

## Plonevez-les-Flots: a fictional showcase of the dilemmas faced by local authorities dealing with coastal hazard management

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**ABSTRACT.**— In France, the mayors of coastal municipalities that are exposed to sea flooding and coastal erosion face a situation in which they need to coordinate an increasingly complex raft of legal duties, liabilities and responsibilities in order to safeguard people and property. Their goals of economic and social development are being constrained by new obligations to comply with a variety of legal documents and funding opportunities that proliferated after the devastating storm *Xynthia*, in 2010. This paper analyzes the current situation from a combined legal and geographic viewpoint, and reveals gaps between the political level of coastal planning and a more local level that must consider field constraints and stakeholder attitudes.

*Key words: coastal hazards, sea flooding, coastal erosion, local authority, judicial tools, legal framework, integrated coastal zone management*

### Introduction

The tragic episode of storm *Xynthia* on February 27 and 28, 2010 in Vendée, Charente-Maritime and Gironde, on the French Atlantic coast, led to a reinforcement of the prevention and management of coastal hazards (chiefly flooding and erosion), which poses a threat to the residents of coastal towns and villages (Anziani, 2010; Legal, 2012; Le Louarn, 2012). In addition to public behavior observed during an emergency, management of these risks is in line with a wider process of public policy, which involves the introduction of new legislation.

Coastal risk management systems can be extremely complex<sup>1</sup>. This paper sets out to explore from a geographic and legal perspective how local authorities tackle this issue. Waterfront spaces are highly coveted by our society, and the application of the law can lead to conflicts of interests within a community, as well as the difficulty of dealing with and maintaining a landscape that may be constantly shifting or under threat.

In France, the mayor is the primary authority with a responsibility for monitoring relief efforts as well as preventing any accidents and disasters that might threaten the population

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<sup>1</sup> This article refers to another, more detailed companion survey that focuses on legal references, published in the *Gazette des Communes*, 2013, under the title: “Des textes au terrain: les défis posés aux élus locaux par la gestion des risques côtiers d’érosion submersion”.

under his jurisdiction<sup>2</sup>. The task is exceedingly complex, particularly when conflicting local interests are at play. Broader territorial development imperatives must be borne in mind while at the same time ensuring citizen safety and being obliged to incorporate legal duties into local decision making (not to mention the risk that he runs of facing criminal proceedings if failing to do so). Anyone in office with such responsibilities may justifiably feel disorientated.

In order to illustrate and analyze the complexities of municipal management that mayors must face, we constructed an imaginary model of local government, empirically inspired by sociologist Max Weber's "ideal type" (1904), in which the local governing body is faced with the typical planning problems relating to coastal hazard management.

### **An "ideal type"<sup>3</sup>: Plonevez-les-Flots**

This fictional administrative division was crafted from feedback acquired through several research programmes relating to coastal hazards in the French regions of Nord–Pas-de-Calais (PNEC, 2002–2004), Languedoc–Roussillon (ANR Miseeva 2007–2011), Bretagne (GICC Adaptalitt 2009–2012, ANR Cocorisco 2011–2014), as well as participation in several national working groups: long-term strategy of the Coastal Protection Agency (*Conservatoire de l'Espace Littoral*: Sogreah–Artelia, 2011), and the coastline management strategy (Cousin, 2011). Though imaginary, this space was constructed by aggregating several real situations in such a way that a synthesis of all the issues relating to coastal risk management in mainland France<sup>4</sup> can be concentrated in one place.

At the western boundary of Plonevez-les-Flots lies a sandy, low-lying coastline with a foredune separating it from a former saltmarsh; at the eastern side, a cliffline in poorly consolidated loess undergoing rapid recession (Fig. 1).

#### **Fig. 1/ The fictional municipality of Plonevez-les-Flots**

The western part of the municipality used to be a wetland but was reclaimed in the early 20th century for agricultural purposes, and then partially built over in the 1990s. It is now an estate of around fifty houses. This housing estate lies two meters below the highest spring tides. A coastal embankment, currently in poor condition and under unknown ownership, prevents the sea from entering this former marsh. To the far west, the formerly municipal campsite has been taken over by a private company. A large number of tent spaces have been replaced by cabins. A major part of this trailer park is situated more than one metre below the level of high-water spring tides.

The area is agricultural and owes its agronomic identity to sandy soils, to a mild, humid climate, and to the traditional practice of using seaweed as fertilizer. These features have earned local producers the "*primeurs bio de Plonevez*" certification mark for organic early vegetables. Late in the 19th century, Plonevez experienced a tourist boom and a classic split between the old village, situated 3 kilometers inland, and the seaside resort with opulent villas on the clifftops. The owners, who are mostly secondary residents, have formed an association to contain cliff erosion and have demanded municipal intervention to install effective coastal defences.

