

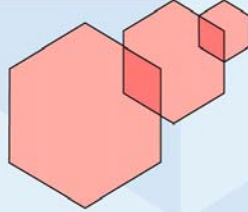


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***The Risk  
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Section***



# ***Prospective Risk Management:***

*A Review of German Legislation  
Targeting Integral Flood  
Management*

by Jakob Rehbach and Inés Hinsberger

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## Foreword

Prospective risk management has been defined as the set of measures, either structural or non-structural, which is established by a community, a local government, or a national agency to promote a more sustainable framework for development from the point of view of minimizing the generation of risks which may lead to disasters (Lavell, 2003; Villagrán, 2008). Examples of non-structural measures associated with prospective risk management include legislation, policies, plans, regulations, and norms which are set up by governments at various levels targeting land-use planning and building codes. Their aim is to impede the population and the private sector from constructing infrastructure or setting up livelihoods in geographical areas which are exposed to hazards such as floods and landslides. Such measures, while difficult to enforce due to the counter-effects related to their impacts regarding modifications to the value of land and its potential uses, aim at reducing the exposition of assets to such hazards and their subsequent damage or destruction in case of floods.

Germany, having recently experienced vast floods along the Rhine River in 1993 and 1995, in the Oder River in 1998, and extreme floods in the Elbe River in 2002 and in 2006, has introduced prospective risk management policies aiming at major modifications to land-use planning norms at all levels (from the Federal to the Municipal levels) in order to minimize losses as a consequence of such floods. The top-to-bottom approach which begins with the European Directive ESDP (European Spatial Development Perspective) will minimize the establishment of settlements in floodplains, and sets a standard for a "state-of-the-art" legislation in relation to mainstreaming development without modifying natural processes. The new legislation aims at establishing and preserving the floodplains associated with floods which have a period of return of 100 years. The purpose to restrict modifications to such a floodplain and hence, to the flood hazard along the riverbanks, to prevent areas which have been built outside such floodplains from being flooded in decades to come. Such policies and their respective legislation arise as recognition by the government of the impact which trends in development have had in changing the nature of floods in recent decades, in particular through the modification of floodplains. Hydrologists and spatial planners in Germany have realized that the alteration of river channels introduced decades ago to promote urban or industrial development in some areas of the basin have led to the modification of floodplains in other parts of the basin. Therefore, in order to minimize changes in the geographical extent and location of floodplains in the future, legislation is being introduced to impede such processes, with the aim of ensuring a more sustainable development recognizing and establishing boundaries which should not be modified.

Recognizing the autonomy of provincial governments with respect to regional land-use planning and the autonomy of municipal governments in relation to the granting of permits to build infrastructure of any kind, the new legislation introduces the notion of polders or retention areas along rivers to control the level of floods in particular cities such as Cologne. This policy demands provincial governments to define the floodplains and to elaborate planning guidelines regarding integral basin and water management; requests municipal governments to define such floodplains in their locality, and to promote land-use regulations which impede future settlements within such floodplains.

This document presents a systematization of the new German legislation targeting land-use planning in the context of flood management. It is structured in a hierarchical way encompassing from the European level to the municipal level. Such systematization offers a view regarding how such "top-to-bottom" approaches are structured in Germany. The document includes a section regarding how this new legislation will introduce restrictions regarding the construction of infrastructure or its modifications. As such, this document elaborated by Mr. Rehbach and Mrs. Hinsberger provides and excellent entry point into the issue of legislation focusing on prospective risk management in the case of floods.



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## **Introduction:**

Legislation targeting flood management in Germany spans from the national to the local level, and can be linked to legislation and trends emanating from the European level. The current legislation is contained in the German Federal Building Code, in the German Water Resources Act, in Regional Development Plans and in Municipal Land Use plans. This legislation is structured in a hierarchical way to establish norms regarding the definition of floodplains, and imposes restrictions concerning the use of land in such areas as a strategy to control floods in cities and industrial areas and to promote a more sustainable development of settlements in terms of not exposing them to frequent floods.

This document highlights the main segments concerning flood prevention in the various types of legislation enacted at the different levels, recent changes in such legislation, and discusses issues related to building codes in areas affected by floods. While there could be different approaches to presenting such segments of legislation, the approach selected in this document follows a top-to-bottom hierarchy from the European level to the local level in order to highlight linkages in legislation enacted at different political levels.

