



Flood Risk Management in Europe: European flood regulation

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Preface

This report is the first deliverable of the EU 7th Framework Programme STAR-FLOOD (see www.starflood.eu for an outline of the project). STAR-FLOOD focuses on flood risk governance. The project investigates strategies for dealing with flood risks in 18 vulnerable urban regions in six European countries: England and Scotland in the UK, Belgium, France, The Netherlands, Poland and Sweden. The project assesses the institutional embedding of these strategies from a combined public administration and legal perspective, with the final aim of determining what forms of governance make European regions more resilient to flood risks.

Within the first Work Package of STAR-FLOOD, four reports have been prepared providing an extended problem analysis related to flood risk governance in Europe:

- i) Flood Risk Management in Europe: actual flood risks in the STAR-FLOOD consortium countries (report no D1.1.1: Green et al. 2013);
- ii) Flood Risk Management in Europe: governance challenges related to Flood Risk Management (report no D1.1.2: Dieperink et al. 2013);
- iii) Flood Risk Management in Europe: European flood regulation (report no D1.1.3: this report);**
- iv) Flood Risk Management in Europe: similarities and differences between the STAR-FLOOD consortium countries (report no D1.1.4: Hegger et al. 2013)

The four reports together aim to provide a problem analysis of flood risk governance in Europe. In so doing, they give a further specification of the scope of the STAR-FLOOD project and raise some preliminary conclusions, expectations and assumptions to be challenged in the subsequent Work Packages of the project. Furthermore, the reports identify relevant issues, questions and themes that are considered to be in need of further research and will be taken up in WP2 and WP3 of STAR-FLOOD.

Reports number D1.1.1 (Green et al. 2013) and D1.1.2 (Dieperink et al. 2013) focus on the main trends and challenges that occur. D1.1.1 discusses the nature of the flood risks as well as the developments to be expected therein (e.g. increased vulnerability due to urbanisation and climate change). D1.1.2 approaches multi-level, multi-sector and multi-actor governance challenges related to Flood Risk Management from a theoretical perspective. Report number D1.1.4 (Hegger et al. 2013) highlights essential similarities and differences between the STAR-FLOOD consortium countries. Issues addressed include the actual experiences with floods in these countries, the Flood Risk Management Strategies and Flood Risk Governance Arrangements that are in place, the competent authorities for different Flood Risk Management Strategies and their actual competences, and the way in which the discourse on flood management has actually evolved in these countries. An important message conveyed by the report is that not each strategy is feasible (appropriate) everywhere. The report also raises some preliminary assumptions regarding the factors explaining (lack of) appropriateness.

This third report (D1.1.3) focuses on European flood regulation, specifically the Water Framework Directive (WFD) and the Floods Directive (FD). The report discusses, amongst other things, the relationship between these two Directives, the normative principles the FD is based upon, as well as the transboundary issues and relevance and questions for next work packages.

Yours sincerely,

Prof. Colin Green
Leader of WP1

Prof. Peter Driessen
STAR-FLOOD project coordinator

Executive summary

In Europe, water management is moving from flood defense to a risk management approach, which takes both the probability and the potential consequences of flooding into account. In this report, we will look at Directives and (non-)EU- initiatives in place to deal with flood risk in Europe indirectly and directly. Emphasis will lie on the two Directives most specifically aimed at floods: the Water Framework Directive (WFD) and the Floods Directive (FD) – how are they related and how they have been or are implemented in the Member States (MSs)?

In February 1995, the Netherlands and France took the initiative for a discussion on streamlining the water legislation of the European Union (EU) which resulted in the creation of the WFD in 2000. The WFD provided a new system for the protection and improvement of Europe's water environment – its rivers, lakes, estuaries, coastal waters and groundwaters. Its main innovation is the requirement that water be managed in an integrated way, with river basin management as leading managing unit. Since flood protection is not explicitly addressed in the WFD, the need to clarify the role of the WFD in flood protection was put on the European agenda as early as 2003, and in 2007, the FD became a fact. The FD is to be implemented in coordination with the WFD, notably by coordinating Flood Risk Management Plans (FRMPs) and River Basin Management Plans (RBMPs).

Both the WFD and the FD reflect a shift in EU-governance. Instead of the more traditional top-down legalistic approach they emphasise the importance of more bottom up initiatives from the actors who have to implement the Directives. Combined with the expanded freedom and flexibility for national and local governments, with this new approach, the FD is the first Water Directive in EU law that does not offer an equal minimum level of protection for EU citizens. While both Directives are meant to harmonise European legislation, much flexibility on objectives and measures in the FD is left to the MSs, justified by the nature of flooding and the subsidiarity principle. This creates multi-actor, multi-level and multi-sector challenges addressed in report D1.1.2 (Hegger et al. 2013). For instance, the FD sets out general obligations for transboundary cooperation, but at the national level, the scope and distributions of duties, rights and powers of the various organizations involved should be set out in law. Other challenges identified in the literature are concrete issues related to mandatory flood risks assessments, flood risk maps, and Flood Risk Management plans, but also the involvement of the public and stakeholders, the science-policy interface, uncertainties related to climate change predictions and effects, the coordination with the WFD, the lack of safety standards, the lack of possibilities for EU citizens to rely on substantive provisions before the administrative courts and finally, transboundary aspects such as issues of scale, mismatches between national policies, the assessment of transboundary effects and division of costs related to this.

In sum, this report has clarified the development, content and implementation of the current European flood risk governance policies, possible synergies between the two most important Directives linked to floods, and identified topics and questions for more in-depth questions relevant for the next work packages, pertaining to, in no particular order, a) the level of implementation and level of ambition as well as the competent authorities in the case study countries; b) the transboundary nature of floods; c) synergies and conflicts between FD and WFD and other issues not mentioned in these Directives; d) the degree of harmonization, for instance when it comes to flood safety standards and e) the subsidiarity principle – is this conform the requirements set out in the FD? Because while current European flood regulation specified in the WFD and FD provides several potential opportunities for improving flood risk governance, it is not self-evident that all of these opportunities will materialise in all MSs.

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1.Introduction

Floods are natural phenomena but taking the right measures can reduce their likelihood and limit their impacts. In addition to economic and social damage, floods can have severe environmental consequences, for example when installations holding large quantities of toxic chemicals are inundated or wetland areas destroyed. Between 1998 and 2009, Europe suffered over 213 major damaging floods. Severe floods in 2005 further reinforced the need for resolute action. Between 1998 and 2009, floods in Europe have caused some 1126 deaths, the displacement of about half a million people and at least €52 billion in insured economic losses (EEA 2011). Although Europe already adopted the Water Framework Directive (WFD) in 2000 dealing with the integrated water management, flood protection is not explicitly addressed in it, thus as a response to these events, a European approach to flood protection was put on the European agenda resulting in first a Flood Action Programme in 2004, and later on the adoption of the Floods Directive (FD) in 2007. This marks a shift in water management – from flood defense to a risk management approach, which takes both the probability and the potential consequences of flooding into account.

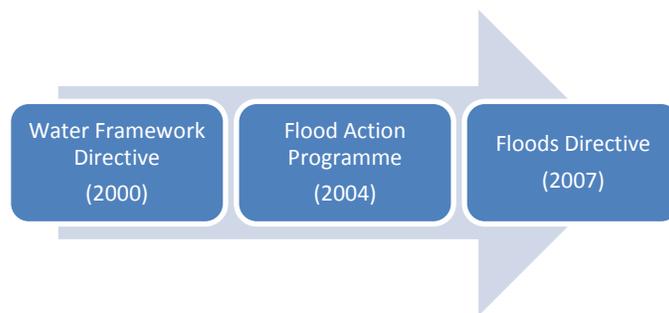


Figure 1: Sequence of Directives and events leading up to the implementation of the Flood Directive

In this report we will reflect upon Directives and (non-)EU initiatives linked to flood risk management. The focus will lie on the two EU Directives directly dealing with floods, namely the WFD and the FD; why are there two Directives dealing with floods, what are the differences in aims and objectives, the similarities and dissimilarities, and how can these be used to maximize synergies? Since the FD is explicitly set up to deal with floods, this Directive will be described in more detail, including the normative principles it is based upon as well as the transboundary issues associated with it, and we will end with a list of relevant research questions for the next work packages.