In the early 1980s, the Coastal Protection Agency acquired around 30% of the area consisting

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<sup>2</sup> Article L.2212-2.5° of the Code Général des collectivités territoriales

<sup>3</sup> The notion of "ideal type" refers to Max Weber (1904)

<sup>4</sup> The list of municipalities that have inspired this model are Bray-Dune, Oye-Plage, Wissant, Wimereux, Trébeurden, Guissey, l'île Tudy, Gâvres, Penestin, Noirmoutier, la Faute-sur-Mer, Palavas-les-Flots, Carnon...

of coastal dunes, meadows and wetlands. This area today is a classified Natura 2000 zone<sup>5</sup>. The Coastal Protection Agency and the Natura 2000 project officer are currently working on a managed realignment project (termed *de-polderization*, in French) designed to let the sea back into a part of this land area, and to thus also increase the site's biodiversity through the creation of new wetland habitat. In order to achieve this, it would simply be necessary to destroy a small, unclassified embankment owned by the Coastal Protection Agency. Members of the recently founded "Save Our Seawall" (SOS) association are highly skeptical of this project because they fear that re-opening a part of the polder would indirectly promote seawater incursions into their land. This issue causes heated debates during public meetings at the townhall.

Because of the risk to human life, a feasibility study for relocating the 50 estate houses is being carried out by the Technical Land Planning Office (*Centre d'Études Techniques de l'Équipement*: CETE), in accordance with the national coastline management strategy (Cousin, 2011). Given that the municipality no longer has any land available for this kind of operation, the Technical Land Planning Office is turning to the inter-municipal council, which includes Plonevez-les-Flots among other municipalities. The estate residents have formed a citizens' association and are, once again, strongly opposed to this project and are demanding a prompt reinforcement of the protective embankment, without which their lives and property would be put at risk.

The local population has been declining over the last two decades. The population is ageing and the primary school is closing down classes every year. More than half the houses are second homes, which makes it difficult for local businesses during the off-peak season. In order to re-energize the area, the municipal council would like to offer social housing to young couples, but the very limited land available in the district is agricultural. The Young Organic Farmers of Plonevez union, supported by the Land Development and Rural Settlement Organization (*Société d'aménagement foncier et d'établissement rural*: SAFER), is strongly opposed to this project.

Having set the scene for our fictional town, this article will continue with an overview of the current provisions on matters of coastal hazard management, aiming to characterize their implementation modalities. We shall follow the thread of concerns faced by the elected representatives of this fictional local authority. As a first step, and in accordance with the Mayor's priorities, the daily safety of the population is ensured through information, preparation and warning. Next comes the problem of protection against hazards (flooding in the context of the housing estate, and cliff erosion in the case of the villas), and hence the search for funds to launch major repair works. At the same time, the issue of municipal strategies on matters of urban planning will also be raised. Finally, the subject of relocating the installations advocated by the national coastline management strategy will be discussed with regard to the long-term future of the municipality and its relations with adjacent municipal councils in a context of climate change.

### **Ensuring population safety**

Being aware of the vulnerability of residents and installations, the new municipal team has made flood risk management and the issue of erosion a priority for its term. After taking office, it made an assessment of population safety. The findings indicate that information and awareness-raising to coastal hazards could be greatly improved.

### ***Police duty of maintaining law and order***

The mayor's prime duty is the enforcement of law and order with assistance from the

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<sup>5</sup> See the following links:

<http://www.conservatoiredulittoral.fr/>, and <http://ec.europa.eu/environment/nature/natura2000/>

municipal police<sup>6</sup>. On these grounds, any mayor is under obligation to take action when the case arises<sup>7</sup>. Any refusal to comply could be challenged and the mayor would be prosecuted by an administrative court on grounds of liability for negligence. Against this backdrop, the mayor of Plonevez and his team have been working on a series of municipal orders intended to warn the public and inform them about potential natural hazards (poster campaign suspending the pedestrian right of way on certain stretches of the coastal paths, closing off an area to the public at the base of cliffs susceptible to landslides). Liability claims against the municipal authorities on account of failure to provide information about the hazards have thus been prevented.

Next comes the issue of the attitude to adopt with the SOS pressure group, which wants the local authorities “to face up to its responsibilities in respect of embankment maintenance”. As no embankment owner or manager has yet been traced, the SOS group considers that the municipal authorities should oversee the maintenance of this privately owned sea defence. For this, the SOS supporters refer to the fact that the local authority, on account of its general policing duties—even in the context of privately managed property—must take action from the moment it becomes aware of the infrastructure’s state of disrepair. This is required in order to prevent any public safety infringements. Sea defence maintenance is thus not transferred to the municipality, but in order to uphold law and order, the mayor still has to carry out his police duties on the matter.

The mayor must also closely monitor the campsite as part of his general policing duty shared with the County Police Commissioner (or Prefect). In order to prevent public safety infringements in the case of serious and imminent danger (flooding, in this case), the municipal authority can prescribe all necessary measures. These include ordering temporary closure of the settlement, or its evacuation, or ensuring this evacuation through legal action under the condition that the mayor states the reasons for his decision and justifies the proportionate nature of the measure with respect to the risk involved. In addition, because of the provisions stemming from the Urban Planning Code (Articles R. 443s), and the circular dated April 7, 2010 pertaining to the measures to be taken following storm *Xynthia*, the issue of campsite maintenance looms large. After investigating and reviewing the situation, the county authorities finally decided to maintain the Plonevez campsite. Its operator must now comply with the obligation of issuing warnings and evacuating its occupants, in accordance with the provisions established by the Municipal Emergency Action Plan and those under Articles R.443-9 to 12 of the Urban Planning Code.

