



LAWA

German Working Group on Water Issues of the Federal States and the Federal Government

Recommendations for the Establishment of Flood Risk Management Plans

Adopted at the 139th LAWA General Meeting in Dresden on 25/26 March 2010

LAWA Permanent Committee on Flood Protection and Hydrology (LAWA-AH)

German Working Group on Water Issues of the Federal States and the Federal Government (LAWA)
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List of Abbreviations

BauGB	Federal Building Code
BGBl.	Federal Law Gazette
EIA	Environmental Impact Assessment
FRMD	Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (Flood Risk Management Directive)
FRM	Flood risk management
FRM cycle	Flood risk management cycle
FRM plan	Flood risk management plan
LAWA	German Working Group on Water Issues of the Federal States and the Federal Government
ROG	Federal Regional Planning Act (<i>Raumordnungsgesetz</i>)
SEA	Strategic Environmental Assessment
UVPG	Environmental Impact Assessment Act (<i>Gesetz über die Umweltverträglichkeitsprüfung</i>)
WFD	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive)
WHG	Federal Water Act (<i>Gesetz zur Ordnung des Wasserhaushalts – Wasserhaushaltsgesetz</i>)

Contents

1	The FRMD: Objectives, Tasks and Timeframe	7
2	The Directive's Provisions Relating to Flood Risk Management Plans	8
3	Flood Risk Management	9
3.1	Definition and objectives of flood risk management (FRM)	9
3.2	Protected interests pursuant to the FRMD	11
3.3	Integration into LAWA's existing strategies and areas of action.....	11
4	Relevant Sectors and Stakeholders	15
5	Establishment of the Flood Risk Management Plan	17
5.1	Spatial scope of the flood risk management plans.....	17
5.2	Organisation of participation by competent authorities and interested parties	18
5.3	Identifying appropriate objectives.....	19
5.4	Target-actual comparison.....	20
5.5	Identification of possible actions.....	20
5.5.1	Precautionary Land Use.....	22
5.5.2	Natural Water Retention.....	26
5.5.3	Technical Flood Protection	28
5.5.4	Precautionary Building	34
5.5.5	Protection against Risks.....	37
5.5.6	Information.....	38
5.5.7	Precautionary Behaviour.....	40
5.5.8	Provision of Resources and Preparation of Hazard Prevention and Civil Protection	42
5.5.9	Flood Response	46
5.5.10	Recovery	47
5.6	Summary and prioritisation of measures	48
5.7	Coordination with other directives.....	48
5.8	Monitoring	49
5.9	Draft structure for the FRM plan.....	49
6	Strategic Environmental Assessment (SEA)	50
7	Informing the Public	52

8 References

1 The FRMD: Objectives, Tasks and Timeframe

Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks (FRMD) entered into force on 26 November 2007.

It was transposed into German national law by means of the Federal Water Act (*Gesetz zur Ordnung des Wasserhaushalts (Wasserhaushaltsgesetz) – WHG*) of 31 July 2009 (Federal Law Gazette (BGBl.) I p. 2585). The Act entered into force on 1 March 2010. Section 72 of the Act defines the term “flood” as follows: “Flood means the temporary inundation of land not normally covered by water by surface waters or influx of sea waters in coastal areas”. Section 75 of the Act contains provisions on the establishment of flood risk management (FRM) plans.

In September 2008, the German Working Group on Water Issues of the Federal States and the Federal Government (LAWA) adopted a Strategy for the Implementation of the FRMD in Germany which contains basic positions and practical guidance.

The purpose of the FRMD is to mitigate flood risks and reduce the adverse consequences for human health, the environment, cultural heritage and economic activity. This aim is to be achieved through concerted and coordinated action by all stakeholders within the framework of flood risk management. The Directive focusses on all elements of risk management in its approach.

The FRMD requires the Member States to undertake a number of specific tasks, including the following actions, in accordance with various deadlines:

- To undertake a **preliminary flood risk assessment** (cf. Section 73 WHG: Assessment of flood risks, risk areas) in order to identify the areas/water bodies for which potential significant flood risks exist. This assessment must be completed by the end of 2011.
- To produce **flood hazard maps and flood risk maps** (cf. Section 74 WHG: Hazard maps and risk maps) for those water bodies for which, according to the preliminary assessment, potential significant flood risks exist. The maps provide information about the areas affected by flooding and the extent of the hazards and risks. These maps must be completed by the end of 2013.
- **To establish flood risk management plans (FRM plans)** (cf. Section 75 WHG: Risk management plans) for those water bodies for which potential significant flood risks exist. These identify appropriate objectives and measures, adapted to the risk area, for the reduction of flood risks. The flood risk management plans must be completed by the end of 2015.

The FRMD requires appropriate steps to be taken to coordinate the application of the FRMD and that of the Water Framework Directive (WFD). Pursuant to Section 80 WHG, the two directives should be coordinated with a particular focus on improving

efficiency, information exchange and for achieving common synergies and benefits having regard to the environmental objectives laid down in the Water Framework Directive. The flood hazard maps and flood risk maps must be produced in such a way that the information they contain is consistent with relevant information presented according to the Water Framework Directive, particularly the provisions of Article 5(1) of the Water Framework Directive in conjunction with Annex II of the WFD.

The FRMD supports the objectives already set forth in the flood risk protection strategies of Germany's federal states (*Länder*) and builds on the wide-ranging preliminary work, both legal and technical, carried out at national and state level. The implementation of the federal states' flood protection concepts and plans should continue without delay during the implementation of the FRMD.

Concerted and coordinated action within the framework of flood risk management should improve the overall level of flood protection (FRMD, recital 5). This means that all stakeholders and competent authorities within the area covered by a FRM plan should be involved in setting appropriate objectives and devising possible actions, as well as in implementing the relevant measures. The local authorities in particular must set appropriate objectives, to be implemented through actions undertaken within the timeframes stated in the Federal Water Act (WHG).

The FRMD and the Federal Water Act (WHG) require implementation of the plans to be reviewed and if necessary updated every six years. The production of the documentation, maps and plans is therefore an ongoing process which, depending on the state of knowledge and participation of stakeholders, will continue to require further development and adaptation. Section 75(6) WHG requires all plans to be reviewed, and if necessary updated, by 22 December 2021 and every six years thereafter, taking account of the likely impacts of climate change.

2 The Directive's Provisions Relating to Flood Risk Management Plans

Provisions on flood risk management plans are set out in Article 7 and in the Annex to the Directive. Section 75(3) WHG makes direct reference to these provisions. Flood risk management plans should address all aspects of flood risk management, focussing on prevention, protection and preparedness, including flood forecasts and early warning systems, and, as far as is appropriate, non-structural flood protection measures and/or measures to reduce the probability of flooding. Account should be taken of the characteristics of the particular river basin or sub-basin. Flood risk management plans may also include the promotion of sustainable land use practices, improvement of water retention as well as the controlled flooding of certain areas in the case of a flood event.

The FRM plans are produced at the level of the river basin district or unit of management for those areas for which, according to the preliminary flood risk assessment, a potential significant flood risk exists (cf. Section 75(1) WHG). It should be emphasised that flood risk management plans should address all relevant aspects

of flood risk management in the particular river basin and should include appropriate objectives and actions for each basin or sub-basin.

In transboundary river basins, the aim should be to produce one single flood risk management plan. The competent authorities for Germany, particularly the national and international river basin districts, are identified. They ensure that there is appropriate information and coordination during the production of the FRM plan.

In the flood risk management plans, the conclusions of the preliminary flood risk assessment are explained and depicted in the form of a summary map of the river basin district. The flood hazard maps and flood risk maps are also included and evaluated. Based on this hazard and risk assessment, a description is provided of the appropriate objectives of flood risk management that have been identified, along with a summary of the measures and their prioritisation aiming to achieve the appropriate objectives of flood risk management. Further provisions relate to transboundary catchments. The flood risk management plans are to be reviewed, and if necessary updated, by 2021 and every six years thereafter.

The FRMD includes qualitative provisions on appropriate flood risk management objectives for the protected interests that must be considered, but does not include any quantified flood protection objectives to be aimed for or any specific risk management targets. FRM plans are drawn up as part of an interdisciplinary process in which all the interested parties are actively involved (Section 79(1) WHG).

