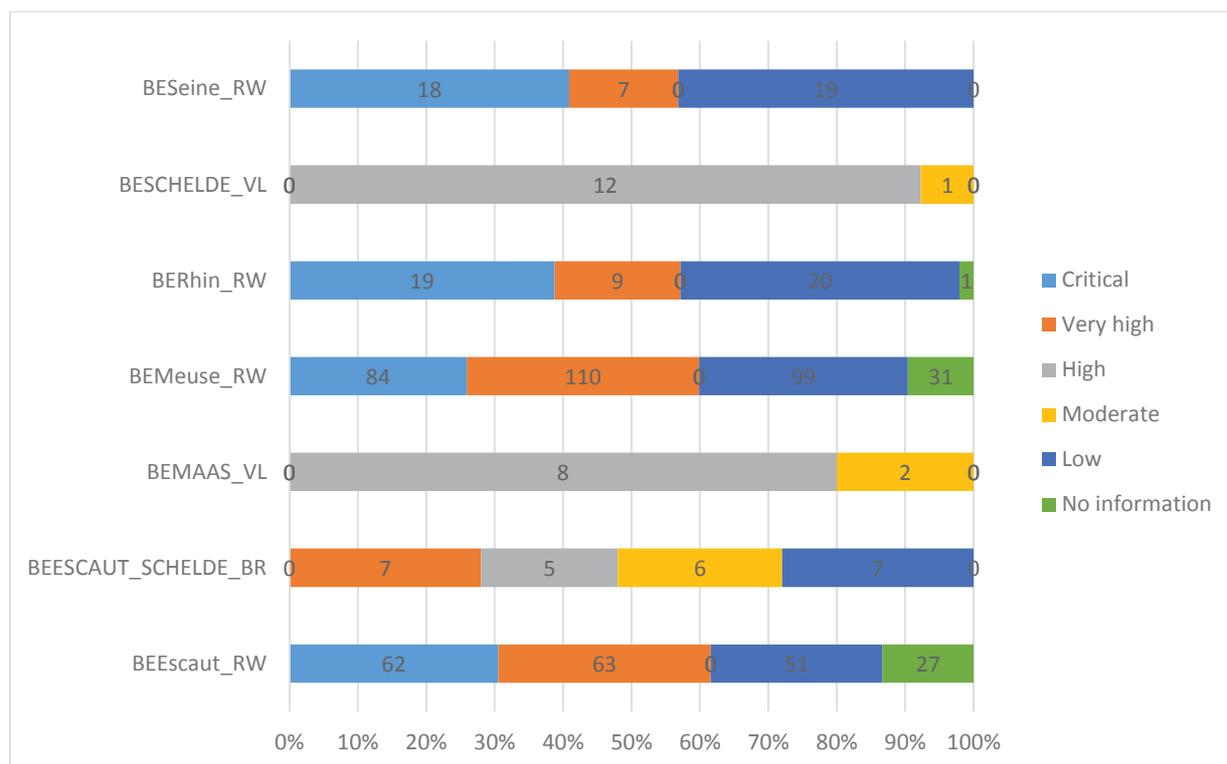


Table A8 - Category of priority by UoM

	Critical	Very high	High	Moderate	Low	No information	Grand Total
BEEscout_RW	62	63			51	27	203
BEESCAUT_SCHE LDE_BR		7	5	6	7		25
BEMAAS_VL			8	2			10
BEMeuse_RW	84	110			99	31	324
BERhin_RW	19	9			20	1	49
BESCHELDE_VL			12	1			13
BESeine_RW	18	7			19		44
Grand Total	183	196	25	9	196	59	668
Average per UoM	26	28	4	1	28	8	95

Figure A6 - Visualisation of Table A8: Category of priority by UoM



Timetable

Information on the timetable was provided for the majority of measures, a summary is provided in the following tables.

