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**First Flood Risk Management Plans - Member State: Latvia**

***Accompanying the document***

**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL**

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

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# Acronyms

| | |
|---|---|
| APSFR | Areas of Potential Significant Flood Risk |
| CBA | Cost-Benefit Analysis |
| EEA | European Environment Agency |
| FD | Floods Directive |
| FHRM | Flood Hazard and Risk Map |
| FRMP | Flood Risk Management Plan |
| NGO | Non-Governmental Organisation |
| NWRM | Natural Water Retention Measures |
| PFRA | Preliminary Flood Risk Assessments |
| PoM | Programme of Measures |
| RBD | River Basin District |
| RBMP | River Basin Management Plan |
| SEA | Strategic Environmental Assessment |
| UoM | Unit of Management |
| WFD | Water Framework Directive |
| WISE | Water Information System for Europe |

# Introduction

The Floods Directive (FD) (2007/60/EC) requires each Member State to assess its territory for significant risk from flooding, to map the flood extent, identify the potential adverse consequences of future floods for human health, the environment, cultural heritage and economic activity in these areas, and to take adequate and coordinated measures to reduce this flood risk. By the end of 2011, Member States were to prepare Preliminary Flood Risk Assessments (PFRAs) to identify the river basins and coastal areas at risk of flooding (Areas of Potential Significant Flood Risk – APSFRs). By the end of 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 version of the report assesses the FRMPs for Latvia[1]. Its structure follows a common assessment template used for all Member States. The report draws on two main sources:

- Member State reporting to the European Commission on the FRMPs[2] as per Articles 7 and 15 of the FD: this reporting provides an overview of the plans and details on their measures
- Latvia has four Units of Management (UoMs) for which four FRMPs have been developed and reported. All the FRMPs reported are assessed.

[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 MSs may have altered since then.

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

# Overview

***Figure 1 Map of Units of Management/River Basin Districts***


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

*Source: WISE, Eurostat (country borders)*

Latvia is divided into four Units of Management (UoMs), which correspond to the River Basin Districts (RBDs) under the Water Framework Directive (WFD). Flood Risk Management Plans (FRMPs) have been approved and reported for all UoMs. The approach for preparing the

FRMPs is similar in each UoM, based on work developed by the Latvian Environmental Geology and Meteorology Centre (LEGMC).

In total, 25 Areas of Potentially Significant Floods Risk (APSFRs) have been assigned. An overview of the UoMs is shown in the table below. The delineation of the APSFRs, originally submitted in 2012, has not changed since.

The FRMPs for Latvia were formally adopted by the Minister of Environmental Protection and Regional Development Order. The FRMPs were adopted together with the RBMPs:

- FRMP for Daugava River basin district was adopted by Order No. 335 on 17/11/2015
- FRMPs for Gauja, Lielupe and Venta RBP by Order No.378 on 22/12/2015. Order No. 378 later was amended by Order No. 160 on 14/06/2016.

The table below gives an overview of all UoMs in Latvia, including the UoM code, the name, and the number of APSFRs reported. It also shows if the UoM reported all documents required to European Environment Agency's (EEA) WISE[3] – the FRMP as a PDF and the reporting sheet as an XML.

***Table 1 Overview of UoMs in Latvia***

| UoM | Name | Number of APSFRs | XML reported | PDF Reported |
|---|---|---|---|---|
| LVDUBA | DAUGAVA | 10 | Yes | Yes |
| LVGUBA | GAUJA | 2 | Yes | Yes |
| LVLUBA | LIELUPE | 5 | Yes | Yes |
| LVVUBA | VENTA | 8 | Yes | Yes |
| **TOTAL** | | **25** | **4** | **9**[4] |

The FRMPs can be downloaded from the following web page:

- https://www.meteo.lv/lapas/vide/udens/udens-apsaimniekosana-/upju-baseinu-apsaimniekosanas-plani-/upju-baseinu-apsaimniekosanas-plani?&id=1107&nid=424

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

[4] Two PDFs per UoM except for LVVUBA for which three PDFs were submitted, including one with corrected data.

## Overview of the assessment

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

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

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

| Criterion | Evidence | Comments |
|---|---|---|
| **FRM objectives have been established** | Strong evidence | All four FRMPs have defined objectives. One overall objective is defined and four to five specific objectives per UoM. |
| **FRM objectives relate to...** | | |
| ...the reduction of potential adverse consequences | Strong evidence | The overall objective of each FRMP is to reduce adverse consequences of floods on human health, environment, cultural heritage and economic activities. Further objectives also aim to reduce the adverse consequences of floods. |
| ...to the reduction of the likelihood of flooding | Some evidence | An objective in one of the four FRMPs aims to reduce the risk of floods in areas that are protected with hydro-technical constructions (for example dams). |
| ...to non-structural initiatives | Strong evidence | The objectives aim to reduce the adverse consequences of floods and refer to measures that will be implemented, including non-structural measures (flood forecasting and raising awareness of flooding). |
| **FRM objectives consider relevant potential adverse consequences to...** | | |
| ...human health | Strong evidence | In addition to the overall objective, more detailed objectives refer to the reduction of adverse consequences in densely populated areas and to providing inhabitants with early warning of floods. |
| ...economic activity | Strong evidence | In addition to the overall objective, more detailed objectives refer to the reduction of adverse consequences to public infrastructure specifically and to economic activities in general. |

| Criterion | Evidence | Comments |
|---|---|---|
| ...environment | Some evidence | The overall objective refers to the reduction of adverse consequences for environment. |
| …cultural heritage | Some evidence | The overall objective refers to the reduction of adverse consequences for cultural heritage sites. |
| **Measures have been...** | | |
| ...identified | Strong evidence | Measures have been identified, there is a separate chapter in all FRMPs where all measures are listed. The following types of measures are identified: prevention, preparedness and protection |
| ...prioritised | Strong evidence | Measures have been prioritised into three categories (high, moderate and low). Prioritisation was based on the following criteria: 1) the number of inhabitants, 2) roads of great importance, 3) hydroelectric power stations, 4) polder protected areas, 5) polluting facilities (waste water treatment plants, contaminated and potentially polluted sites), 6) specially protected nature territories (Natura 2000), 7) agricultural land areas, 8) drinking water abstraction points in flood risk areas. The detailed information on the prioritisation process results are not reported. |
| **Relevant aspects of Article 7 have been taken into account such as...** | | |
| ...costs & benefits | No evidence | CBA was not used |
| ...flood extent | Strong evidence | Flood hazard maps are available for all four FRMPs and provide information for each probability scenario (10 %, 1 % and 0.5 %) |
| ...flood conveyance | Strong evidence | The route of the flood conveyance depends on the level of water during the flood and the surface terrain. The flood conveyance routes have been modelled for the three flood scenarios (10 %, 1 % and 0.5 %) |
| ...water retention | Some evidence | The FRMPs for LVDUBA (Daugava UoM) and LVLUBA (Lielupe UoM) include two measures (one in each UoM) that foresee the possibility of Natural Water Retention Measures. The measure in the Daugava FRMP aims to reduce flood risk for the Plavinas city urban areas. The Lielupe FRMP has a measure aimed to reduce flood risk in residential areas[5]. |
| ...environ-mental objectives of the WFD | Some evidence | Latvia coordinated the preparation of its FRMPs and RBMPs, and the FRMPs considered the objectives of the WFD. |

[5] Information is based on the FRMP for LVDUBA (measure 1.15) and FRMP for LVLUBA (measure 1.6).

| Criterion | Evidence | Comments |
|---|---|---|
| ...spatial planning/land use | Some evidence | No measures specifically address spatial planning or land use; however, since 1997 national legislation includes restrictions on buildings and development in floodplains: there is a ban on the construction in floodplains with a 10 % probability of flooding; and planning documents for spatial planning must take into account areas of high risk, including areas of flood risk. |
| ...nature conservation | Some evidence | The FRMPs indicate that nature conservation is considered in the development of the measures, but there are no specific nature conservation measures defined. |
| ...navigation/ port infrastructure | No evidence | The FRMPs do not indicate that ports and navigation have been considered in the development of the measures or in specific measures, because inland navigation does not exist in Latvia, except in Riga and Jurmala cities, where port infrastructures are not exposed to flood risk. |
| ...likely impact of climate change | No evidence | Impacts of climate change were not taken into account in the first FRMPs and will be included in the second FRMPs. |
| **Coordination with other countries ensured in the RBD/UoM** | Some evidence | The FRMPs provided some information on exchange of information with Lithuania and with Estonia regarding cross-border UoMs; however, no information was provided on coordination with bordering third countries (i.e. Belarus and Russia). |
| **Coordination ensured with WFD** | Strong evidence | The FRMPs and RBMPs are developed by the same Competent Authority, coordinated by one responsible Ministry, and the WFD's objectives were considered in preparing the FRMPs. |
| **Active involvement of interested parties** | Some evidence | State institutions, local governments, non-governmental organisations as well as the private sector and other stakeholders were involved via Consultative Councils for each UoM. |

## Good Practices

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

***Table 3 Good practices in the Latvian FRMPs***

| Topic area | Good practices identified |
|---|---|
| Planning/implementing of measures and their prioritization for the achievement of objectives. | Measures are prioritised, taking into account eight criteria.<br>The measures are measurable: the description of the measures provides information on what it is planned to achieve; where the measure will be implemented; how the measure will be achieved; and the time of execution of the measure (years). This description indicates if measures will be implemented at national, RBD/UoM, APSFR or water body level.<br>The measures are linked to the objectives: each measure refers to a sub-objective whose achievement it will contribute to. |
| Public participation | In 2014, a local government survey was carried out on flood risks, planned measures and non-traditional solutions to reduce the risk of flood. The results of the survey were used in the development of FRMPs.<br>Consultative Councils were established in each UoM and provided a forum for the active involvement of stakeholders. Environmental non-governmental organisations, state institutions (Ministry of Economics, Ministry of Agriculture, Ministry of Health and the Ministry for Environmental Protection and Regional Development, MEPRD) and planning regions and municipalities are represented in the Consultative Council for each UoM.<br>Comments received from the public consultation of the RBMPs and the FRMPs were summarised in a single document, available on the LEGMC homepage.<br>All the FRMPs underwent an SEA procedure. |

## Areas for further development

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

***Table 4 Areas for further development in the Latvian FRMPs***

| Topic area | Areas identified for further development |
|---|---|
| Integration of previously reported information in the FRMPs. | The link to the flood risk information system is incorrect for three of the four FRMPs[6]. |
| Setting of objectives for the management of flood risk. | While the FRMPs contain objectives that are specific (in the sense of identifying specific locations), the objectives are not measurable. Only one objective, related to hydro-technical installations, refers to the reduction of the likelihood of flooding[7]. |
| Planning/implementation of measures and their prioritization for the achievement of objectives. | Costs appear not to be estimated for all measures[8], nor the sources of funding for most of the measures[9].<br>There is a reference for each measure to which sub-objective the measure refers, but for the objectives themselves measurable parameters are not set. Overall, it is not possible to assess by how much the measures will contribute to the achieving of objectives and it is not possible to assess whether the objectives will be achieved.<br>A baseline against which progress of FRMPs can be monitored and assessed has not been specified. |
| Consideration of climate change in the FRMPs assessed. | Impacts of climate change were not taken into account in the FRMPs[10]. |
| Use of cost-benefit analysis (CBA) in the FRMPs assessed. | Although a methodology for CBA was developed[11] (via a national project "*Development of criteria and methodology for flood risk reduction measures*"[12]) the FRMPs do not present its results. |
| International issues in flood | No information is provided in Latvia's FRMPs, or in the reporting |

6 Latvia subsequently stated that the Flood Information System is under development and this resulted in incorrect links for the FRMPs.

