

Adaptation Measures to Climate Change within the European Floods Directive (2007/60/EC) [†]

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Abstract: Extreme weather conditions, attributed to climate change, include the increase in floods. The only available and appropriate response to the impacts of climate change already shown is adaptation. Adaptation is defined as the process of adjusting to climate change by taking appropriate action to prevent or minimize the damage it may cause. Within this framework, the EU 2007/60/EC Floods Directive foresees that the member states shall undertake preliminary flood risk assessments, taking into account inter alia the impacts of climate change on the occurrence of floods. The present paper aims at the identification of the existing legislative gaps in the Floods Directive taking into consideration the adaptation need regarding climate change.

Keywords: Floods Directive 2007/60/EG; climate change; adaptation

1. Introduction

According to the Working Group II report of the Intergovernmental Panel on Climate Change (IPCC), adaptation will be necessary to address climate change impacts attributed to past emissions [1] (p. 19). The concept of adaptation was initially introduced by the drafters of the 1992 United Nations Framework Convention on Climate Change (UNFCCC) [2] and was developed in the context of mitigation as one of its implementation measures for the mitigation of the adverse climate change impacts (Art. 3 § 3 of the UNFCCC) [2]. The difficulty of the implementation of adaptation measures is credited to the fact that they prerequisite enforcement in every single policy field concerned [3] (p. 258). In this regard, the transformation of the existing law, when regarding adaptations to climate change, appears to be inevitable. A reconsideration and update of the law should aim at the enhancement and promotion of effective governmental policies and management of the expecting increase in the number of lawsuits attributed to the increasing damage caused by climate change [3] (p. 262).

The increased damage caused by floods is listed among the impacts that require adaptation as the only available and appropriate policy tool to tackle climate change [1] (pp. 16, 19). Nonetheless, it should be noted that the restrictive prediction possibility of floods—that allows only the prediction of increased rainfall intensity in particular areas [3] (p. 263)—may constitute an additional barrier to the adaptation actions. Within this framework, the present paper aims at: (a) providing an overview of the evolution of the adaptation concept at an international legislative level and in flood management in particular, and (b) evaluating the adaptation measures in terms of the European Floods Directive.

2. Adaptation at an International Legislative Level

2.1. Definition Issues

Adaptation is defined as the process of adjusting to the actual or expected effects of climate change and their impact [4] (p. 5). The inherent difficulty in adaptation actions to climate change lies in the idiosyncrasy of climate change impacts: they are complex, diverse and they may be sudden and drastic as well [5] (p. 1).

Adaptation can be differentiated from mitigation. Albeit adaptation overall contributes to mitigation goals, it has also the potential to lead to an increase in greenhouse gas emissions (e.g., by the installation of air conditioners) or a reduction in carbon uptake (e.g., adaptation constructions into natural habitats) [3] (p. 263). The wide term of adaptation can be specified by the principle of resilience. Resilience refers to the capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation [4] (p. 5).

2.2. Under the UNFCCC

The objective of the initial version of the UNFCCC in 1992, as stated in the Art. 2, focused on the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system [2]. Art. 2 provided, furthermore, for the achievement of such a level within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed sustainably [2]. However, in 2007, adaptation was considered to be the only available and appropriate response for the climate change impacts already shown or expected to emerge in the near future [1] (p. 18).

The UNFCCC contains, in Art. 4, a long list of commitments dealing with adaptation imposed on all parties of the convention. More specifically, it foresees that all the parties shall [2]:

- formulate, implement, publish and regularly update national and regional programs containing measures to facilitate adequate adaptations to climate change (Art. 4 § 1 b);
- cooperate in preparing for adaptations to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods (Art. 4 § 1 e);
- take climate change considerations into account in the relevant social, economic and environmental policies and actions, and employ appropriate methods—for example, impact assessments formulated and determined nationally to minimize adverse effects on the economy, public health and the quality of the environment—or measures to mitigate or adapt to climate change (Art. 4 § 1 f);
- promote, cooperate (Art. 4 § 1 g) and exchange the relevant information (Art. 4 § 1 h) in scientific, technological, technical, socio-economic and other research, intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the economic and social consequences of various response strategies;
- promote and cooperate in the education, training and public awareness related to climate change (Art. 4 § 1 i).

2.3. Under the Kyoto Protocol

The target set by the Kyoto Protocol adopted in 1997 was for a reduction in greenhouse gas emissions (Art. 2) [6]. It touched upon adaptation strategies only superficially. Art. 10(b) (i) of the Kyoto Protocol provided for programs to facilitate the adequate adaptation to climate change concerning energy, transport, and industry sectors as well as agriculture, forestry and waste management for the importance of adaptation technologies and methods for improving spatial

planning in the adaptation process [6]. From a practical point of view, the most important provision was Art. 12 § 8, stating that a share of the proceeds from certified project activities should be used to assist developing country parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation. The establishment of the Adaptation Fund, 4 years later, was based on this provision [3] (pp. 271–272).