1.1 Position of this report

This report is deliverable D1.1.3 of the EU 7th Framework Programme STAR-FLOOD (see www.starflood.eu for an outline of the project). The project investigates strategies for dealing with flood risks in 18 vulnerable urban regions in six European countries: The Netherlands, Belgium, Sweden, France, Poland and The UK. The project assesses the institutional embedding of these strategies. The researchers within the project analyse this institutional embedding from a combined public administration and legal perspective, with the aim to make European regions more resilient to flood risks.

The current report is the third report from a series of reports providing an extended problem analysis related to flood risk governance in Europe. The three other reports focus on the nature of the flood risks in the STAR-FLOOD consortium countries (D1.1.1: Green et al. 2013), theoretical governance challenges related to flood risk management (D1.1.2: Dieperink et al. 2013) and Flood Risk Management in the

STAR-FLOOD consortium countries (D1.1.4: Hegger et al. 2013). The focus of the current report is on European flood regulation.

The four reports together give a further specification of the scope of the STAR-FLOOD project and raise some preliminary conclusions, expectations and assumptions to be challenged in the subsequent Work Packages of the project. Furthermore, the reports identify relevant issues, questions and themes that are considered to be in need of further research and will be taken up in WP2 and WP3 of STAR-FLOOD.

The more detailed analyses on national level governance processes (by conducting case studies, interviewing and talking to people, observing meetings and attending conferences) will be done in WP3. WP1 restricts itself to seminal literature and policy documents, general information at country level as well as the main similarities and differences between countries. In WP2 a protocol will be developed which will be applied in the case studies in WP3. WP1 provides the basis for these next steps.

1.2 Reading guide

Chapter 2 describes the history of flood regulation in the EU, touching upon the WFD. Chapter 3 focuses on the FD, its structure, principles and requirements. Chapter 4 describes the similarities and dissimilarities between the WFD and the FD, while chapter 5 specifies the transboundary aspects related to the FD. Chapter 6 brings the five chapters together with concluding remarks, and the final chapter, chapter 7, specifies relevant questions for the next work packages.

2. Flood risks on the EU agenda

Floods are the most prevalent natural hazard in Europe. Between 1998 and 2009, Europe suffered over 213 major damaging floods, including the catastrophic floods along the Danube and Elbe rivers in summer 2002 (EEA 2011). In November of 2002, triggered by these severe floods, a core group led by the Netherlands proposed a European approach to flood protection. As a result, the Water Directors of the European Union, Norway, Switzerland and the then Candidate Countries agreed to take the initiative for stern action in the field of flood prediction, prevention and mitigation. A core group led by the Netherlands and France prepared a guide on "Best practices on flood prevention, protection and mitigation" (EU 2003) thereby initiating a shift in attention from protection against floods to managing flood risks (for instance Klijn *et al.* 2008; Twigger-Ross *et al.* 2008; Hecker *et al.* 2008; Vinet 2008 and Manojlovic and Pasche 2008). The European Commission took the initiative to launch concerted action at Community level to help reduce the severity of flood events and the damage caused by these floods. In the Communication on Flood Risk Management; Flood prevention, protection and mitigation (COM (2004) 472 final of 12.7.2004) the Commission proposed to develop and implement a concerted EU Action Programme on Flood Risk Management. It proposed that the MSs and the Commission shall work together to develop and implement a coordinated flood prevention, protection and mitigation action programme (COM 2004) The issue of flood protection including the Communication from the Commission were discussed at both the Informal Environment Council on 18 July 2004 and at the Environment Council on 14 October 2004. In October the Council adopted Conclusions on Flood Risk Management (Council of the European Union 2004) and agreed that based on the Communication, the MSs and the European Commission, in the context of the regular meetings of the EU Water Directors in co-operation with other stakeholders and relevant parties, should prepare the contents of such concerted European action. The Council invited the Commission to submit an "appropriate proposal taking into account the Council conclusions and the work of the Informal meeting of the Water Directors, preferably before mid-2005". Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, in short Directive 2007/60/EC or Floods Directive (FD) was proposed by the European Commission on 18 January, 2006. After a short period of consultation covering details of the draft FD and resulting modifications, the proposal was officially adopted on 23 October 2007 and published in the Official Journal on 6 November 2007 (Mostert & Junier 2009).

2.1 Water Framework Directive & Flood Risk Management

The need for developing a more comprehensive European water legislation was already identified by the Council in 1988. In February of 1995, officials of France and the Netherlands met bilaterally to discuss the integration of European water policy legislation. Following an informal meeting in April 1995 between the Netherlands, France, Germany, the United Kingdom and Spain, a joint position paper was drafted, which served as the basis for a wider consultation between water directors of all EU MSs. This process resulted in the adoption of "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, OJ 2000, L 327/1", in other words the Water Framework Directive or WFD, on 22 December 2000. The WFD provided a new system for the protection and improvement of Europe's water environment – its rivers, lakes, estuaries, coastal waters and groundwaters. Its main innovation is the requirement that water be managed in an integrated way and based on a river basin approach, one of the main challenges described in report D1.1.2 (Dieperink *et al.* 2013).

The implementation of the WFD is based on the idea of river basin management; River Basin Management Plans (RBMPs) play a central role in the WFD. These plans should enable achieving good water quality for each river basin (Moss and Monstadt 2008) and be construed on the basis of a detailed analysis of the pressures on the water bodies located in the river basin (Moss and Monstadt 2008). The plans are based on a detailed analysis of the impacts of human activity on the water environment and set environmental objectives for all groundwaters and surface waters (including transitional waters and coastal waters) within each river basin district (Art. 5 of the WFD). The first RBMP were due to be adopted by the end of 2009 and then updated every 6 years thereafter. The current status of the implementation of the RBMPs per MS, as well as other official EU WFD country reports can be viewed here http://ec.europa.eu/environment/water/participation/map_mc/map.htm (last accessed May 2013).

While a stated goal of the WFD is to reduce the impact of floods, however, flood protection is not explicitly addressed in the WFD, but the necessity for such requirements had been evident for several years. With regards to the overall goal of the WFD, the implementation of the WFD was seen as an opportunity to optimize sustainable flood protection with an ecological orientation (Dworak and Hansen 2003) but because it was not explicitly mentioned as such in the WFD, the need to clarify the role of the WFD in flood protection was put on the European agenda in 2003 (Dworak et al. 2003).

Box 1: EU policy documents and (non-) EU-initiatives related to flood risk management

Next to the Directives discussed in this report, there are numerous other policy initiatives taken all over the world dealing with flood risk management. This textbox provides a short and therefore by no means intended to be exhaustive overview of a such initiatives. First, certain UN initiatives are discussed, then some EU initiatives will be described.

UN International Strategy for Disaster Reduction (UNISDR)

The UN General Assembly adopted the International Strategy for Disaster Reduction in December 1999 and established UNISDR, the secretariat to ensure its implementation. UNISDR, the UN office for disaster risk reduction, is also the focal point in the UN system for the coordination of disaster risk reduction and the implementation of the international blueprint for disaster risk reduction - the "Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters" (see next paragraph). UNISDR currently has several campaigns, amongst which 'Making cities resilient' which aims at engaging all stakeholders (national governments, local government associations, international, regional and civil society organizations, donors, the private sector, academia and professional associations as well as every citizen) in reducing their risk to disasters such as floods. For more information on the UNISDR and their campaigns, please visit <http://www.unisdr.org/> (last accessed 11 June 2013).

Hyogo Framework for action

In January 2005, 168 Governments adopted the Hyogo Framework for Action 2005 – 2015: Building the Resilience of Nations and Communities to Disasters. This 10-year plan goal is to make the world safer from natural hazards at the World Conference on Disaster Reduction, held in Kobe, Hyogo, Japan. The HFA is a global blueprint for disaster risk reduction efforts during the next decade. Its goal is to substantially reduce disaster losses by 2015 – in lives, and in the social, economic, and environmental assets of communities and countries. The Hyogo Framework offers guiding principles, priorities for action, and practical means for achieving disaster resilience for vulnerable communities. Responsibilities for monitoring the HFA are assigned mainly to governments, but they are also identified for regional

organizations and institutions, international organizations and partners in the International Strategy for Disaster Reduction secretariat (UNISDR).