3 Flood Risk Management

3.1 Definition and objectives of flood risk management (FRM)

The FRMD does not contain a precise definition of the term “flood risk management”. Sustainable flood risk management within the meaning of the Directive encompasses the full cycle of preparedness, hazard prevention and aftercare and therefore includes all phases before, during and following a flood. The FRM plans should include appropriate objectives for flood risk management and identify actions which address all aspects of flood risk management (see Figure 1). According to the Directive, appropriate objectives are to be established, focussing on the reduction of potential adverse consequences of flooding for human health, the environment, cultural heritage and economic activity.

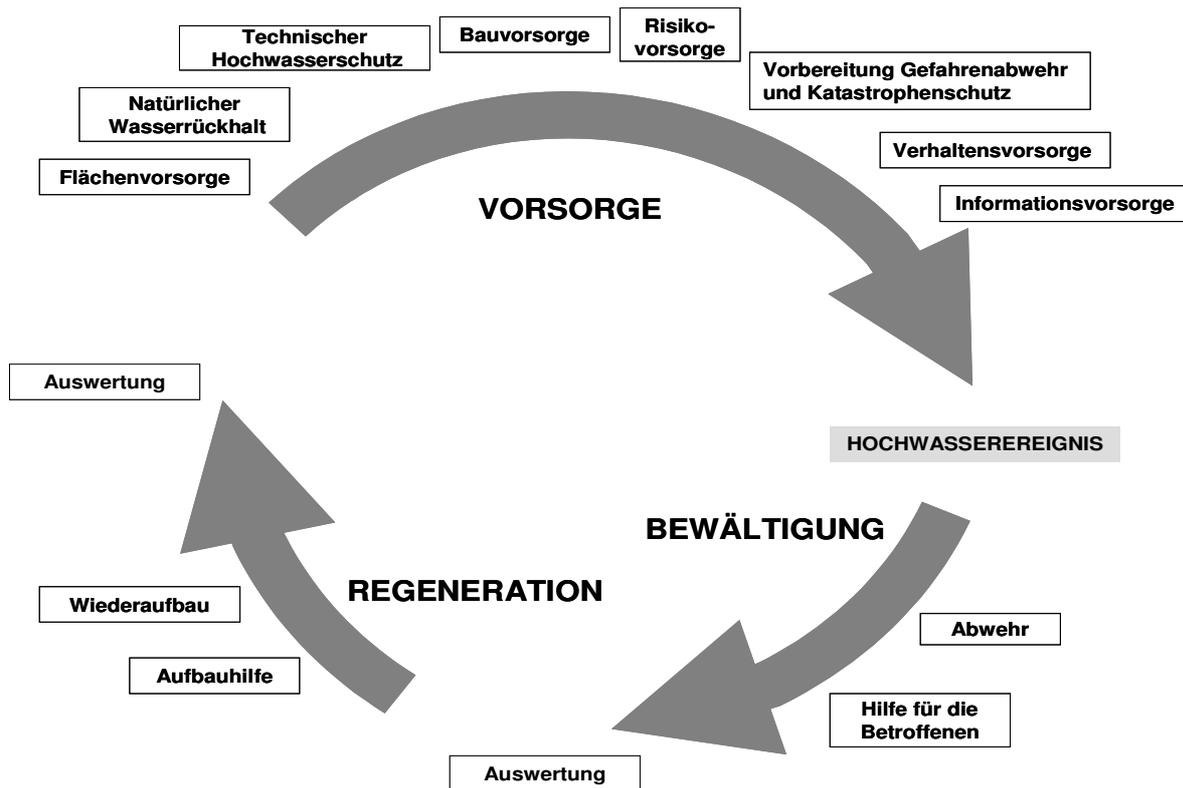


Figure 1: The flood risk management cycle

Based on the flood risk management cycle depicted in Figure 1, four basic objectives can be defined for flood risk management in general:

- Prevention of **new** risks (before a flood) in the flood risk area
- Reduction of **existing** risks (before a flood) in the flood risk area
- Reduction of adverse consequences **during** a flood
- Reduction of adverse consequences **following** a flood

Flood risk management plans should also take into account relevant aspects such as costs and benefits, flood extent, flood conveyance routes, areas which have potential to retain flood water, such as natural floodplains, soil and water management, spatial planning, land use, nature conservation, navigation and port infrastructure. The objectives of the Water Framework Directive should be taken into account in the areas of action “precautionary land use” and “natural water retention”, and should be developed further and implemented as appropriate.

3.2 Protected interests pursuant to the FRMD

The FRMD and the Federal Water Act (WHG) require that the FRM plans set out the objectives pursued by means of flood risk management for specific protected interests. These are¹:

- human health,
- the environment,
- cultural heritage, and
- economic activity and considerable material assets.

The Directive includes some references to criteria for the setting of objectives and evaluation. The relevant areas of action already adopted by LAWA should serve as a basis on which to develop measures (see Section 3.3).

3.3 Integration into LAWA's existing strategies and areas of action

The provisions on FRM plans contained in the FRMD largely accord with the LAWA Guidelines for Forward-Looking Flood Protection (1995) and LAWA's subsequent publications based on them. These continue to be relevant in substantive terms but must be harmonised with the concepts and priorities of flood risk management.

For the planning of measures in the FRM plan, the following areas of action should be applied, based on the LAWA Strategy for the Implementation of the FRMD:

a) Prevention of new risks in the flood risk area

- The area of action "**precautionary land use**" comprises measures in the fields of regional planning and area development planning, the designation of floodplains in water law, and adapted use in flood risk areas, including the adoption of the requisite legislation.
- The area of action "**natural water retention**" includes the improvement of natural retention on areas (especially agricultural and forestry land) in the catchment and the recovery of floodplains in valleys and low-lying areas via restoration of water bodies, reconnection of backwaters, management of river meadows, and similar measures.

b) Reduction of existing risks in the flood risk area

¹ The term "protected interest" is used in Section 75(2), second sentence, in conjunction with Section 73(1), second sentence, of the Federal Water Act to refer to human health, the environment, cultural heritage, economic activity and considerable material assets.

- **Technical flood protection** includes the construction or more intensive use of systems for the retention of flood water in the catchment and along water bodies (e.g. polders in bypass areas), structural measures to remove hydraulic bottlenecks and increase the flood discharge profile, the construction of dikes, dams, flood protection walls, barrages and mobile flood defences to protect built-up areas, and measures to keep the flood discharge cross-sections clear in settlement areas, especially with maintenance measures and removal of potential obstructions (e.g. bridges with poor hydraulic performance) or foreland management. It also includes physical protection of buildings, facilities, etc. at at-risk sites.
- **Precautionary building** means adapting planning and modes of construction, including the provision of architectural, engineering and artisanal services, in areas which are susceptible to flooding so that buildings are able to withstand any flood which may occur. It also includes flood-proof storage of water-hazardous substances.
- **Protection against risks** means that financial provision is made, mainly through insurance against flood damage but also the accumulation of reserves.
- **Provision of resources and preparation of hazard prevention and civil protection** includes contingency planning, resource planning, practice exercises, training for emergency services, and civil-military cooperation.
- **Precautionary behaviour** means raising awareness of flood risks in affected communities and measures to prepare for flood events.
- **Information** means flood forecasting and information and the issuing of flood warnings for all affected stakeholders.

c) Reduction of adverse consequences during a flood

- A further element of FRM, besides the preparedness measures within the above-mentioned areas of action, is **the response to the flood event**. This starts while the flood is still occurring. The relevant areas of action are “Defence against the disastrous impacts of flooding” and “Assistance for persons affected by flooding”.

d) Reduction of adverse consequences following a flood

- Recovery means assistance with post-flood repair and reconstruction (**aftercare**). The FRM plan should include provisions on the analysis of flood events that have occurred and recommendations to improve preparedness for future flood events.

As Table 1 below shows, the areas of action identified by LAWA cover all the aspects of flood risk management specified in the FRMD for the protected interests. The measures identified in the various areas of action are appropriate to mitigate or prevent risks to all the protected interests stated in the FRMD.

