



SOLARIS

SOLIDARITY IN CLIMATE CHANGE

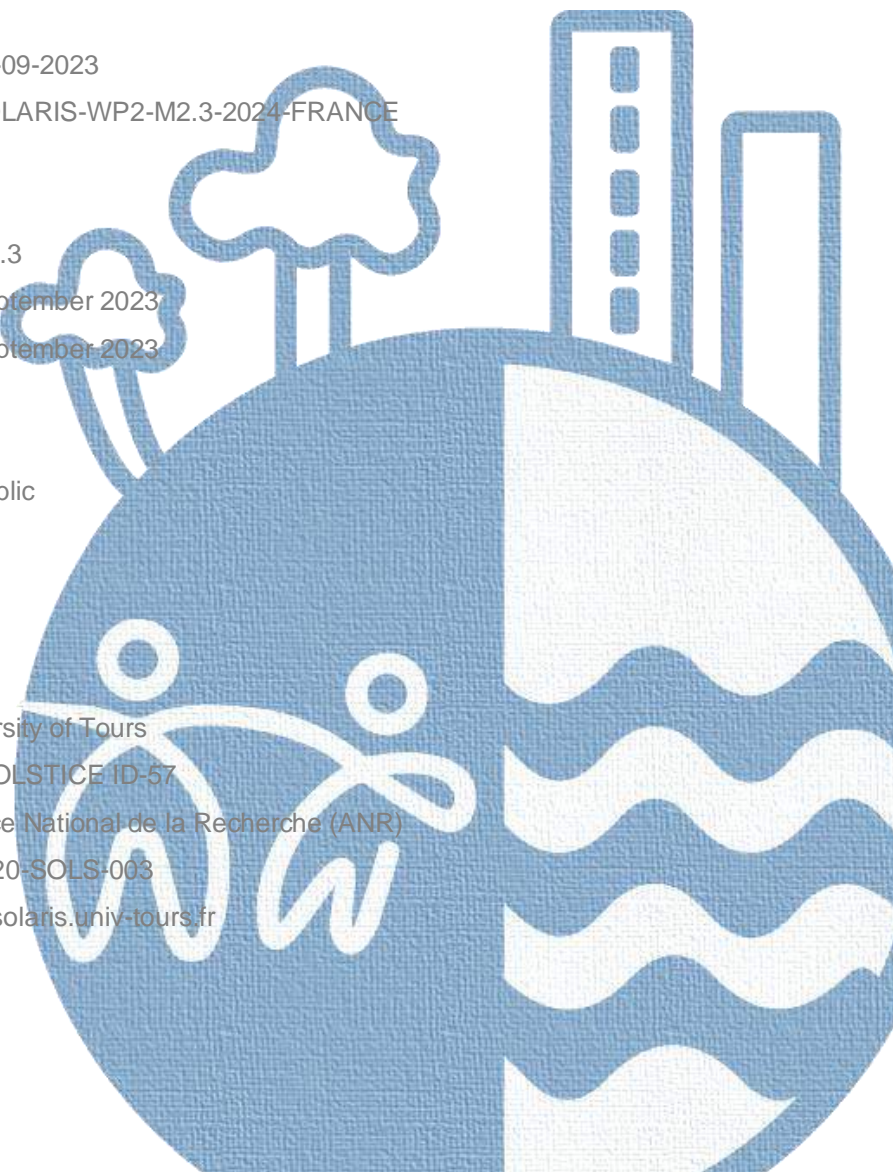
SOLIDARITY IN CLIMATE CHANGE ADAPTATION POLICIES: TOWARDS MORE SOCIO-SPATIAL JUSTICE IN THE FACE OF MULTIPLE RISKS

COUNTRY REPORT: FRANCE

Date: 01-09-2023
Report Number: SOLARIS-WP2-M2.3-2024-FRANCE
Revision Number: 5
Milestone Number: M2.3
Due date for deliverable: September 2023
Actual submission date: September 2023

Document Dissemination level: Public

Coordinator: University of Tours
Project Contract No.: JPI-SOLSTICE ID-57
National funding: Agence National de la Recherche (ANR)
ANR-20-SOLS-003
Project website: www.solaris.univ-tours.fr



Document Information

Work Package	2
Year	2023
Document type	Final deliverable
Status	Final version
Date	30-09-2023
Editors	Sofia Guevara Viquez, Jérôme Cardinal, Mathilde Gralepois, Marie Fournier, Corinne Larrue