The HFA has obvious links to flood risk management, since floods are one of the main hazards affecting millions of people all over the globe every year. Together with the HFA, the FD are two key policies designed to help protect communities at risk. So far, at the regional level, the cross-border cooperation required by the FD has proven to be both a challenge and an opportunity to countries and regions to mobilize resources and coordinate efforts. Countries reported that economic constraints limited such disaster risk reduction activities (UNISDR 2012).

6th Environmental Action Programme

The Sixth Environmental Action Programme (6EAP) – Environment 2010: Our Future, Our Choice – was published in 2002. The 6EAP effectively sets the environmental objectives and priorities that will be an integral part of the EU Sustainable development Strategy. The programme sets out the major priorities and objectives for environmental policy over the next five to ten years and details the measures to be taken. Flood management strategies could potentially have a range of environmental impacts; building dams for instance changes natural river flows and reduces water for related ecosystems, thereby influencing the biodiversity – which links the FD and the 6EAP.

European adaptation strategies

Addressing climate change requires two types of response. Firstly, and importantly, the greenhouse gas emissions (GHG) (i.e. take mitigation action) need to be reduced and secondly, the EU encourages the MSs to develop adaptation actions to deal with the unavoidable impacts. Regarding water, a number of existing EU policies contribute to adaptation efforts. In particular, the Water Framework Directive (WFD) establishes a legal framework to protect and restore clean water across Europe by 2015 and to ensure the long-term sustainable use of water. The River Basin Management Plans due in 2009 under the Directive may take into account the impacts of climate change and the aim is to have the next generation of plans due in 2015 fully climate-proofed. However, it should be noted that the WFD does not refer to climate change. In addition, it is advisable to integrate climate change properly in the implementation of the FD. Full implementation of this Directive by the EU MSs will help increase resilience and facilitate adaptation efforts.

While the FD is seen as potentially direct responses to the need for adaptation, it is important to note the distinct difficulty in determining the impact on flooding that can be specifically attributed to anthropogenic climate change (some argue that it is unnecessary to determine the extent to which climate change is anthropogenic (an argument that can be derived from the work of Pielke (2011)). As pointed out in the FD itself, floods are considered natural phenomena that are caused by multiple factors, only one of which is climate change (EU Directive 2007/60/EC).

EU Strategy on adaptation to climate change

The European Commission adopted an EU strategy on adaptation on 16 April 2013. The overall goal is to support coherent, multi-level, multi-sector integrated adaptation policies in the EU. The strategy specifically states that the “Commission will promote adaptation particularly in the following vulnerable areas: - cross-border management of floods, fostering collaborative agreements based on the EU Floods Directive” (COM(2013) 216 final). The official document can be found at http://ec.europa.eu/clima/policies/adaptation/what/docs/com_2013_216_en.pdf (last accessed 11 June 2013).

Common Agricultural Policy (CAP)

The CAP is the agricultural policy of the EU. Its main objectives are to ensure a fair standard of living for farmers and to provide a stable and safe food supply at affordable prices for consumers. In 2000, the Rural Development Policy, also known as the "second pillar" of the CAP, was introduced. This policy concerns three main areas, one of which is the improvement of the environment and the countryside through support for land management as well as helping to fight climate change. Such projects could for example concern planting trees to lessen the impact of floods or even prevent them.

INTERREG

INTERREG IVC provides funding for interregional cooperation. The overall objective of the INTERREG IVC Programme is to improve the effectiveness of regional policies and instruments. The FD requires regional plans, therefore INTERREG can play an important role in the process. For more information, please visit <http://www.interreg4c.eu/> (last accessed 11 June 2013).

Blueprint for Water

The Blueprint to Safeguard Europe's Water Resources has been issued in November 2012. It outlines actions that concentrate on better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular as regards water quantity and efficiency. As part of the Fitness Check, the entire relevant body of legislation – including the WFD and the FD – has been analyzed to identify potential improvements.

To deal with the increase in vulnerability against flooding, the Flood Risk Management Plans (FRMPs) that should be developed by 2015, should bring about improved land use and spatial planning, accounting for climate change, resilience and adaptation needs. From a freshwater policy point of view, special attention needs to go to Flood Risk Management measures like restoring floodplains and wetlands and reducing soil sealing. These measures may contribute to flood safety, drought prevention, as well as water quality and ecology. Therefore, they should be included in both RBMPs (WFD) and FRMPs (FD) and become a priority for financing under the CAP, Cohesion and Structural Funds.

Box 2: CIS Working Group F

Both the implementation of the WFD and the FD raises common technical challenges for the different actors involved. In addition, many of the European river basins are international, crossing administrative and territorial borders and therefore a common understanding and approach is paramount in order to implement the WFD and FD successfully and effectively.

Five months following the entry into force of the WFD, the MSs, Norway and the Commission agreed upon a Common Implementation Strategy (CIS) for the WFD. In December 2006 EU Water Directors established a Working Group on Floods, which reports to the Strategic Coordination Group and the Water Directors (Water Directors 2007). Working Group F will coordinate with other activities in the CIS, taken into account the strong need for coordination, the implementation between the WFD and the FD and the important role of floods in relation to other WFD related activities (such as the strategic steering group on Climate change, drafting groups on exemptions and hydro-morphology as well as WG D on reporting) (Water Directors 2007).

One core objective of the group is to provide a platform for dialogue and support of the implementation of the Directive, in particular focusing on the formal requirements of the FD on developing reporting formats, and the related requirements of the Water Framework Directive (i.e. on heavily modified water bodies, exemptions, water service cost recovery, accidental pollution prevention). Moreover, such cooperation will foster more integrated river basin management and could be seen as a response to multi-actor and multi-level challenges posed by flood management. The other core objective is information exchange. As recognized through the fruitful and successful information exchange between MSs in the Exchange circles on Flood forecasting and on Flood mapping, there is a strong need to further promote information exchange to enable MSs to learn from each other's' good practices and experiences of Flood Risk Management. Continued information exchange will be vital part of preparing the implementation of the FD.

3. Floods Directive

The EU Directive on the assessment and management of flood risks (2007/60/EC), often referred to as the Floods Directive or FD, entered into force on November 26, 2007. The main aim of the FD is to reduce and manage the risks posed by floods to human health, the environment, cultural heritage and economic activity. The MSs are required to follow a certain process, described in §3.1, coordinate their Flood Risk Management practice in shared river basins, and should not undertake measures that would increase the flood risks in neighbouring countries (the solidarity principle, see §3.4.2). In addition, the implementation of the FD should be carried out in coordination with the implementation of the WFD, especially through the coordination of the FRMPs and the RBMPs, and through coordination of the public participation procedures in preparation of these plans – the coordination of these two Directives is discussed in the next chapter, chapter four, of this report.

Box 3: Definitions used in Floods Directive

Floods are defined as “the temporary covering by water of land not normally covered by water including floods from rivers, mountain torrents, Mediterranean ephemeral water courses, floods from the sea in coastal areas”. Particular cases such as pluvial floods, floods caused by groundwater and reservoir dam breaks are also included; floods from sewerage systems may be excluded. This does not mean that these risks cannot be incorporated in the flood hazard maps; Scotland, for instance, is preparing flood hazard maps with areas of risk of a 100-year return period flood from rivers or coasts, including surface water, groundwater and drainage or sewage flood risks.

As Van Rijswick & Havekes (2012) note, though: “The question arises whether the inundation of floodwater storage areas or emergency flooding areas to avoid floods elsewhere is covered by the definition of flood. However, in the preamble floods are described as natural phenomena which cannot be prevented and which can cost lives, cause people to flee, cause harm to the environment, seriously jeopardize economic development and disrupt economic activity in the European Union. For this reason the construction and use of floodwater storage areas and emergency flooding areas can be seen as a management measure for preventing floods”.