7 Latvia subsequently noted that specific objectives for the management of flood risk, as well as the baseline for progress monitoring of measures. will be elaborated for the second FRMPs.

8 The total estimated budget is about EUR 203 m based on information subsequently provided by Latvia.

9 Latvia subsequently clarified that the indicated costs of measures are provisional. The calculation of possible costs was based on the results of feasibility studies and market value. Further, FRMPs do not provide an overall budget because of unknown possible funding sources.

10 Latvia subsequently clarified that impacts of climate change will be assessed in the second FRMPs.

11 Latvia subsequently informed that the "Methodology of flood impact assessment and damage calculation in Latvia" has been developed and the socio-economical flood risk has been calculated for the APSFRs in GUBA, LUBA & VUBA (for DUBA this will be done in the second FRMPs). Both the methodology and the criteria for the assessment of flood reduction measures will be included in the second Preliminary Flood Risk Assessment Report.

12 Link to the project report: http://www.varam.gov.lv/lat/publ/petijumi/petijumi_vide/?doc=15514 (the project was funded by national sources)

| Topic area | Areas identified for further development |
|---|---|
| risk management. | sheets, regarding coordination with non-EU countries[13]. |

## Recommendations

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

- Information on flood risk management should be continuously available to all concerned and the public in an accessible format, including digitally.
- Whereas the measures are linked to sub-objectives, to be able to assess progress towards achieving the objectives these should be measurable too, to the extent possible. A baseline established against which progress of the FRMPs can be monitored has not been specified.
- Sources of funding for measures should be specified.
- A methodology for assessing measures in terms of costs and benefits should be presented and applied whenever feasible, and its results should be provided.
- Climate change impacts should be considered, including coordination with the National Climate Change Adaptation Strategy (already during the development stage of the latter).
- Further information on coordination with both Member States and non-EU countries should be provided.

[13] Latvia subsequently informed that the Daugava river basin district covers the territories of Latvia, Belarus and Russia; a minor part is located also in Lithuania. There is an intergovernmental agreement between the Latvian Republic and the Russian Federation on cooperation in the field of environmental protection, signed on 20/12/2010 (https://likumi.lv/ta/lv/starptautiskie-ligumi/id/748). There is an intergovernmental agreement between Latvia and the Republic of Belarus on cooperation in the field of environmental protection, signed on 21/02/1994 (https://likumi.lv/ta/lv/starptautiskie-ligumi/id/153). Relevant ministries in Latvia and the Republic of Belarus are currently discussing possibilities to agree on bilateral cooperation within the Daugava/Zapadnaja Dvina river basin, which may include cooperation in the area of flood risks.

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

## 1.1 Reporting of the FRMPs

Latvia has four Units of Management (UoMs) for which four FRMPs have been developed and reported. Latvia did not make use of Art. 13(3) of the Floods Directive, which allows Member States to make use of previous flood risk management plans (provided their content is equivalent to the requirements set out in the Directive).

## 1.2 Assessment of the FRMPs

The main competent authority for implementation of the Floods Directive is the Ministry for Environmental Protection and Regional Development (MEPRD). Other institutions are in charge of the practical implementation of the Directive: notably, the FRMPs were prepared by the Latvian Environment, Geology and Meteorology Centre (LEGMC), a state-owned organisation. Consequently, the approach for the preparation of the FRMPs was similar throughout the country.

All four reported FRMPs have been assessed. These FRMPs cover Latvia's four UoMs:

***Table 5 UoMs in Latvian FRMPs***

| UoM code | UoM Name |
|---|---|
| LVDUBA | Daugava |
| LVGUBA | Gauja |
| LVLUBA | Lielupe |
| LVVUBA | Venta |

The FRMPs can be downloaded from the following web page:

- https://www.meteo.lv/lapas/vide/udens/udens-apsaimniekosana-/upju-baseinu-apsaimniekosanas-plani-/upju-baseinu-apsaimniekosanas-plani?&id=1107&nid=424

# 2. Integration of previously reported information

## 2.1 Conclusions drawn from the preliminary flood risk assessment

According to the PFRA and FHRM assessments, Latvia applied Art. 13.1(a), which allows Member States to not undertake the PFRA if they have already undertaken a risk assessment prior to 2010 which has concluded that an area is identified as an APSFR. The FRMPs note however that the risk assessment was carried out in 2007, but do not specifically refer to the application of Art. 13.1(a). The conclusions of the pre-existing flood risk assessment are presented in all four Flood Risk Management Plans assessed[14].

The FRMPs contain two maps - a PFRA map showing the areas of potential significant flood risk (APSFRs) and a map presenting the separately designated flood risk areas of national importance. The maps that are included in the FRMP are maps at a high scale (1: 250 000) and do not show detailed information[15]. APSFRs are the territories that were assigned during the preliminary flood risk assessment process in 2007. Flood risk areas of national importance are priority flood risk areas where flood protection measures or in-depth research are to be carried out first.

The FRMPs provide a link for the detailed maps (http://pludi.meteo.lv/floris/); however, this web page only provides complete information for the Daugava FRMP. For the other three RBDs/UoMs – Gauja, Lielupe and Venta – detailed information can be found at a separate web page[16], the Flood risk information system platform, however this is not indicated in these FRMPs (this platform also provides detailed information for the Daugava UoM).

Conveyance routes have been taken into account in the PFRA in all the FRMPs assessed. They have been modelled under three flood scenarios: floods with a probability 10 % (once per 10 years), 1 % (once per 100 years) and 0.5 % (once per 200 years), they are presented for all UoMs[17].

### 2.1.1 Coordination with neighbouring Member States on shared RBDs/UoMs

No shared flood risk areas with neighbouring countries have been identified, according to the four FRMPs.

[14] Found in Chapter II of each FRMP.
[15] Detailed information can be found at on online tool, the flood risk information system platform: http://syke.maps.arcgis.com/apps/webappviewer/index.html?id=f60441869a654c298a2d3b150ea7dc1c.
[16] The flood risk information system platform indicated in the previous footnote.
[17] Information available on the flood risk information system.

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

In the preparation of the FHR maps, the findings of the PFRA were used: the areas designated as potential flood risk areas in the PFRA are the basis of the areas that have been modelled in detail and are presented in maps to be found on Flood risk information system platform[18].

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

The flood hazard and flood risk maps have been presented in all FRMPs assessed. There is a problem with the quality of the flood hazard and flood risk maps presented in the flood risk management plans: it is difficult to read the legends and to read the information in the maps. Detailed maps can be found online on the flood risk information system platform cited above.

As indicated above, a link is provided in all four FRMPs to the flood risk information system platform, but this web page only provides detailed information on the Daugava RBD. This may relate to the process of developing the FHRMs, as the FRMPs indicate that maps were first developed for the Daugava FRMP as a pilot project and then for the other three RBDs. The flood risk information system platform cited above provides detailed maps for the other three FRMPs.

Floods from fluvial, pluvial sources, as well as the sea have been identified. In addition, floods from artificial water bearing infrastructure sources[19] and floods with the combined effects of more than one sources of flooding have been identified. Floods from groundwater and floods with no specific sources have not been identified in the UoMs assessed[20].

### 2.2.1 Maps for shared flood risk areas

Flood hazard and flood risk maps have been prepared for flood risk areas only for the territory of Latvia. There are no shared flood risk areas with neighbouring countries identified, according to the four FRMPs.

### 2.2.2 Conclusions drawn from the flood hazard and flood risk maps

The process of FRMP development is described in the Introduction section of FRMPs. Article II ("Results of the flood risk initial assessment and other researches") includes previously reported information as well as new information about territories at risk of flooding.

[18] Information source: reporting sheets, FRMPs, Flood risk information system platform.
[19] Areas at risk of flooding that are of national importance have been designated for three hydropower plant reservoirs on the Daugava River.
[20] Information source: reporting sheets, FRMPs, Flood risk information system platform, website of the responsible authority LEGMC www.meteo.lv

In all the FRMPs, flood hazard and risk maps (FHRMs) have been used to develop the FRMPs. Based on the reporting sheets and the FRMPs assessed:

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

In the public participation process, the FHRMs were available during public hearings. The FHRMs were used to define specific objectives and measures[21].

## 2.3 Changes to the APSFRs or other Flood Risk Areas

Any changes in the identification of Areas of Potential Significant Flood Risk (APSFRs) or other Flood Risk Areas since December 2011 should be reflected in the FRMP. The Latvian FRMPs do not describe any such changes. Nor do the FRMPs describe changes on the preparation of Flood Hazard and Flood Risk Maps since December 2013.

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

The following areas for further development were identified in the earlier assessment of the flood hazard and risk maps[22]:

- Three APSFRs were reported to be associated with artificial water bearing infrastructure, but the Latvian Authorities confirmed that hazard of floods arising from artificial water bearing infrastructure have not been mapped.
- According to Art.6(2) of the Floods Directive, the preparation of FHRMs for areas identified under Art.5 which are shared with other Member State shall be subject to prior exchange of information between Member States concerned. All four UoMs in Latvia are

[21] In the FRMPs, the chapter "Introduction" states - "*measures that have to be taken in order to achieve the set objectives have been defined on the basis of the FHRMs*" (same text in all FRMPs). There is a separate chapter, 1.5 "Flood risk information system platform" (in all FRPMs), where there is detail on the cartographic information that can be found on the Flood risk information system platform for all four RBDs. Then there is a long section, IV "Flood hazard and risk maps" (in all FRMPs), where there is description of all flood risk areas; this description is based on information from the maps.

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

cross-border UoMs. Ventas and Lielupes UoMs share flood risk areas with neighbouring countries, however none are not identified as significant. It was not clear whether information was exchanged with the other interested Member States.

- According to Art. 6(4)(b), Member States shall report for each probability scenario the flood extent and the water depths or level, as appropriate. At the time of the FHRM assessment,,flood hazard maps were only available for one RBD (LVDUBA – Daugava)[23]. According to the information reported, both water depth/level and water flow have been assessed, but these have not been shown on the publicly available map used for the assessment.
- According to Art.6(5)(b), flood risk maps shall show the potential adverse consequences associated with flood scenarios in terms of type of economic activity. As reported in WISE, affected economic activities and potential economic loss were assessed and modelling of risk to economic activity was carried out, but they are not shown in the maps.
- Climate change has not been included in the analysis.

The following points describe the way each of the areas for further development above have been addressed, based on information available[24]:

- As noted above, flooding from artificial water bearing infrastructure sources has now been included in the FHRMs available online.
- In the reporting sheet provided by Latvia, in the chapter on "Summary of Coordination", information is provided on exchange of information between Latvia and Lithuania regarding their cross-border UoMs: LVLUBA (Lielupe) and LVVUBA (Venta) in Latvia. The reporting sheet states that no cross-border APSFRs have been identified. This was also clarified for the FHRM assessment, according to the final FHRM report for Latvia[25]. (The information provided in the FRMPs and reporting sheets also indicates that projects in Latvia would not impact flood hazards and risks in Lithuania, which is upstream in both cross-border UoMs.)
- In the flood hazard maps now available for all four UoMs, it is possible to obtain information for each probability scenario (10 %, 1 % and 0,5 %).
- In the flood risk information system platform, information on economic activities is now included.