Acknowledgements

The work conducted for and reported on in this publication is supported by the SOLARIS project (*SOLidarity in climate change Adaptation policies: towards more socio-spatial justice in the face of multiple RISks*), funded by the joint transnational SOLSTICE call “Enabling Societal Transformation in the Face of Climate Change” launched by JPI Climate (JPI-SOLSTICE: ID-57). The research was supported by funding from the Belgian Science Policy Office (BELSPO) (B2/20E/P3/SOLARIS), the Economic and Social Research Council in the UK (grant number ES/V014021/1), the Research Council of Finland (decision number 338284), and the Agence National de la Recherche (ANR) in France (ANR-20-SOLS-003). The authors would like to thank the respondents for their cooperation and insights into FRM policy and practice.

Disclaimer

This document reflects only the authors’ views and interpretations of the results. This work may also rely on data from sources external to the SOLARIS project consortium. Members of the consortium do not accept liability for loss or damage suffered by any third party as a result of error or inaccuracies in such data. The information in this document is provided ‘as is’ and no guarantee or warranty is given that the information is fit for any particular purpose. The user of the information does so at its own risk.

Keywords

Climate change adaptation

Flood risk

Flood risk management

Coastal erosion

Vulnerability

(In)equality

Justice

Recognition

Participation

Knowledge

Public policy

France

Author Information

Sofia Guevara is a research fellow at Lab'Urba Research Centre, University of Paris-Est Créteil. She is also an associated researcher at the *Cities, Territories, Environment and Society* (CITERES) research centre, University of Tours

Jérôme Cardinal is a Phd candidate, at the *Cities, Territories, Environment and Society* (CITERES) research centre, University of Tours

Mathilde Gralepois is an assistant professor, at the *Cities, Territories, Environment and Society* (CITERES), School of engineering, Spatial Planning and Environment, University of Tours

Marie Fournier is an assistant professor at the Geomatics and Land Management Research Center, National Conservatory of Arts and Crafts (CNAM)

Corinne Larrue is a full professor at the Lab'Urba Research Centre, Paris School of Urban Planning (EUP), University of Paris-Est Créteil (UPEC)

Table of Contents

Preface	7
<i>What to find in this Work Package 2 country report?</i>	7
<i>Context</i>	7
<i>Methods</i>	8
Section 1: National-level analysis	10
<i>Hydro-meteorological events</i>	10
Types of flood risks in France.....	10
<i>Timeline of recent flood events</i>	12
<i>Public policies</i>	13
Climate Change Adaptation Policies: from mitigation to adaptation.....	13
Flood Risk Management policies.....	15
Links between CCAP and FRM.....	19
<i>Answering SOLARIS research questions from a national level perspective</i>	20
Attention paid to justice/fairness/inequalities in policies (RQ1).....	20
Role of participation (RQ2).....	23
Knowledge and capacity-building on social inequalities (RQ3).....	26
Section 3. Blois (Case study 1)	29
<i>Introduction: narrative of the local context</i>	29
Description of case study area: localization, socio-spatial indicators.....	29
Flood Risk Management background	32
The specific project at stake for SOLARIS	34
The socio-spatial issues raised by the policy/project.....	41
<i>Methods</i>	41
<i>Empirical Results</i>	42
Analysis of the local legal context.....	42
Analysis of the actor's game	48
<i>Answering the research questions</i>	56
Attention attributed to justice/fairness/inequalities (RQ1)	56
Role of participation (RQ2).....	60
Knowledge and capacity building on social inequalities (RQ3).....	64
<i>Conclusion</i>	67
Section 3. Ault (Case study 2)	68
<i>Introduction: narrative of the local context</i>	68
Description of case study area: localization	68
Risk management background.....	72
The specific project under study for SOLARIS	77
The socio-spatial issues raised by the policy/project.....	80
<i>Methods</i>	81
<i>Empirical results</i>	82

Analysis of the local legal context.....	82
Analysis of the actor's game.....	88
<i>Answering the research questions</i>	95
Attention attributed to justice/fairness/inequalities (RQ1)	95
Role of participation (RQ2).....	99
Knowledge and capacity building on social inequalities (RQ3).....	100
<i>Conclusion</i>	101
Annexe	109
Partners	110