Note that in 2006, it was proposed by the General Secretariat that the definition of “flood” should be narrowed. According to the proposed definition the flood means even very short-term (for example, just several minutes) covering of land by water or very narrow area of land covering by water (for example, only half of meter). A possible modification of proposed term “flood” was to link this definition with a significant rise of water level above normal water body level (lake, river or sea). Otherwise, it would be impossible to fulfil the requirements set out in Article 4 (to make the description of the floods which have occurred in the past or could be forecast in the future and so on). The suggestion was not followed. See http://www.europa-nu.nl/id/vi7jgtag5py2/proposal_for_a_directive_of_the_european#p2

Flood risk is defined as “a combination of probability of a flood event and of the potential adverse consequences for human health, environment, cultural heritage and economic activity associated with a flood event”. Flood risk and hazard mapping will be performed between 2011 and 2015, including the use of flood scenarios.

River means a body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course.

River basin means the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.

River basin district means the area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is identified as the main unit for management of river basins.

Competent authority: Member States shall ensure the appropriate administrative arrangements, including the identification of the appropriate competent authority, for the application of the rules of this Directive within each river basin district lying within their territory.

Transitional waters are bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.

3.1 Three stages

The FD requires that wherever a significant flood risk is identified, maps must be drawn up to show the potential extent and consequences of flooding. On the basis of these maps, MSs must then establish a Flood Risk Management plan with the aim of reducing the risk to an acceptable level. Within the plan a wide range of methods can be taken to achieve this goal, depending on the nature and scale of the issues (Watson, 2011). To aid in this process, the FD contains a three-stage approach: first, a preliminary flood risk assessment must be undertaken, then flood hazard maps and flood risk maps are to be prepared and in the final stage, MSs must establish Flood Risk Management plans.

Stage I: Preliminary flood risk assessment (Articles 4 and 5 of the FD)

The first stage of the FD has come and gone: a preliminary flood risk assessment had to be carried out by the MSs for each of their river basin districts by 22 December 2011. The assessment had to be based on available or readily derivable information, such as records and studies on long-term developments. The assessment of the potential adverse consequences of future floods, which cannot be derived from floods that have occurred in the past, was optional. Art. 13.1 of the FD contains an exception to this obligation. MSs could decide not to undertake a preliminary flood risk assessment in two cases: first for the areas for which the MS had already undertaken a risk assessment and concluded, before 22 December 2010, that a potential significant flood risk exists or can be expected and second, for the areas for which the MS had decided, before 22 December 2010, to prepare flood hazard maps, flood risk maps and Flood Risk Management plans (Van Rijswijk & Havekes 2012; Mostert & Junier 2009). The preliminary flood risk assessment has to be reviewed, and if necessary updated, by 22 December 2018 and every six years thereafter (Article 14.1 of the FD).

Stage II: Flood hazard maps and flood risk maps (Articles 6 and 7 of the FD)

The second stage, which has to be completed by 22 December 2013, is the drafting of flood hazard maps and flood risk maps for the areas with potential significant flood risks. These maps must be reviewed, and if necessary updated, by 22 December 2019 and every six years thereafter (Art. 14.2 of the FD). The flood hazard maps cover geographical areas, which could be flooded according to the following three scenarios (Art. 6.3 of FD):

1. Floods with a low probability, or extreme event scenarios;
2. Floods with a medium probability (likely return period ≥ 100 years), and
3. Floods with a high probability, where appropriate.

For each scenario the maps must show information on: a) the flood extent, b) water depths or water level, as appropriate and c) where appropriate, flow velocities or the relevant water flow.

Whereas the flood hazard maps only show the probability of flooding and the hydrological situation in event of such a flood, the flood risk maps identify the potential adverse consequences in these three scenarios. The flood risk maps are expressed in terms of (Art. 6.5 of the FD and Van Rijswijk & Havekes 2012; Mostert & Junier 2009):

- a. The indicative number of inhabitants potentially affected;
- b. Type of economic activity of the area potentially affected;
- c. The IPPC (integrated pollution prevention and control) installations (installations as referred to in Directive 96/61/EC) which might cause accidental pollution in case of flooding, and potentially affected protected areas designated under the WFD (now: Industrial Emissions Directive);
- d. Other information which the MS considers useful, such as the indication of areas where floods with a high content of transported sediments and debris floods can occur and information on other significant sources of pollution.

De Moel *et al.* (2009) point out that a number of countries have good starting points to map their national flood hazards, but that very few countries have maps that include detailed information on the consequences of flooding. Maps currently available are mostly used for emergency and spatial planning, but flood zones in these maps serve mainly as guidelines. Where it is legal to regulate floodplain development using flood zones (France and Poland for instance; see report D1.1.4: Hegger *et al.* 2013), the practical problems encountered limit the mitigating effects of such binding legislation.

In addition, producing flood risk maps is expensive and depends on availability of data. As a consequence, the ability to produce flood risk maps differs significantly between countries due to differences in knowledge and the availability of technical infrastructure for data gathering and exchange, modelling and mapping, and financial resources (http://www.unece.org/fileadmin/DAM/publications/oes/Transboundary_Flood_Risk_Management_Final.pdf, accessed 12 June 2013).

Stage III: Flood Risk Management plans (Articles 7 and 8 of the FD)

The third stage contains the preparation of Flood Risk Management plans. These plans must be completed and published by 22 December 2015 and be reviewed, if necessary updated, by 22 December 2021 and every six years thereafter (Art. 14.3 of the FD).

The MS must establish Flood Risk Management plans for each river basin district. The basis of the plans should be provided by the flood hazard maps and the flood risk maps. In the Flood Risk Management plans the MSs have to establish “appropriate objectives for the management of flood risks” for the areas with potential significant flood risks. The focus hereby must be on “the reduction of potential adverse consequences of flooding for human health, the environment, cultural heritage and economic activity, and, if considered appropriate, on nonstructural initiatives and/or on the reduction of the likelihood of flooding”. The measures for achieving these objectives must also be included in the plans.

Where international river basin districts (IRBDs) fall entirely within the territory of the EU, the MSs should aim to draft a single international Flood Risk Management plan, or a set of Flood Risk Management plans coordinated at the level of the IRDB (Art. 8.2 of the FD). However, if the MSs are not

able to produce such plans, they should produce Flood Risk Management plans covering the part of the IRBD located within their territory, and as far as possible coordinated at the level of the IRBD (Art. 8.2 of the FD). For more on IRBDs, see chapter 5.

Further guidance on the content of these plans is provided in Art. 7.3 of the FD. It stipulates that relevant aspects (for example cost and benefits) must be taken into account, and that the plans have to address all aspects of Flood Risk Management, hereby focusing on prevention, protection and preparedness, and including flood forecasts and early warning systems (http://www.unece.org/fileadmin/DAM/publications/oes/Transboundary_Flood_Risk_Management_Final.pdf, accessed 12 June 2013). This can be seen as an incentive to address multi-actor and multi-sector challenges as identified in report D1.1.2. The 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” (ibid). Rescue and recovery measures are not explicitly mentioned in Art. 7.3 of the FD, but it seems best that these are also included in the plans (Van Rijswijk & Havekes 2012; Mostert & Junier 2009).