[23] Latvia subsequently informed that as of 2016 FHRM are available for all four RBDs.

[24] Information sources: reporting sheets, FRMPs, Flood risk information system platform, recommendations from previous assessments.

[25] Background to the PFRA European Overview – UC10508, Assessment of Flood Hazard and Flood Risk Maps Member State Report: LV – Latvia, 21 November 2012. Available at: http://ec.europa.eu/environment/water/flood_risk/pdf/fhrm_reports/LV%20FHRM%20Report.pdf

- The reporting sheets provided by Latvia (for all four FRMPs) indicate that climate change will be considered in the preparation of the second FRMPs.

In summary, the first four of the five areas for further development have been addressed; the fifth area for further development, the consideration of climate change, has not been addressed yet.

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

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

- The FRMPs contain some errors. For example, there are typing errors in the texts: in some cases, the wrong rivers are named[26].
- The link to the flood risk information system is incorrect for three of the four FRMPs[27].

[26] Latvia took note and will correct the typographical errors.

[27] Latvia subsequently stated that the Flood Information System is under development and this resulted in incorrect links for the FRMPs.

# 3. Setting of Objectives

## 3.1 Focus of objectives

The four FRMPs contain essentially the same objectives. These objectives aim to reduce the adverse consequences of floods, refer to measures that will be implemented and refer to non-structural measures (flood forecasting and raising awareness of flooding).

The overall objective for each FRMP is to[28]: Reduce adverse consequences of floods on human health, environment, cultural heritage and economic activities, including the reduction of potential surface water pollution and of erosion processes along the sea, rivers and lake shores.

Further sub-objectives of all the FRMPs are to:

1. Reduce coastal erosion and flood threat to densely populated areas, by minimising the risk for inhabitants and public infrastructure.
2. Reduce the risk of floods in areas that are protected with hydro-technical facilities (for example dams) and the adjacent areas as well as in the adjacent areas of regulated sections of slowly flowing plain rivers.
3. Ensure the maximum flow capacity during spring floods in order to reduce the risk to safety of inhabitants (only for Daugava FRMP).
4. Provide responsible authorities with information in advance (before the flood) on flood risks and inform inhabitants about the flood risk by developing a Flood Risk Information System and improving the early warning system.
5. Development of surface runoff and rainwater drainage systems to prevent flooding from heavy rain floods and spring floods.

For the first three objectives, each FRMP specifies the areas that the objectives apply to. Consequently, in all four FRMPs[29]:

- The objectives aim to reduce the adverse consequences of floods
- One of the objectives refer to reducing the likelihood of flooding[30]
- The objectives refer to measures that will be implemented
- The objectives refer to non-structural measures[31]

[28] In all four FRMPs, the objectives are defined in chapter V.
[29] These categories are included in Art.7 of the Floods Directive.
[30] 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.
[31] Non-structural measures include measures such as flood forecasting and raising awareness of flooding as well as land use planning, economic instruments and insurance.

## 3.2 Specific and measurable objectives

For each further objective (as listed above), the location is identified, specifically, the APSFR(s) concerned. Further details are not provided. Instead, the FRMPs provide specific and measurable information for measures.

## 3.3 Objectives to reduce adverse consequences from floods

In the FRMPs assessed, objectives refer to reducing risks to inhabitants and to infrastructure.

## 3.4 Objectives to address the reduction of the likelihood of flooding

There is one objective that addresses reduction of the likelihood of flooding, for hydro-technical infrastructure on the Daugava.

## 3.5 Process for setting the objectives

The FRMPs do not provide information on coordination during the process of setting of the objectives. The FRMPs overall were discussed during public hearings which took place within the frame of the strategic EIA process. The draft plans were discussed also during the RBD Consultative Board meetings. The same approach was used for all FRMPs.

## 3.6 Good practices and areas for further development regarding setting objectives

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

- While the FRMPs contain objectives that are specific (in the sense of identifying specific locations), they are not measurable.
- Only one objective, related to hydro-technical installations, addresses reduction of the likelihood of flooding.

# 4. Planned measures for the achievement of objectives

According to the information that Latvia has reported to WISE, there are 81 individual measures and 15 aggregated[32] measures across its four UoMs, so a total of 96 measures[33]. While Latvia reported both individual and aggregated measures, definitions for these categories were not found in the FRMPs.

Across all four UoMs, there are 50 measures for prevention, 38 measures for protection, and eight measures for preparedness[34]. Latvia did not report any measures for recovery and review.

Please see Tables A1 to A4 and Figures A1 and A2 in Annex A for further details on the measures reported.

The total reported number of measures in the reporting sheet does not correspond to the total number of measures that are listed in the FRMPs (their chapter 5). In the reporting sheet, there are altogether 96 measures, but in all four FRMPs, 101 measures[35]. It is not possible to compare the lists because only measure codes are available in the reporting sheet - these do not correspond to the codes of measures that are listed in the FRMPs.

## 4.1 Cost of measures

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

| UoM code | Estimated budget of planned measures (2015-2021) in EUR[36] |
|---|---|
| LVDUBA (Daugava) | 33 m |
| LVGUBA (Gauja) | 17 m |
| LVLUBA (Lielupe) | 15 m |
| LVVUBA (Venta) | 31 m |

[32] 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.

[33] 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.

[34] See Annex B for the list of measure aspects and types.

[35] Latvia subsequently stated that corrections will be made in the second FRMPs.

[36] The estimates in the table are Commission's calculations based on the FRMPs. Latvia subsequently provided the following estimates, totalling EUR 203 m:

LVDUBA (Daugava) ~ EUR 139 m
LVGUBA (Gauja) ~ EUR 18 m
LVLUBA (Lielupe) ~ EUR 26 m
LVVUBA (Venta) ~ EUR 20 m

Note: Latvia provided information about costs and cost explanations for 87 of the 96 measures reported.

In its reporting sheets, Latvia provided the costs for 87 of the 96 measures reported (see the table above). On this basis, the total budget is at least €96 m[37]. As noted, not all measures are covered (please see Tables A5 and A6 and Figures A3 and A4 in Annex A for further information).

In Latvia's FRMPs, costs are provided for most measures[38]. The highest cost measure, over €40 m is to be implemented in Riga to protect inhabitants in lower parts of the city that are affected from floods, "Construction of protection dams, reconstruction of water passages under the roads, reconstruction of roads". The lowest cost reported was €5 000 per UoM (for an assessment of the necessity of flood protection measures in a polder area).

## 4.2 Funding of measures

In each FRMP, the sources of funding are specified for two kinds of measures only. Sources of funding are provided for the "integration of ice flood model in flood risk information system" measure and for the "maintenance of hydropower plant hydro-technical facilities" measure.

The information is summarised in the table below.

***Table 7 Funding of measures***

| | **All UoMs** |
|---|---|
| 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[39] | |

[37] EUR 203 m based on information subsequently provided by Latvia.

[38] The information provided in the FRMPs differs somewhat from the information reported: The total budget in the FRMPs is about €140 m. Costs are provided in the FRMPs for the majority, but not all measures. The FRMPs state that both investment and operating costs are included. Information was not found which costs – i.e. investment costs, operating costs or both – are included in the data provided by Latvia in its reporting sheets (shown in the table on this page).

[39] Latvia subsequently noted that source of funding for most of measures will be EU Cohesion funds; the FRMP only refers to the responsible authority.

| | All UoMs |
|---|---|
| EU CAP funds | |
| International funds | |
| European Social Fund | |

*Source: Reporting sheets and FRMPs*

## 4.3 Measurable and specific (including location) measures

All FRMPs assessed include a clear and explicit description of the measures with regard to[40]:

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

The measures are measurable, the description of the measures provide the information - what it is planned to achieve; where the measure will be implemented, location; description of how the measure will be achieved, and also the time of execution of the measure is indicated (years).

The following information is provided regarding the level of implementation of the measures:

***Table 8 Location of measures***

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

*Source: Reporting sheet and FRMPs*

## 4.4 Measures and objectives

From the list of measures presented in the FRMPs, it is clear how (by which measures) it is planned to achieve each sub-objective. There is a reference for each measure to a specific sub-objective. However, it is not possible to assess by how much the measures will contribute to the achieving of the sub-objectives, and it is not possible to assess whether the sub-objectives will be achieved.

## 4.5 Geographic coverage/scale of measures

Each of the four FRMPs include one measure at national scale; all other measures are indicated at UoM scale. It should be noted, however, that many measures indicated in the FRMPs as

[40] Sources: Project report "Development of criteria and methodology for flood risk reduction measures", 2015, http://www.varam.gov.lv/lat/publ/petijumi/petijumi_vide/?doc=15514 ; reporting sheets; FRMPs.

being at UoM scale appear to be water body specific, as the water body code is indicated in the description of the measure.

## 4.6 Prioritisation of measures

Latvia provided information for the priority of all measures. The following categories are used in the FRMPs[41]: high, moderate and low. Latvia reported the same categories to WISE, and thus did not report any measures of very high or critical priority.

Based on the information in Latvia's reporting sheets (see Tables A7 and A8 and Figures A5 and A6 in Annex A), 48 measures are of high priority (50 % of all measures), 20 are of moderate priority (21 %) and 28 are of low priority (29 %).

Prioritisation for all four FRMPs was carried out on the basis of criteria developed in a national project on the "*Development of criteria and methodology for flood risk reduction measures*"[42]. The criteria were based on the presence of the following in flood risk areas:

1. the number of inhabitants,
2. roads of great importance,
3. hydroelectric power stations,
4. polder protected areas,
5. polluting facilities (waste water treatment plants, contaminated and potentially polluted sites),
6. specially protected nature territories (Natura 2000),
7. agricultural land areas,
8. drinking water uptake points.

One FRMP, for LVDUVA (Daugava), describes how the criteria for prioritisation were used[43]. For the other three UoMs, the FRMPs do not provide such detail but mention that the prioritisation process took place.

## 4.7 Authorities responsible for implementation of measures

Latvia provided the names of the responsible authorities for the 96 measures indicated in its reporting sheets: these are national, regional and municipal authorities. Of these 96 measures, national authorities are responsible for 50 measures (52 % of the total); regional authorities for

[41] FRMPs, chapter V, tables in sub chapter 5.1 and 5.2, column "priority".

[42] Link to the project report: http://www.varam.gov.lv/lat/publ/petijumi/petijumi_vide/?doc=15514 (the project was funded by national sources).

[43] This information is available in the report from the project "*Development of criteria and methodology for flood risk reduction measures*", chapter 4.

13 measures (14 %); municipal authorities for 11 (11 %); a combination of these levels for seven measures (7 %); and no authority is indicated for 15 measures (16 %).

## 4.8 Progress of implementation of measures

Latvia reported the timetable for all measures in its reporting sheets (see Table A9 and A10 and Figures A7 and A8 in Annex A). Four timeframes are identified: 2016, 2017, 2016-2018 and 2016-2021. For the first timeframe, the period up to 2016, four measures are to be implemented (4 % of all measures); the same number in the second timeframe, 2017; one measure in 2018; 83 measures in the period 2016-2021 (86 %); and four measures are to be carried out continuously.