Area of Action	Protected Interests			
	Reduction of adverse consequences for human health	Reduction of adverse consequences for the environment	Reduction of adverse consequences for cultural heritage	Reduction of adverse consequences for economic activity
<u>Precautionary land use</u>				
- regional planning	X	X	X	X
- area development planning	X	X	X	X
- floodplains	X	X	X	X
- adapted use	X	X	X	X
<u>Natural water retention</u>				
- in the catchment	X	X	X	X
- recovery of floodplains	X	X	X	X
<u>Technical flood protection</u>				
- retention systems in the river basin	X	X	X	X
- dikes, dams, flood protection walls, barrages, mobile flood defences	X	X	X	X
- keeping clear flood discharge cross-sections in settlement areas	X	X	X	X
- physical protection of property	X		X	X
<u>Precautionary building</u>				
- flood-adapted planning and modes of construction	X	X	X	X
- flood-proof storage of water-hazardous substances	X	X	X	X
- architectural, engineering and artisanal services	X		X	X
<u>Protection against risks</u>				
- financial protection				X
<u>Information</u>				
- flood information and forecasting	X		X	X
- warning	X		X	X

Recommendations for the Establishment of Flood Risk Management Plans
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<u>Precautionary behaviour</u>				
- awareness-raising	X			X
Preparation for flood events	X			
<u>Hazard prevention and civil protection</u>				
- contingency planning	X	X	X	X
- resource planning	X	X	X	X
- practice exercises	X	X	X	X
- training for emergency services	X	X	X	X
- civil-military cooperation	X	X	X	X
<u>Flood response</u>				
- defence	X		X	X
<u>Aftercare</u>	X	X	X	X

Table 1: Areas of action of relevance to the various protected interests

4 Relevant Sectors and Stakeholders

In managing the impacts of extreme flood events, solidarity-based cooperation between the various specialised disciplines has proved its worth. Similarly, this cooperation has a key role to play in the establishment and implementation of flood risk management plans.

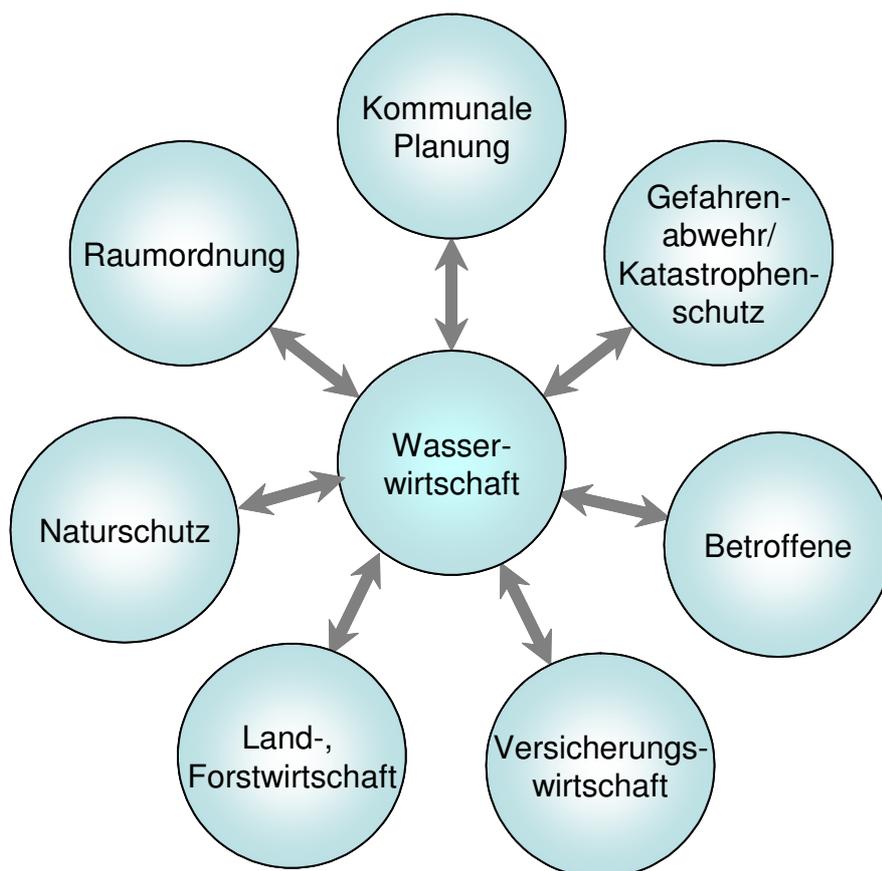


Figure 2: Agencies and stakeholders involved in the establishment of FRM plans

In accordance with their key role in flood protection, it is appropriate for the water management agencies to take the lead in initiating and then coordinating the production of the FRM plans. They raise awareness of flood hazards and flood risks in advance of a flood event and provide up-to-date flood information and forecasts. This information is then analysed jointly with the specialised disciplines.

The following sectors and stakeholders are involved in the establishment of FRM plans:

- **Spatial planning**
These agencies are responsible for preparedness as it relates to the functions and uses of land. Their task is to safeguard retention areas and improve the security of flood risk areas through the spatial planning process and, by ensuring that at-risk areas are kept clear, counteract any increase in the damage that could potentially occur.
- **Building law/local planning**
By taking account of flood hazards, building planning law and building regulations and the local planning and decision-making based on them can make a key contribution to damage reduction. Rules on damage reduction can be introduced, in particular, by incorporating relevant criteria into area development plans and building regulations.
- **Disaster and emergency planning**
These agencies are responsible for developing operational plans on the basis of strategies and for making the organisational and technical preparations to assist affected persons in the event of a flood and protect their property and the environment as far as possible. The resources required for this purpose must be kept at the ready and the emergency response practised.
- **Water management**
These agencies are responsible for technical and infrastructural flood protection along watercourses as well as for developing, technical monitoring and, if appropriate, regulating measures to improve water retention in the catchment and floodplains. In some cases, these tasks are performed by the local authorities or associations.
- **Agriculture and forestry**
Adapted management of agricultural areas, e.g. by means of a conservative approach to soil cultivation or the creation of grassland instead of cropland, together with natural forest development and afforestation, can increase water retention in the catchment.
- **Nature conservation**
With their planning, area conservation and other instruments and support programmes, nature conservation agencies can help to increase water retention in the catchment and in floodplains.
- **Stakeholders / insurers**
Stakeholders themselves (individuals, industry/commerce) and agencies concerned with land and property use, such as insurers, energy suppliers, architects and engineers, should also take account of local conditions in their planning or, if appropriate, within the framework of own provision.

The agencies responsible for the individual areas are shown in the tables in Section 5.5, and should be involved in the establishment of the FRM plans from an early stage. Where responsibilities overlap, the objectives and actions must be agreed on the basis of consensus.

5 Establishment of the Flood Risk Management Plan

In accordance with the LAWA Strategy for the Implementation of the FRMD in Germany, the following should be taken into account when drawing up an FRM plan:

- The existing flood protection concepts and plans developed by the *Länder* should continue to be implemented without delay.
- The improvement of flood risk management, including precautionary flood control measures, is a priority in the context of operationalisation, whereby due consideration must be given to the formal requirements of the Directive.

Starting with the identification of areas for which potential significant flood risks exist and the flood hazard and flood risk maps, the FRM plan is drawn up in the steps depicted in the overview below.

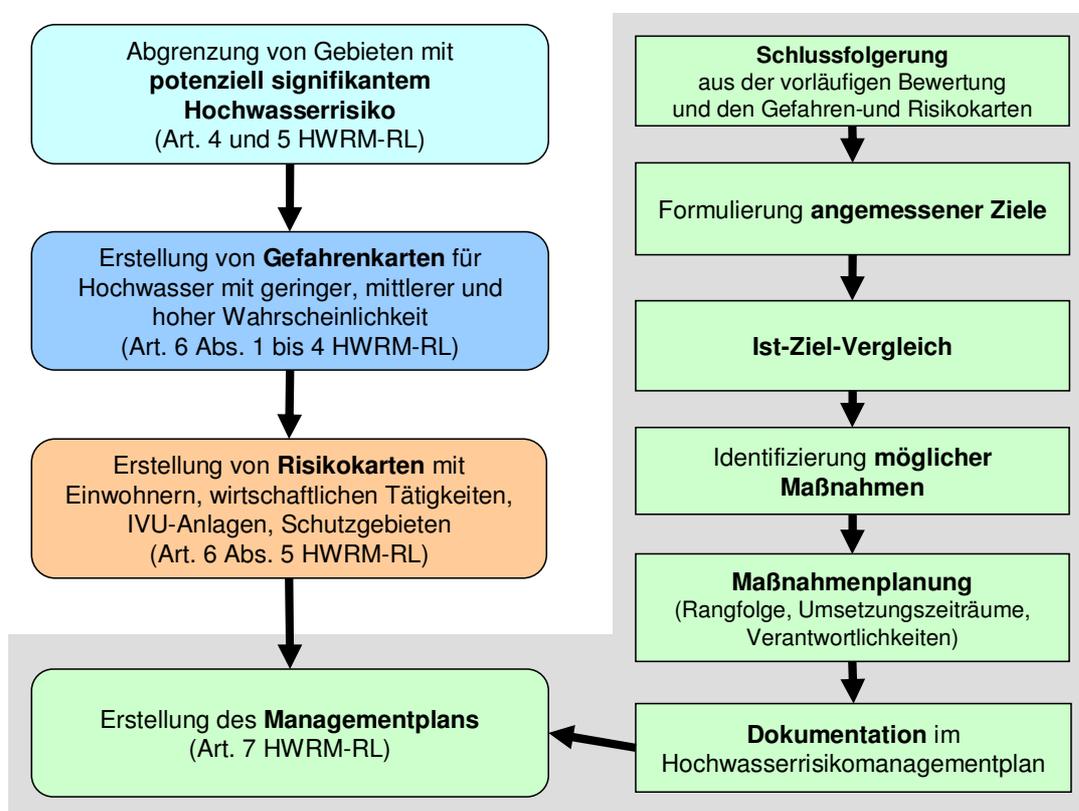


Figure 3: Establishment of a flood risk management plan

The requisite steps are outlined below.