List of Figures

Figure 1. Number of people exposed to flood risk in French Departments.....	11
Figure 2. Recent floods events in France. Source: CCR (2021;2021), DGPR (2017), Cerema (2016).	12
Figure 3. Summary diagram of public policies associated with climate change (Guevara 2022).....	14
Figure 4. Overview of the five Flood Risk Management strategies. Source: Starflood (Larrue et al. 2016, 4). .	16
Figure 5. Location of the department Loir-et-Cher (41). Credits : F.DELONIN et R.TORRENT. Source: background map ArcGIS.....	30
Figure 6. Location of Blois in the Centre-Val de Loire Region. Credits : F. DELONIN et R.TORRENT. Source: Géoportail.....	30
Figure 7. Evolution of the urbanisation of Blois between 1946 and 2005.	31
Figure 8. Working of the spillways of the Boullie and Monttlivault in case of flooding.	33
Figure 9. Technical operation of fuse wire on a spillway.....	34
Figure 10. Location of the Bouillie's spillway and the Vienne district.....	35
Figure 11. La Bouillie district, surrounded by the ZAD perimeter before the de-urbanization process.....	36
Figure 12. The rehabilitation project perimeter. Source : Agglopolys (2021)	37
Figure 13. Map of local actors in flood risk management in Blois.....	40
Figure 14. Timeline of the transformation of the state's positioning.....	48
Figure 15. Timeline of the transformation of the Agglomeration's positioning.....	49
Figure 16. The agricultural renewal in la Vacquerie district. Credits : Cardinal (2021)	51
Figure 17. Timeline of the transformation of the Inhabitant's positioning.....	52
Figure 18. The historical house of the Association still remained with a protest banner. Sources : Cardinal (2020)	53
Figure 19. Banners deployed during public meeting by the inhabitants. The first claimed la Bouille deurbanization project is an "impostor". The second one makes a parallel Ingrid Bettancourt, former french hostage in Colombia, and la Bouillie's inhabitants defined as hostages as well by the banner. Credits: personal press archives of an inhabitants	54
Figure 20. Synthesis of the transformation of main's stakeholders positioning.....	56

Figure 21. A banner in la Bouillie calling for public participating for the workshops to come: “what future for la Bouillie ?”. Credits: Cardinal (2021).....	61
Figure 22. Current and future uses for la Bouillie. Credit : Guevara Viquez, Cardinal, 2022.....	64
Figure 23. Ault in the Somme department at the North of France. Credits Ault Commune	69
Figure 24. Neighbourhoods of Ault (INterland, 2012, p. 25).....	69
Figure 25. Proportion of poor households in Ault in 2017. Source: Géoportail.....	71
Figure 26. Property transactions registered by DVF from 01/01/2020 to 30/06/2022 in neighbourhood of Onival. Blue properties are the ones sold.....	72
Figure 27. The evolution of coastline erosion in Ault (Agence Urbanités 2017, 24).....	73
Figure 28. History of sea defence measures between 1939 and 1980 in Ault (Sogreah-Antea 2011).....	74
Figure 29. Defensive works in Ault	75
Figure 30. The polder area on the north of Ault.....	75
Figure 31. Longshore drift in Ault.....	76
Figure 32. Global view of Ault and its cliff	76
Figure 33. The “ZAC du Moulinet”, a specific area to relocate housing and activities from the coastline. Credits: Syndicat Mixte de la Baie de Somme/DRI	78
Figure 34. The perimeter of the PAPI (SMBSGLP and ARTELIA Eau et Environnement 2015, 21)	79
Figure 35. PPRN 2001	84
Figure 36. PPR 2015.....	85
Figure 37. Timeline of the State’s position	88
Figure 38. Timeline of the Municipality’s position	90
Figure 39. Modes of action of 'Ault Environment	94
Figure 40. Timeline of Ault environment, from opposition to a collaborator in the project	94
Figure 41. Timeline of the project	95

List of tables

Table 1. Key indicators of Floods in France. Source: Ministry of Environment, 2023.....	10
Table 2. Affectation of recent flood events in France	12
Table 3. Summary of the five flood risk governance strategies	18
Table 4. Table of Interviews.....	41
Table 5. List of interviews	81
Table 6. Documents dealing with risk management at local scale in Ault	82
Table 7. Documents dealing with environment and urban planning at local scale in Ault.....	83
Table 8. Comparative table of the two cases studies.....	102
Table 9. Comparative table on the two mobilisations.....	102

Preface

What to find in this Work Package 2 country report?