## 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: Latvia has reported this information for nine measures; however, it appears that in all nine cases, Latvia reported national legislation (on civil protection and on hydroelectric power plant safety) rather than EU legislation[44].

## 4.10 Specific groups of measures

With regard to **spatial planning and land use**, it appears that there are no measures that address this in Latvia's four FRMPs. According to Latvia's reporting sheets, the legislative framework for spatial planning and land use has evolved since 2000. Buildings and other developments in floodplains are restricted by the legal acts for spatial planning: national legislation sets a ban on the construction of river floodplains and floodplains with a 10 % probability of flooding. National legislation stipulates that planning documents for spatial planning must take into account areas of high risk, including areas of flood risk. In areas of flood risk, the municipality may impose specific requirements for construction and environmental infrastructure[45].

Two of Latvia's FRMPs include **natural water retention measures (NWRMs)**: a measure in LVDUBA (Daugava) aims to reduce flood risk for the Plavinas city urban areas[46]; and a measure in LUVLUBA (Lielupe) aims to reduce flooding in residential areas adjacent to the Lielupe River[47]. While the brief descriptions of both measures indicate that NWRMs are foreseen, further details are not provided.

[44] This information is based on the reporting sheets.
[45] Reporting sheets; "Law on buffer zones" (*Aizsargjoslu likums*) adopted on 11.03.1997, as amended.
[46] Measure code 1.15 in the Daugava FRMP.
[47] Measure code 1.16 in the Lielupe FRMP.

The four FRMPs indicate that **nature conservation** has been considered in the development of the measures, but no specific nature conservation measures have been defined.

The four FRMPs do not indicate that **navigation and port infrastructure** have been considered in the development of the measures or in the specific measures. No reference has been found in the FRMPs to **dredging**[48], except for one measure in the Lielupes FRMP, which includes dredging and is expected to result in reduced flood risk in Jurmala and at the same time contribute to yacht waterway maintenance.

## 4.11 Recovery from and resilience to flooding

Insurance policies are not included among the measures in the four FRPMs. The FRMPs do not mention if insurance is available or is to be developed for potential flooding areas, however, the potential costs to insurance companies are mentioned in a description of previous flooding cases (the FRMPs note that losses from Latvia's 2013 floods were approximately €9 m, though costs to insurance companies are not specified). No information was found whether insurance is conditional on making at risk properties (domestic, industrial) as flood resilient as possible, nor if environmental liability insurance covers restoration costs arising from flooding of potentially polluting sites and installations (consequently, the role of ecosystem services in restoration costs is not discussed).

## 4.12 Monitoring progress in implementing the FRMP

In its reporting sheets, Latvia indicated the progress of implementation for measures. Latvia reported that progress is ongoing for 17 measures (18 % of the total), but the great majority of measures, 79 of 96 (82 %) were reported as not started.

There are no specific measurable targets set in order to assess the exact progress for ongoing measures. General dates are indicated, as for example for regular measures such as the annual maintenance of hydroelectrical power plants. The FRMPs do not identify organisations responsible for overseeing the monitoring[49].

A baseline against which the FRMPs' progress will be monitored and assessed has not been established. However, it can be noted that an assessment was prepared for the development of water use trends, for the "baseline scenario" for Latvia's RBMPs. In the baseline scenario,

[48] Information is based on the FRMPs and reporting sheets.

[49] Latvia subsequently informed that its national legislation establishes that LEGMC's functions include coordination of the implementation of the programme of measures, compilation of information on the measures undertaken and effectiveness analysis of the measures. Moreover, SEA procedures require monitoring of the implementation of planning documents; the implementation of FRMP measures will be assessed following requirements set in the SEA report.

trends in relation to hydro-morphological pressures were assessed. Without regulation of land moisture and protection against flooding, intensive agricultural development is not possible in Latvia.

## 4.13 Coordination with the Water Framework Directive

The table below shows how the development of the FRMP has been coordinated with the development of the second River Basin Management Plan of the WFD.

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

| | **DaugavaLVDUBA** | **Gauja LVGUBA** | **Lielupe LVLUBA** | **Venta LVVUBA** |
|---|---|---|---|---|
| Integration of FRMP and RBMP in a single document | | | | |
| Joint consultation of draft FRMP and RBMP | ✓ | ✓ | ✓ | ✓ |
| Coordination between authorities responsible for developing FRMP and RBMP | ✓ | ✓ | ✓ | ✓ |
| Coordination with the environmental objectives in Art. 4 of the WFD | ✓ | ✓ | ✓ | ✓ |
| The objectives of the Floods Directive were considered in the preparation of the RBMPs [a] | | | | |
| Planning of win-win and no-regret measures in FRMP | | | | |
| The RBMP PoM includes win-win measures in terms of achieving the objectives of the WFD and Floods Directive, 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 WFD applies to the same management units as the FD; the FRMPs and RBMPs are developed by same Competent Authority, coordinated by one responsible Ministry; the FRMPs

and RBMPs have the same time frame[50]. While the FRMPs do not specifically refer to Art. 4(7) of the WFD, the RBMPs, in their discussion of this provision, refer to the FRMPs.

In its reporting under the WFD, Latvia indicated that the objectives of the Floods Directive had not been considered in its river basin management plan. According to the information reported, there were no specific win-win measures in terms of achieving the objectives of the WFD.

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

The following **good practices** were identified:

- The measures are prioritised, taking into account eight criteria (developed within the frames of the project "Development of criteria and methodology for flood risk reduction measures").
- The measures are measurable, the description of the measures provides information on what it is planned to achieve; where the measure will be implemented, location; how the measure will be achieved, and the time of execution and timetable of each measure. This description indicates if measures will be implemented at national, RBD/UoM, APSFR or water body level.
- The measures are linked to the objectives: each measure refers to a sub-objective whose achievement it will contribute to.

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

- Whereas costs for the majority of the measures are provided, the FRMPs do not provide overall budgets[51], either per UoM or per APSFR, and the calculation method for costs is not reported in the FRMPs. The sources of funding are not specified for most of the measures.
- There is a reference for each measure to which sub-objective the measure refers to, but for the objectives themselves measurable parameters are not set. Overall, it is not possible to assess by how much the measures will contribute to the achievement of objectives and it is not possible to assess whether the objectives will be achieved (due in part to the fact that the objectives are not measurable).
- A baseline established against which progress of the FRMPs can be monitored has not been specified.

[50] Reporting sheets.
[51] EUR 203 m based on information subsequently provided by Latvia.

- The total reported number of measures in the reporting sheet does not correspond to the total number of measures that are listed in the FRMPs (their chapter 5). In the reporting sheet, there are all together 96 measures, but in all four FRPMs - 101 measures. It is not possible to compare the lists because only measure codes are available in the reporting sheet - these do not correspond to the codes of measures that are listed in the FRMPs[52].

[52] Latvia subsequently stated that it will make corrections in the second FRMPs.

# 5. Consideration of climate change

Measures to address the expected effects of climate change on the likelihood and potential adverse consequences of flooding have not been included in the four FRMPs. Latvia's reporting sheets state that impacts of climate change were not taken into account in the FRMPs and that they will be addressed in the second cycle.

According to the reporting sheets, studies of climate change impacts in Latvia have shown that extreme atmospheric precipitation events are increasing, particularly during the winter period. Anomalies in runoff have been observed during the winter season. In coming years, an increase in the frequency of storms and wind speed during storms is projected in coastal areas and a decrease in the period that rivers are covered by ice. Changes in air temperature and precipitation in the future could affect the seasonal distribution of river runoff, potentially decreasing the risk of spring floods. However, the projected increase in the frequency and intensity of storms could increase coastal erosion and flooding of coastal areas. The FRMPs and the reporting sheets do not, however, identify specific climate change scenarios.

There is no reference to the national Climate Change Adaption Strategy in the FRMPs: indeed, Latvia's National Adaptation Strategy has not been approved yet, despite initial indications it would be approved by the national government in mid-2017[53]; information on approval plans were not found in February 2018.

## 5.1 Specific types of measures to address expected effects of climate change

No measures in Latvia's FRMPs refer to climate change.

## 5.2 Good practices and areas for further development concerning climate change

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

- Impacts of climate change were not taken into account in the FRMPs[54].
- No apparent coordination with the national climate change adaptation strategy that is under development.

[53] https://climate-adapt.eea.europa.eu/countries-regions/countries/latvia (accessed November 2018)
[54] Latvia subsequently stated that climate change will be addressed in the second FRMPs.

# 6. Cost-benefit analysis

Latvia's reporting sheets indicate that a CBA methodology was prepared (within the frame of a national project, "*Development of criteria and methodology for flood risk reduction measures*"[55]). Two indicators from the methodology that was developed for the identification and preparation of measures could be applied to characterise flood protection structures: "protected population" (number of inhabitants); and "protected infrastructure and its value". In the methodology, it is stated that in order to employ the indicator "protected infrastructure and its value", further research work and calculations are needed.

The FRMPs refer to the use of a CBA methodology but do not provide the results[56].

## 6.1 Good practices and areas for further development

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

- Although a methodology for CBA was developed[57] (via a national project "Development of criteria and methodology for flood risk reduction measures"[58]), the FRMPs do not provide details on its results.

[55] Link to the project report: http://www.varam.gov.lv/lat/publ/petijumi/petijumi_vide/?doc=15514

[56] Latvia subsequently informed that for the prioritisation of measures all eight indicators developed in the methodology were used to evaluate measures.

[57] Latvia subsequently informed that the "Methodology of flood impact assessment and damage calculation in Latvia" has been developed and the socio-economical flood risk has been calculated for the APSFRs in GUBA, LUBA & VUBA (for DUBA this will be done in the second FRMPs). Both the methodology and the criteria for the assessment of flood reduction measures will be included in the second Preliminary Flood Risk Assessment Report.

[58] Link to the project report: http://www.varam.gov.lv/lat/publ/petijumi/petijumi_vide/?doc=15514 (the project was funded by national sources).

# 7. Governance including administrative arrangements, public information and consultation

## 7.1 Competent authorities

Based on Latvia's FRMPs and its reporting sheets, the Competent Authorities and Units of Management identified for the Floods Directive have not changed compared. Documents submitted to the European Commission on the subject have not been updated since 2011.

## 7.2 Public information and consultation

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

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

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

*Source: FRMPs*

The draft plans of the Flood Risk Management Plans were released for the public consultation on March 6, 2015. They were placed on the LEGMC website, which, according to the Water Management Law, is developing both the RBMPs and the FRMPs. The announcement of the launch of a public consultation on the FRMP was also posted on the website of the Ministry of Environmental Protection and Regional Development (MEPRD), which coordinates both the management of the RBMPs and the FRMPs. Information about the public consultations was also sent to the Consultative Councils of the RBDs, described below (in addition, River Basin Consultative Councils have been established for all four RBDs).

Input to the four FRMPs also occurred via a 2014 study on "*Substantial Water Management Issues in Latvian River Basins*": for this study, a local government survey was carried out on the significant risks in the areas of use and protection of water in municipalities. The questionnaire included questions about flood risks in the municipality, planned measures and

non-traditional solutions to reduce the risk of flood. The results of the survey were used in the development of FRMPs. In addition, consultations were held with the municipalities that had contacted the LEGMC and the MEPRD in connection with flood damage and planning regions[59].