Table A9: Timetable of implementation by measure aspect

	Planned 2016 - 2018	Planned 2019 - 2021	2016-2021	In progress	Periodic	No information	Grand Total
No action						2	2
Prevention	6	5	88	46	14	13	172
Protection	103	50	28	145	60	20	406
Preparedness	8		40	4	6	7	65
Recovery & review		1	12		4	4	21
Other						2	2
Grand Total	117	56	168	195	84	48	668

Figure A7: Visualisation of Table A9: Timetable of implementation by measure aspect

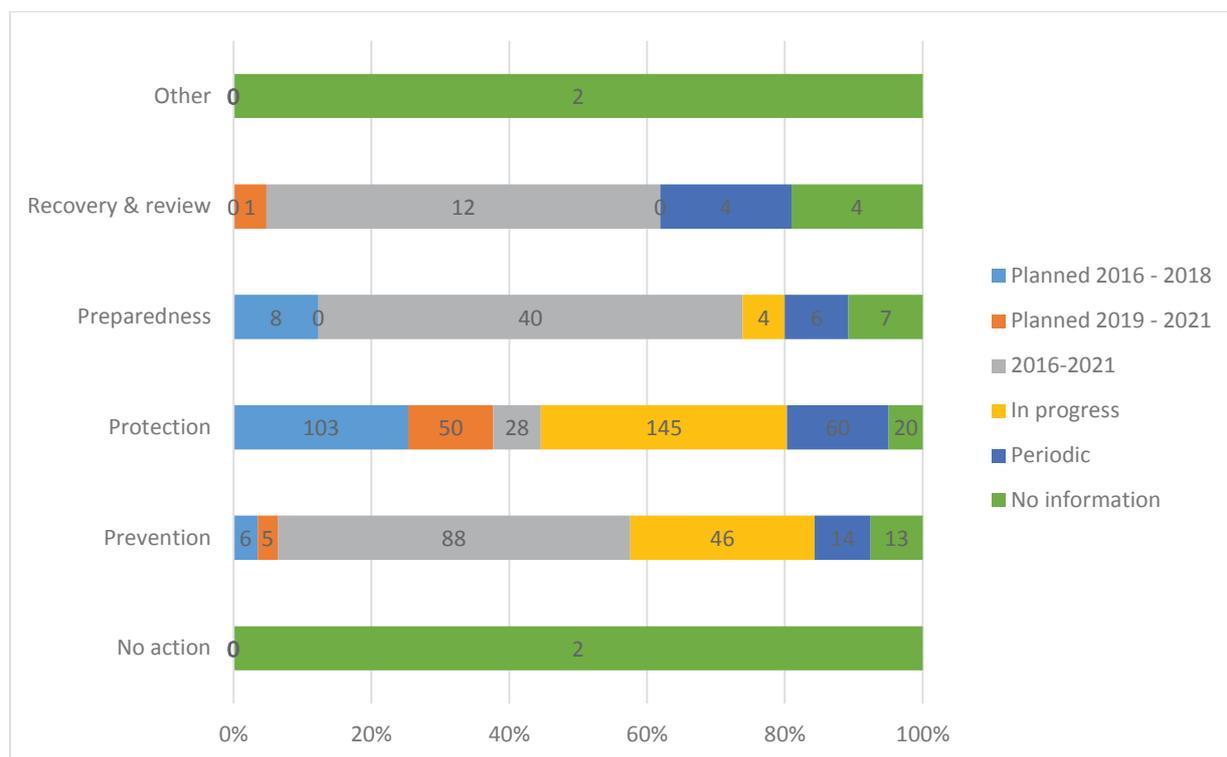


Table A10: Timetable of implementation by UoM

	Planned 2016 - 2018	Planned 2019 - 2021	2016-2021	In progress	Periodic	No information	Grand Total
BEEscout_RW	35	16	42	99	11		203
BEESCAUT_SCHE LDE_BR ⁹⁴						25 ⁹⁵	25
BEMAAS_VL						10	10
BEMeuse_RW	79	40	42	95	68		324
BERhin_RW	3		42	1	3		49
BESCHELDE_VL						13	13
BESeine_RW			42		2		44
Grand Total	117	56	168	195	84	48	668
Average per UoM	17	8	24	28	12	7	95