5.1 Spatial scope of the flood risk management plans

Risk management plans are established for areas with potential significant flood risks in the river basin districts or management units. Pursuant to Section 75(4) WHG, they

must be coordinated among Member States and, pursuant to Section 75(5) of the Act, should constitute the only plan for a river basin district or management unit on German national territory, or should be coordinated where several plans exist. What this means, in practice, is that the areas covered by a plan should form a coherent unit for the purpose of flood risk management.

The further organisation in the river basin district or unit of management is a matter for the river basin associations. As with the implementation of the WFD, the river basin district or unit of management should be subdivided into smaller units for the purpose of reporting to the European Commission.

The *Länder* may further subdivide their sub-basins for operational purposes. However, coordination of objectives and actions across administrative boundaries must be ensured. The objectives and actions developed at the lower tiers are bundled at the next highest level. In order to facilitate coordination among the *Länder*, the structure described in Section 5.9 is maintained at the various levels.

5.2 Organisation of participation by competent authorities and interested parties

Pursuant to Section 79 WHG, the public must be given access to the initial assessment of the flood risk, the hazard maps and risk maps, and the FRM plans. The competent authorities should encourage active involvement of all interested parties in the production, review and updating of the flood risk management plans. The process required for this purpose must be coordinated at the level of the river basin district or unit of management and implemented by the competent authorities in the federal states (*Länder*).

Interested parties are the relevant authorities involved in the drawing up and implementation of the FRM plans, municipalities, recognised associations (e.g. agriculture and forestry, environmental associations, organisations involved in the protection of cultural assets, key representatives from trade, industry and commerce), as well as other interest groups determined on a case-by-case basis. Interested parties are involved as appropriate in the drawing up of the appropriate objectives, and the drawing up of the action plan and prioritisation.

Experience with the involvement of interested parties and the organisation of this type of process has been gained with the drawing up of flood protection concepts, flood action plans, flood protection plans and the implementation of the WFD. Based on this experience, the participatory process can be adapted to meet the specific requirements of the FRMD.

The facilitation of the drafting of the plan can be taken on by the responsible agency of the water management authorities of the *Länder*; this agency may, if required, call on external assistance with the facilitation and/or drawing up of the plan.

Where possible, information and discussion forums are used to encourage the involvement of interested parties. Where that is not possible, the interested parties

are given the appropriate information and the opportunity to submit statements regarding the draft objectives and the action plan as part of the participatory process. Existing cooperation and participatory structures should be used where appropriate.

The general public is informed about the preliminary assessment and the flood hazard and flood risk maps. It is not obligatory to provide the public with any other information. Such information is especially important where the public can make a key contribution to achieving the objectives. Corresponding measures to provide the general public with information will be included in the action plan and implementation.

5.3 Identifying appropriate objectives

Starting with the basic objectives of flood risk management described in Section 3.1, appropriate objectives are to be defined for the protected interests in the areas/water bodies with a potential significant risk (see Section 3.2). This must take account of the local situation, the type of risks identified, and existing protection systems. Depending on the local situation in the river basin or sub-basin, priorities may vary. The objectives set forth in the flood risk management plans are designed to be transparent and verifiable with regard to outcomes and take legal objectives as their basis.

In order to ensure that the participating agencies and stakeholders recognise the need for flood risk management, they must identify and implement the objectives and actions lying within their field of responsibility. The identification of objectives can therefore only take place in cooperation with the agencies responsible for the individual areas of action. For this reason, early involvement of these agencies is essential. The objectives are, as a rule, identified on a river-basin-specific basis for the risk areas in cooperation with the bodies responsible for the FRM areas of action, and are discussed and coordinated with relevant stakeholders.

In order to ensure that the process of identifying objectives is efficient, the following preparatory work must take place:

- examination and compilation of documents from the preliminary assessment of the flood risk,
- examination and compilation of documents relating to the hazard and risk maps,
- examination, assessment and compilation of documents containing other data and existing studies, especially existing flood action plans, flood protection plans and management plans under the WFD.

Based on this preparatory work, an overview is obtained of previously identified technical priorities in the area to be covered by the FRM plan.

To prepare the involvement of competent authorities and interested parties, these Recommendations contain various suggestions for objectives which may be appropriate. These can be used as a basis for discussion at consultation sessions, to the extent that the appropriate objectives are to be agreed on a decentralised basis.

5.4 Target-actual comparison

As the basis for drawing up measures, the as-is state is established and assessed in the form of target-actual comparison with regard to the risk situation and the previous handling of flood events. The target-actual comparison or the situation assessment can also be understood as determining the need for further action. The following are basic requirements for the target-actual comparison:

- Formulation of appropriate objectives,
- Survey of the river basins,
- Assessment of the flood risk, and
- Flood hazard / flood risk maps.

The Federal Water Act requires that from 2021 the FRM plans must be revised taking account of climate change and, if necessary, updated.

5.5 Identification of possible actions

The outcome of the FRM plan is a document listing the measures, identified by the competent authorities and stakeholders, which enable the appropriate objectives to be achieved. The FRM plans and therefore also the measures take account of all aspects of the flood risk management cycle. The Federal Water Act formulates the requirements to be made of these measures and their effect as follows:

- a) No measures may be included that considerably increase the flood risk in the river basin or sub-basin. Exceptions must be coordinated on a transboundary basis and agreement reached on solutions.
- b) The measures are designed such that account is taken of the objectives of flood risk management as well as the environmental objectives set out in Article 4 of the EU Water Framework Directive (e.g. non-deterioration).
- c) The measures are designed in an integrative manner, taking account of soil and water management, spatial planning, land use and nature conservation, navigation and port infrastructure (Article 7 of the EU FRMD; Section 75 of the Federal Water Act).
- d) Sustainable land use practices, improvement of water retention, as well as the controlled flooding of certain areas may also be included in the action planning.

To that end, all the key areas of action are included. Depending on the conditions and problems existing in the area covered by the FRM plan, work on the individual areas of action may vary in terms of its depth and detail. All stakeholders should have the opportunity to express their views on the topic and present their ideas. The

identification of actions is undertaken by the agency responsible for the specific sub-area of action, preferably on the basis of a consensus among all stakeholders.

The general catalogue of measures shown in Section 5.5 can be used to select relevant actions for the FRM plans at river basin and sub-basin level. Complementary measures may be agreed at regional or local level.

When selecting appropriate measures, the following approach may be adopted for each area of action:

a) Review of status quo:

Questions to be answered here include: "What is the present situation with regard to the attainment of the identified objective? Which actions are already under way? Which deficits exist?" (See also Section 5.4).

b) Identification of actions:

The question to be answered here is: "What still needs to be done in order to achieve or move closer to the objective?"

The basic idea is to list feasible actions for the FRM plan and describe their implementation in meaningful steps. The aim is to set priorities, not to work through all areas of action in full. The actions should be identified for a manageable period of time, ideally for the period until the next update of the FRM plan in 2021.

The following catalogue subdivides each area of FRM action further into sub-areas. It identifies the legal bases, the competent authorities, the scope of the review of the status quo, provides examples of appropriate actions to achieve the appropriate objectives, and sets out criteria for the prioritisation of implementation over time.

5.5.1 Precautionary Land Use

The area of action “Precautionary land use” comprises measures in the fields of regional planning and area development planning, the designation of floodplains in water law, and the safeguarding, in the plans, of adapted uses in flood risk areas.