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

***Table 11 Methods used for the actual consultation***

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

*Source: FRMPs*

All four FRMPs describe the overall procedure regarding the information to and consultation of interested parties and the public. The plans and other documents reviewed do not provide information about the number of individuals that contributed to the internet consultation or that participated in workshops and seminars. There is, however, a summary of comments received provided for all FRMPs in table format. The table in each FRMP lists all questions and remarks received during the public consultation process and the responses of the FRMP developers. This Summary reports on comments received concerning both FRMPs and RBMPs[60]. Altogether (for all four RBMPs and four FRMPs), five public institutions have sent their comments to the plan developers[61].

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

The information on how documents for the consultation were provided was not provided in the reporting sheets or the FRMPs. From the publicly available information on the LEGMC

[59] Reporting sheets and information from website of LEGMC

[60] Latvia informed that no proposals from stakeholders were received regarding win-win measures during the preparation of the RBMPs.

[61] Reporting sheets and information from website of LEGMC Summary reports on comments received: https://www.meteo.lv/fs/CKFinderJava/userfiles/files/Sabiedriskas_apsp_apkopojums_Gauja_Lielupe_Venta.pdf https://www.meteo.lv/fs/CKFinderJava/userfiles/files/Vide/Udens/Ud_apsaimn/UBA%20plani/Sabiedriskas_apsp_apkopojums_Daugava.pdf

website it can be concluded that the documents for consultation were available in PDF file format and they were downloadable.

***Table 12 Methods used to provide the documents for the consultation***

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

*Source: FRMPs*

## 7.3 Active involvement of Stakeholders

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

***Table 13 Groups of stakeholders***

| | All UoMs |
|---|---|
| Civil Protection Authorities such as Government Departments responsible for emergency planning and coordination of response actions | |
| Flood Warning / Defence Authorities[62] | |
| Drainage Authorities | ✓ |
| Emergency services | |
| Water supply and sanitation | |
| Agriculture / farmers | ✓ |
| Energy / hydropower | ✓ |
| Navigation / ports | |
| Fisheries / aquaculture | ✓ |
| Private business (Industry, Commerce, Services) | |
| NGO's including nature protection, social issues (e.g. children, housing) | ✓ |
| Consumer Groups | |
| Local / Regional authorities | ✓ |
| Academia / Research Institutions | |

*Source: FRMPs*

[62] Latvia subsequently informed that the LEGMC, responsible for the preparation of the FRMP, is also the authority responsible for flood warnings.

Active involvement of stakeholder took place mainly through the Consultative Councils, bodies in each RBD/UoM that bring together state institutions, local governments, non-governmental organisations as well as the private sector and other interest groups in matters related to the achievement of environmental quality and flood risk objectives in each RBD/UoM. The main function of the Councils is to evaluate the RBMPs and FRMPs and their programmes of measures in accordance with the public interest and provide opinions and recommendations for their further development to LEGMC. Environmental non-governmental organisations, state institutions (Ministry of Economics, Ministry of Agriculture, Ministry of Health and MEPRD) and planning regions and municipalities are represented in the four Consultative Councils. The private sector representatives involved in the Consultative Councils come from the drainage, water, agriculture and energy sector[63].

Separately, negotiations took place with the Ministry of Agriculture, which is the responsible authority for implementation of flood risk management measures in rural areas[64].

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

***Table 14 Mechanisms used to ensure the active involvement of stakeholders***

| | **All UoMs** |
|---|---|
| Regular exhibitions | |
| Establishment of advisory groups | ✓ |
| Involvement in drafting | |
| Workshops and technical meetings | |
| Formation of alliances | |
| Information days | |

*Source: FRMPs*

As noted above, the Consultative Councils provided the main venue for the active involvement of stakeholders.

[63] Latvia subsequently identified the Regional Environment Boards and regional authorities and municipalities as the main stakeholders that were involved in the development of the FRMPs. Stakeholder involvement will be described in detail in the second FRMPs.

[64] Reporting sheets and information from website of LEGMC

## 7.4 Effects of consultation

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

***Table 15 Effects of consultation***

| | All UoMs |
|---|---|
| Changes to selection of measures | |
| Adjustment to specific measures | ✓ |
| 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" | |

*Source: FRMPs*

Comments that were received during public consultation regarding FRMPs concerned clarifications, but they did not call for essential changes in the plans. The strategic environmental assessment process did not identify the need for major changes in FRMPs. The comments received from the public consultation of the RBMPs and the FRMPs were summarised in a single document (for all four FRMPs) available on the LEGMC homepage[65].

## 7.5 Strategic Environmental Assessment

An SEA procedure was applied to all FRMPs. The procedure was carried out jointly with the RBMPs' SEA procedure. The SEA reports for both – RBMPs and the FRMPs – are summarised in one document for each RBD/UoM[66].

## 7.6 Good practices and areas for further development regarding Governance

The following **good practices** were identified:

- Consultative Councils were established in each UoM and provided a forum for the active involvement of stakeholders. Environmental non-governmental organisations, state institutions (Ministry of Economics, Ministry of Agriculture, Ministry of Health and the Ministry for Environmental Protection and Regional Development, MEPRD) and

[65] Available at: https://www.meteo.lv/fs/CKFinderJava/userfiles/files/Vide/Udens/Ud_apsaimn/UBA%20plani/Info_zinojums_UBAP_PP_210916.pdf

[66] Reporting sheets and information from website of LEGMC

planning regions and municipalities are represented in the Consultative Council for each UoM.

- In 2014, a local government survey was carried out on flood risks, planned measures and non-traditional solutions to reduce the risk of flooding. The results of the survey were used in the development of the FRMPs.
- Comments received from the public consultation of the RBMPs and the FRMPs were summarised in a single document, available on the LEGMC homepage[67]
- All the FRMPs underwent an SEA procedure.

[67] Available at: https://www.meteo.lv/fs/CKFinderJava/userfiles/files/Vide/Udens/Ud_apsaimn/UBA%20plani/Info_zinojums_UBAP_PP_210916.pdf

# Annex A: Supplementary tables and charts on measures

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

## Background & method

This document was produced as part of the assessment of the Flood Risk Management Plans (FRMPs). The tables and charts below are a summary of the data reported on measures by the Member States and were used by the Member State assessors to complete the questions on the Flood measures. The data are extracted from the XMLs (reporting sheets) reported by Member State 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 Floods Directive)[68], 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, often answers given in the national language.

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

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

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

- Measures missing information may be assigned categories based on other fields (for example, if the level of Responsibility Authority is missing, the information may be obvious from the field "name of Responsible Authority").
- Measures where no obvious categories can be defined based on other available information (as in the example above on the name of the responsible authorities), are categorised as "no information".

## Types of measures used in reporting

The following table[69] is used in the reporting on the types of measures. Each type of measures is coded as an M-number. Measures are grouped in an 'aspect'.

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

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

## List of Annex A tables & figures

## Measures overview

### *Table A1: Total number of measures*

| | |
|---|---|
| Number of individual measures | 81 |
| Number of individual measures including measures which have been allocated to more than one measure type | 81 |
| Number of aggregated measures | 15 |
| Number of aggregated measures including measures which have been allocated to more than one measure type | 15 |
| Total number of measures | 96 |
| Total number of measures including measures which have been allocated to more than one measure type | 96 |
| Range of number of measures between UoMs including measures which have been allocated to more than one measure type (Min-Max) | Min 3 - 30 |
| Average number of measures across UoMs including measures which have been allocated to more than one measure type | 24 |

### *Table A2: Number of aggregated measures per measure type and UoM*

| | **Prevention** | **Protection** | **Preparedness** | | | **Recovery & Review** | **Other** | **Grand Total** |
|---|---|---|---|---|---|---|---|---|
| | **M24** | | **M41** | **M42** | **M44** | | | |
| LVDUBA | 2 | | | 1 | 1 | | | 4 |
| LVGUBA | 2 | | 1 | 1 | | | | 4 |
| LVLUBA | 2 | | 1 | 1 | | | | 4 |
| LVVUBA | 1 | | 1 | 1 | | | | 3 |
| **Grand Total** | **7** | **0** | **3** | **4** | **1** | **0** | **0** | **15** |
| **Average per UoM** | **2** | **0** | **1** | **1** | **0** | **0** | **0** | **4** |

Note: See Types of measures (above) and Annex B for the codes used. No aggregated measures were reported for the categories Protection, Recovery and Review or Other.

***Table A3: Number of individual measures per measure type and UoM***

| | Prevention | | Protection | | | | Preparedness | Recovery & Review | Other | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | M23 | M24 | M32 | M33 | M34 | M35 | | | | |
| LVDUBA | 12 | 1 | 11 | | | 3 | | | | 27 |
| LVGUBA | 5 | 1 | 2 | 3 | | | | | | 11 |
| LVLUBA | 1 | | | 11 | | 1 | | | | 13 |
| LVVUBA | 20 | 3 | | 1 | 6 | | | | | 30 |
| **Grand Total** | **38** | **5** | **13** | **15** | **6** | **4** | **0** | **0** | **0** | **81** |
| **Average per UoM** | **10** | **1** | **3** | **4** | **2** | **1** | **0** | **0** | **0** | **20** |

Note: See Types of measures (above) and Annex B for the codes used. No individual measures were reported for the categories Preparedness, Recovery and Review or Other.

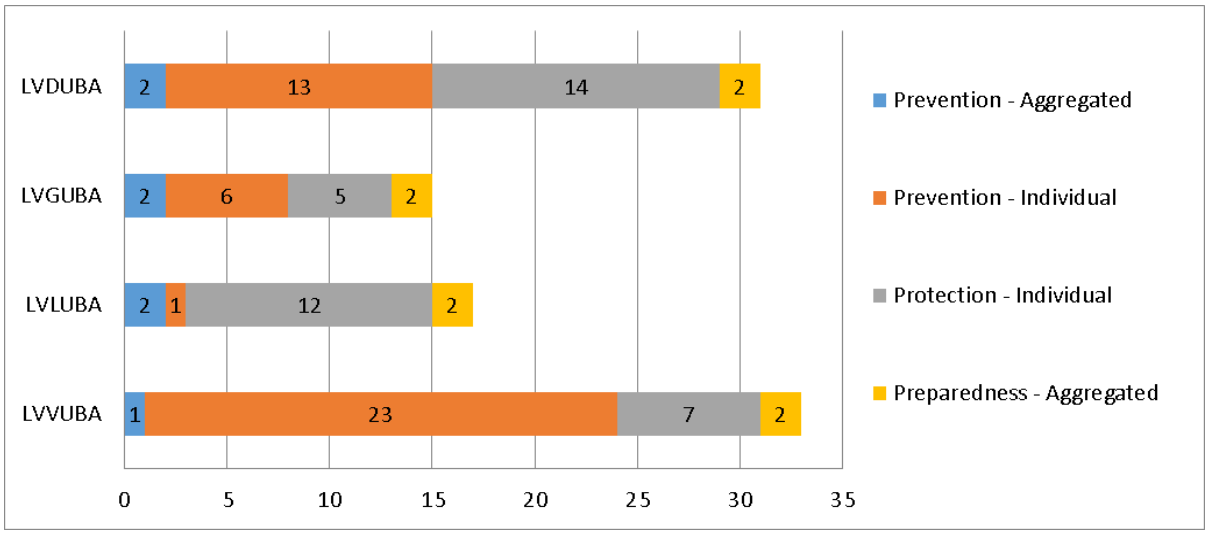
***Table A4: Total number of measures (aggregated and individual) per measure type and UoM, including duplicates***

| | Prevention | | Prevention Total | Protection | Protection Total | Preparedness | Preparedness Total | Recovery & Review | Other | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | Aggregated | Individual | | Individual | | Aggregated | | | | |
| LVDUBA | 2 | 13 | **15** | 14 | **14** | 2 | **2** | 0 | 0 | **31** |
| LVGUBA | 2 | 6 | **8** | 5 | **5** | 2 | **2** | 0 | 0 | **15** |
| LVLUBA | 2 | 1 | **3** | 12 | **12** | 2 | **2** | 0 | 0 | **17** |
| LVVUBA | 1 | 23 | **24** | 7 | **7** | 2 | **2** | 0 | 0 | **33** |
| **Grand Total** | **7** | **43** | **50** | **38** | **38** | **8** | **8** | **0** | **0** | **96** |
| **Average per UoM** | **2** | **1** | **13** | **10** | **10** | **2** | **2** | **0** | **0** | **24** |

Note: See Types of measures (above) and Annex B for the codes used. No measures were reported for the categories Recovery and Review or Other.