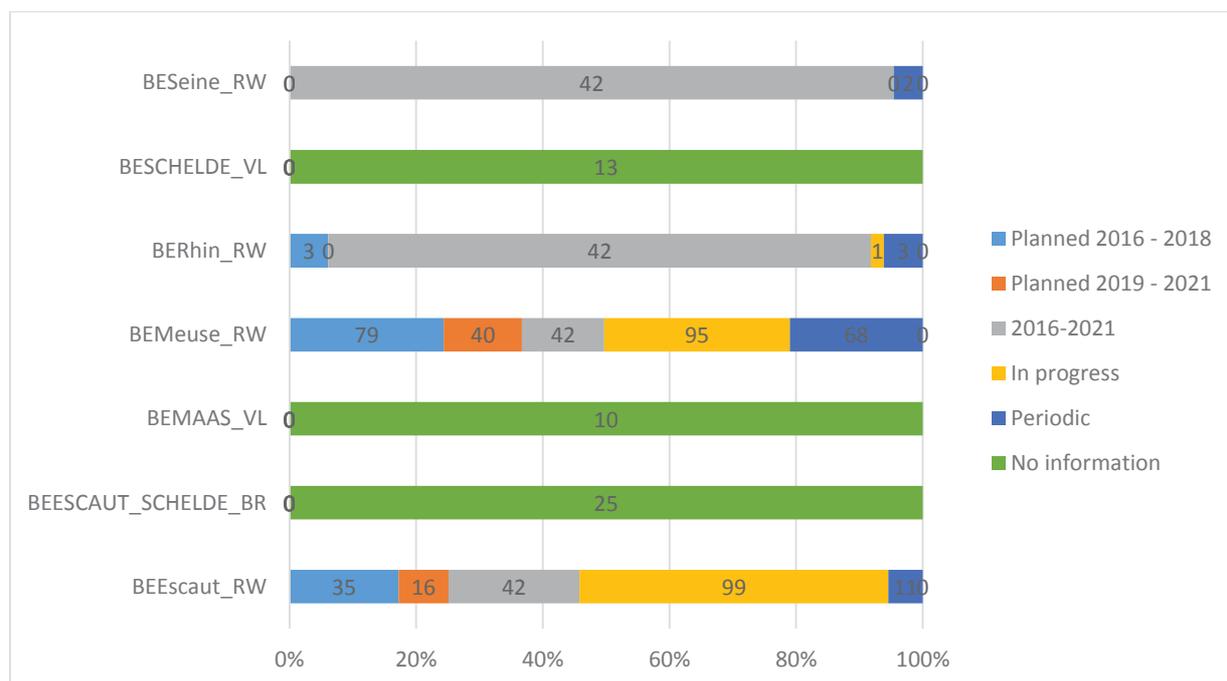
⁹⁴ Brussels subsequently clarified that for the Brussels Region the phasing of the measure is done and linked to a timetable.

- Priority 1 measures should be implemented in the first years of implementation of the Plan (2016-2017),
- Priority 2 measures during the years 2018-2019 and
- Priority 3 measures, considered as lower priority, should have started by 2021 (2020-2021).

This is explained on p. 435 of the RMBP.

⁹⁵ Information on how many measures are planned in the different periods is not explicitly mentioned in the FRMP.

Figure A8: Visualisation of Table A10: Timetable of implementation by UoM



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).

Information about the name of the responsible authority was provided for most measures. However, due to the large number of different authorities mentioned, aggregation of the data was not possible.