This report is part of the Work Package 2 (WP2) deliverable of the research project SOLARIS (SOLidarity in climate change Adaptation policies: towards more socio-spatial justice in the face of multiple RISks), funded by the participant countries to the SOLSTICE program of JPI Climate "Connecting Climate Knowledge for Europe". More information about the SOLARIS project, its purpose and outputs can be found here <https://jpi-climate.eu/project/solaris/>.

This document is part of the compilation of reports on the empirical investigations carried out at national level in the four SOLARIS countries (Belgium, England, Finland, and France) and eight case studies. WP2 is dedicated to case study analysis, based on common conceptual and methodological work conducted in in WP1, which enables cross-case analysis (WP3) and finally dissemination (WP4). The eight case studies cover climate change adaptation policies (CCAPs) and flood risk management (FRM) strategies implemented in the four countries. These strategies are implemented differently from one country to another, but they share similar questions when they launch projects and have similar concerns about the impacts of CCAPs. WP2 analyses the justice implications of these policies, the socio-spatial inequalities deriving from these strategies, and any initiatives that institutional stakeholders adopt to limit these inequalities.

An important aim of the project is to disseminate results of case studies analysis among practitioners and scientists via different media (practitioner's handbook, oral presentations, scientific articles, e-doc website etc.).

Context

Facing the unpredictability and unavoidability of climate change effects, public policies in Europe must (re)consider their CCAPs. In this field, adaptation to extreme hydraulic events such as flooding and erosion are more urgent than ever. As Tradowski et al. considered when they examined floods in Western Europe in July 2021: "Models indicate that intensity and frequency of such events will further increase with future global warming" (Tradowsky et al. 2023).

In such a context, climate change impacts raise controversies on the distribution of negative consequences. At the same time, however, adaptation to climate change itself raises questions of fairness, justice, and equity (Adger 2001; Byskov et al. 2021). Studies have highlighted the essential issue of justice in climate change exposure, especially in countries in the Global South (Bobo 2006; Owen 2020) as well as in Europe (Reckien et al. 2014), however further analysis of justice issues related to CCAPs in Europe is needed. The SOLARIS project focuses on flood risk issues and illustrates how justice can be considered in public policy.

FRM has long raised issues of justice (Walker and Burningham 2011). Flood risk itself is often unevenly distributed, due to the diversity of causes of flooding, types of landscape, the location of the houses and assets on which people depend. The impacts of floods and their consequences on individuals and communities is determined by a range of factors other than the severity of the flood itself, such as socioeconomic characteristics and capital, health conditions, age, and psychological characteristics (Thaler et al. 2018). Furthermore, access to the benefits of FRM is also said to be “inherently unfair” (Johnson et al., 2008; Johnson et al., 2005). The (un)fairness of FRM is principally a question of who benefits from the measures and who pays for them (Begg 2018). But other considerations include the ability of stakeholders to influence the decisions made and the way in which vulnerable people are recognised and defined.

As such, justice in FRM can be categorised as **distributional justice** (winners and losers in FRM including who pays for measures and whose flood risk is reduced), **procedural justice** (mechanisms to support representative and fair decision making), and **recognition justice** (how vulnerable and/or disenfranchised people are identified so that injustices can be tackled).

These three forms of justice – as well as the way FRM is carried out – help to define some related terms, namely fairness, solidarity, equality, and equity. To analyse the socio-spatial injustices within CCAPs related to FRM, SOLARIS utilises three key research questions:

1. How and when are issues of equality and justice identified and addressed in FRM? How does it link up with other policies, like CCAPs?
2. How is participation in decision making for FRM facilitated?
3. What is the role of (and access to) knowledge in FRM? How does this support capacity building for addressing social inequalities?

Methods

SOLARIS is a qualitative social science research project aiming to explore justice in FRM across four countries: Belgium, England, Finland, and France. The three research questions have been answered for each participant country at both national and sub-national (case study) level.

This project takes a case study approach with a common protocol used during the investigation. The above research questions dominated the analysis, and the case study approach utilises four main empirical tools (mixed-method design): analysis of policy/guidance documents/grey literature, interviews with stakeholders, local discussion groups, and participant observation.