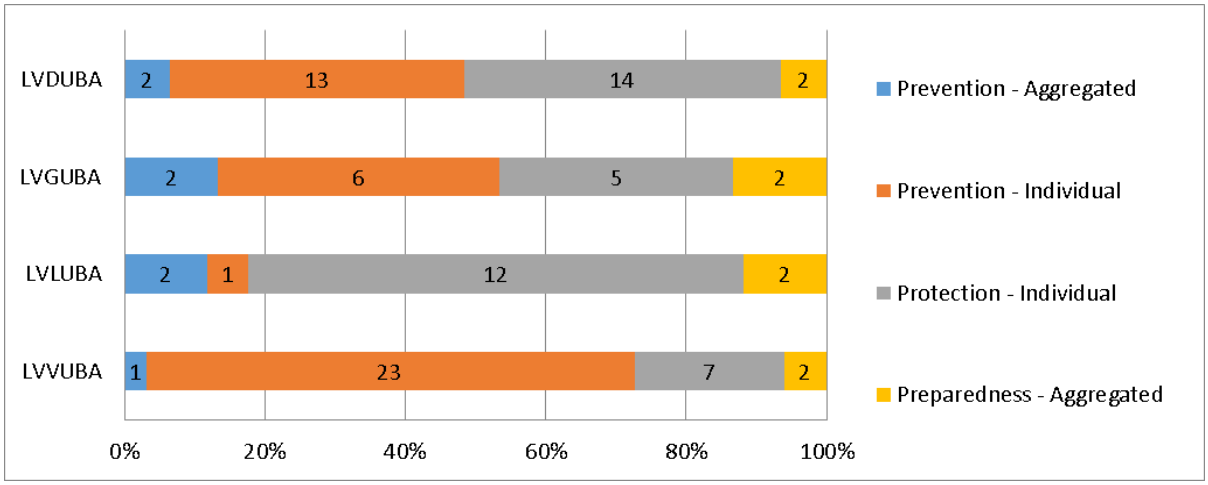
The information in Table A4 is visualised in Figures A1 and A2 below.

***Figure A1: Number of total measures (individual and aggregated) by measure aspect***




Note: No measures were reported for the categories Recovery and Review or Other.

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




Note: No measures were reported for the categories Recovery and Review or Other.

## Measure details: cost

Member States were requested to report information on:

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

Latvia provided information about costs and cost explanations for 87 of the 96 measures reported. For cost explanation a large number of different responses was provided, and it was thus not practical to aggregate the information.

The highest reported cost was over €40 m and the lowest cost reported was €5 000. The data reported are summarised in the following tables.

***Table A5: Cost by measure aspect (EUR)***

| | 0-100k | 100-500k | 500k-1M | 1-5M | 5-10M | 10-50M | No information | Grand Total |
|---|---|---|---|---|---|---|---|---|
| Prevention | 2 | 24 | 4 | 14 | 2 | | 4 | 50 |
| Protection | 3 | 5 | 7 | 15 | 4 | 3 | 1 | 38 |
| Preparedness | | 4 | | | | | 4 | 8 |
| **Grand Total** | **5** | **33** | **11** | **29** | **6** | **3** | **9** | **96** |

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

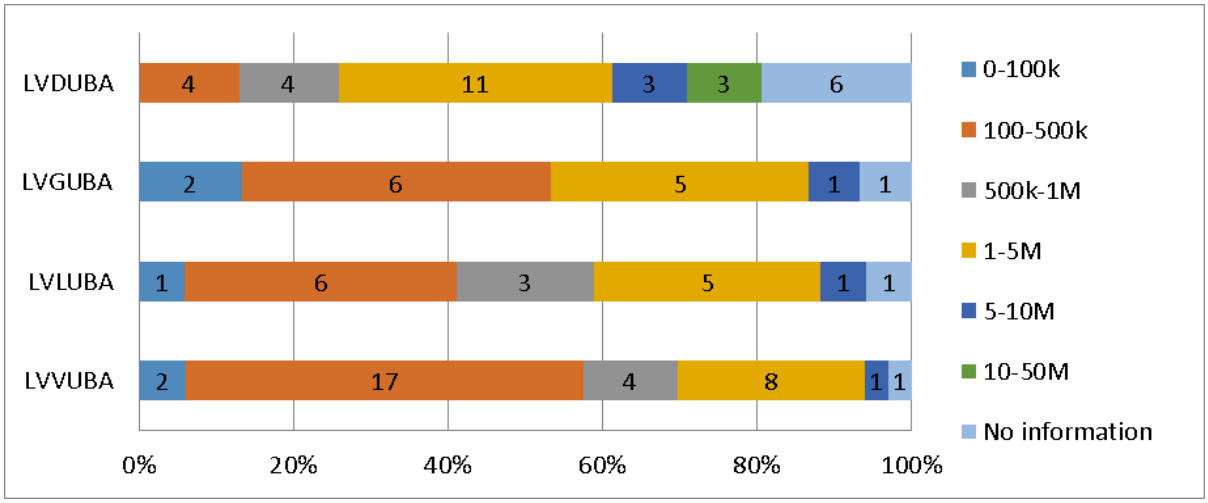
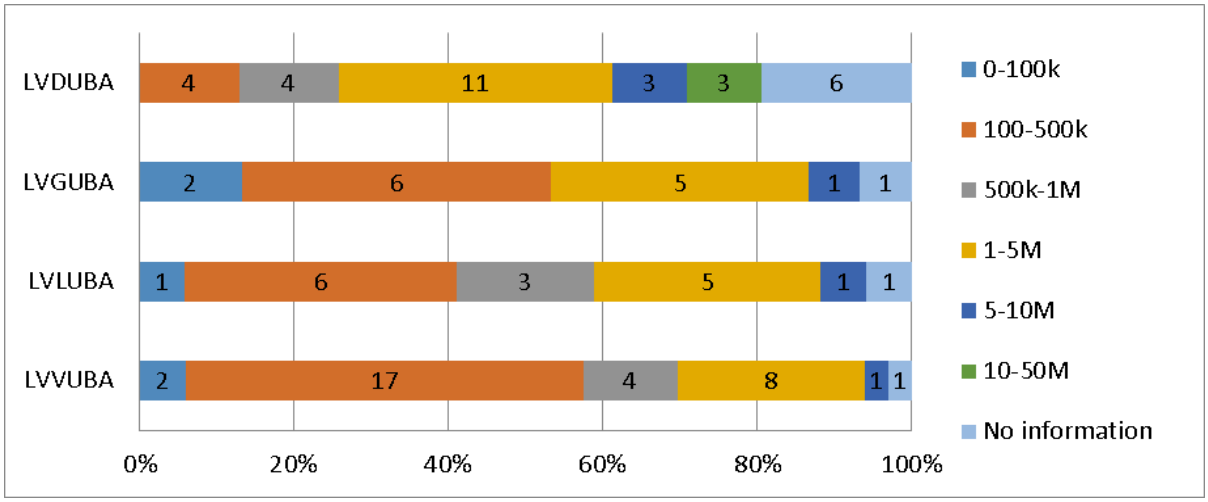



***Table A6: Cost by UoM (EUR)***

| | 0-100k | 100-500k | 500k-1M | 1-5M | 5-10M | 10-50M | No information | Grand Total |
|---|---|---|---|---|---|---|---|---|
| LVVUBA | 2 | 17 | 4 | 8 | 1 | | 1 | 33 |
| LVLUBA | 1 | 6 | 3 | 5 | 1 | | 1 | 17 |
| LVGUBA | 2 | 6 | | 5 | 1 | | 1 | 15 |
| LVDUBA | | 4 | 4 | 11 | 3 | 3 | 6 | 31 |
| **Grand Total** | **5** | **33** | **11** | **29** | **6** | **3** | **9** | **96** |
| **Average per UoM** | **1** | **8** | **3** | **7** | **2** | **1** | **2** | **24** |

*Figure A4: Visualisation of Table 6: Cost by UoM (EUR)*




## Measure details: name & location

Member States were requested to report information on:

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

### Location of measures

Latvia reported the location of all measures; however, this was an open question, and as such, the level of detail varies, and a large number of different responses was given. It was thus not practical to aggregate the information.

### Geographic coverage

Latvia reported the geographic coverage of only 14 measures in the reporting sheets. Given the small number of responses and the variety of answers it was not practical to aggregate the information.

## Measure details: objectives

Member States were requested to report information on:

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

### Objectives

Latvia reported the objectives of all measures; however, this was an open question, and as such, a large number of different responses was given. It was thus not practical to aggregate the information.

### Category of priority

Latvia provided information for the priority of all measures. The following categories are used:

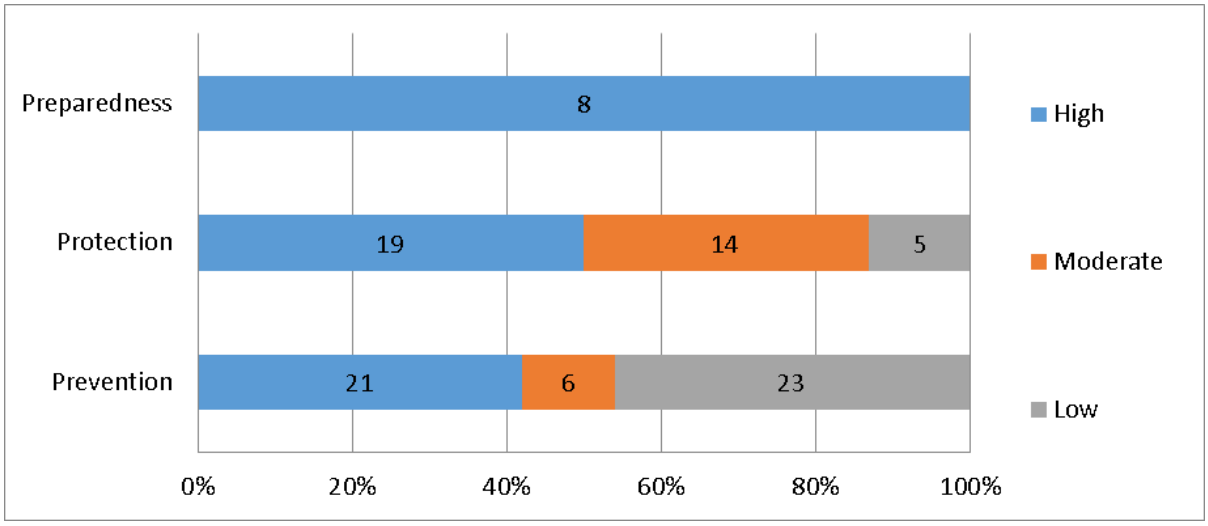
- High
- Moderate
- Low

***Table A7: Category of Priority by measure aspect***

| | High | Moderate | Low | Grand Total |
|---|---|---|---|---|
| Prevention | 21 | 6 | 23 | 50 |
| Protection | 19 | 14 | 5 | 38 |
| Preparedness | 8 | | | 8 |
| **Grand Total** | **48** | **20** | **28** | **96** |

Note: No measures were reported as critical or very high priority.