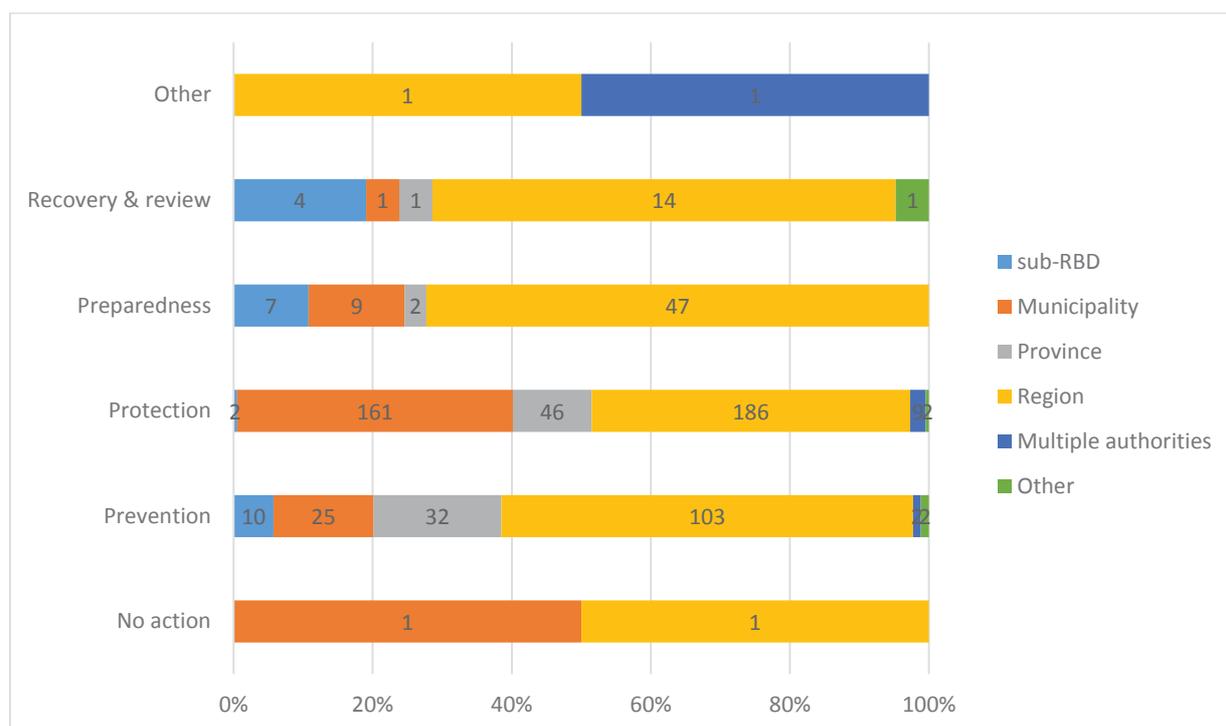
Information about the level of the responsible authority was provided for all measures, with two measures reported twice, making the total 670 instead of 668. It is assumed that these measures were reported twice as they have more than one responsible authority.

Table A11 - Level of responsibility by measure aspect

	Sub-RBD	Municipality	Province	Region	Multiple authorities	Other	Grand Total
No action		1		1			2
Prevention	10	25	32	103	2	2	174
Protection	2	161	46	186	9	2	406
Preparedness	7	9	2	47			65
Recovery & review	4	1	1	14		1	21
Other				1	1		2
Grand Total	23	197	81	352	12	5	670

Notes: The original data reports information about responsible authorities for 670 measures instead of 668, indicating that several measures have reported multiple authorities.

Figure A9 - Visualisation of Table A11: Level of responsibility by measure aspect



Notes:

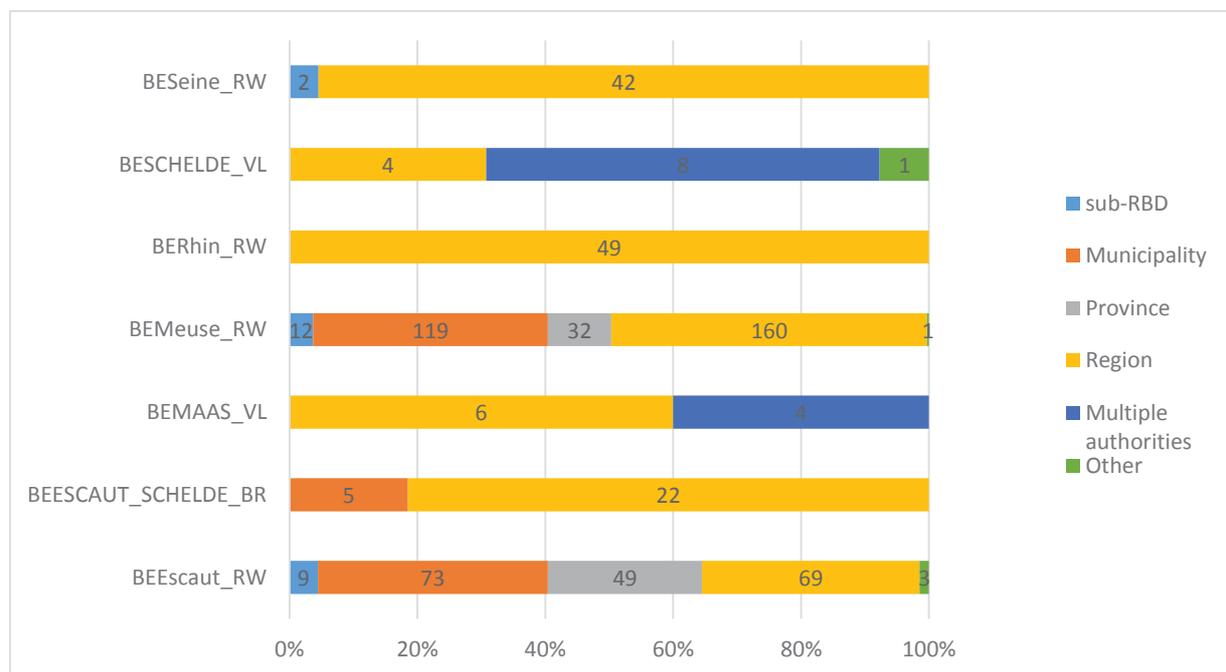
The original data reports information about responsible authorities for 670 measures instead of 668, indicating that several measures have reported multiple authorities.