## **1. European Level:**

Within the contexts of the European Union and the European Commission three guidelines target the issue of prospective flood management. A Perspective by the European Union and a Directive by the European Commission foster guidelines regarding how to approach a more sustainable use of natural resources and hence of the territory. The respective Regional Development Fund provides resources to design and implement a variety of measures within the scope of such perspective and directive.

### **1.1 ESDP**

Established in 1999 by the European Union, the *European Spatial Development Perspective, ESDP*, promotes the adoption of a new supranational level of spatial planning (territorial ordering). Although legally non-binding in the context of Member States, this Perspective outlines a framework aimed at achieving a balanced and sustainable development of the territory encompassing the European Union. In the context of floods, it urges local planning authorities to take into account potential risks.

### **1.2 European Directive**

The European Commission is also involved in the topic of flood risk management. One example is the “*Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the records*” published in 2004. This document gives a brief overview of current strategies focusing on floods and stresses the importance of effective flood prevention and the reduction of losses. It also includes guidelines for the development and implementation of flood risk management plans and flood risk maps. (KOM/2004/0472endg.)

### **1.3 INTERREG**

The *European Regional Development Fund, ERDF*, can be accessed by Member States to request funds to conduct specific projects focusing on preventive measures in the case of floods. One example is the project which targets measures taken to reduce the risks of floods along the Rhine and the Maas Rivers which belong to the C strand of the INTERREG initiative. (IRMA)

Despite these efforts, as of 2007 no European directive concerning flood protection has been adopted.

## 2. Federal Level: Germany

At the Federal level, the Republic of Germany is responsible for developing and implementing policies and legislation regarding the management of water resources, spatial planning, and building codes. The new legislation targeting floods requires each State or Province to incorporate measures concerning flood protection along these lines.

### **2.1 Spatial Planning - *Raumordnung***

Spatial planning at the Federal level<sup>1</sup> includes a set of abstract requirements and guidelines which have to be adopted by each state. The *Regional Planning Act* (“*Raumordnungsgesetz*”), which is the most important law in the context of flood protection, requires development plans to include retention areas or “polders” as a means to control the extent of floods.

In addition to these guidelines, the Federal Government can decree framework legislation for all states and may influence regional planning through two instruments:

#### **2.1.1. Regional Planning Procedure - *Raumordnungsverfahren***

To comply with Federal regulations, provincial governments in Germany have to design and establish spatial planning guidelines within their jurisdiction concerning flood management. The Federal Government examines such spatial planning guidelines to ensure compliance with policies set up at the federal level.

#### **2.1.2. Counseling**

The Federal Government may also provide advice to regional and local planning departments regarding spatial planning, water-resource management, and land-use norms when required. While suggestions made by the Federal Government are not considered as legally binding, they are usually taken into consideration by state (Laender) and local governments.

### **2.2 German Federal Building Code - *Baugesetzbuch***

The German Federal Building Code is the most relevant norm or code when it comes to the construction of infrastructure. It has been enacted at the Federal Level and includes detailed requirements concerning Land-use plans (“*Flaechennutzungsplan*”) and in the context of the Master Zone Mapping Plan “*Bebauungsplan*”. Although both plans are enacted at the municipal level, the minimum requirements for their contents and design are set at the Federal Level. The federal building code is not legally-binding for builders or property developers at the individual level, but is legally-binding for the planning agency in charge of the Master Zone Mapping Plan.

The most relevant paragraphs in the context of flood protection contained in the Federal Building code are **Article 1, section 6, number 12** (requiring local planning agencies to consider flood protection while setting up land-use plans), and **Article 5, section 4a** and **Article 9, section 6a** (requiring the transfer of legally defined flood plains from the regional planning level to the municipal planning level).

**Article 35, section 3, number 6** defines flood protection as an important public concern (“*oeffentliche Belange*”). This is especially important in areas which are not yet covered by a legally binding zoning map. Being labeled as an important concern, flood protection is considered



A small levee along the Rhine River in the area of Beuel in Bonn. The levee is blended with the recreation area which reaches the shore of the river. Foto: JCV

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<sup>1</sup> In Germany, at the Federal level spatial planning (territorial ordering) is termed “*Raumordnung*”.

to be more important than the construction of new projects for example.

**Article 24** gives municipalities the right to deny building permits (first-refusal) in geographical areas which have been defined to serve as floodplains, as such areas should be kept free from buildings.