### ***Preventive information and risk preparedness***

Apart from the general principle of access to environment-related information held by the public authorities (Article L. 124-1 of the Environmental Code), and regardless of the Municipal Information Documents on Major Hazards and of the Municipal Emergency Action Plan, the public has to be informed about the actual risks detected within the municipal boundary.

This mandatory information does not rest exclusively in the hands of the municipality and can be incumbent on private individuals at the time of property transactions. This is relevant to newcomers to Plonevez. Being a municipality governed by a Risk Prevention Plan, Plonevez stands under the obligation to inform buyers and tenants of potential hazards under Article L. 125-5.I of the Environmental Code.

Regarding prevention through public information of residents as well as county-wide preparedness in the event of a disaster, Plonevez has undertaken to draw up a Municipal Information Document on Major Hazards as a local adaptation of the County File on Major

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<sup>6</sup> This contribution owes a lot to the Prim.net database

<sup>7</sup> Article L.2212-2.5° of the Code Général des collectivités territoriales

Hazards. On the basis of Articles R. 125-10 and 11 of the Environmental Code, the future Municipal Information Document on Major Hazards must specify the list of natural hazards likely to occur within the Plonevez municipal boundary, and must formulate appropriate provisions for the Risk Prevention Plan—including the set of measures to be taken by the authorities in order to deal with any potential hazard-related disasters (particularly the modalities for displaying safety instructions in accordance with Article R. 125-12 and with the list of cases mentioned in Article R. 125-14 of the Environmental Code). Moreover, the public should be informed of the existence of the Municipal Information Document on Major Hazards, which must be displayed at the town hall for two months. It is subsequently available on request for consultation only.

Apart from these measures, the municipal council must also consider putting in place its Municipal Emergency Action Plan, which is henceforth mandatory wherever a Risk Prevention Plan has been approved<sup>8</sup>. Moreover, setting out such a plan will allow the council to apply for a higher State subsidy for the design and construction work<sup>9</sup> (40%, as against 25% without such a plan). This is also an important undertaking for Plonevez since the future Municipal Emergency Action Plan will include all the documents under the municipality's purview relating to preventive information and public protection, and will operate as a local version of the national ORSEC<sup>10</sup> emergency plan, with which it has to be compatible. Once the Municipal Emergency Action Plan is finalized, it will become an essential tool in future disaster management. This plan has actually allowed greater precision in organizing and disseminating the warning signal, in identifying available resources, in determining measures for public assistance, and in delivering safety and protection.

Nevertheless, without any further resources available from the municipal police force for ensuring civilian security (the police would be assigned other work in the event of a disaster, e.g., maintaining order, traffic regulation, signaling, etc.), the municipal authorities consider that the Municipal Emergency Action Plan should be drafted by, and entrusted to, the inter-municipal council. Thus, as stated in Article 5 of the decree from 2005, an Inter-Municipal Emergency Action Plan will be finalized in order to make it possible to muster greater resources and make them better suited to the specified magnitude of the disaster. By being conceived at the broader inter-municipal (or district) level, the plan would thus foster solidarity between neighboring communities affected by the coastal hazards and among members of the different councils. In any case, the plan requires revision at least every five years.

#### ***Implementation of the warning system and organization of emergency services***

As well as the dissemination of information and warnings, the mayor and the police must be prepared to take action in the event of proven hazards and risks. However, this obligation runs further than crisis management or damage limitation. While the mayor retains his powers over the municipal police force, extreme coastal dangers may also involve the deployment of emergency services as part of a distinct operational framework, e.g. the ORSEC plan or the Municipal Emergency Action Plan.

As anywhere else in France, the National Warning System at Plonevez-les-Flots is likely to be applied. Thus, in the first place, the conditions for the warning follow the 2004 Law on the modernization of civilian security, by which State services must uphold constant vigilance and disseminate information about hazards among the population at risk. The means of broadcasting the warning signal are specified by the decree of October 12, 2005, pertaining to the national warning code<sup>11</sup>.

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<sup>8</sup> Act no. 2004-811 dated August 13, 2004, and decree no. 2005-1156 dated September 13, 2005.

<sup>9</sup> As part of the Action Plan for Flood Prevention and the Rapid Inundation Plan.

<sup>10</sup> ORSEC is the acronym for Organisation de la réponse de sécurité civile [Civilian Security Response Plan].

<sup>11</sup> Decree no. 2005-1269 dated October 12, 2005.

Warning procedures that are specific to coastal hazards have been in existence since storm *Xynthia*. One example is the storm surge monitoring system. This warning system follows the same approach as for the eight other meteorological and hydrological hazard systems for hurricane-force winds, flashfloods, river floods, thunderstorms, black ice, avalanches, extreme cold waves, and heatwaves. The public is informed and warned through bulletins and maps published twice a day, associating four colors and a special pictogram, along with updates on further developments. The system is developed and its operational implementation is jointly monitored by Météo-France, the National Hydrographic Office (*Service hydrographique et océanographique de la Marine*: SHOM), the Directorate for Risk awareness and Safety, and the General Directorate of Homeland Security. Whereas the mayor is responsible for monitoring these various states of emergency in his capacity as head of the police authority, the County Police Commissioner should inform the mayor in the eventuality of an extreme (“red flag”-rated) emergency so that the District Emergency Action Plan can be implemented. Depending on the geographic area and on the number of municipalities hit by the disaster, the County Police Commissioner, or even the chief of the defence zone, will then be responsible for dealing with the crisis and coordinating the relief operation at the relevant level. The mayor will retain his jurisdiction over law and order, and will implement relevant provisions of the Municipal Information Document on Major Risks and the Municipal Emergency Action Plan.