Table A12 - Level of responsibility by UoM

	Sub-RBD	Municipality	Province	Region	Multiple authorities	Other	Grand Total
BEEscaut_RW	9	73	49	69		3	203
BEESCAUT_SC HELDE_BR		5		22			27
BEMAAS_VL				6	4		10
BEMeuse_RW	12	119	32	160		1	324
BERhin_RW				49			49
BESCHELDE_V L				4	8	1	13
BESeine_RW	2			42			44
Grand Total	23	197	81	352	12	5	670
Average per UoM	3	28	12	50	2	1	96

Notes: The original data reports information about responsible authorities for 670 measures instead of 668, indicating that several measures have reported multiple authorities.

Figure A10 - Visualisation of Table A12: Level of responsibility by UoM



Notes: The original data reports information about responsible authorities for 670 measures instead of 668, indicating that several measures have reported multiple authorities.

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.

Belgium reported information about the progress of implementation of the measures. The Progress of implementation was reported as⁹⁶:

- 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.

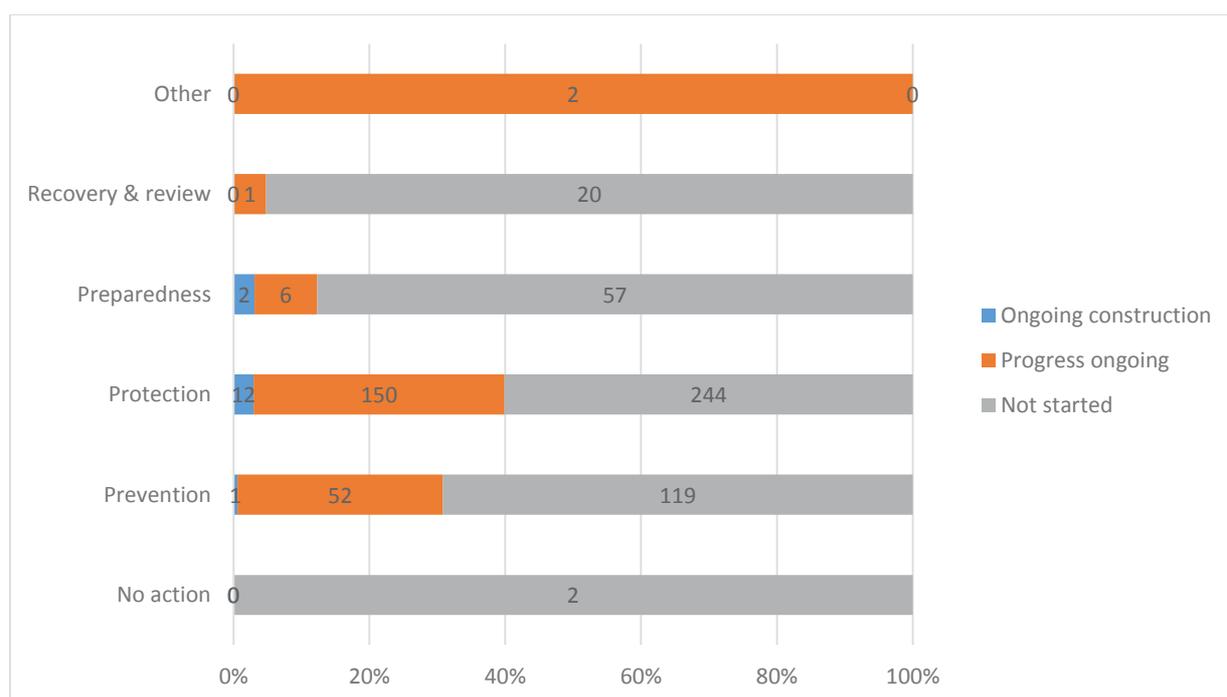
Table A13 – Progress of implementation by measure aspect