Area of action	Precautionary Land Use
Sub-area	Regional planning
Legal bases	Federal Spatial Planning Act (ROG) and the Regional Planning Acts of the federal states (<i>Länder</i>)
Competent authorities	<i>Land</i> administration and regional planning bodies
Possible objectives	Identify floodplains and flood-prone areas in regional plans Designate all the necessary areas as Priority and Reserve Areas (<i>Vorrang- und Vorbehaltsgebiete</i>) for preventive flood protection Designate areas for planned transregional flood retention basins as Priority Areas (<i>Vorranggebiete</i>)
Review of status quo	Ascertain to what extent stretches of water with a potential significant flood risk have already been identified in regional plans (e.g. based on flood hazard maps).
Possible actions	Designate the remaining areas as Priority Areas and Reserve Areas in the regional plans
Possible implementation	Sequentially with the updating of the regional plans

Area of action	Precautionary Land Use
Sub-area	Area development planning
Legal bases	Federal Building Code (BauGB)
Competent authorities	Local authorities
Possible objectives:	<p>Take account and ensure compliance with designations in regional plans and with specialist information provided by the water management agencies when drawing up and amending area development plans; identify areas at risk of flooding</p> <p>Identify areas for planned actions for the expansion of water bodies and flood protection in the area covered by the plan</p> <p>Identify alternative areas, which are not at risk of flooding, for development in the area covered by the plan</p>
Review of status quo	<p>Ascertain to what extent, in the local authorities along affected watercourses, the area development plans identify and are geared towards flood risk</p> <p>Ascertain whether, in the land use plans, areas for expansion and protection measures have been secured</p> <p>Where there is pressure to build on at-risk areas, ascertain whether alternative sites can be made available</p>
Possible actions	Adapt and/or amend local authorities' area development plans; adopt regulations under building law in individual cases
Possible implementation	Sequentially with planned updates

Area of Action	Precautionary Land Use
Sub-area	Designation of floodplains in water law
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>)
Competent authorities	Water management agencies / water authorities
Possible objective	Designate or initially safeguard floodplains by means of land use restrictions along stretches of water with a significant flood risk
Review of status quo	Ascertain which watercourses currently have designated floodplains
Possible actions	Designate/update floodplains and develop land use restrictions on the basis of water law
Possible implementation	Sequentially with planned designations

Area of action	Precautionary Land Use
Sub-area	Adapted land use
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>), building law
Competent authorities	Local authorities, agriculture, forestry
Possible objective	Flood-adapted use in settlement areas and on agricultural and forestry land
Review of status quo	Ascertain whether existing uses along stretches of water with a significant flood risk are flood-adapted.
Possible actions	Remove/mitigate identified deficits, e.g. adaptation of infrastructure; provide advice to farmers and foresters on adapted land management Adopt provisions in water law and building law in individual cases
Possible implementation	In line with local authority planning, agriculture, forestry

5.5.2 Natural Water Retention

The area of action “Natural Water Retention” means improving natural retention on agricultural and forestry land in the catchment and the recovery of natural floodplains in valleys.

Area of action	Natural Water Retention
Sub-area	Natural water retention in the catchment
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>), building law, nature conservation law
Competent authorities	Local authorities, agriculture, forestry, water management agencies
Possible objective	Increase natural water retention in the catchment, e.g. through site-appropriate agriculture and forestry, restoration of water bodies, recovery of floodplains, rainwater infiltration and use
Review of status quo	Review of status quo tailored to the local situation/problems, e.g. agricultural land with steep gradients (flood originating areas, erosion), drained areas, or areas with forest monocultures Survey of watercourse and river meadow structures
Possible actions	Land management programme to reduce flood risk on agricultural land Land management programme to reduce flood risk on forestry land Programme to restore water bodies and river meadows Activation of former wetlands Reduction in the new sealing of soil surface without designation of compensation areas, especially at locations with increased precipitation/discharge Local programmes to reduce surface sealing and promote rainwater management in settlement areas; municipal retention systems to balance out water levels
Possible implementation	In line with the action programme; if appropriate, supported by government funding

Area of action	Natural Water Retention
Sub-area	Recovery of floodplains along watercourses
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>)
Competent authorities	Local authorities, agriculture, forestry, water management agencies
Possible objective	Recovery of lost floodplains and retention areas along watercourses
Review of status quo	Ascertain to what extent former floodplains can be recovered
Possible actions	Establishment of a programme identifying potential actions, support organisations, funding and timetable: Recovery of suitable former floodplains Removal/ re-siting of redundant flood protection installations (dikes, walls), removal of embankments Reconnection of backwaters Restoration of water bodies
Possible implementation	In line with the action programme

5.5.3 Technical Flood Protection

Technical flood protection includes the construction of systems for the retention of flood water, dikes, dams, flood protection walls, mobile flood defences to protect built-up areas, and keeping clear flood discharge cross-sections in settlement areas. It also includes physical protection of buildings, facilities, etc. at risk from flooding.

Area of action	Technical Flood Protection
Sub-area	Construction of systems for the retention of flood water in the catchment
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>)
Competent authorities	Water management agencies, water associations, local authorities, owners
Possible objective	Reduce flood discharge to target level
Review of status quo	Ascertain whether modifying or increasing the inlet control structures on existing retention systems could improve flood protection (if there is a probability of reducing the flood risk). Investigate the feasibility of creating new flood retention areas in the catchment with reference to existing studies
Possible actions	Optimised control of existing flood retention basins and reservoirs Review and construction/renovation of flood retention basins and retention systems Implementation of risk assessments in line with universally recognised technical regulations
Possible implementation	In line with the action plan; if appropriate, supported by government funding

Area of action	Technical Flood Protection
Sub-area	Floodgates, impounding dams
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>), dike law
Competent authorities	<i>Länder</i> , associations
Possible objective	Protection from storm surges/flood
Review of status quo	Inspect structures to determine whether they are designed to provide the required level of storm surge/flood protection Risk assessment of land-side sections
Possible actions	Modification of dimensions to provide requisite level of storm surge/flood protection
Possible implementation	In line with action plan

Area of action	Technical Flood Protection
Sub-area	Flood retention along watercourses in line with regulations
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>)
Competent authorities	Water management agencies
Possible objective	Reduce flood discharge to target level
Review of status quo	Review existing building programmes Ascertain whether the flood discharge can be reduced by constructing new flood retention systems or modifying the control of existing systems
Possible actions	Continuation, acceleration and/or expansion of building programmes Inspection of appropriate excavation works in alluvial zones
Possible implementation	In line with action plan

Area of action	Technical Flood Protection
Sub-areas	Dikes, flood protection walls, dams, dunes, <i>Stöpen</i> (gated thoroughfares through dikes), beach ridges, mobile flood defences
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>), dike law
Competent authorities	Federal states (<i>Länder</i>), associations, local authorities
Possible objective	Protection from storm surges / flood
Review of status quo	Inspect structures to determine whether they are designed to provide the required level of storm surge/flood protection Risk assessment of land-side sections Maintenance measures Local inspections of structures Survey to ascertain which other settlement areas should be protected by defences, taking account of economic efficiency and feasibility
Possible actions	Programme of expansion and new construction for a manageable period of time, which can and should implement the following: Reinforcement, expansion and construction of dikes and walls New construction of other static/mobile flood defence systems Identification of overloaded areas in dikes and emergency polders Backflow protection and safeguarding of inland drainage
Possible implementation	In line with the programme; if appropriate, supported by government funding

Area of action	Technical Flood Protection
Sub-area	Keeping clear flood discharge cross-sections in settlement areas
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>)
Competent authorities	Water management agencies, water associations, local authorities, owners of buildings along watercourses
Possible objective	Safeguard/improve discharge capacity in settlement areas
Review of status quo	Hydraulic bottlenecks and hazard areas are analysed on the basis of the flood hazard maps
Possible actions	Removal of bottlenecks and impediments to outflow in watercourses (bridges, culverts, weirs, other obstructions) and in the discharge area Watercourse maintenance measures, landscape management to keep flood discharge cross-sections clear
Possible implementation	In line with the programme devised for these actions

Area of action	Technical Flood Protection
Sub-area	Physical protection of buildings
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>), building regulations
Competent authorities	Local authorities, riparian landowners (property owners)
Possible objective	Flood protection for individual properties and sites already located in the flood risk area
Review of status quo	Removal of deficits. In this area of action, there is still a considerable need for action as the responsibility for the implementation of measures generally lies with individual public and private property owners.
Possible actions	Implementation of measures for the physical protection of public buildings and infrastructure. Awareness-raising, information and advice programmes on ways of protecting properties on private land and sites, with a particular focus on the security of oil tanks and water-hazardous substances in commerce and industry.
Possible implementation	Depends on the available opportunities to implement measures.