### **Consolidation of sea defences**

In addition to the daily management of the safety of residents, the municipal authorities fear the exceptional combination of stormy weather and high-water spring tides, as occurred during storm *Xynthia*. The most common reaction in such a situation is to find ways of buffering the shoreline by reinforcing flood defences and preventing coastal erosion. This type of project raises the problem of who controls and who pays.

#### ***Reinforcing an embankment classified as hydraulic structure***

The circular dated April 7, 2010, pertaining to the measures to be taken following storm *Xynthia*, asks the State services to identify “protection systems” against flooding, and to determine the structures that protect a large number of people effectively and thus come under the decree dated 2007 on hydraulic structures<sup>12</sup>.

This decree is not specific to polder dykes or sea walls; it was instead conceived for river dams and levees. Its principle is to make the owners or operators of hydraulic structures responsible by obliging them to regularly monitor and maintain them as a protective measure for the benefit of human life and property. By extension, this decree also covers sea defences, but before storm *Xynthia* it was never applied to sea defences. Since the storm, all the sea-defence systems must now be classified by the County Directorates for Territory and Sea (*Direction Départementale des Territoires et de la Mer*: DDTM), and controlled by one of the 21 Regional Directorates for Environment, Urban Planning and Housing (*Directions régionales de l'environnement, de l'aménagement et du logement*: DREAL). The largest structures must be subjected to a hazard assessment study, with regular safety monitoring and repair work at the expense of the owners or operating managers.

A perceptible gap exists between this legal document, which deals with how to handle a rise in river level and to operate dams accordingly, and its application to coastal systems. In fact, sea defences are not subjected to any “exploitation” as such and are not riverbank structures designed to protect residential properties. They were often conceived instead for protecting agricultural polders from the sea, for which the event of occasional flooding was not a serious threat (Verger, 2011). Another fundamental problem arising out of this classification is that

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<sup>12</sup> Decree no. 2007-1735 dated December 11, 2007.

the number of residents is calculated only as a function of the height of the existing structure, and does not take into account abnormally high tide levels. In the case of low structures that are already undersized, this way of calculating minimizes the number of people at risk and, therefore, undervalues the maintenance constraints.

As a result, it often happens that sea-defences are perceived by their owners as pointless, even though they allow them to keep their land “dry” and hence their status of private plots, outside the public maritime domain. They are perceived instead as a burden involving heavy responsibilities and increasing maintenance costs. Where the owners are individuals, they often try to get rid of them or, at the very least, to remain silent over their right of ownership. In the absence of identifiable owners<sup>13</sup>, such structures are thus left in limbo as unclaimed property. Such is the case of the embankment in the vicinity of the housing estate at Plonevez-les-Flots. Yet with regard to existing hydraulic structures, the “Grenelle II”<sup>14</sup> Act of 2010 states that these have to comply with regulations or, failing that, must be “neutralized”, i.e., destroyed—on the basis that an unmaintained structure can be more of a liability<sup>15</sup> than an asset. This rather unrealistic State order clears the State of the responsibility of taking care of all abandoned defence structures by devolving the issue to local authorities which, as in Plonevez-les-Flots, are reluctant to destroy the embankment. The municipality is thus forced to take responsibility for organizing structural maintenance, or to find another solution such as relocating the properties at risk. Apart from the legal obligations related to the hydraulic structures, “the fundamental point is funding. The issue of project management will be resolved when the funding issue is resolved” (Noël Faucher, mayor of Noirmoutier-en-l'Île, July 7, 2010; quoted in CEPRI, 2011).

#### ***Funding sea defence work: Fast Flooding Plan***

The “dyke plan”, dated March 2010, has gradually evolved into a Sudden Submersion Plan (Plan Submersions Rapides: PSR), which covers coastal floods, flash floods, and dyke failures (CEPRI, 2011; MEDDTL, 2011). Like the decree on hydraulic structures, the PSR concerns sea surges and flash floods. However, it puts forward a program that is advantageous to coastal areas because it addresses the issues of erosion and flooding simultaneously.

The Sudden Submersion Plan is conceived as an inter-ministerial effort involving contract-based agreements with local authorities, which submit their projects to the State via the DREAL. At the coast, being granted the Sudden Submersion Plan certification provides access to the “Barnier Fund”<sup>16</sup> for reinforcement work on marine flood defences. The budget allocated by the State to the Sudden Submersion Plan is 500 million euros for the period 2011-2016.