The first method of data collection is **document analysis**. Document analysis involves the analysis of legal and policy documents such as legislations, rules, and programs (Massey et al. 2014) to underline how FRM has considered the issues of justice. We aim to note the distance between the formal documents and the discourses of the different groups (through interviews and local discussion groups). In total, 187

documents (France, 86; Belgium, 24; Finland, 43, England, 34) have been formally analysed by the four countries, however others may have been consulted to direct the research. Where appropriate it has also been possible to draw on the analysis of documentation undertaken in previous research projects (see, e.g., Alexander et al., 2016).

The second method of data collection is **semi-structured interviews** carried out with public authorities, policy makers, and other experts and practitioners involved at the national and case study level, as well as local NGOs. In some of the cases, interviews were also conducted with local at-risk inhabitants to supplement data. Specific attention was given to the implementation from national to local. Interviews typically lasted 60-90 minutes and began with a set of pre-prepared questions focussing on the role of justice and equality in FRM, both in policy and in practice, as well as participatory practices and the role of knowledge. Following on from these questions, the interviews would become less structured to expand and probe issues that participants had raised. All interviews were recorded with the participants' permission, transcribed, and thematically analysed through an iterative process. A total of 166 interviews were conducted in the four countries (France, 53; Belgium, 39; Finland, 49; England, 28).

The third data collection approach is the organisation of **local discussion groups**. The aim was to contribute to the analysis through a discussion with a limited number of relevant experts (flood risk managers, i.e., engineers, spatial planners, etc.; policy makers; NGOs, local resident experts) invited to the local discussion group. The idea is twofold: first, to ask for feedback on preliminary results and to provide knowledge exchange concerning next steps, and then to invite experts to reflect on the (in)equality and (in)justice issues that are raised by current spatial planning policies for FRM. Each country organised a Local Discussion Group per case study level.

The final and fourth data collection approach is **participation observation**. Participant observation implies the presence of the researcher in the social world of the respondents, in their usual activities (Beaud and Weber 2003; Bryman 2016). The objective is to understand their relationships and daily practices beyond the mere collection of their discourse (carried out in the context of an interview). This data collection strategy was implemented according to the case studies, the disciplinary context, and the willingness to experiment in each country. For instance, Finland realised an art experience called *SOLARIS-ART: Engaging with Solidarities in Flood Risk Management Through Community Art*. It is “a temporary public space for listening called the Outdoor Living Room (OLR). This is a unique method that was developed to set up a living space in public places to engage people, who would otherwise not feel comfortable attending more formal meetings” (Mazzotta 2022).

Section 1: National-level analysis

Hydro-meteorological events

Types of flood risks in France

Due to meteorological, climatic and topographical differences, France faces **a variety of flood risks** (Table 1 and Figure 1) : fluvial floods along the main rivers; pluvial and flash floods especially in the south of France; tidal floods and storm surges on the western and northern coasts ; and runoff floods especially in urban areas. Fluvial, pluvial and flash floods are **well defined and identified** in Flood Risk Management (FRM) policies. However, storm surges, marine submersion and urban run-off are **less predictable** and more frequent in the context of climate change (IPCC 2023). In addition, the **combination of factors of risk** exacerbates the phenomenon, and leads to a disaster. One example is the combination of high tides, dam breaches, sea inundation and storm surge during Storm Xynthia in 2010.

Table 1. Key indicators of Floods in France. Source: Ministry of Environment, 2023

17.1 million inhabitants exposed to the consequences of fluvial flooding
1.4 million inhabitants exposed to the risk of marine submersion
More than 9 million jobs exposed to river floods and more than 850,000 jobs exposed to marine flooding
20% of homes exposed to submersion



Figure 1. Number of people exposed to flood risk in French Departments¹.

Source: IGN

How is climate change influencing flood risk?