5.5.4 Precautionary Building

The area of action “Precautionary Building” means flood-adapted planning and modes of construction and also includes flood-proof storage of water-hazardous substances.

Area of action	Precautionary Building
Sub-area	Flood-adapted planning, construction and renovation
Legal bases	Building law
Competent authorities	Local authorities, affected property owners, architects involved in the planning of buildings, engineers
Possible objective	Reduce flood damage by adapting modes of construction in new-build and renovation projects (applies to existing building stock, urban regeneration areas, in-fill development and new builds, also in flood-protected areas)
Review of status quo	Removal of deficits. In this area of action, there is still a considerable need for action as the responsibility for the implementation of measures generally lies with individual public and private property owners. Awareness of risks is still low, especially in areas behind flood protection systems.
Possible actions	<p>Flood-adapted planning, construction and renovation of public buildings and public infrastructure</p> <p>Account is taken of the flood situation in urban regeneration strategies and programmes</p> <p>Awareness-raising, information and advice programmes on flood-adapted planning, construction and renovation on private land and sites</p> <p>Provision of training for the administration (building and licensing authorities) and architects on issues relating to flood-adapted construction in the public building stock</p>
Possible implementation	In line with the action programmes devised

Area of action	Precautionary Building
Sub-area	Flood-proof storage of water-hazardous substances
Legal bases	Federal Water Act (WHG) and Water Acts adopted by the federal states (<i>Länder</i>), Ordinance for Plants and Facilities Handling Water-Hazardous Chemicals (<i>Anlagenverordnung</i>)
Competent authorities	Affected property owners, industry and commerce, local authorities, energy supply companies
Possible objective	Flood-adapted handling and storage of water-hazardous substances
Review of status quo	Identification of priority areas in which the handling and storage of water-hazardous substances take place: Industry and commerce Settlement areas without a gas supply
Possible actions	Awareness-raising, information and advice programmes Conversion of the energy supply from oil to gas heating
Possible implementation	According to the environmental agencies' plans and advice programmes

Area of action	Precautionary Building
Sub-area	Architectural, engineering and artisanal services
Legal bases	If appropriate, Architects Acts and similar legislation applicable to other professions
Competent authorities	Professional bodies (chambers) of architects, engineers and trades
Possible objective	Competent advice and planning
Review of status quo	Ascertain the level of knowledge about flood-adapted planning, construction and renovation among architects, engineers and tradespersons
Possible actions	Advanced training programmes Adaptation of the university curriculum
Possible implementation	In line with the advanced training programmes established

5.5.5 Protection against Risks

The area of action “Protection against Risks” means that financial provision is made through insurance or the accumulation of reserves.

Area of action	Protection against Risks
Sub-area	Financial protection
Legal bases	Insurance law, contractual arrangements
Competent authorities	Insurers, local authorities, riparian landowners (property owners).
Possible objective	Protection against risks by means of insurance
Review of status quo	Ascertain whether the opportunity to obtain insurance exists everywhere in the risk areas and which conditions apply.
Possible actions	Awareness-raising, information and advice for affected stakeholders from local authorities, with support from insurers
Possible implementation	In line with the planned information programme

5.5.6 Information

The area of action “Information” means flood forecasting and the issuing of flood warnings for all stakeholders.

Area of action	Information
Sub-area	Flood information and forecasting
Legal bases	Water Acts adopted by the federal states (<i>Länder</i>) and related ordinances
Competent authorities	Water management agencies, local authorities
Possible objective	Provide timely information and forecasts on storm surges, flood, water levels
Review of status quo	Ascertain to what extent flood forecasts/early warnings are issued for all risk areas Ascertain to what extent regulations on the provision of flood information are in place in all risk areas, or could be beneficial For coastal areas: flood and storm surge information systems
Possible actions	Set up/improve flood information services and storm surge forecasting Create the organisational and technical parameters for flood forecasting and warning
Possible implementation	In line with action plan

Area of action	Information
Sub-area	Warning
Legal bases	Water Acts adopted by the federal states (<i>Länder</i>) and related ordinances
Competent authorities	Local authorities
Possible objective	Issue warnings for all stakeholders as early as possible
Review of status quo	Ascertain to what extent all local authorities in the risk areas have established effective warning systems to pass on flood forecasts
Possible actions	Establish/improve local warning systems
Possible implementation	In line with planned action programme

5.5.7 Precautionary Behaviour

The area of action “Precautionary Behaviour” means raising awareness of flood risks in affected communities and providing information about actions that can be taken to prepare for flood events.

Area of action	Precautionary Behaviour
Sub-area	Awareness-raising
Legal bases	Federal Water Act (WHG), Water Acts adopted by the federal states (<i>Länder</i>) and related ordinances
Competent authorities	The federal states (<i>Länder</i>) (coastal protection, water management agencies and civil protection agencies), local authorities
Possible objective	Raise awareness of flood risks in affected communities
Review of status quo	Ascertain to what extent affected stakeholders in risk areas are actively informed about flood risks
Possible actions	Local publication of hazard and risk maps Local information via the media (flood-level markers in public places, etc.)
Possible implementation	In line with planned action programme; one example is the Safecoast project “ <i>Sturmflut wat geht mi dat an</i> ” (“Storm floods – why should I care?”) already implemented

Area of action	Precautionary Behaviour
Sub-area	Preparation for flood events
Legal bases	Water Acts adopted by the federal states (<i>Länder</i>) and related ordinances
Competent authorities	Local authorities
Possible objective	Raise awareness of appropriate flood-related behaviour among affected communities
Review of status quo	Ascertain to what extent stakeholders in risk areas are actively informed about appropriate flood-related behaviour
Possible actions	Awareness-raising, advice on flood-related behaviour, also in protected areas: Publication of information materials Provision of advice by local agencies Practice exercises for flood events
Possible implementation	In line with planned action programme

5.5.8 Provision of Resources and Preparation of Hazard Prevention and Civil Protection

The area of action “Provision of resources and preparation of hazard prevention and civil protection” includes contingency planning, resource planning, practice exercises, training for emergency services, and civil-military cooperation.

Area of action	Provision of Resources and Preparation of Hazard Prevention and Civil Protection
Sub-area	Contingency planning
Legal bases	The laws on hazard prevention and civil protection adopted by the federal states (<i>Länder</i>)
Competent authorities	Local authorities, civil protection agencies and emergency services
Possible objective	Prepare detailed contingency plans for the response to flood events
Review of status quo	Ascertain to what extent the existing contingency plans need to be updated on the basis of the hazard and risk maps.
Possible actions	Updating of contingency plans, taking particular account of actions to protect the general public’s lives and physical integrity (especially evacuation plans) and key at-risk infrastructure such as <ul style="list-style-type: none"> - transformer substations, gas supply, telecommunication systems - roads, bridges.. - hospitals, schools, kindergartens, homes for the elderly... Development of information systems on flood hazard management
Possible implementation	In line with planned updating of existing systems/adoption of functioning systems already in place

Area of action	Provision of Resources and Preparation of Hazard Prevention and Civil Protection
Sub-area	Resource planning
Legal bases	Water Acts adopted by the federal states (<i>Länder</i>) and related ordinances; the laws on hazard prevention and civil protection adopted by the federal states (<i>Länder</i>)
Competent authorities	The federal states (<i>Länder</i>) (coastal protection, water management and civil protection agencies), local authorities, emergency services
Possible objective	Provide the resources necessary to manage storm surge and flood events
Review of status quo	<p>Ascertain to what extent resource planning is able to deliver the available resources to the optimum extent in an emergency. Also to ascertain whether a reliable communications system with appropriate crisis management is in place.</p> <p>Provide advice on coast protection issues (local authorities)</p>
Possible actions	<p>Optimisation of existing resource planning and crisis management systems</p> <p>Establishment of organisational structures, flood protection headquarters</p> <p>Establishment of flood brigades</p> <p>Creation of warning systems for the general public</p> <p>Provision of infrastructure and resources</p>
Possible implementation	In line with action plan