	Ongoing construction	Progress ongoing	Not started	Grand Total
No action			2	2
Prevention	1	52	119	172
Protection	12	150	244	406
Preparedness	2	6	57	65
Recovery & review		1	20	21
Other		2		2
Grand Total	15	211	442	668

Notes: No measures were reported as completed

⁹⁶ Guidance for Reporting under the FD (2007/60/EC):
<https://circabc.europa.eu/w/browse/a3c92123-1013-47ff-b832-16e1caaafc9a>

Figure A11 - Visualisation of Table A13: Progress of implementation by measure aspect



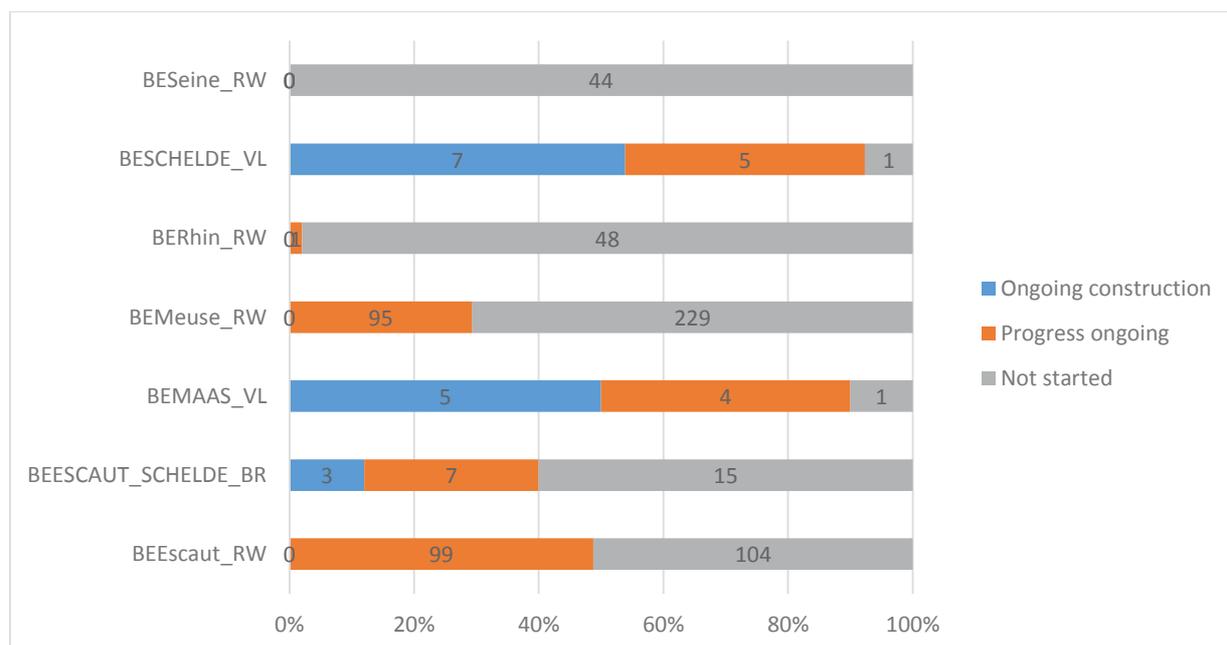
Notes: No measures were reported as completed

Table A14 – Progress of implementation by UoM

	Ongoing construction	Progress ongoing	Not started	Grand Total
BEEscout_RW		99	104	203
BEESCAUT_SCHELDE_BR	3	7	15	25
BEMAAS_VL	5	4	1	10
BEMeuse_RW		95	229	324
BERhin_RW		1	48	49
BESCHELDE_VL	7	5	1	13
BESeine_RW			44	44
Grand Total	15	211	442	668
Average per UoM	2	30	63	95

Notes: No measures were reported as completed

Figure A12 - Visualisation of Table A14: Progress of implementation by UoM



Notes: No measures were reported as completed

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 finalised.
- 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).

All measures have information for ‘any other information’. However, due to the large number of different responses the data could not be aggregated.

No information was provided for the field ‘Other Community Act’.

Annex B: Definitions of measure types

Table B1 *Types of flood risk management measures⁹⁷*

	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

⁹⁷ 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 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, 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

Agriculture	Forest	Hydro Morphology	Urban
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