In Europe as in France, the increase in the probability of occurrence, frequency and intensity of extreme precipitation events is now clearly attributed to climate change, as well as climate change is directly attributed to humans, socio-economic activities and urbanisation (Hoegh-Guldberg, 2018; Philip et al., 2018; World Weather Attribution, 2021, IPCC 2023). In France, the Covea insurance report explains that the 3.2 to 5.4°C temperature increase scenario (IPCC 2022) will **increase the flows** above the reference high water level in the southern and northern east France (Andre and Marteau 2022). This means for instance that floods with a return period of 10 years will have a higher flow. On the Atlantic and Channel coasts, this increase would be more moderate. This increase would change each return period towards a **shorter return period** (a 100-year flood today would become a 50-year flood in 2050) and an **increase of 110% in damages and costs** (Andre and Marteau 2022). In addition, extreme and unpredictable rainfalls events causing pluvial and flash floods will become more frequent. Rainfall events that are currently decadal would occur every 4.5 years; 20-year events (once every 20

¹ The department is a French territorial division. It defines the perimeter of the deconcentrated services of the State. It is also an electoral entity (led by the Conseil du Département) with general interest responsibilities such as the maintenance of infrastructure for high schools, museums, libraries, sports facilities. It also has planning and environmental responsibilities, such as the preparation of the regional plan for sustainable development, which defines medium-term objectives in this area.

years) would occur every seven years; and 50-year events would occur every 11 years. As a result of the **increase in extreme events**, the costs and damage caused by flash floods in France will increase by 130% (Andre and Marteau 2022).

Timeline of recent flood events

Every year, France faces major flood disasters. Figure 2 shows recent floods events.

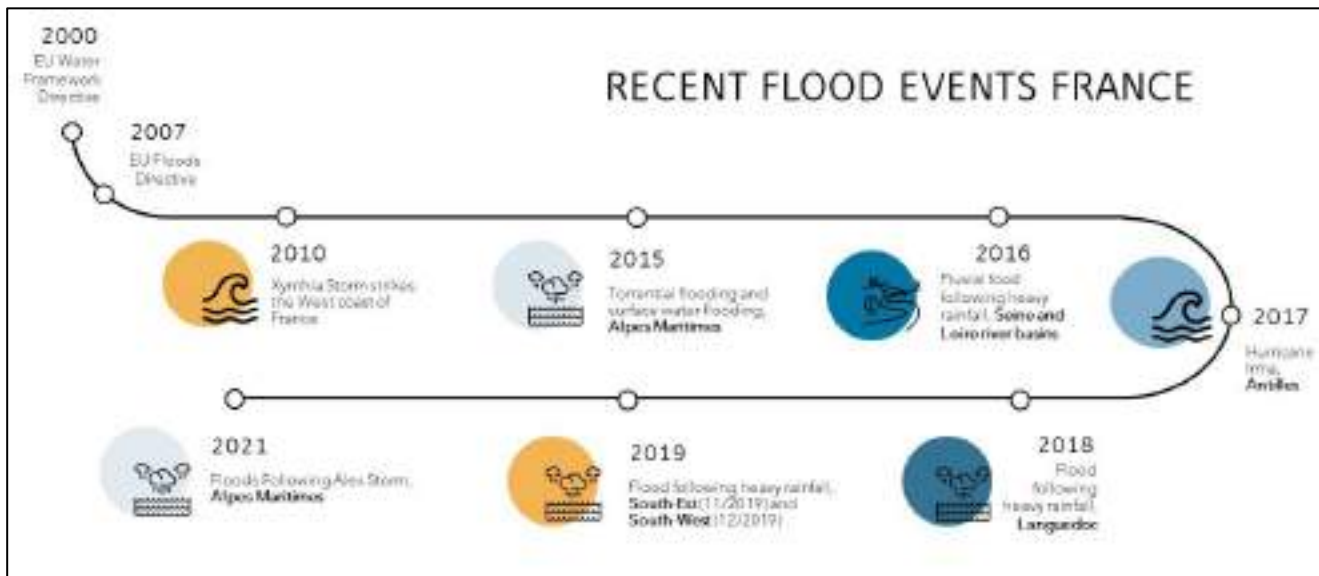


Figure 2. Recent floods events in France. Source: CCR (2021;2021), DGPR (2017), Cerema (2016).

Each event has significant casualty and high damage consequences (table 2)².