The mayor of Plonevez-les-Flots is thus preparing a Sudden Submersion Plan to reinforce the old polder dyke near the housing estate. He has hired an engineering and design consultancy firm, paid for by the municipality. The consultant’s report recommends that the wall be raised to anticipate the effects of climate change. But a simple Sudden Submersion Plan does not allow this type of operation. If the work involves raising the structure, it also has to be included in a larger project developed as part of an Action Plan for Flood Prevention (*Programme d’Actions pour la Prévention des risques d’Inondation: PAPI*).

#### ***Obtaining additional funding by developing a more integrated territorial management project: the Action Plan for Flood Prevention (PAPI)***

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<sup>13</sup> Around 119 km out of 510 km of sea dykes do not have identified managers, that is, 23 % (national database “Bardigues” of the Environmental Ministry and CEMAGREF, in Collectif, CEPRI, 2011).

<sup>14</sup> Act no. 2010-788 dated July 12, 2010, pertaining to the national commitment for the environment, article 220.

<sup>15</sup> Government instruction dated October 20, 2011 (NOR: DEVPI127131J), unpublished in the Official Gazette of the French Republic.

<sup>16</sup> Major Natural Risk Prevention Fund created by Act no. 95-101 dated February 2, 1995.

Action Plans for Flood Prevention were launched in 2002 by the Ministry of the Environment, and were originally concerned with mainland flooding only. However, following the *Xynthia* disaster, a “second generation” PAPI was extended to coastal environments.

The operating principle behind the new Action Plans for Flood Prevention is that projects can be submitted on a continuous-flow basis. The local authorities submit their applications to the State. The budget allocated by the State to Action Plans for Flood Prevention is 350 million euros for the period 2011-2015, with additional funds provided by the Barnier Fund and the Risk Prevention Program of the Ministry for Ecology, Sustainable Development and Energy.

The purpose of an Action Plan for Flood Prevention is broader than for a Sudden Submersion Plan; it is not mandatory for it to include interventions on defence structures (even though this is often the main incentive for the local authorities) and it involves an integrated vision as part of a coherent risk management project. In addition, the scale of an Action Plan for Flood Prevention is larger than that of a Sudden Submersion Plan; it requires a territorial plan to be elaborated, and this can scale with a Territorial Coherence Programme (*Schéma de Cohérence Territoriale*: SCoT) or even a joint SCoT between several municipal councils, and it must also encompass at least one coastal cell (a natural coastline unit within which longshore sediment movement is self-contained).

As a first step, Local authorities can develop a “target Action Plan for Flood Prevention” in order to apply for a research fund. The “complete Action Plan for Flood Prevention” will necessarily include a diagnosis, a strategy, an action plan and a cost–benefit analysis where investment costs are involved. For the benefit of the candidates (and the design and engineering consultancy firms that they will choose), the State has drafted detailed specifications (MEDDTL, 2011) closely related to the 2007 European Flood Directive<sup>17</sup> and to the methodology advocated for “new coastal” Natural Hazard Prevention plans. Drafting an Action Plan for Flood Prevention is a laborious process, requiring extensive research that has to be supported and carried out by the local authorities themselves.

During a regional meeting of the National Association of Elected Representatives from coastal local authorities, the mayor of Plonevez-les-Flots discovered a recent circular<sup>18</sup> encouraging those who have a Sudden Submersion Plan to integrate their project into a larger PAPI project. Given that an Action Plan for Flood Prevention is mandatory for major projects and for gaining access to the Barnier Fund, this effort would increase the mayor’s chances of obtaining substantial funds to strengthen sea defences in his municipality.

The municipality’s initial reflex is thus to defend its territory against the sea, in the light of the tangible threat posed by storms such as *Xynthia*. But these actions are predicated on only one of the risk parameters: natural hazards (flood and erosion). Another, complementary way of reducing the vulnerability of an area to natural hazards is to act on the location of installations through land-use planning.

### **Urban planning strategy and development capacity in the light of coastal hazards**

With its latest version adopted much before the SRU Act (*Solidarité et Renouvellement Urbain*)<sup>19</sup>, the municipal Land Use Plan (*Plan d’Occupation des Sols*: POS) needs to be reviewed immediately and, on this occasion, must be replaced by a Local Urban Planning

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<sup>17</sup> European Directive 2007/60 dated October 23, 2007

<sup>18</sup> Circular dated May 12, 2011.

<sup>19</sup> Act no. 2000-1208 dated December 13, 2000, “Solidarité et renouvellement urbains” [Urban Solidarity and Renewal], called “SRU” Act.



Scheme (*Plan Local d'Urbanisme*: PLU). In order to avoid cancellation, drafting the future Local Urban Planning Scheme must take into account foreseeable natural hazards specified in Article L. 121-1.3° of the Urban Planning Code. At the same time, the inter-municipal authority decided to develop a SCoT, which must also include natural hazard management. Moreover, Plonevez is subject to the enforcement of the Coastal Act.

### ***3.1 Developing a Local Urban Planning Scheme with provision for coastal hazards***

Although drafting the Local Urban Planning Scheme is for the moment at a more advanced stage than drafting the SCoT, it nevertheless has to be made compatible with the provisions of the SCoT under Article L. 121-1.15° of the Urban Planning Code. This issue of interconnectedness between the two processes is all the more significant as the mayor of Plonevez is considering the possibility of opening up agricultural areas to urbanization in order to accommodate possible relocation of the housing estate. However, the “Grenelle II” Act amended Article L.122-2 of the Urban Planning Code in 2010, stating that “a Local Urban Planning Scheme cannot be modified or revised for opening up a demarcated area or natural zone to urbanization after July 1st, 2002 [...] unless the municipal councils of concern already come under the regulations of a SCoT”.