2.4. Under the Cancun Adaptation Framework

The conference of the parties to the UNFCCC held in Cancun in 2010 established the Cancun Adaptation Framework, which invited all parties to the UNFCCC to undertake [7] (pp. 4–5):

- the planning, prioritizing and implementing of adaptation actions;
- impact, vulnerability and adaptation assessments, including assessments of financial needs as well as economic, social and environmental evaluations of adaptation options;
- strengthening institutional capacities and enabling environments for adaptation, including for climate-resilient development and vulnerability reduction;
- building the resilience of socio-economic and ecological systems;
- enhancing climate change-related disaster risk reduction strategies, taking into consideration early warning systems, risk assessments and management, and sharing and transfer mechanisms such as insurance;
- measures to enhance understanding, coordination and cooperation concerning climate change induced displacement, migration and planned relocation;
- research, development, demonstration, diffusion, deployment and the transfer of technologies, practices and processes, and capacity-building for adaptation;
- strengthening data, information and knowledge systems, education and public awareness;
- improving climate-related research in order to provide decision-makers at the national and regional levels with improved climate-related data and information.

2.5. Under the Paris Agreement

The Paris Agreement (2015) expressed the aim of increasing the ability of adaptation to the adverse impacts of climate change and promoting climate resilience and low greenhouse gas emissions development (Art. 2 § 1 b) [8]. It elevated the significance of adaptation by [8]:

- establishing the global goal on adaptation (GGA) to enhance adaptive capacity, strengthening resilience and reducing vulnerability to climate change (Art. 7 § 1);
- recognizing that adaptation is a global challenge faced by all with local, subnational, national, regional and international dimensions, and that it is a key component of a long-term global response to climate change (Art. 7 § 2);
- recognizing the importance of supporting developing countries and of taking into account their needs (Art. 7 § 6);
- recommending parties to strengthen their cooperation regarding enhancing actions for adaptation (Art. 7 § 7);
- recommending parties to submit and update periodically an adaptation communication, which may include its priorities, implementation and support needs, plans and actions (Art. 7 § 10).

The broad formulation of Art. 7 in connection with the extensive use of the verbs “recognize” and “recommend” indicate a declaratory, superficial and general approach to adaptation. The agreement lacks in a quantitative concretization of adaptation goals due to the unwillingness of developed states (and some developing) to set a quantitative finance goal of adaptation, based on an assessment of impacts and adaptation costs, as proposed by African states [9] (p. 308).

3. Adaptation in the Policy Field of Floods Management

In the flood context, protection and prevention from flooding are considered as an adaptation action [10] (p. 25). Ecosystems must develop resistible mechanisms to withstand flooding. For

instance, protected areas should be made able to resist occasional floods and, inside cities, transportation infrastructure should adapt to flooding. Furthermore, lands may be designated to serve as controlled flooding areas to protect more sensitive parts of the land against floods [3] (pp. 260–261).

The protection and prevention from flooding include both structural and nonstructural measures [10] (p. 25). Structural measures are the designation of water retention areas used for controlled flooding, the widening of the river bed and/or the creation and management of controlled water levels through dams and other technical measures [3] (p. 279). In this regard, the Netherlands' vision 2053 approaches flood defense in new ways, for example, by building earth dunes and beaches in front of existing coastlines instead of constructing higher dikes that can be weakened against the power of sea waves [10] (p. 26). Nonstructural measures include the detection of natural flooding areas, land use limitations in flood hazard areas, updating of local plans, relocation of elements at risk, flood forecasts and early warning systems, and flood surveillance services [10] (p. 74).

4. The European Floods Directive (2007/60/EC)

4.1. An Overview

The purpose of the Floods Directive [11], as set out in Art. 1, is the establishment of a framework for the assessment and management of flood risks that aims at the reduction in the adverse effects of flooding. This target has to be achieved through the development of flood risk management plans by the member states (Recital 13 of the directive) that should focus on the prevention, protection and preparedness (Recital 14 of the directive). Moreover, the directive states that an integrated river basin management demands the coordination with the European Water Framework Directive 2000/60/EC (Recital 17 of the directive).

The directive prompted the member states to review their flood risk management in a three-step approach [10] (p. 31). Firstly, they are obliged to carry out a preliminary flood risk assessment, by 22 December 2011, of their river basins and associated coastal zones to identify areas where potential significant flood risk exists (Art. 4 and 5). Secondly, they are required to provide flood hazard maps and flood risk maps for the previously defined zones until 22 December 2013 (Art. 6). Thirdly, they have to prepare flood risk management plans that consist of objectives and measures that shall be identified by the responsible institutions until 22 December 2015 (Art. 7 and 8). All three steps have to be reviewed and updated every six years (Art. 14).