***Figure A5: Visualisation of Table A7: Category of Priority by measure aspect***



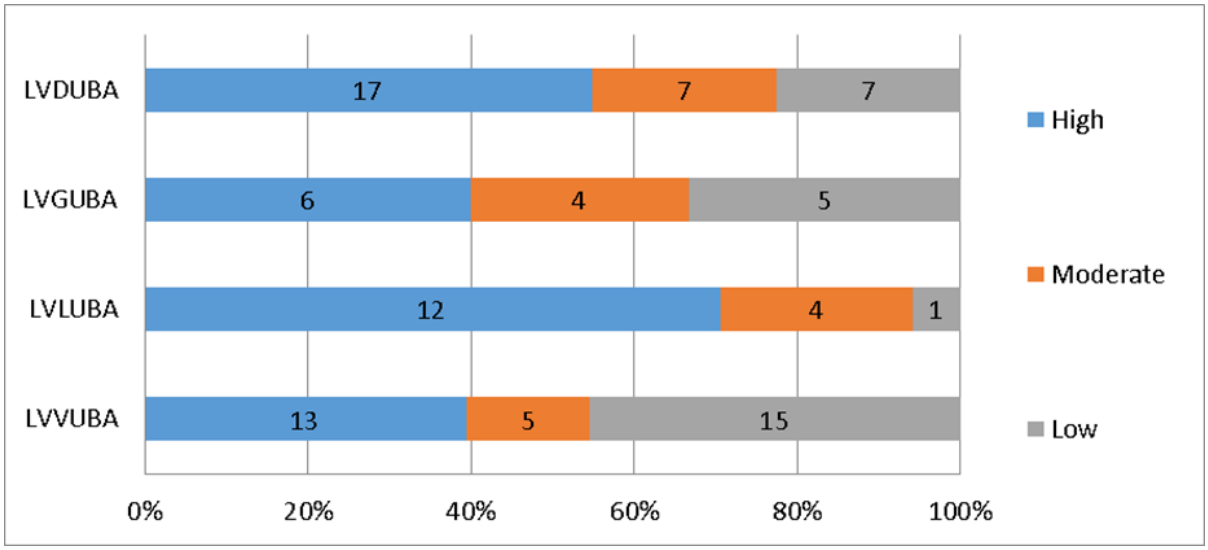

Note: No measures were reported as critical or very high priority.

*Table A8: Category of Priority by UoM*

| | High | Moderate | Low | Grand Total |
|---|---|---|---|---|
| LVVUBA | 13 | 5 | 15 | 33 |
| LVLUBA | 12 | 4 | 1 | 17 |
| LVGUBA | 6 | 4 | 5 | 15 |
| LVDUBA | 17 | 7 | 7 | 31 |
| **Grand Total** | **48** | **20** | **28** | **96** |
| **Average per UoM** | **19** | **8** | **11** | **38** |

Note: No measures were reported as critical or very high priority.

*Figure A6: Visualisation of Table A8: Category of Priority by UoM*




Note: No measures were reported as critical or very high priority.

**Timetable**

Latvia reported the timetable of all measures. The information was summarised in the following tables.

*Table A9: Timetable of implementation by measure aspect*

| | 2016 | 2017 | 2016-2018 | 2016-2021 | Continuously | Grand Total |
|---|---|---|---|---|---|---|
| Prevention | 4 | | 1 | 41 | 4 | 50 |
| Protection | | | | 38 | | 38 |
| Preparedness | | 4 | | 4 | | 8 |
| **Grand Total** | **4** | **4** | **1** | **83** | **4** | **96** |

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

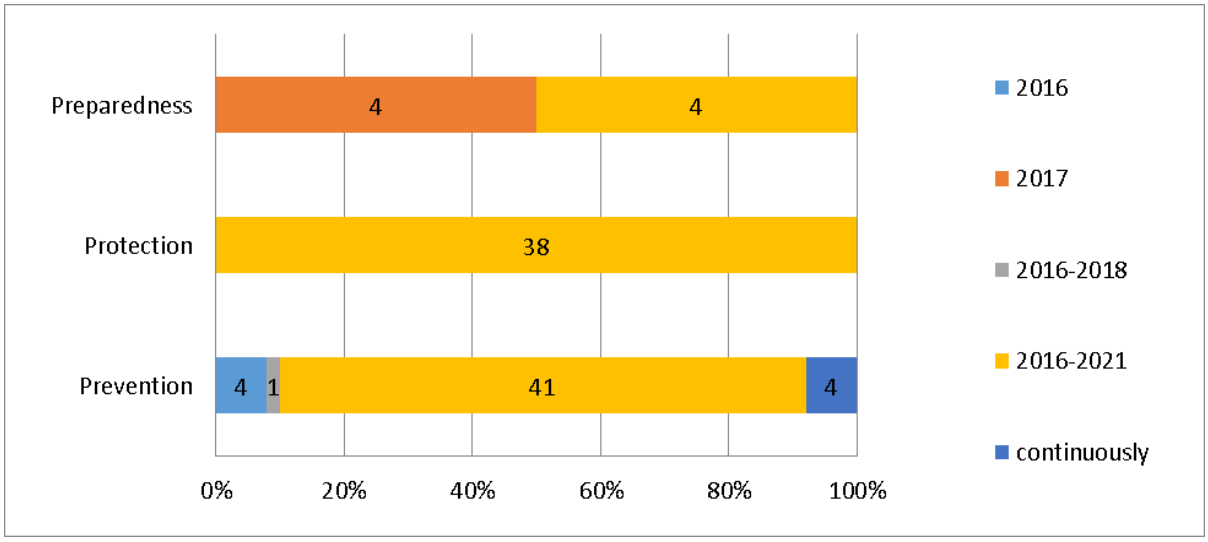
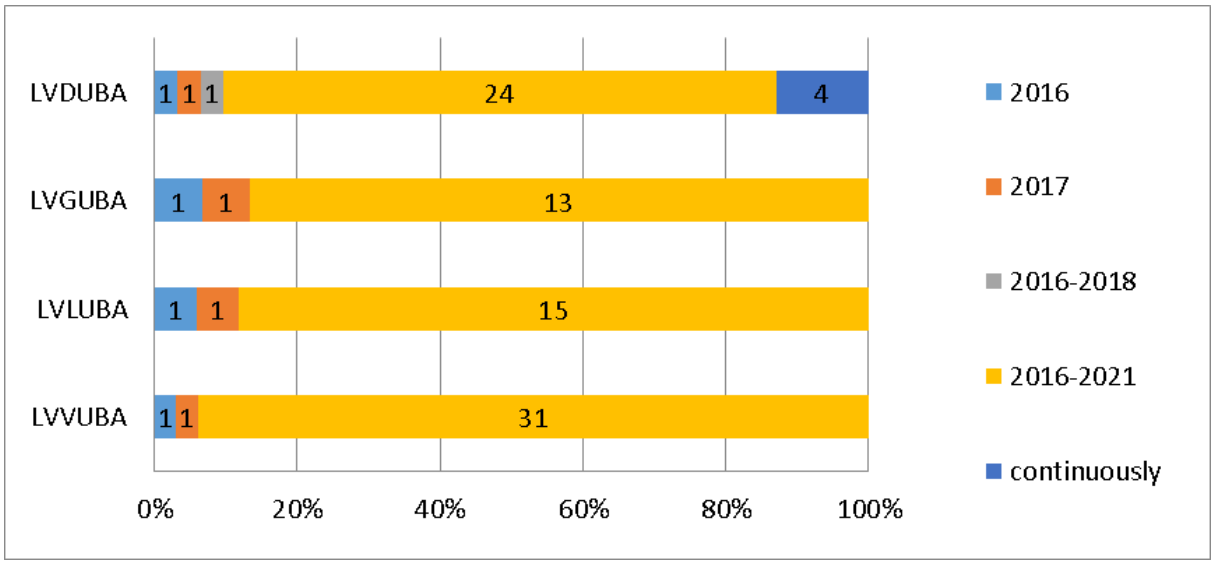



*Table A10: Timetable of implementation by UoM*

| | 2016 | 2017 | 2016-2018 | 2016-2021 | Continuously | Grand Total |
|---|---|---|---|---|---|---|
| LVVUBA | 1 | 1 | | 31 | | 33 |
| LVLUBA | 1 | 1 | | 15 | | 17 |
| LVGUBA | 1 | 1 | | 13 | | 15 |
| LVDUBA | 1 | 1 | 1 | 24 | 4 | 31 |
| **Grand Total** | **4** | **4** | **1** | **83** | **4** | **96** |
| **Average per UoM** | **1** | **1** | **0** | **21** | **1** | **24** |

*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).

Latvia reported the names of the responsible authorities for the majority of the measures. However, for this open question, a large number of different responses were given, and it was not practical to aggregate the information.

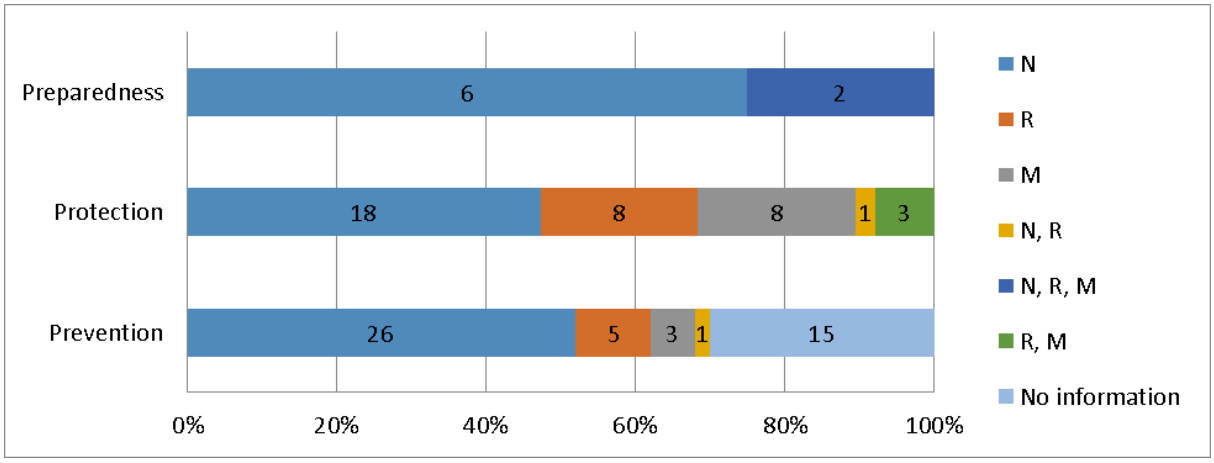
The information about the level of responsible authorities was summarised in the following tables.