These articles contained within the Federal Building Code stress the importance of incorporating flood protection measures and introduce the notion of flood plains as a strategy related to such flood protection measures. Recognizing the traditional use of building permits by architects and developers to request authorization to construct infrastructure in any area of the country, such articles give municipal governments the right to deny requests in case of developments targeting areas inside such floodplains. The right to deny such requests is based on the fact that such floodplains can be used as retention or storage areas to contain floods in particular areas of the basin, thereby inhibiting floods in other areas such as cities.

## **2.3 German Water Resources Act WRA - *Wasserhaushaltsgesetz (WHG)***

The German Water Resources Act introduces the official definition of floodplains and establishes restrictions regarding new developments within such floodplains, as well as modifications to existing infrastructure inside these floodplains. In addition, it introduces the notion of additional areas which are endangered by floods in case of failure of flood protection measures. The Act urges all States to prepare flood-protection-plans for all rivers by the 10<sup>th</sup> of May of the year 2009 and dictates States to define such floodplains through state legislation by the 10<sup>th</sup> of May of the year 2012.

### **2.3.1 Definition of floodplains - *Ueberweschwemmungsgebiete***

According to the German Water Resources Act, flood plains are defined as areas that can be inundated during floods. The Act urges German Federal States to define legally such areas which may be inundated during design floods (HQ100 – a flood which statistically occurs once in 100 years). This legal definition needs to be implemented by the 10<sup>th</sup> of May of the year 2012. For high risk areas, especially settlement areas, the target date has been advanced two years, the 10<sup>th</sup> of May of the year 2010.

An important issue to recognize relates to the interval of time which is allocated by such legislation for measures to be implemented at the level of Federal States within Germany. A period of several years has been granted by the Federal Level to the Federal States to comply with the demands imposed in this new legislation.

### **2.3.2 Prohibitions/Restrictions regarding new Buildings within the Floodplains**

One important novelty concerning the construction of buildings within floodplains is **Article 31b, sec.4** of the WRA which was enacted in 2005. It forces municipalities to completely interdict or at least severely restrict the construction of new buildings within the legally-defined floodplains. It is now officially forbidden for municipal authorities to define new building areas within floodplains in the legally-binding zone-mapping plan (“Bebauungsplan”). Since this restriction is also legally binding for private individuals wishing to construct houses, it is almost impossible for such individuals to be granted a permit for such purposes within a floodplain.

However, there are some exceptions. The municipal authority may define a new building area at the request of an architect or a private developer if the following 9 criteria are met:

1. No alternative location is available for the proposed building area.
2. The proposed building location would be adjacent to an existing building location.
3. No danger to life, health or property is anticipated.
4. The runoff of floods and the water level during floods will not be worsened.
5. The retention of floods will not be impaired and lost retention areas will be compensated regarding time, extent, and function.

6. Existing flood protection will not be impaired.
7. No disadvantageous consequences will arise for people living upstream or downstream of the proposed building location.
8. All concerns regarding flood protection must be considered.
9. The proposed buildings will be constructed in such a way that no structural damages occur during a design flood considered during the demarcation of the legally-binding floodplain.

Since all 9 criteria have to be met, expenses for the justification of a new building area are usually too high for individuals.

### **2.3.2 Restrictions regarding existing Buildings within the Floodplains**

The enlargement or modification of existing buildings within the legally-defined floodplains is also subject to restrictions:

1. The retention of floods should only be marginally impaired.
2. Loss of retention areas should be replaced within a short period of time.
3. The runoff of floods and the water level during floods should not be worsened.
4. Existing flood protection should not be impaired.
5. The modifications of buildings should be carried out in such a way that no structural damages occur during a design flood considered within the legally-binding definition of the floodplain.

In addition, people will not be compensated for the higher building costs.

### **2.3.3 Areas endangered by floods - *Überschwemmungsgefährdete Gebiete***

**Article 31** demands municipalities to include these areas in their maps to promote public awareness. Also, the Federal States are required to make provisions for an effective protection against possible damages and losses within these areas. However, the legislation does not state which provisions must be considered explicitly.

**Article 31c** targets geographical areas beyond the legally defined floodplains which may be affected in case the official protection systems fail. These may include areas which could be inundated due to a breach in a dyke. This article focuses on the definition of this category of areas which are relevant for the protection of areas endangered by floods.