Area of action	Provision of Resources and Preparation of Hazard Prevention and Civil Protection
Sub-area	Practice exercises
Legal bases	Laws on hazard prevention and civil protection
Competent authorities	The federal states (<i>Länder</i>), local authorities, emergency services
Possible objective	Targeted preparation and instruction of rescue workers to minimise initial damage Targeted measures to prepare affected communities to react appropriately to flood events
Review of status quo	Ascertain to what extent flood practice exercises have already been carried out or are planned.
Possible actions	Implementation and evaluation of practice exercises Training for rescue workers
Possible implementation	According to the practice exercise schedule

Area of action	Provision of Resources and Preparation of Hazard Prevention and Civil Protection
Sub-area	Training of rescue workers
Legal bases	Legislation pertaining to rescue services
Competent authorities	Local authorities, civil protection agencies and emergency services
Possible objective	Deploy competent rescue workers in the event of flood
Review of status quo	Ascertain to what extent the rescue workers from the local authorities, civil protection agencies and emergency services are trained for specific deployment in the event of flood.
Possible actions	Run comprehensive training programmes and regular training events
Possible implementation	According to planned programme

Area of action	Provision of Resources and Preparation of Hazard Prevention and Civil Protection
Sub-area	Civil-military cooperation
Legal bases	Laws on hazard prevention and civil protection
Competent authorities	Civil protection agencies, the Federal Armed Forces (Bundeswehr)
Possible objective	Provide resources and rescue workers in the event of a disaster
Review of status quo	Review existing civil-military cooperation
Possible actions	Practice exercises
Possible implementation	According to planned programme

5.5.9 Flood Response

The area of action “Flood Response” is a further element of flood risk management alongside preparedness (see above-mentioned areas of action). The response begins when the flood event occurs. It initially consists of defence against the catastrophic impacts of flood, assistance for those affected, and assistance with post-flood repair, followed by reconstruction.

Aftercare – like flood preparedness – can be integrated into a plan (e.g. removal of debris, lists of experts to provide advice on structural engineering, companies specialising in aftercare, etc.). In addition, systematic analysis of the event can be carried out in order to further improve preparedness for future events.

Area of action	Flood Response
Sub-area	Aftercare
Legal bases	Updating of risk assessment pursuant to Section 73(6) WHG
Competent authorities	Federal Government, the federal states (<i>Länder</i>), local authorities, civil protection agencies and emergency services
Possible objective	Further improve flood aftercare
Review of status quo	Review flood events and evaluate experience
Possible actions	Aftercare planning Systematic review and evaluation of flood events Compilation of “best practice” examples Identification of responsibilities and tools Development and publication of manuals
Possible implementation	According to planned action programme

5.5.10 Recovery

The area of action “Recovery” begins after the event and is broken down into assistance with post-flood repair, and reconstruction. The information available in all other areas of action must be taken into account when designing appropriate actions.

Area of action	Recovery
Sub-area	Assistance with post-flood repair, reconstruction
Legal bases	EU Solidarity Fund, regulations adopted by the Federal Government and the federal states (<i>Länder</i>) such as ODER 1997, ELBE /DONAU 2002
Competent authorities	Federal Government, federal states (<i>Länder</i>), local authorities
Possible objective	Further improve flood preparedness
Review of status quo	Document and evaluate the recovery process
Possible actions	Systematic review and evaluation Compilation of “best practice” examples Identification of responsibilities and tools Development and publication of manuals
Possible implementation	According to planned action programme

5.6 Summary and prioritisation of measures

Pursuant to the provisions of the FRMD (Article 7 and Annex), the FRM plan must include a summary of the measures and their prioritisation aiming to achieve the appropriate objectives of flood risk management, including the measures taken in accordance with various other EC directives.

In accordance with stakeholders, the summarised measures are ranked according to priority. Criteria for prioritisation include, for example:

- Effectiveness with regard to achieving the objectives,
- Implementability,
- Economic efficiency (where assessable), and
- Synergy effects with other objectives (e.g. other directives).

For each measure, the responsible body and proposed timeframe for implementation are determined. It is clarified whether this is a legally regulated, mandatory task for the authority concerned (e.g. designation of floodplains) and which timeframes for implementation apply. The list should include the actions to be taken up to 2021.

The establishment of an FRM plan is a process during which specific measures are identified, but these may be prioritised very differently according to regional conditions. That being the case, no generally valid prioritisation of measures can and should be provided here. In general, the sequencing of measures should be based on the proposed timeframes for implementation, based on local conditions and feasibility, and should not be defined too narrowly.

5.7 Coordination with other directives

According to the FRMD, coordination with the WFD is essential. Pursuant to Article 9 of the FRMD, the application of the two directives should be coordinated, with a particular focus on improving efficiency, information exchange and for achieving common synergies and benefits having regard to the environmental objectives laid down in Article 4 of the WFD.

Pursuant to Annex A. I. 4 of the FRMD, the measures aiming to achieve the objectives of flood risk management should also include flood-related measures taken under the following Community acts (other than the WFD):

- Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (85/337/EEC),
- Council Directive of 9 December 1996 on the control of major-accident hazards involving dangerous substances (96/82/EC, Seveso II Directive),

- Directive of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (2001/42/EC).

5.8 Monitoring

The FRM plan must also include a description of the implementation process, including the methods by which progress with implementation of the plan is to be monitored.

As the FRM plan describes specific measures, the stage reached in the implementation process can be ascertained simply by contacting the competent authorities concerned. This takes place as part of the preparations for the next scheduled updating of the FRM plan.

5.9 Draft structure for the FRM plan

The draft FRM plan can be compiled once the above-mentioned steps have been taken, with an initial focus on the report for the sub-basin (see **Section 5.1**).

Besides the obligatory components defined in the Annex to the FRMD, the report should contain explanatory and descriptive sections so that the plan can be understood by the public at large and is suitable for publication. The following outline is based on the structure specified in the annex to the Directive.

Proposed structure of an FRM plan:

1. Introduction

- Flood risk management (general)
- Spatial scope of the FRM plan
- Competent authorities

2. Assessment of the flood risk

- Brief description of methodology used for the preliminary assessment of the flood risk and the results
- Map showing the stretches of water with potential significant flood risks

3. Description of flood hazard and flood risks

- Brief description of the content of hazard and risk maps
- Hazard map
- Risk map
- Conclusions drawn from the maps

4. Description of appropriate objectives that have been identified

- For the protected interests based on the areas of action in Table 1 (see Section 5.3)

5. Summary of measures and their prioritisation

- Ranking according to proposed implementation (see Sections 5.4 - 5.6)
- If appropriate, including the flood control measures adopted under other Community directives (see Section 5.7)
- Monitoring of progress (see Section 5.8)

6. Involvement of interested parties, provision of information for the public

- Stakeholders and interested parties (see Section 5.2)
- Strategic Environmental Assessment (SEA) (see Chapter 6)
- Information for the public (see Chapter 7)

6 Strategic Environmental Assessment (SEA)

Pursuant to Annex 3, no. 1.3 of the Act on the Assessment of Environmental Impacts (*Gesetz über die Umweltverträglichkeitsprüfung – UVPG*), which was also amended in 2009, a strategic environmental assessment must be carried out for the FRM plans. The stages in the SEA procedure and integration into the FRM development process are shown below. The SEA identifies, describes and evaluates the impacts of the proposed measures on:

1. People, including human health, animals and plants, and biological diversity,
2. Soil, water, air, climate and landscape,
3. Cultural and other physical assets, and
4. The interaction between these protected interests.

The SEA is carried out with the participation of the public. The authorities whose environmental and health-related mandates are affected must be involved and informed at an early stage. The study may be limited to those areas in which the measures are expected to impact on the above-mentioned protected interests. These areas as well as the scope of the assessment and the methodology to be applied should be determined at a scoping meeting.