3.2 Public participation during the three phases

Article 10 of the FD states that “In accordance with applicable Community legislation, Member States shall make available to the public the preliminary flood risk assessment, the flood hazard maps, the flood risk maps and the flood risk management plans.” Furthermore, “Member States shall encourage active involvement of interested parties in the production, review and updating of the flood risk management plans”. Thus, public participation can and ought to take place during every phase of the implementation of the FD. The format in which this should take place, however, is not specified. For more on this, see §3.2

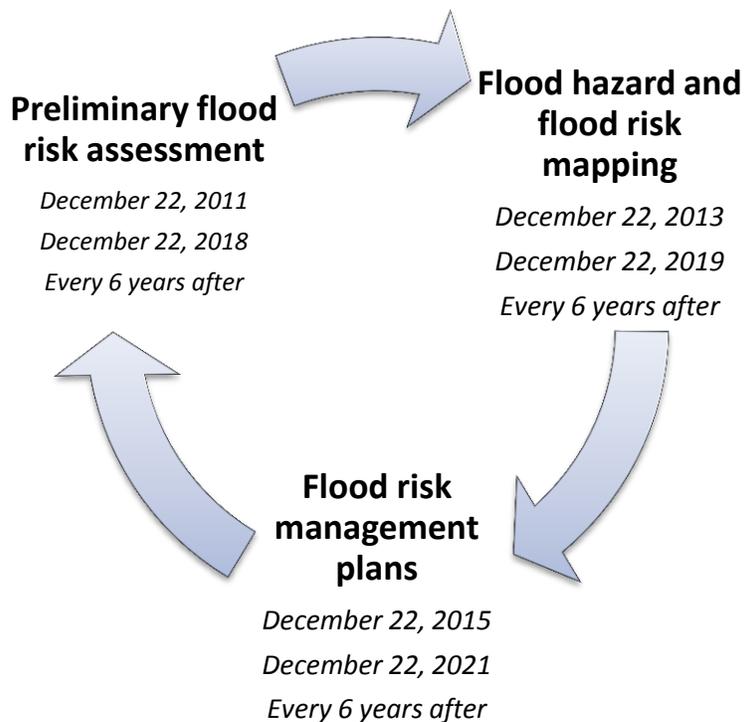


Figure 2: the Floods Directive planning cycle. Adapted from: Stowa (http://deltaproof.stowa.nl/Publicaties/deltafact/Floods_Directive.aspx?pld=28; last accessed 11 June 2013).

The products mentioned above and in Figure 2 are compulsory, except for the obligation to make preliminary flood risk assessments in case a MS chooses to directly make flood hazard and flood risk maps, and the FD also defines regulations which must be reflected in the development of these products, as well as the implementation of objectives and measures (Art. 6 and 7 of the FD):

- catchment basin approach: flood risks are to be considered for the entire catchment basin;
- safety chain: measures must address the reduction of risks, reducing probability and/or consequences, crisis management and aftercare (prevention, protection and preparedness);
- risk approach: objectives and measures are based on an assessment of the flood probability and the potential consequences of a flood event;
- integration: the flood risk assessment and the preparation of the Flood Risk Management Plans should take into account other EU directives and the consequences of climate change, and
- solidarity or non-transference of risk: Member States should refrain from measures that would increase the risk of flooding in other Member States, unless these measures have been agreed upon among the Member States (see §3.4.2)

3.3 Stakeholder participation requirement

The Aarhus Convention (1998) grants the public rights and imposes on Parties and public authorities obligations regarding access to information and public participation and access to justice; it forges a process for public participation in the negotiation and implementation of international agreements (for more on this, please visit <http://www.unece.org/env/pp/introduction.html> last accessed May 2013). The WFD came into being when the Aarhus Convention was already signed and in the process of ratification, hence the MSs and the EU decided to implement the Aarhus provisions directly into the WFD with regard to access to information and participation. These provisions are quite detailed (WFD, Art. 14). The FD entered into force however after the Aarhus Directives on information and participation came into being, resulting in the exclusion of the FD from the scope of the Aarhus Directives. Instead, the FD procedure should be coordinated with the WFD procedure after the first flood management plan period. This is stated – with a reference to the WFD – in Art. 9 of the FD: coordination with Directive 2000/60/EC, public information and consultation. The phrase “public participation” does not appear in the FD, but it does aim for “active involvement of all interested parties” (Art. 9.3), but should a good stakeholder engagement process comes up with an answer which is inconsistent with the text of one of the Aarhus Directives, it would be necessary to reject the results of the stakeholder engagement and to try again to come up with an answer consistent with that Directive through a stakeholder engagement process. The implementation of the Aarhus Convention in the EU Directives is more problematic when it comes to the requirements of access to justice.

But while the FD offers citizens, as well as businesses and governments, a clear overall understanding of possible flood risks (vulnerable areas and potential damage), there is at the same time lack of possibilities for EU citizens to rely on substantive provisions before the administrative courts (Van Rijswijk et al. 2010).

3.4 Other requirements

The FD requires the creation of the flood risk maps and the Flood Risk Management Plan, but the EC does not enforce realization of these plans. The FD does not have robust requirements regarding restoration after flooding, nor for protection, spatial planning, flood mitigation, or for flood preparation.

Flood risk maps however hold the promise of assisting in the creation of more sustainable spatial planning.

Because the FD does not mention any specific measures, the way in which flood management is handled still strongly depends on the national approaches. Thus, some published hazard maps show areas protected by levees as not being in the flood plain and therefore suffer from a shortcoming: neither residual risk from larger floods, nor the risk from levee failure, is reflected on such flood hazard maps. Maps may for instance also not show the residual risk associated with the possible failure of hydraulic infrastructures. According to some experts, such flood hazard maps can create a misperception of the actual risk, which in turn can have severe implications both for risk perception and preparedness (Llobot and Kondolf 2012).

The FD is demanding regarding topographic data of high accuracy and socio-economic data (not easily available for every river basin) (Tsakiris et al. 2009), but the choice of flood exceedance probability, i.e. the safety standard, is left to the MSs; the FD only mentions three probabilities of flooding (high, medium, low), see also 3.1.

The FD does require that in addition to economic damage and casualties, health effects, environmental effects and effects on cultural heritage of flooding, should be given attention (a multi-sector and multi-actor challenge, see report D1.1.2: Dieperink et al. 2013). There is, however, limited experience with assessing these other effects (Mostert & Junier 2009).

MSs have been given significant amounts of flexibility in setting the appropriate objectives (cf. recital 10), but once a MS sets the objectives, it is not clear how binding these objectives are. Art. 7.3 of the FD specifies that the plans should include measures “for achieving the objectives”, which suggests that the objectives are binding. Art. A.1.4 of the Annex to the FD however, says that the plans should contain “a summary of the measures and their prioritization aiming to achieve the appropriate objectives”. Mostert & Junier (2009) correctly conclude that “aiming to achieve” is less strict than “for achieving”, and “prioritization” implies that some measures get a lower priority. They furthermore notice that Art. B.3. of the Annex explicitly states that the updated Flood Risk Management Plans “should contain a description of and an explanation for the measures that were planned but not implemented” which may be good excuses not to implement them at all. However, Art. B.4 of the Annex also provides the possibility of implementing measures that were not foreseen (Mostert & Junier 2009).

3.5 Normative principles of the FD

The FD rests on two guiding principles: subsidiarity and solidarity. Subsidiarity is expressed, for example, by the responsibility of the MSs to determine acceptable risk levels; solidarity by the call for cooperation between MSs as for instance in the international Flood Risk Management Plan and not to choose measures that may have negative effects for flood risks in other MSs within the same river basin.

Other principles embedded in the EU environmental policies, and thus indirectly relevant for the FD, are the solidarity principle and the precautionary principle.

3.5.1 The subsidiarity principle

MSs must make the proper administrative arrangements, including the identification of the appropriate competent authority, for the application of the rules of the FD. In addition, the principle of subsidiarity, entailing that matters should be handled by the least centralized authority capable of addressing the

matter at hand successfully, is embedded in Art. 5 of the Treaty on the Functioning of the European Union (EU 2008). While not included in the final text of the FD, but mentioned on the Proposal proceeding the FD (EC 2006), the reason to develop the FD in the first place was that, due to the often transboundary nature of floods, purely national approaches to Flood Risk Management are neither technically nor economically feasible, and a common framework is needed to establish common approaches. It is further underlined that very detailed objectives for flood protection and, the determination of measures adequate to achieve the objectives and deadlines are not to be defined at the EU level because of the subsidiarity principle and the fact that for water quantity management and land use planning other voting procedures are required.

However, certain authors are of the opinion that the requirements set out in the FD, whereby MSs should develop plans for assessing flood risk and ensuring flood management in regions vulnerable to flooding, is not in conformity with the principle of subsidiarity (Stoibe 2006). Indeed, in this line of reasoning, the involvement of the EU should be limited to cross-border catchment areas because this is where the EU legislation is more appropriate to achieve the goals than an individual MS.