The extent of the regulatory discretion left to the member states in the application of the three steps is impressive, as it includes:

- the developing of policies referring to water and land uses, in which the member states should consider the potential impacts that such policies might have on flood risks and the management of flood risks (Recital 9 of the directive);
- the determination of the objectives regarding the management of flood risks that should be based on local and regional circumstances due to the variation of the damage caused by flood events across the countries and regions of the community (Recital 10 of the directive).

Taking into account the room left to national policies, the three-step approach provides for complicated procedural instruments without content [12] (p. 453). Unfortunately, the directive abstains from establishing of a mandatory content for the abovementioned instruments. Flood risk management has to take into consideration all the relevant aspects of water management, physical planning, land use, agriculture, transport and urban development, the degree of soil sealing and nature conservation [10] (p. 56). Thereby, the three-step approach constitutes not an environmental approach, but a disaster management one [12] (p. 446).

As mentioned above, adaptation is a parameter of major significance in dealing with climate changes expected to arise in the near future as it requires preventive actions. The directive requires that member states take climate change into account only in the preliminary flood risk assessment depending on their specific needs to deal with climate changes (Art. 4 § 2 d). With regard to flood

hazard maps, flood risk maps and flood risk management plans, the directive explicitly excludes climate change effect on floods from its scope (Recital 4 of the directive). However, the incorporation of climate change in flood risk management could, for instance, enhance the interaction between floods and land-use planning: spatial planners and investors could be encouraged to design more sustainable housing and infrastructure in flood prone areas [10] (p. 56).

Within this framework, the goal of the reduction in the adverse effects of flooding appears to be a declaratory statement in terms of a procedural approach. The main failure of the directive is the lack of setting binding flood risk standards at the EU level, as it leaves the establishment of appropriate objectives for the management of flood risks at the policy discretion of member states [13] (pp. 45–46).

4.2. Evaluation According to the European Adaptation Strategy

In 2013, the European Commission adopted an EU strategy on adaptation to climate change [14]. The strategy aimed to strengthen Europe's climate resilience by enhancing the preparedness and capacity of all governance levels to respond to the impacts of climate change [14]. It focused on three objectives:

- the providing of funding to help member states build up their adaptation capacities and take action;
- the promotion of adaptation actions in key vulnerable sectors such as agriculture, fisheries and cohesion policies to ensure Europe's infrastructure is made more resilient;
- the improvement of decision-making by addressing gaps in knowledge about adaptation.

The European Adaptation Strategy lacks binding power. It promotes adaptation at a theoretical level. Apart from the fact that it foresees financial support for the undertaking of adaptation measures by the member states, it does not provide any particular binding characteristics of such actions. The EU prescribes once more overall guidelines, expressing the hope to persuade member states to take action. The continuing passive role of the European legislator, who remains unwilling to adopt (a) concrete and compulsory adaptation measures and (b) compensatory measures in case of the noncompliance of member states, which is the greatest threat to the adaptation policy.

Following the European Adaptation Strategy, the European Commission released a proposal for a new Floods Directive [15]. Inter alia, the Evaluation Committee highlighted the need to take into account climate change, to focus on preventive measures, not just disaster responses and engineering solutions, and to consider the role of forests in flood risk management [15] (p. 3).

5. Conclusions

The increase in floods constitutes a climate change impact. In contrast to other phenomena, floods cannot be precisely forecasted. Therefore, the adaptation measures to floods have to be obligatory for member states and effective. Unfortunately, the directive offers large regulatory discretion to member states with regard to measures controlling flood risks. In terms of adaptation policy, the weaknesses of the existing Floods Directive can be summarized as follows: (a) it excludes climate changes from the assessment of flooding risks; (b) it does not prescribe specific criteria regarding flood risk management (e.g., the role of forests) to be taken into account by flood hazard maps and flood risk maps by providing the reasoning that floods are different from region to region and therefore need to be tackled at a regional level; (c) foresees complicated flood risk management procedures; (d) does not promote European coordination on adaptation; (e) does not provide a coherent management plan in alignment with the Water Framework Directive.

The illustrated weaknesses of the directive cannot be repaired by the European Adaptation Strategy as the latter adopts an overall approach for actions to be taken in all adaptation policy fields. The only encouraging provision of the European Adaptation Strategy refers to the funding of adaptation measures taken by the member states.

The equality between mitigation and adaptation, as stated by the Paris Agreement, becomes meaningless. Incidentally, the legislative framework for mitigation laid down by the Paris Agreement

lacks in the establishment of mandatory obligations of the parties. We no longer need declarations and promises of the mitigation/adaptation of/to climate change that ends up in the creation of a “legislative jungle” without practical consequences. The effectiveness of the implementations of adaptation actions relies upon their concrete imposition by mandatory provisions.

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