### **2.3.4 Guidelines for the Construction of Buildings**

An important paragraph overlapping with the building codes is **Article 1a, section 2** of the WRA which obliges every person likely to be affected by a flood to take all necessary precautions to avoid or to reduce losses. Although the paragraph is formulated like an appeal it is legally binding and violations may result in penalties.

It is important to note that this Article is not only aimed at people or companies handling hazardous materials but also at private individuals. A more specific regulation is made in **Article 31, section 2** which restricts the construction of oil heating systems within areas legally defined as floodplains.

### **2.3.5 Cooperation**

**Article 31d** and **Article 32** of the WRA oblige all Federal States to prepare flood-protection-plans for all rivers by the 10<sup>th</sup> of May of the year 2009. The aim is to establish a standardized flood protection plan for the whole country. Furthermore, the WRA obliges all Federal States to cooperate with each other and with other European countries.

### 2.3.6 Other aspects covered in the WRA

Other aspects covered in the WRA include the guarantee of compensation for land parcels within the floodplains. Other Articles urge all Federal States to provide for an effective protection against erosion and to secure current floodplains and to reclaim as many floodplains as possible.

### 2.4 Federal Building Norm or Code - *Musterbauordnung*

The Conference of the Regional Ministers of Public Infrastructure introduced a master building code (“Musterbauordnung”) which serves as a basis for all Federal States. The most recent version of this master building code was published in 2002.

## 3. State Level:

### 3.1 Regional Development Plan - *Landesentwicklungsplan*<sup>2</sup>

Each Federal State designs a development plan at this state level and enacts a state planning law which strengthens the national law. While this plan is not legally binding, it is important for the rest of the planning process. The Plan includes general objectives for the development of the state through spatial planning. The most important segment concerning flood protection is contained in section **B.III.4** and is cited explicitly as follows:

*4.24 As a precaution, sites for planned water supply dams and planned flood retention basins are not to be designated for uses that are likely to jeopardise the intended purpose of conserving water resources. In addition, catchment areas in dams used as drinking water supply are to be safeguarded.*

*4.25 Flood plains and valley plains of running waters should be kept and developed as natural retention areas to counteract any acceleration of the runoff.*

North Rhine-Westphalia  
Regional Development Plan  
(<http://www.wirtschaft.nrw.de/600/200/100/index.php>)

## 4. Regional Level

### 4.1 Regional Development Plan - *Regionalplan / Gebietsentwicklungsplan*

Administrative districts (“Landkreise” and “Regierungsbezirke”) or multiple districts which cooperate for planning purposes are allowed to establish regional plans (“Regionalpläne”). In some areas like the administrative region Cologne (“Regierungsbezirk Koeln”) which incorporates Bonn, this plan is also called the “Gebietsentwicklungsplan” (GEP). Amongst other subjects, the GEP includes specific topics like waste and water management.

The most important instrument for flood protection at this level is the declaration of particular geographical areas as floodplains (see also 2.3). Areas within the GEP or the “Landesentwicklungsplan” may be assigned to one of the following categories:

1. Areas of priority (“Vorranggebiet”): areas in which one type of use rules out other types of use. [Floodplains belong to this category].
2. Reserved areas (“Vorbehaltsgebiete”): areas in which one type of use has to be considered as more important than other types in subsequent decisions.
3. Suitable areas (“Eignungsgebiete”): areas which are especially suitable for one type of use but may also be used in a different way.

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<sup>2</sup> Landesentwicklungsplan or “Landesplan”



Floodplains are usually defined at a regional level and are declared as priority areas for flood protection. This means that municipalities have to respect these areas while setting up their own master plans.

## **5. Municipal Level:**

### **5.1 Land-use plan - Flaechnutzungsplan**

Urban land use planning in Germany consists of two layers. The first one is a land use plan called “Flaechnutzungsplan”(FNP) which is not legally binding for individual persons but is binding for the local planning authority. It is set up for the whole municipal area and shows different uses of areas but not for each land parcel.

A detailed list of all components included in the FNP is included in **Article 5** of the German Federal Building Code (“Baugesetzbuch” [BauGB], see also: 2.2). The most important sections concerning floods are **Section 2, numbers 6 and 7** and **Section.3, number 1** which demand the display of areas that have to be restricted concerning their use in order to provide protection against natural hazards including areas for flood protection.

**Article 5, section 4a** demands the display of all legally defined floodplains and further areas endangered by floods in the FNP.