3.5.2 The solidarity principle

The solidarity principle is strongly reflected in the FD: MSs should be encouraged to fairly share responsibilities with regard to Flood Risk Management along watercourses (Recital 15 of the FD). By analogy, the importance of solidarity in Flood Risk Management is equally reflected in the international guidelines and regulations for Flood Risk Management, as set out by the United Nations Economic Commission for Europe (UNECE) (UNECE 2009). The FD states that “In the interests of solidarity, Flood Risk Management Plans established in one Member State shall not include measures which, by their extent and impact, significantly increase flood risks upstream or downstream of other countries in the same river basin or sub-basin unless these measures have been coordinated and an agreed solution has been found among the Member States concerned” (Art. 7.4).

3.5.3 Precautionary principle

The European Environment Agency defines the precautionary principle as follows (EEA 2002): “The precautionary principle provides justification for public policy actions in situations of scientific complexity, uncertainty and ignorance, where there may be a need to act in order to avoid, or reduce, potentially serious or irreversible threats to health of the environment, using an appropriate level of scientific evidence, and taking into account the likely pros and cons of action and inaction”. In short, the precautionary principle requires risk assessments to be made.

The precautionary principle is strongly embedded into the environmental policy of the EU. The legal basis of the precautionary principle can be found in article 191 of the Treaty on the Functioning of the European Union (“Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle (...”). Also, see Commission Communication on the precautionary principle, http://ec.europa.eu/dgs/health_consumer/library/pub/pub07_en.pdf last accessed June 2013). Based on case law of the ECJ and doctrine, the precautionary principle is considered as a general (and autonomous) principle of EU law. Competent authorities should take necessary measures in order to prevent potential risks to the environment (see, J. JANS, principles of European environmental law).

A stated goal of the WFD is to reduce the impact of floods, though precautionary flood protection measures are not specifically prescribed. And while the guide on “Best practices... “ (EU 2002, see also chapter 2) includes the phrase “Flood prevention has also to be based on the precautionary principle”,

the FD itself does not contain a reference to this principle. It is, however, one of the fundamental principles of the EU governing policies related to the environment (as well as health and food safety).

The WFD also explicitly refers to the precautionary principle as included in article 191 TFEU (in recital 11). The implication of the precautionary principle (that authorities should take measures to prevent potential risks to the environment) is reflected in the WFD amongst others through the obligation imposed on Member States to take all necessary steps to prevent any further deterioration of the status of waters (Art. 1).

3.5.4 Proportionality principle

The principle of proportionality implies that the government must not overreact in its policy ambitions but must limit itself to measures that serve the collective interest; and it should leave sufficient latitude for the market (Tridimas 2006). The principle of proportionality is also one of the general principles of EU law. The principle is laid down in Article 5 of the Treaty on European Union. The criteria for applying this principle are set out in the Protocol (No 2) on the application of the principles of subsidiarity and proportionality. In addition, proportion between the measures taken and the chosen level of protection is one of the general principles of risk management which apply when the precautionary principle is invoked (COM 2000) 1 final).

The FD refers to this principle, stating that “... this Directive does not go beyond what is necessary in order to achieve that objective” when referring to the objective of reducing the risks of flood damage. The FD furthermore states that “ In accordance with the principles of proportionality and subsidiarity [...],considerable flexibility should be left to the local and regional levels, in particular as regards organisation and responsibility of authorities”. In addition, the concept of proportionality is one of the general principles of EU law.

3.6 Competent authorities for WFD and FD

For many MSs, the competent authority for the WFD is the Ministry of Environment as the main issues in the WFD are considered environmental. However, since the main issue in the FD is flood protection, a different Ministry is in some cases the lead competent authority for the MS. Report D1.1.4 (Hegger et al. 2013) contains more specifics on competent authorities per case study country.

3.7 The Floods Directive Scoreboard

The European Commission has developed an informal “Floods Directive Scoreboard” in order to monitor and inform about how well MSs follow the reporting obligations, outlined in §3. The table shows if notifications or reports have been submitted, and whether or not they are complete. The table does however not give any indication as to whether the notified legislation is conform the requirements of the FD, or if the reported information fulfills all requirements of the respective Articles. Also note that the deadlines for publications differ from the three stages mentioned before; this is because the scoreboard refers to ‘reporting’ which is not equal to ‘completed and published’. For information about enforcement of EU laws, including on infringements by Directive and by MSs see <http://ec.europa.eu/environment/legal/law/index.htm> (last accessed May 2013).

Table 1: Implementation of the Floods Directive

Country	Notification transposition deadline 26.11.2009	Competent authorities /Units of management deadline 26.5.2010*	Preliminary Flood Risk Assessment deadline 22.3.2012	Flood Hazard & Flood Risk Maps deadline 22.3.2014	Flood Risk Management Plans deadline 22.3.2016
	STAGE I		STAGE II	STAGE III	
Belgium	[Green]		[Green]	[Green]	
France	[Green]		[Orange]	[Green]	
Netherlands	[Green]		[Green]	[Green]	
Poland	[Green]		[Green]	[Green]	
Sweden	[Green]		[Green]	[Green]	
United Kingdom	[Green]		[Green]	[Green]	

Explanation of symbols and colors	
Report or information submitted	[Green]
Requirements only partially fulfilled	[Orange]
Report or information not submitted	[Red]

* If other units of management or competent authorities than used for Directive 2000/60/EC.

The Commission is in dialogue with MSs through a Common Implementation Strategy Working Group on Floods (see box 2) to closely follow the implementation of the FD in the MSs, and may consider appropriate legal action in case of delays in delivering the different stages of implementation would occur (i.e. orange or red categories).

As Table 1 shows and as is described in more detail in report D1.1.4 (Hegger et al. 2013), the formal implementation of the FD is on its way. It is at this point in our research however very difficult to indicate whether or not the processes so far have initiated an improvement of Flood Risk Management.

4. Links between Water Framework Directive and the Floods Directive

The WFD sought to provide an integrated framework for water management on a catchment basis to replace the previous single purpose and function Directives. Thus, it may be argued that the necessity to introduce a single function Directive in the form of the FD illustrates a weakness of what was a long, difficult and complex process of negotiation of the WFD (Kaika 2006; Kaika 2003; Page and Kaika 2003; Boschek 2006). Nonetheless, according to the European Commission, the FD has to be seen in the context of the WFD and an integrated approach for the implementation of both Directives should be promoted in order to maximise synergies. This should be achieved by, most notably, coordinating the FRMPs and the RBMPs. Thus to enable coordination, the implementation of the FD and the WFD has been synchronized; both Directives “are to be applied and implemented as far as possible in a coordinated and integral manner: during the entire process it is therefore necessary to ensure coordination within river basin districts covering the territory of different MSs and/or third countries, coordination between the FD and the WFD and public consultation” (Van Rijswick & Havekes 2012).

And indeed, Art. 9 of the FD explicitly contains an obligation on the MSs to coordinate the application of the FD and the WFD: “They must ensure consistency in the information provided in flood hazard maps, flood risk maps and river basin management plans. The periodic reviews of the analyses and assessments required by both directives must also be coordinated. The river basin management plans and the Flood Risk Management Plans should preferably be integrated. Coordination in the application of the two directives is mandatory” (Van Rijswick & Havekes 2012).

There are already some examples of MSs incorporating the FD in the RBMPs: the UK undertook preliminary climate checks of the WFD measures needed to reduce pressures on the water environment and an assessment of the impact on flood risk was included in this preliminary climate check. France’s RBMPs include a chapter on flood prevention (general principles), which will be updated in the next cycle (2015) and will be integrated in the FRMP in order to ensure the coherence between the two documents (WG F 2013). Also, in the Netherlands, both strategic plans (National Water Plan and Regional Water Plan of the provinces), the operational plans of the central and regional water authorities (water boards), deal with both water quality, water quantity and flood protection.