In any event, the natural hazards to be characterized and integrated in the two frameworks (i.e., SCoT and PLU) have to be set out by the County Police Commissioner in the public notification that follows the decision to draft or review the Local Urban Planning Scheme in accordance with Article R.121-1 of the Urban Planning Code. This public notice officially commits the State to its content and must list the hazards, and indicate the provisions meant to prevent them (such as the approved Coastal Risk Prevention Plan<sup>20</sup>) or the technical data.

However, the local authority must first concentrate its efforts on drafting its Local Urban Planning Scheme and on incorporating the list of threats relating to coastal hazards. The municipal team thus studies the hazard-related data transmitted by the Prefect in the public notification, and also examines the conclusions of various studies produced by specialist consultancies on cliff erosion and sea defences (their reinforcement or destruction), on the relocation of the housing estate, and on the development of the campsite. Preliminary studies carried out during the course of drafting the Coastal Risk Prevention Plan by the Prefect are also considered.

Today, the main fear of the mayor with regard to the legality of his future Local Urban Planning Scheme is to know if flood and erosion risks will be adequately addressed at the local level. An order by the Marseille Administrative Court of Appeal<sup>21</sup> was brought to his notice, stating that “by failing to address flood hazards adequately, the approved Local Urban Planning Scheme has seriously compromised one of the principles stated by Article L. 121-1 applicable to the Urban Planning Code, according to which a Local Urban Planning Scheme must determine the conditions that make it possible to ensure the prevention of foreseeable natural hazards [...]”.

Zoning maps for a future Local Urban Planning Scheme are strategic components of the application process because these have to be linked consistently to the zoning units of the Coastal Risk Prevention Plan. Subsequently, the regulations of the Local urban Planning Scheme will be key features in any risk management strategy because of their prescriptive value in future land-use authorizations. The rules and regulations can be based on the Coastal Risk Prevention Plan. It is mandatory for the Coastal Risk Prevention Plan to be annexed to the Local Urban Planning Scheme because of its public utility easement value. It will help to prescribe any conditions<sup>22</sup> for future construction in the hazard zones.

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<sup>20</sup> In Plonevez, the Risk Prevention Plan is “Coastal” because it deals jointly with flood and erosion hazards.

<sup>21</sup> Administrative Court of Appeal of Marseille, January 29, 2010 “commune of Saint-Privat-des-Vieux”.

<sup>22</sup> Article L.562-4 of the Environmental Code.

### ***Land-use authorizations***

Even before mentioning the conditions for issuing a construction permit, the impact of integrating the risks on urban planning certificate applications is crucial. The local authority must issue the relevant information<sup>23</sup> to the person who has submitted the application (potential buyer of a plot, for example), and take the nature of the application into account: “ordinary certificate” mentioning the restrictions, or “detailed certificate” if it pertains to a specific operation. The mayor of Plonevez, for example, turned down a request from the owner of a villa situated on the clifftop because of the landslide hazard listed in the Risk Prevention Plan. The occupant wanted to find out about restrictions to planning permission in case he decided to build an extension to his house.

In the case of construction permits, it will be necessary to include coastal hazards right from the time the application is processed. In the event of new urbanization occurring in the “blue zone” of the Risk Prevention Plan, the applicant must provide a “preliminary study”<sup>24</sup> attesting that the project takes into account the provisions of the Risk Prevention Plan. In all cases, the mayor retains the right to refuse the issuance of a construction permit on the basis of Article R.111-2 of the Urban Planning Code.

The Coastal Act also restricts the opening up of new areas to urban planning near sites of special cultural or scientific interest, in diffuse urban areas, seaward of the coastal construction line (in France: a 100-metre band), etc. The relocation of the 50-strong housing estate in an area close to the shore is unlikely to be accepted under such constraints. Relocating the housing estate close to the old village instead could be a better solution, provided there is agricultural land available to do so.

Urban planning precautions related to coastal hazards imposed by the Risk Prevention Plan, together with the restrictions induced by the Coastal Act, thus complicate the municipal development policy and weaken the legality of the future Local Urban Planning Scheme. The consequences of this set of restrictions on the authorizations that could be issued by the municipal council trouble the mayor. The administrative jurisprudence on this issue specifies that the determining criterion is the extent of prior knowledge that the authority had of the hazards. When the authority, which issues the authorization, is in possession of sufficient evidence that should lead the the mayor to refuse a land-use application but ends up issuing a permit nevertheless, the mayor could be held responsible in the event of an ensuing disaster<sup>25</sup>. Conversely, he cannot be held liable if the municipal council had no knowledge of the hazards at the time of issuing the authorization<sup>26</sup>. These specific constraints in matters of urban planning also crop up in cases involving the relocation of buildings that are exposed to a high risk of damage or destruction. The prospect of expropriation is also often added to the equation.