### **5.2 Master Zone Mapping Plan - Bebauungsplan**

The second level of urban land-use planning is the Master Zone Mapping Plan or “Bebauungsplan” (B-Plan) which is legally binding. Although the FNP discussed in 5.1 is not legally binding, the B-Plan is based on it. The German Federal Building Code includes a list of all features which have to be displayed in a B-Plan in **Article 9, section 1**. Important features for flood protection are the legally defined floodplains, areas endangered by floods, and other areas which have to be kept free of buildings to provide an effective protection against environmental risks. (**Article 9, section 1, numbers 10, 16, and 20; Article 9, sections 5 and 6a**)

Since the Master Zone Mapping Plan is legally binding, it is a powerful instrument to enforce and secure floodplains.

As it can be seen, German legislation concerning flood prevention has been tailored at all levels of government in a coherent way, introducing and reinforcing the notion of floodplains and restricting the use of floodplains for urbanization. Through such legislation, developers and architects are forced to obey such restrictions and municipal officers can refer local ordinances to similar ordinances enacted at the regional, state, and federal levels.

## **6. Recent Changes**

The most important recent change in legislation concerning flood protection was the **Federal Government's bill of Law to improve the provision of flood protection** (Gesetz zur Verbesserung des vorbeugenden Hochwasserschutzes”), which was passed in 2005. It was part of the government’s response to the devastating floods of the Elbe and the Danube rivers in 2002 which caused damages surpassing a few billion Euros.

Although the German Advisory Council on the Environment (“Sachverstaendigenrat fuer Umweltfragen”) had stated that German legislation incorporated sufficient provisions for an efficient flood protection; in its annual report corresponding to the year 2000, the Federal Government was of the opinion that consistent legislation could further improve flood protection and speed up the efforts of individual states.

As a reaction to the floods in the Elbe and Danube rivers, an action program consisting of five points was passed. Its goals are:

1. A collective program including states and national institutions to provide more retention area for rivers and to reduce possible losses through spatial planning.
2. Cooperation between Federal States.
3. European cooperation.
4. Environment-friendly use of rivers.
5. Immediate measures for better flood protection and early warning.

The Bill of Law focusing on the improvements regarding the provision of Flood Protection is intended to cover these five points. It substituted five existing laws:

1. The German Federal Water Act - *Wasserhaushaltsgesetz*
2. The German Federal Building Code - *Baugesetzbuch*
3. The Regional Planning Act - *Bundesraumordnungsgesetz*
4. Waterways Act/ Bundeswasserstrassengesetz
5. The Law concerning the German Meteorological Service - *Gesetz ueber den Deutschen Wetterdienst*

The most important changes focus on strict regulations regarding the establishment of infrastructure of any kind in floodplains and more detailed directives concerning how to implement flood protection in the context of spatial planning.

## **7. Special Building Codes in Germany Concerning Areas Affected by Floods:**

Up to now there is no special building code targeting zones exposed to floods. The region of North Rhine-Westphalia used to have such an ordinance about the construction and modification of buildings in the floodplains of streams that are dangerous during floods<sup>3</sup>. It came into effect on the 25<sup>th</sup> of November of the year 1959, but was disestablished in the early 1970s. This ordinance included the following standards:

1. All segments of any building which are up to 0,50m above the highest ice free water level recorded since 1882 should be constructed with material resistant and impervious to water.
2. All segments of any building within this height need to be able to resist the current of the stream and of ice drift.
3. The floor of each room designed for permanent inhabitation should be at least 0,50m above the highest ice-free water-level recorded since 1882. The walls surrounding such a room need to be secured against ascending water or constructed of water-resistant material.
4. Windows and door-openings in exterior walls should be



An old building in Beuel incorporating an elevated ground floor to minimize the impacts of floods. Foto: JCV

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<sup>3</sup> Labeled “Verordnung ueber die Errichtung und Aenderung von Gebaeuden in den Ueberschwemmungsgebieten der bei Hochwasser gefahrbringenden Wasserlaeufer” in German language.

secured against water penetration.

5. The cellar should be equipped with a sump pit and all cellar floors should be constructed with a slope towards this pit.