Verfahrensschritte der SUP und Integration in das Trägerverfahren

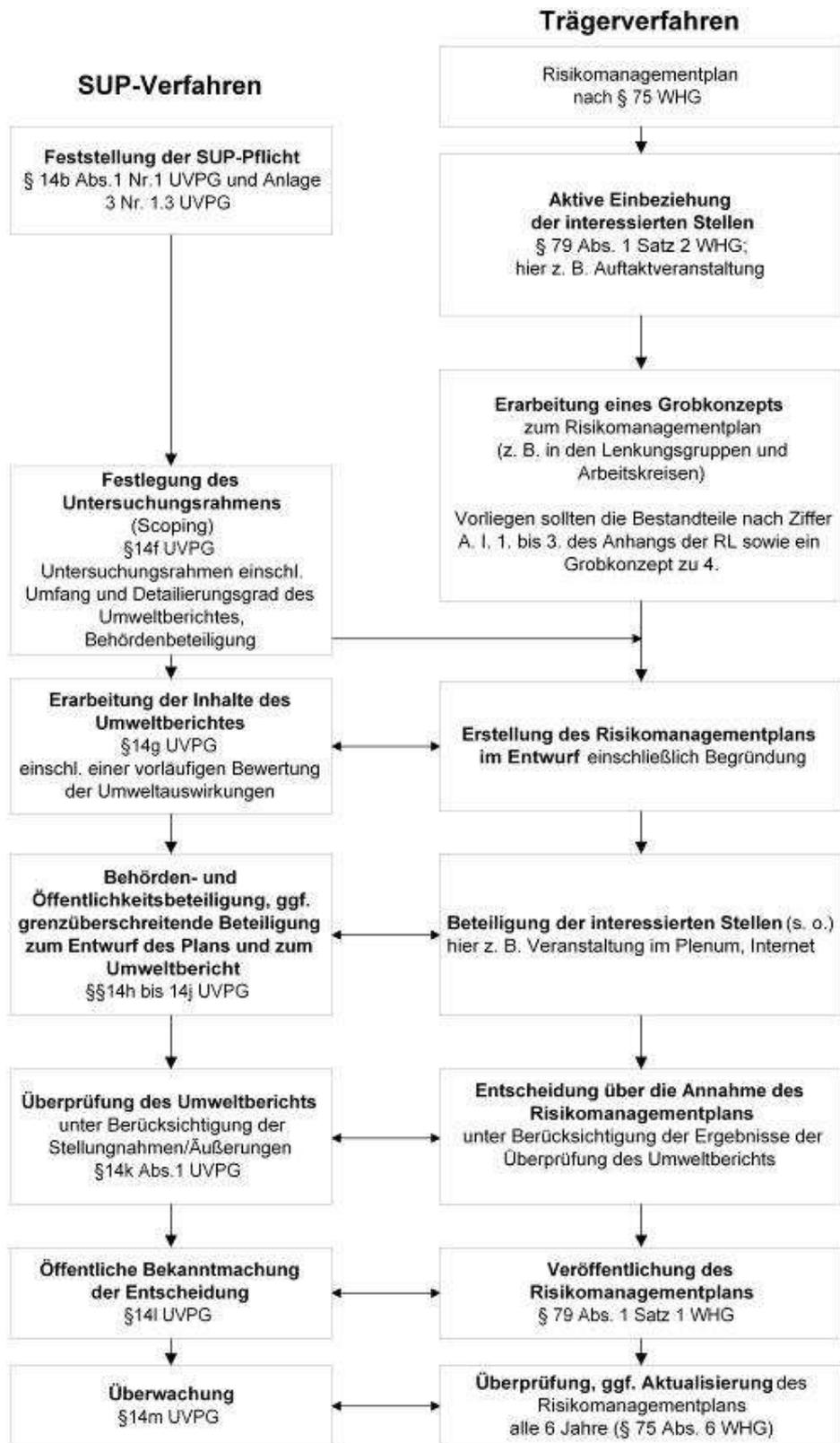


Figure 4: Stages in SEA procedure and integration into the FRM development process

7 Informing the Public

Section 79(1) WHG requires the FRM plans to be published by the competent authorities.

As with the implementation of the WFD, the general public can be informed by means of brochures, flyers, Internet presentations and events in the local authorities where larger-scale measures are envisaged.

The FRM plans are made available to the public, e.g. on the Internet, along with information showing the areas identified as having potential significant flood risks and the hazard and risk maps. An obligation to involve the public also arises from Sections 14 i and l UVPG (see above). There is also a requirement for the draft plan to be laid out for public inspection and for the plan to be published on completion of the process.

8 References

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- Gesetz zur Ordnung des Wasserhaushalts (Wasserhaushaltsgesetz - WHG) vom 31. Juli 2009 (BGBl. I S. 2585) [Federal Water Act (WHG) of 31 July 2009 (Federal Law Gazette (BGBl.) I p. 2585]
- Gesetz über die Umweltverträglichkeitsprüfung in der Fassung der Bekanntmachung vom 24. Februar 2010 (BGBl. I S. 94) [Act on the Assessment of Environmental Impacts in the version published on 24 February 2010 (Federal Law Gazette (BGBl.) I p. 94)]
- Richtlinie 96/61/EG des Rates vom 24. September 1996 über die integrierte Vermeidung und Verminderung der Umweltverschmutzung (IVU-Richtlinie) [Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control]
- Richtlinie 2000/60/EG des Europäischen Parlaments und des Rates vom 23. Oktober 2000 zur Schaffung eines Ordnungsrahmens für Maßnahmen der Gemeinschaft im Bereich der Wasserpolitik (Wasserrahmenrichtlinie - WRRL) [Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive)]
- Richtlinie 2007/60/EG des Europäischen Parlaments und des Rates vom 23. Oktober 2007 (Hochwasserrisikomanagementrichtlinie – HWRM-RL) [Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks]

Figures

Figure 1: The flood risk management cycle (see page 10)

Technischer Hochwasserschutz = Technical flood protection

Bauvorsorge = Precautionary building

Risikovorsorge = Protection against risks

Vorbereitung Gefahrenabwehr und Katastrophenschutz = Preparation of hazard prevention and civil protection

Verhaltensvorsorge = Precautionary behaviour

Informationsvorsorge = Information

Abwehr = Defence

Hilfe für die Betroffenen = Assistance for affected persons

Auswertung = Analysis

Aufbauhilfe = Assistance with post-flood repair

Wiederaufbau = Reconstruction

Flächenvorsorge = Precautionary land use

Natürlicher Wasserrückhalt = Natural water retention

Vorsorge = Preparedness

Bewältigung = Response

Regeneration = Recovery

Hochwasserereignis = Flood event

Figure 2: Agencies and stakeholders involved in the establishment of FRM plans (see page 15)

Wasserwirtschaft = Water management

Raumordnung = Spatial planning

Kommunalplanung = Local planning

Gefahrenabwehr/Katastrophenschutz = Disaster and emergency planning

Versicherungswirtschaft = Insurers

Betroffene = Stakeholders affected by flooding

Naturschutz = Nature conservation

Land-, Forstwirtschaft = Agriculture and forestry

Figure 3: Establishment of a flood risk management plan (see page 17)

Left Column:

Identification of areas with **potential significant flood risk** (Articles 4 and 5 of the Floods Directive)

Preparation of **flood hazard maps** for floods with a low, medium and high probability (Article 6(1)-(4) of the Floods Directive)

Preparation of **flood risk maps** showing the number of inhabitants, type of economic activity, installations of relevance to integrated pollution prevention and control, and protected areas (Article 6(5) of the Floods Directive)

Establishment of the **flood risk management plan** (Article 7 of the Floods Directive)

Right Column:

Conclusions drawn from the preliminary assessment and hazard and risk maps

Formulation of **appropriate objectives**

Target-actual comparison

Identification of **possible actions**

Planning of measures

(Prioritisation, timescales, competences)

Documentation in the flood risk management plan

Figure 4: Stages in SEA procedure and integration into the FRM development process (see page 51)

Left Column:

SEA procedure

Determination of the obligation to produce an SEA

§14b(1), no. 1 UVPG and Annex 3, no. 1.3 UVPG

Determination of the investigation framework

(Scoping)

§ 14f UVPG

Investigation framework, including scope and level of detail of the environmental report, participation of authorities

Drafting of the content of the environmental report

§14g UVPG

including preliminary assessment of environmental impacts

Participation of the public and authorities and, if appropriate, cross-border participation, on the drafting of the plan and the environmental report

§§14h-14j UVPG

Review of the environmental report, taking account of statements/comments

§14k(1) UVPG

Publication of the decision

§ 14l UVPG

Monitoring

§14m UVPG

Right Column:

FRM Development Process

Risk management plan

(§ 75 WHG)

Active involvement of interested parties

§ 79(1), second sentence WHG:

here, for example, via an introductory event

Development of an outline

for the risk management plan
(e.g. in steering groups and working groups)

To include the components specified in A.I.1-3 of the Annex to the Directive and a general concept based on A.I.4

Production of the draft risk management plan, including justifications

Involvement of interested parties (see above)
here, for example, via plenary event, Internet

Decision on the adoption of the risk management plan
taking account of the results of the review of the environmental report

Publication of the risk management plan
§ 79(1), first sentence WHG

Review/updating of the risk management plan
every 6 years (§ 75(6) WHG)