### **Conceiving a long-term future in a context of climate change**

Apart from controlling future urban planning, it might be appropriate in certain cases to eliminate existing installations or to place them out of reach in order to reduce their vulnerability to flooding or cliff erosion. This solution was officially advocated *in* a post-*Xynthia* circular dated April 7, 2010, but it clearly came too late. Sharp controversies have

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<sup>23</sup> On this account, the urban planning certificate is linked to the issue of public information addressed in the first part of this article.

<sup>24</sup> Article R. 431-16 e) of the Urban Planning Code.

<sup>25</sup> CAA of Bordeaux, December 28, 2009, municipality of Argenton-sur-Creuse.

<sup>26</sup> Conseil d'État, June 16, 2010, M. Jean A., no. 312331.

arisen from hasty decisions to destroy buildings located in “black areas”<sup>27</sup> (i.e. danger zones). These decisions appeared to ignore the alternative possibilities of preventive expropriation already proposed by the Barnier Act since 1995<sup>28</sup>.

### ***Expropriation of “property exposed to natural hazards posing serious threats to human life”***

First of all, Article L.561-1 of the Environmental Code provides an exhaustive list of foreseeable natural hazards likely to justify expropriation on grounds of public utility. The list includes “earth movements” and sea flooding. Despite the debatable conflation of erosion with “earth movements”, it seems that existing jurisprudence allows expropriation for erosion-related hazards<sup>29</sup>. The national coastline management strategy also takes this approach (Cousin, 2011).

Next, in order to use the expropriation option, it is specified that the identified hazards have to constitute “serious threats to human lives”. Article R.561-2 of the Environmental Code states that the seriousness of the threat (probability and frequency) must be distinguished from the estimated time frame for warning and evacuating the persons at risk. This assessment will be carried out through a risk analysis, which is subsequently subjected to a public enquiry.

At Plonevez, this risk analysis could turn out to be complex for a flood that follows a rupture of the embankment. It is difficult to specify the probability of this occurring, even though the observed deterioration of the dyke leaves little room for doubt about its mechanical strength. Also, for the villas threatened by cliff erosion, the conditions for expropriation seem once again difficult to fulfill, notably because of the difficulty in determining the imminence and magnitude of a landslide. Finally, and in accordance with the principles of the Barnier Act, expropriation because of natural hazards can be carried out only under a third condition: that a less expensive solution does not exist<sup>30</sup>. Once again, the cost–benefit analysis results often involve a great deal of uncertainty.

In addition to the legal limitations to using the expropriation option, the latter is very important and thus remains an exceptional measure. But the expropriation procedure is not the only way to move existing installations away from the hazard zone. Relocation can also be considered through amicable settlement. A circular<sup>31</sup> relating to the Barnier Fund states moreover that it is appropriate to favor amicable acquisitions in the context of an expropriation procedure.

For the last ten years, the State has clearly been trying to develop the coastal realignment option, which constitutes a real alternative to the logic of considering that what was once built must be protected at all cost. However, in practice, this new option meets with persistent reluctance and destruction of existing infrastructures remains a last resort. The people and the local elected representatives are generally those most strongly opposed to it. Moreover, this is why the State launched a call for proposals in the spring of 2012 aimed at inciting local authorities to reflect on the relocation option.

### ***Whether or not to respond to the call for managed retreat***

The option of reducing risk by removing the installations that are most exposed to hazards corresponds to what has been called “managed retreat”, “strategic withdrawal”, and lately “relocation of activities and property” (since the national strategy for coastline management).

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<sup>27</sup> The Court of Auditors gave a report criticizing this expensive operation rushed through by the State (Court of Auditors, 2012). The “black zones”, which were subsequently called “solidarity zones”, are spaces where the State decided to destroy the houses following the *Xynthia* episode.

<sup>28</sup> Act no. 95-101 dated February 2, 1995.

<sup>29</sup> *Cour de cassation* (Final Court of Appeal), Third Civil Division, May 21, 2003, (02-70099).

<sup>30</sup> Article R.561-2.III of the Environmental Code

<sup>31</sup> Circular dated April 23, 2007

The semantic shift reveals efforts made by the State to try to reduce the aversion that this option generates among most of the local stakeholders. Whereas retreat evokes a net loss, the concept of relocation, in contrast, evokes a more positive capacity to adapt, promoted by policies relating to climate change (ONERC, 2009). As such, it implies “incorporating the process into a territorial redeployment strategy” (Cousin, 2011). From this angle, stakeholders see the promise of a commitment by the State to reconstruct elsewhere, and hence an explicit compensation for the owners as well as development opportunities for local authorities.

In March 2012, the Ministry for Ecology, Sustainable Development and Energy launched a call to experiment with managed realignment of areas threatened by coastal hazards (*“Expérimentation de la relocalisation des activités et des biens : recomposition spatiale des territoires menacés par les risques littoraux”*<sup>32</sup>). As expected, the experiment was greeted with limited enthusiasm by local authorities, with little popular support for the idea of “retreat”, and a low expectation among mayors of getting re-elected over such an option.