These standards applied to all buildings within legally defined floodplains (“Ueberschwemmungsgebiete”). The definition of these floodplains dates back to the Prussian Water Act of 1913 (NRW 1959). Although this building code is no longer legally binding, its’ standards are still regarded as a useful guideline. (BMVBW 2002, .11)

Today, there are only vague requirements regarding construction norms and materials to be employed, which are formulated in the Federal Law to improve provident Flood Protection (“Bundesgesetz zur Verbesserung des vorbeugenden Hochwasserschutzes dated 3.Mai 2005”) and taken over by the Federal Water Act of Germany. According to this law, each person affected by a flood is obliged to take the necessary precautions in order to protect his or her property and to reduce possible losses.

The decision concerning the type of measures to be implemented lies in the responsibility of the owner. It is however prohibited to build a house in a manner that a flood could lead to a structural collapse of the whole building. (BMVBW 2002, p. 15)

The German Federal Ministry of Transport, Building and Urban Affairs (“Bundesministerium fuer Verkehr, Bau und Stadtentwicklung”) has published a useful guideline for people living in floodplains. Although it is not legally binding, it offers detailed information on how to protect houses against floods. The most recent version was published in 2006. Apart from information on structural flood protection it also offers an overview of all laws and plans concerning provident flood protection and early warning.

Each Federal State of Germany has got its own building code referred to as “Landesbauordnung”. The differences between these building codes are marginal since they are all based on the master building code named “Musterbauordnung”.

## **8. Exceptions**

While private individuals and architects are required to follow the norms, rules, and abide by the laws presented in the previous sections, the Federal Government is exempted from requesting and obtaining building permits for infrastructure if their design and construction

are supervised by an official of the responsible Public Infrastructure agency. This exception allowed the construction of the “Langen Eugen” which is now used by the United Nations and the “Schürmann-Bau” which is now used by Deutsche Welle<sup>4</sup>.



Some German towns and cities erect small monuments or locate small markings on the walls of buildings to indicate the levels of historic and recent floods. This small plaza in Beuel, within the city of Bonn, has one such monument indicating the levels of historic floods in this area of the Rhine river. Photo: JCV

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<sup>4</sup> Note from the author: this statement was taken from another source and could not yet be confirmed by the legal documents referred to. The procedure might have changed in the meantime.

## 9. Conclusions

A review of the German flood protection leads to the conclusion that the Federal Government in Germany has recently introduced a comprehensive set of guidelines, rules, norms, and legislation with the goal of promoting a more sustainable framework of development by minimizing the exposure of new infrastructure to frequent floods and avoiding existing infrastructure from becoming flooded. Notable advances can be identified along four particular lines:

- The introduction of rules and regulations to inhibit the modification of floodplains as a means to “freeze” the shape, extension, and location of such floodplains. This is achieved by placing prohibiting new developments and restricting modifications to existing infrastructure inside the floodplains
- The official recognition and subsequent demand on Federal States to legally define floodplains and the subsequent demand for their incorporation into land-use plans at state, regional, and municipal levels.
- The promotion concerning the implementation of retention areas or polders to control the extent of floods in conjunction with the multi-level spatial planning norms and building codes as a comprehensive way to manage not only rivers, but also the dynamics of floods.
- The attention to the fact that all levels of government, from the federal to the municipal, must adapt their building norms and land-use plans to such a policy with the goal of minimizing losses associated to floods. This issue becomes crucial when one reviews examples from developing countries where conflicts in legislation enacted at different government levels result in contradictions and end up opening the opportunity for individual persons or businesses to create risks by erecting infrastructure inside the floodplains.

The aim of “freezing” the shape, extension, and location of floodplains is an essential measure to prevent existing urban or industrial areas from beginning to experience floods due to gradual changes in such floodplains. In order to avoid floods in historic centers in many cities in Latin America, Asia, and Africa, Municipal Administrations now have to embark on huge projects to control torrential runoff conditions which have risen gradually over the decades in river channels. Such increases are due to increasing urbanization which did not incorporate integral flood management guidelines. In addition, the “freezing” of such a shape and location of the floodplains allows state, regional, and municipal authorities to promote urban, industrial and recreational developments based on a strategic land-use plan that already contemplates such floods.

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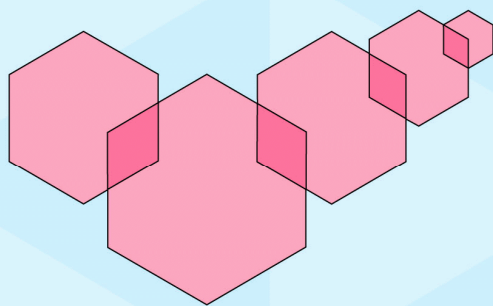
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