***Table A11: Level of Responsible Authority by measure aspect***

| | N | R | M | N, R | N, R, M | R, M | No information | Grand Total |
|---|---|---|---|---|---|---|---|---|
| Prevention | 26 | 5 | 3 | 1 | | | 15 | 50 |
| Protection | 18 | 8 | 8 | 1 | | 3 | | 38 |
| Preparedness | 6 | | | | 2 | | | 8 |
| **Grand Total** | **50** | **13** | **11** | **2** | **2** | **3** | **15** | **96** |

N=National, R=Regional and M=Municipal Authority.

***Figure A9: Visualisation of Table A11: Level of Responsible Authority by measure aspect***



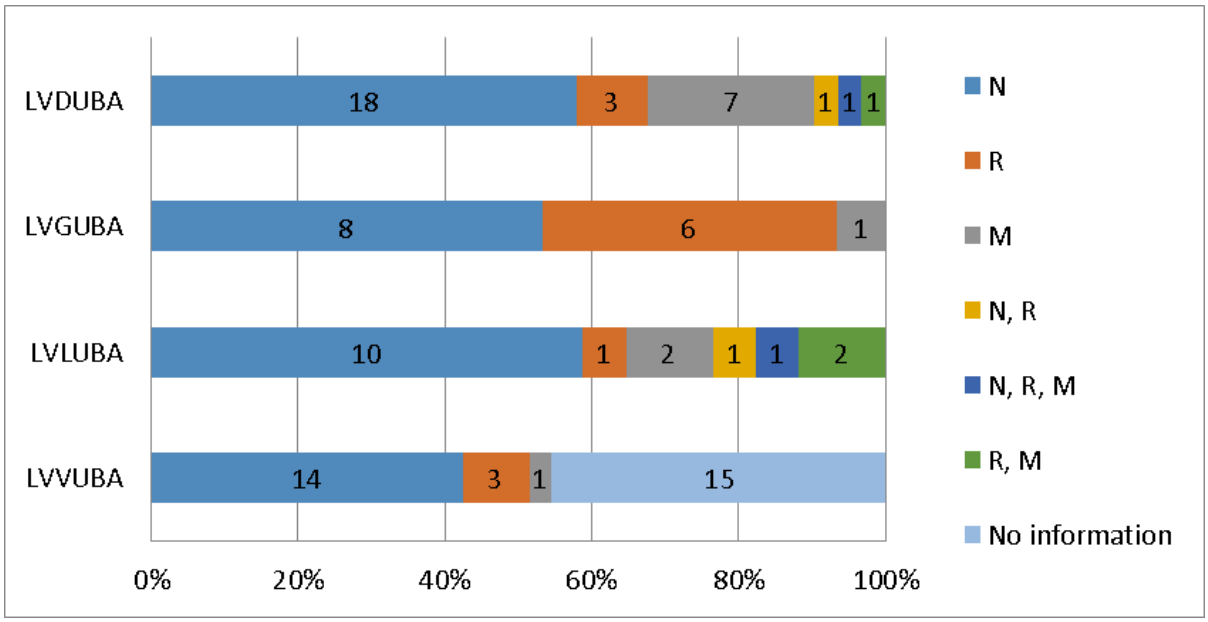

N=National, R=Regional and M=Municipal Authority.

***Table A12: Level of Responsible Authority by UoM***

| | N | R | M | N, R | N, R, M | R, M | No information | Grand Total |
|---|---|---|---|---|---|---|---|---|
| LVDUBA | 18 | 3 | 7 | 1 | 1 | 1 | | 31 |
| LVGUBA | 8 | 6 | 1 | | | | | 15 |
| LVLUBA | 10 | 1 | 2 | 1 | 1 | 2 | | 17 |
| LVVUBA | 14 | 3 | 1 | | | | 15 | 33 |
| **Grand Total** | **50** | **13** | **11** | **2** | **2** | **3** | **15** | **96** |
| **Average per UoM** | **13** | **3** | **3** | **1** | **1** | **1** | **4** | **24** |

N=National, R=Regional and M=Municipal Authority.

***Figure A10: Visualisation of Table A12: Level of Responsible Authority by UoM***




N=National, R=Regional and M=Municipal Authority.

## Measure details: progress

Member States were requested to report information on:

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

The progress of implementation was reported as[70]:

- 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.

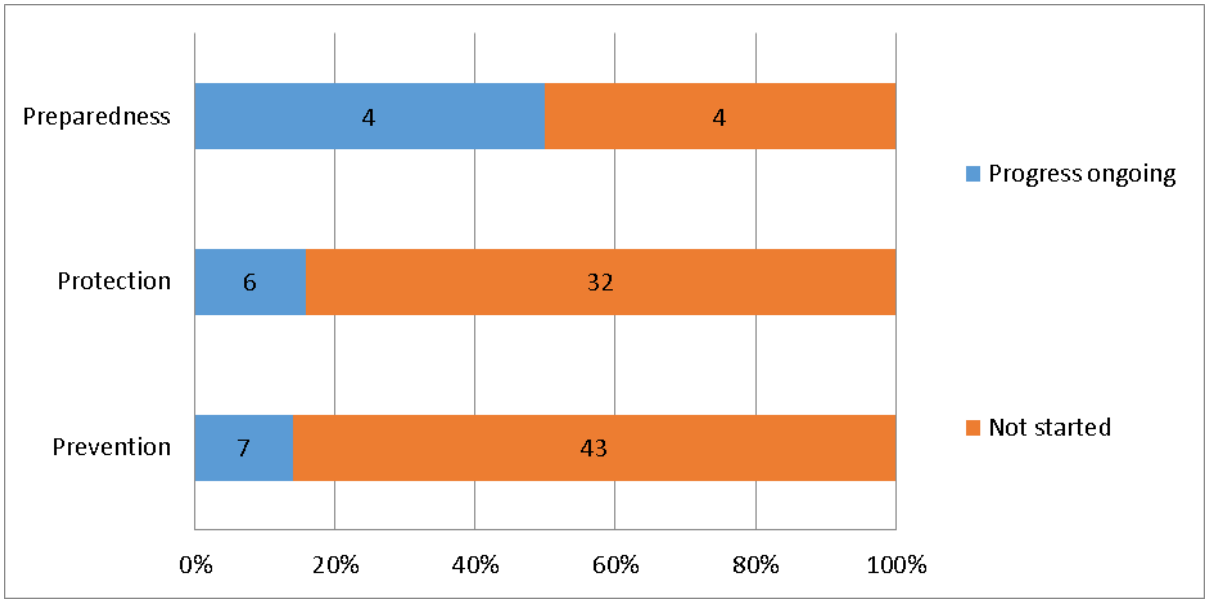
[70] Guidance for Reporting under the Floods Directive (2007/60/EC): https://circabc.europa.eu/w/browse/a3c92123-1013-47ff-b832-16e1caaafc9a

***Table A13: Progress of implementation by measure aspect***

| | Progress ongoing | Not started | Grand Total |
|---|---|---|---|
| Prevention | 7 | 43 | 50 |
| Protection | 6 | 32 | 38 |
| Preparedness | 4 | 4 | 8 |
| **Grand Total** | **17** | **79** | **96** |

No measures were reported as completed or ongoing construction.

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



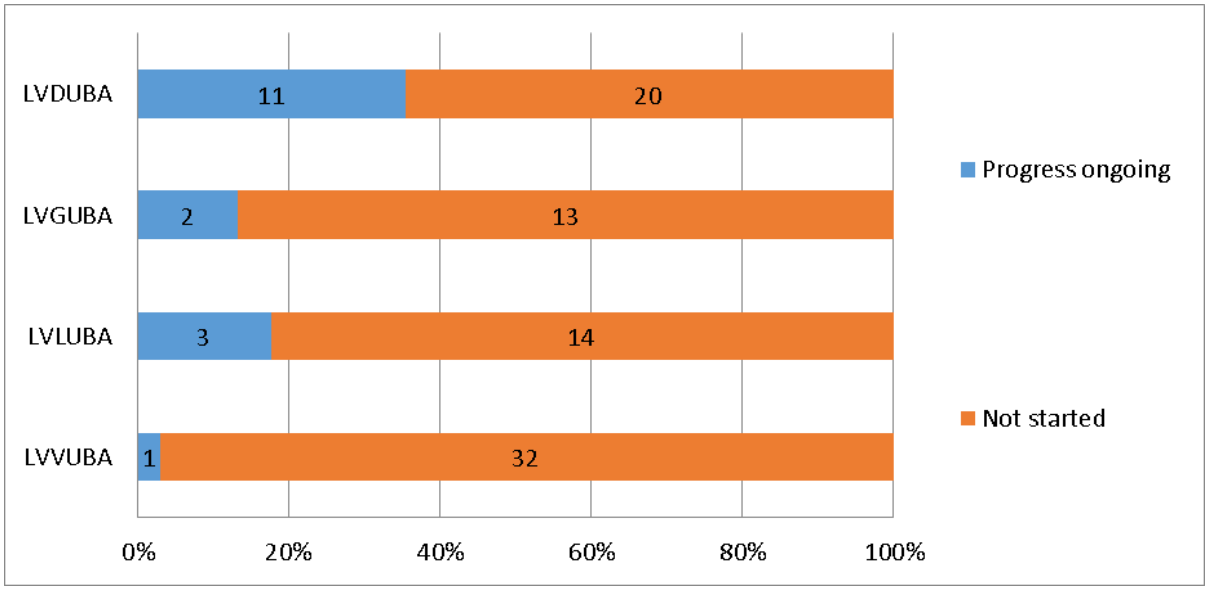

Note: No measures were reported as completed or ongoing construction.

***Table A14: Progress of implementation by UoM***

| | Progress ongoing | Not started | Grand Total |
|---|---|---|---|
| LVDUBA | 11 | 20 | 31 |
| LVGUBA | 2 | 13 | 15 |
| LVLUBA | 3 | 14 | 17 |
| LVVUBA | 1 | 32 | 33 |
| **Grand Total** | **17** | **79** | **96** |
| **Average per UoM** | **4** | **20** | **24** |

Note: No measures were reported as completed or ongoing construction.

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




Note: No measures were reported as completed or ongoing construction.

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

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

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

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

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

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

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

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

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

## Measure details: other

Member States were requested to provide information on:

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

Latvia reported additional information only for eight measures, where it mainly referred to budget and cost issues.

For nine measures, in the field "Community Acts" Latvia reported '*Civil Protection Law*' as an associated act and for five measures – '*Law "On the Safety of Hydrotechnical Structures of Hydroelectric Power Plants"*' as an associated act.

# Annex B: Definitions of measure types

### *Table B1 Types of flood risk management measures*[71]

| | |
|---|---|
| | **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 |

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

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

## Catalogue of Natural Water Retention Measures (NWRM)

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

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

***Table B2 List of NWRMs***

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

| 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*