Five responses, all extremely viable, were sent to the ministry. These were from the following municipalities: Hyères, Vias (*Hérault Méditerranée communauté d’agglomération*), Ault (*Syndicat mixte de la baie de Somme–Grand Littoral picard*, Lacanau, La Teste-de-Buch and Labenne (*Groupement d’intérêt public (GIP) Littoral aquitain*), and Petit-Bourg in Guadeloupe (*communauté d’agglomération du Nord Basse-Terre*). These five pioneering projects, each of a specific magnitude and each with its own specific objectives (seaside tourism, road infrastructure, urban renovation, last resort due to inexorable destruction of existing installations, etc.), are opting for coastal realignment. They reflect the stance of committed elected representatives, who are either convinced of the increasing responsibilities and costs relating to coastal hazards or (and) who see development opportunities in the experiment.

For Plonevez-les-Flots, apart from the reluctance of a few local stakeholders, availability of space for relocating properties and businesses within the municipal boundaries is a major problem. Solutions can probably only be found through agreements with neighboring councils.

### ***Availability of land and reluctance of the population: two factors restricting the withdrawal option***

We have seen that, at Plonevez-les-Flots, the options for relocating buildings are strictly limited by the Coastal Act on the one hand, and by the Risk Prevention Plan on the other (Fig. 2). Moreover, the properties of the Coastal Protection Agency (*Conservatoire de l’Espace littoral*: CEL) are inalienable, and existing vegetable farmland is fiercely defended by the Farmers’ Association and Land Development and Rural Settlement Organization. In this setting, the mayor and the municipal council are divided over whether or not to start feasibility studies for relocating the housing estate and the campsite. Such a solution would allow people to be housed without putting their lives at risk; however, this option could also make the council lose its key residents (i.e., young couples with children of school age) and the campsite, an economic activity that attracts employment opportunities and tourists.

### **Fig. 2/ The main zones restricting development and urban planning**

Losing the housing estate and the campsite lies in the hands of the municipality, but given the uncertainty of a major disaster happening again the mayor is tempted by the *status quo*. Furthermore, the social acceptability of coastal realignment is a major obstacle to this preemptive option. After the *Xynthia* tragedy, the residents of several villages of Charente-Maritime campaigned in favor of sea defences (Sud-Ouest, 11 avril 2010). This highlights a fundamental component of vulnerability to natural hazards that cannot be ignored, which is

<sup>32</sup> <http://www.developpementdurable.gouv.fr/Experimentation-dela.html>

the ingrained, and sometimes irrational, perception of risk among members of the public (Becerra, Peltier, 2009; MEEDDM, 2010; Meur-Ferec et al., 2011). This component is linked to an attachment to place, is a function of risk aversion, depends on mobility, on the capacity of a community to rally and recover, and is an essential factor for understanding and dealing with coastal hazards (Peretti-Watel, 2003; Becerra, Peltier, 2009; Flanquart, 2012; Hellequin et al., 2013).

## Conclusion

Most of the legal measures presented in this article already existed before 2000. The Barrier Act in 1995, for example, had outlined the establishment of a Risk Prevention Plan and the possibility of taking expropriation measures. If they had been strictly applied, such measures could have avoided the construction of new installations in the areas most exposed to hazard threats. The *Xynthia* disaster (announced) and the European agenda relating to the 2007 Flood Directive (particularly the Flood Risk Management Plans) have recently led to a profusion of tools—all too often hastily put in place because of imposed deadlines.

The inflation of (often overlapping) legal texts leaves local elected representatives with the extremely complex task of implementing their various recommendations. A gap between the objectives of the legal texts and the constraints on the ground is particularly tangible in the case of coastal hazards where the fixed rules set by law are constantly challenged by the fluctuating or changing nature of coastlines. One has to also consider the existing contrast between the strategies developed at the global (national or European) level, which often lead to a consensus (Cousin, 2011; MEEDDM, 2010), and the reality of situations on the ground, where conflicts increase gradually as available coastal space shrinks and becomes more expensive (Fig. 3). The option of relocating installations, advocated at the national level and largely rejected at the local level, perfectly illustrates this discrepancy.

### Fig. 3/ Multi-scalar matrix of the main instruments of coastal risk management

Protecting people and property by reinforcing sea defence structures (monitoring the safety of hydraulic structures, implementing a Sudden Submersion Plan, improving crisis management while stopping the construction of new installations), and at the same time studying the option of relocation properties businesses in order to adapt to climate change (Cousin, 2011): such are the current challenges of coastal risk management. The two options, defence or retreat, are not necessarily incompatible because they correspond to two different time scales: measures to stay safe today do not exclude preparing relocation for tomorrow. But the articulation of the two strategies remains nonetheless confused and it becomes difficult for a local elected representative to navigate the bureaucratic system: those who are better informed and advised will be the first to seize opportunities on offer from the State.

The local authorities of Plonevez-les-Flots, like many others, are thus going to pragmatically 1/ put in place a Municipal Safety Plan, which has become mandatory since the approval of the Risk Prevention Plan, 2/ submit a Sudden Submersion Plan in order to reinforce the existing sea defences, 3/ prepare an Action Plan for Flood Prevention to provide more ambitious defense work while, at the same time, 4/ seek, by all legal means available, some room to build a few more houses, thereby trying to avoid situations that might call into question the politicians' responsibility towards future generations—such as postponing the concern of adapting to rising sea levels...

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