As mentioned before, the phrase “public participation” does not appear in the FD. However, since the FD refers to the WFD, it can be assumed that the guidance document on public participation (EU Water Directors 2003), which gives guidance for the implementation of the WFD, is also applicable to the FD. Thus analogous to the WFD, public participation should also be coordinated as far as possible (Van Rijswick & Havekes 2012); the FD obliges MSs to “encourage” participation within the development of Flood Risk Management Plans (Art. 10.2). However, the exact definitions and guidelines regarding how one should go about participation (i.e. who should be involved and how) are not clearly prescribed by the FD; this is a task of each MS. There is no agreed upon definition of what an ‘interested party’ could mean, which makes the definition and identification of ‘interested parties’ a challenging task. However, active involvement of all relevant stakeholders is pivotal, and one could conclude that room is created to address these multi-actor and multi-sector challenges (for more on this, see D1.1.2: Dieperink et al. 2013). The WFD equally encourages the active involvement of ‘interested parties’ in the implementation of its provisions and requirements (Art. 14.1 of WFD). Compared to the FD, the WFD elaborates more on the involvement of the ‘interested parties’. Indeed, the WFD requires MSs to ensure that they make available to the public, for each river basin district, a timetable and work program for the production of

the plan, an overview of the significant water management issues in the river basin for a period of two years prior to the period to which the plan refers, and draft copies of the RBMP. Moreover, MSs should allow at least six months to comment on the documents (Art. 14.2 of the WFD).

Some other similarities between the two Directives are the (goal-oriented) instruments, the geographical units, encouraged participation and many ecological goals. Some dissimilarities are the end goals, the structural and cultural differences of the parties involved, the level of obligingness (no measurable goals), the type of measures, the level of flexibility, the importance of participation and trust and the social aspects (see Evers and Nyberg accepted for publication).

Both the WFD and the FD use the same units of management: river basins assigned to river basin districts (Mostert & Junier 2009). However, for the implementation of the FD, in conformity with Art. 3, MSs may assign coastal areas or individual river basins to a different unit of management (Art. 3). MSs may either produce one single Flood Risk Management Plan or a set of coordinated plans at the level of the river basin district (Art. 8.1). The FD also takes on a similar approach as the WFD as to international river basin districts (or other international management units) (Mostert & Junier 2009). MSs have to ensure coordination with the aim of producing one single international Flood Risk Management Plan (Art. 8.2). If the MSs fail to produce such single plan, they should produce Flood Risk Management Plans covering at least their part of the river basin district, as far as possible coordinated at the river basin district level (Art. 8.2, cf. Art. 13.2 WFD). Where an international river basin district or other management unit extends beyond the boundaries of the EU, the EU MSs have to “endeavour” to produce a single plan (Art. 8.3, cf. Art. 13.3 WFD). As such, in theory, the FD offers a ‘window of opportunity’ to more strategically systematize and formalize already existing participatory practices. But while legal frameworks such as the UNECE Water Convention and the FD itself thus set general obligations for transboundary cooperation, at the national level, clear definitions and distributions of duties, rights and powers of the various organizations involved should be set out in law (UN 2009).

The required RBMPs (WFD) and FRMPs (FD) require an economic analysis, although at present the approach and criteria for the analysis varies between the Directives. The WFD economic requirements comprise an analysis including but not limited to aspects of cost recovery and on deciding measures on cost effectiveness. The analysis of cost effectiveness for RBMP measures should be relevant information for determining appropriate objectives in FRMPs. Cost benefit analyses also play an important role in the use of exemptions of Art. 4 of the WFD, which can be used to implement flood risk reduction measures. However, the economic analysis of flood risk management is more advanced than the economic analysis of beneficial environmental services, so further work is needed to achieve closer coordination between FD and WFD analyses (WG F 2013).

There are some synergies that MSs could benefit from regarding the consultation timetables, while the use of common data or formats and the use of flood risk information in the WFD could also result in benefits (WG F 2013). The first flood hazard and flood risk maps for instance, due by 22 December 2013, have to be coordinated and may be integrated with the first review of the characterization of the river basin district, the review of the impact of human activity on the status of surface waters and on groundwater, and the economic analysis of water use required under Art. 5 of the WFD, which are due by 22 December 2013 (Art. 9.1) (Mostert & Junier 2009). Similarly, the development of the first Flood Risk Management Plans, due by 22 December 2015, has to be coordinated with and may be integrated into the first review of the river basin management plans under the WFD (Art. 9.2) (Mostert & Junier 2009).

Potential conflicts between the two Directives are also a possibility; for instance when FD measures are detrimental to the status of water-bodies or impede the achievement of good status. Likewise, WFD measures could increase flood risk or impede the implementation of effective Flood Risk Management issues. On the other hand, the exemptions of the WFD give room for the implementation of flood risk reduction measures (Van Rijswijk 2003)

5. Transboundary issues and the Floods Directive

Floods do not stop at borders, be they national, regional or institutional. Therefore, transboundary Flood Risk Management is in theory imperative. Indeed, Flood Risk Management in transboundary catchments was the rationale behind the FD and requires among other things joint monitoring, coordinated risk assessment and joint planning of measures (SIC adapt! 2013). It is expected that, in many MSs, the Flood Risk Management strategies adopted nationally will necessarily, but also because of the solidarity principle, co-evolve with that of the other MSs in the transboundary catchment (UNECE 2009).

An important part of implementation in transboundary catchments is being played by the Environmental Dispute Resolution Fund program (EDRF program), notably the projects being undertaken under the INTERREG program (SIC adapt! 2013). These typically involve cooperation on a multi-agent, multi-level basis and whilst often directed at climate change adaptation rather than Flood Risk Management per se, adaptation to increased flood risk is considered as a key aspect of climate change adaptation.

As said before, the FD rests on two guiding principles: subsidiarity and solidarity (see §3.4.1 and §3.4.2). Solidarity is expressed on the one hand by the call for cooperation between MSs, for instance in the international Flood Risk Management Plans), and on the other hand by Art. 7.4 of the FD, which stipulates that measures taken in one country, must not increase flood risks in neighboring countries unless these measures have been coordinated and an agreed solution has been found by the MSs concerned. Furthermore, when a MS identifies a flood risk issue that it cannot solve on its own, it may report this issue to the Commission and any other MSs concerned (Keessen et al. 2008). They can then make recommendations on how to resolve the issue. The Commission has to respond within six months (Art. 8.5 of the FD) (Mostert & Junier 2009). Also, Art. 8 of the FD states that MSs must ensure coordination of their Flood Risk Management practices in transboundary river basins, including with third countries (UNECE 2009) (see §3.4.2). Lastly, information exchange and / or coordination are required between competent authorities in transboundary river basin districts (Recital 15 and Arts 4.3, 5.2, 6.2 and 8 of the FD).

Within larger basins, the challenge may be greater to implement the FD, because of the different scale of the tasks between upstream and downstream countries. In this light, the work of international river basin organizations (IRBOs) is crucial (see box 4) and it may prove beneficial to enhance the level of cooperation between IRBOs and other European and national transboundary committees further.

Joint Flood Risk Management includes costs, but also potentially economic benefits; interventions upstream can have (positive or negative) effects downstream or vice versa. Another transboundary challenge therefore is monetary compensation for transboundary damages or gains due to the regulation of water levels.

Box 4: Existing transboundary institutions and the FD

International river basins organizations (IRBOs) or commissions (IRBCs) come in a myriad of shapes and sizes, ranging from mainly facilitative to those empowered to act on their own. Their mandates often vary profoundly as well. The impact therefore of these IRBOs varies significantly (Lautze *et al.* 2013). Some international river basins have multiple IRBOs, while others have none (Bakker 2009). Many of the established international river commissions (with international agreements signed by all MSs or countries sharing the basin, and which may for instance have a secretariat) have both water management and

Flood Risk Management in their mandate and already coordinate water quality, quantity and Flood Risk Management. Their role in the execution of the FD is therefore evident. Examples are there from the Danube, Elbe, Rhine, Maas, and Scheldt. Sometimes these are complemented by bilateral agreements between some countries only, for instance sharing one particular sub-basin. In other shared river basins there may be an international agreement in place, but cooperation has not advanced yet, and no single international RBMPs were prepared for the first cycle, but at the same time cooperation and coordination is on-going. This is the case for many smaller transboundary catchments. In some shared river basins, there is not yet an agreement in place (WG F 2013).

Europe International Basins



Figure 3: There are 69 transboundary catchments in Europe, with significant differences between the MSs concerning the proportion of land area that is part of a transboundary catchment. This map is a product of the Transboundary Freshwater Dispute Database, Department of Geosciences, Oregon State University. Additional information about the TFDD can be found at: <http://www.transboundarywaters.orst.edu>. Accessed 11 June 2013.

6. Conclusions

Instead of the more traditional top-down legalistic approach, both the WFD and the FD emphasize the importance of more bottom up initiatives from the actors who have to implement the Directives. Since the WFD does not include explicit Flood Risk Management aspects, the FD can be seen as a step forward from previous EU policy, which only recommended natural hazards mapping, and from previous national flood-management strategies in some countries, which were more focused on hard infrastructural approaches for risk reduction. Both Directives support holistic sustainable water management and try to coordinate MSs' activities but, due to the nature of flooding, MSs are flexible in setting out objectives and measures on the basis of the FD. This in turn creates multi-actor and multi-sector opportunities and problems.

Opportunities for synergies between the FD and the WFD are principally related to

- Definitions, and therefore governance and reporting (Arts. 2, 3 and 12 of the FD);
 - *Both Directives use the same definitions for river, river basin and river basin district;*
- The preparation of flood hazard maps and FRMPs (Art. 9.1 and 2 of the FD); and
 - *the information in the flood hazard maps and FRMPs should be consistent with the information made available according to the WFD;*
- Public information and engagement (Art. 9.3 of the FD);
 - *Stakeholder participation should be coordinated with the active involvement of interested parties under the WFD.*

Furthermore, the deadlines and dates for reporting for certain aspects are also aligned with parallel dates in the WFD. Note though that it will not always be possible to avoid conflict between the objectives of the two Directives, although the exemptions of Art. 4 of the WFD provide for solutions. More ecologically sound solutions to deal with flood risk may often help to achieve the ecological goals of the WFD.

The FD rests on two guiding principles: solidarity, meaning that flood measures taken in one MS should not increase flood risks in other MSs, and subsidiarity, meaning that the least centralized authority ought to handle the matter at hand, which would mean that the EU could only be involved in transboundary Flood Risk Management. However, the reason to develop the FD in the first place was that, due to the often transboundary nature of floods, purely national approaches to Flood Risk Management are neither technically nor economically feasible, and a common framework is needed to establish common approaches.

Flood management is complicated enough in river basins controlled by a single authority, and becomes even more challenging when dealing with transboundary floods, i.e., floods that originate in one country or jurisdiction and then propagate downstream to another country or jurisdiction. Under such circumstances, the challenge may be greater to implement the FD, because of the different scale of the tasks between upstream and downstream countries. In this light, it may prove beneficial to enhance the level of cooperation between international river basin commissions and other European and national transboundary committees further.

While both Directives are meant to harmonize European legislation, much flexibility on objectives and measures in the FD is left to the MSs; requirements or goals are not set for issues like safety standards, mitigation or preparation, restoration after flooding, protection, or spatial planning. The way in which

flood management is handled therefore strongly depends on national approaches, which will to say the least decrease the speed of harmonization of Flood Risk Management in Europe.

As Mostert & Junier (2009) conclude, MSs could either see the FD as a procedural requirement or an opportunity; “In the first case the Floods Directive just means extra work without resulting in any additional benefits. In the second case even more work will be needed, but the potential benefits are significant”. The next chapter will pick up on this issue by identifying research questions for the next work packages.

7.Relevance for next work packages

The next work packages will provide more in-depth information on the level and way of implementation, level of ambition, and competent authorities of the different country case studies. This report, as well as report D1.1.4 (Hegger et al. 2013), touch upon all these issues, but much more research is required to understand how every country deals with the FD.

Since each MS has its specific conditions (constitution, legal framework, administrative bodies), the steps each MS has to go through to reach the objectives of the FD can be quite different – and it is expected that the process of coordination in transboundary basins will be a very intensive and challenging process, and might even take more time than set out in the FD. IRBOs are expected to play a major role in the entire process. Which IRBOs are present in the basins, and what does their mandate state about Flood Risk Management? What are the existing international or bilateral agreements between MSs sharing a basin – and what has cooperation brought so far? And if no agreements are present yet – why not, and is this, or will this pose a problem? Is it possible to conceptualize the transboundary nature of Flood Risk Management issues, and if yes, how? These and more possible transboundary aspects of floods in the case study countries, or, putting the solidarity principle into practice, will get more attention in the next work packages.

Another issue that will be picked up on are the possible synergies and conflicts between the FD and the WFD and how these can be stimulated/created or, if possible, avoided. It would be opportune to further integrate the WFD and the FD, especially on the planning level. For example, the WFD elaborates on a set of public information and consultation requirements (Art. 14), whilst the FD equally requires MSs to involve the public, it does not further elaborate on this requirement (see, for example, Art. 14.2 of the WFD, which states that “Member States shall allow at least six months to comment in writing on those documents in order to allow active involvement and consultation”). The consultation requirements included in the FD should be streamlined with those included in the WFD, to enable consistency between FRMPs and RBMPs, in case the former are not integrated into the latter. In addition, other issues, such as biodiversity, water demand (supply, irrigation, hydropower) and supplementary measures as mentioned in the EU Strategy for Adaptation to Climate Change, are also relevant for integrated river basin management and cannot be ignored, especially since they are a vital part of the multi-actor and multi-level challenges (see also D1.1.2: Dieperink et al. 2013). Achieving multiple goals of different stakeholders with a myriad of interests while at the same time achieving the objectives of the FD and WFD will have to be tackled, also at the transboundary level.

The question rises which degree of harmonisation would be appropriate to deal with flood risk issues. An in-depth analysis of this research question shall be carried out. For example, research shall be conducted as to safety standards and approaches, and more specifically, whether these should be set out on a national, regional, and river basin level or at the EU level. The FD itself seems to suggest to leave this category of measures to the MSs by stating: “detailed objectives for protection against floods, measures best suited to achieve the objectives and deadlines will not be defined at EU level” (COM 2006). On the basis of our first research impressions and review of the legal framework at the European level, it seems that suggestions can be made to further improve this framework: it would for instance, be opportune to further embed cooperation structures between the MSs into the FD. The feasibility of the legal anchoring of these structures into the FD will be analyzed.

Finally, it would be interesting to have a closer look at the subsidiarity principle (see §3.4.1), and whether the achievement of effective flood protection throughout Europe will profit from this strong focus on subsidiarity.

A preliminary overview, in no particular order, of specific empirical questions related to European flood regulation is listed below:

Rules & discourses

There are synergies between the FD and the WFD – do MSs recognize these? How can these synergies be maximized for each MS?

- Consultation timetables;
- Use of common data or formats, use of flood risk information in the WFD;
- Links between FRMPs and RBMPs.

What are the potential conflicts between the two Directives, and what can be done about this?

- FD measures could be detrimental to the status of water-bodies; WFD measures could increase flood risk;
- Are exemptions in the WFD sufficient to be able to optimize cooperation between the WFD and the FD and sufficient to achieve the goals of the FD?

Is the FD conform the principle of subsidiarity?

- To which degree is harmonization to deal with flood risk issues appropriate?
- Safety standards; should they be national or at the EU-level? And should they be different for different causes of flooding (allowing consistent Flood Risk Management)?

Specify per country the number of shared river basins;

- Are there international agreements present or in preparation?
- Are there IRBOs in the basins?
- Do a) and b) deal specifically with floods?

Is the end-goal of the FD to guarantee a certain level of safety or to decrease vulnerability to floods?

- Does setting a level of safety limit the implementation of multiple strategies?
- Does decreasing the overall vulnerability to flood permit the implementation of multiple strategies?

Actors & resources

How far is every case study or country with the implementation of the FD?

- Producing flood risk maps is expensive and depends on availability of data thus the ability to produce flood risk maps differs significantly between countries due to differences in knowledge and the availability of technical infrastructure for data gathering and exchange, modeling and mapping, and financial resources;
- On paper and in practice; difference in level of ambition?
- Between countries: difference in level of ambition?
- Transboundary basins: difficulties encountered or not?
- Synchronization with WFD?
- How is stakeholder participation envisioned and/or brought into practice?

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