Table 2. Affection of recent flood events in France

Date (month-year)	Location	Affected population	Estimated damage (€)
10/2015	Alpes Maritimes	20 casualties 28 municipalities recognized as disaster areas	600 million
5-6/2016	Seine and Loire river basins	4 casualties 1500 municipalities recognised as disaster areas	1 billion
09/2017	Antilles	15 casualties	1.2 billion
1-2/2018	Seine and Marne basin	505 municipalities recognised as disaster areas	180-220 million
10/2018	Languedoc	15 casualties	250-300 million

² Based on CCR reports (CCR 2020; 2021), historical flood database (<https://www.grand-est.developpement-durable.gouv.fr/base-de-donnees-historiques-sur-les-inondations-a16776.html>), report to the delegate for major risks (DGPR 2017), CEREMA reports (Cerema 2016), press releases from the French Federation of Insurers (FFA 2019; 2020).

		261 municipalities recognised as disaster areas	
11/2019	South-Est	6 casualties 205 municipalities recognised as disaster areas	390 million
12/2019	South-west	3 casualties 19 municipalities recognised as disaster areas	87-110 million
10/2020	Alpes-Maritimes	71 municipalities recognised as disaster areas	210 million

Public policies

Climate Change Adaptation Policies: from mitigation to adaptation

Although the history of climate change adaptation policy (CCAP) is more recent than that of flood risk management (FRM) policy, its specificity is to frame the latter. This section provides an insight into CCAP in France.

Following the global trend, the first version of climate change policy in France focused on mitigation, i.e. reducing greenhouse effects (Rudolf 2016). In 1992 a new institution was set up to study the greenhouse effect. This was the *Mission Interministérielle de l'Effet de Serre (MIES)*, a transversal ministerial department. Other specific instruments were created, such as the first National Agenda for Climate Action entitled « French Programme for the Prevention of Climate Change » in 1993 and the adoption of the first programme to “Fight Climate Change”³.

Later, the **Climate Change Adaptation Policy (CCAP) was put on the political agenda** with the creation of the National Observatory on the Effects of Climate Change (*Observatoire National sur les Effets du Réchauffement Climatique - ONERC*) in 2001. The ONERC has produced an important body of knowledge, particularly on adaptation to climate change. It led to the adoption of the Climate Plan in 2004⁴. For the first time, adaptation was considered as a main objective in French climate policy. The aim was to raise awareness of climate issues and the need for action among citizens, industry and local authorities. On the one hand, the plan continued to integrate mitigation measures by promoting taxes and better practices on: energy saving, sustainable transport, sustainable industrial activities, or ecological construction. On the other hand, with regard to adaptation, the plan remains at a very prospective stage. It mentions that expertise and research should be supported to define crisis scenarios. With regard to **citizens, the document stresses the importance of**

³ *Programme national de lutte contre le changement climatique — (PNLCC)*

⁴ e.g. *Êtes-vous prêt ? Guide pour l'adaptation à l'attention des collectivités locales* (ONERC 2004); *Un climat à la dérive : comment s'adapter ? Rapport de l'ORNEC au Premier ministre et au Parlement* (ONERC 2005).

individual actions and behaviours (through energy saving, eco-driving, reduced waste production) to reduce carbon emissions.

While they were excluded until the end of the 2000s, **local authorities were gradually included** in climate policies, in particular through the Local Climate Plans (Plan Climat Territorial - PCT). The role of local authorities was gradually strengthened in **the First National Strategy for Adaptation to Climate Change in 2006**. In particular, the laws adopted after the “Grenelle of the Environment” gave full normative status to two strategic planning documents: the Local Climate and Energy Plan (*Plan Climat Energie Territorial - PCET*) and the Regional Scheme for Energy, Air and Climate (*Schéma Régional du Climat, de l’Air et de l’Energie*, SRCAE). These documents aimed to reduce CO2 emissions (by promoting the use of renewable energy or limiting light pollution) and improve energy performance. To encourage their implementation, the national government offers access to financial support. However, scientific literature suggests that the implementation of the PCET and more recently of the PCAET (Local Climate, Air and Energy Plan) should focus on one of their three areas of action aiming : energy saving measures (e.g. improving street lighting), and consequently they pay less attention to energy production, infrastructure and urban planning objectives (Arnauld de Sartre, Baggioni, and Bouisset 2021; Chailleux and Hourcade 2021).

Last, the second “Grenelle Law” of was adopted in July 2010 and the **National Climate Change Adaptation Plan** of 2011 was updated in 2018, with the **Second Climate Change Adaptation Plan**. They constitute the “second generation of climate policy” (Richard 2013). This period led to a **strong political and legal consolidation** for both national and local authorities in the CCAP (Figure 4).

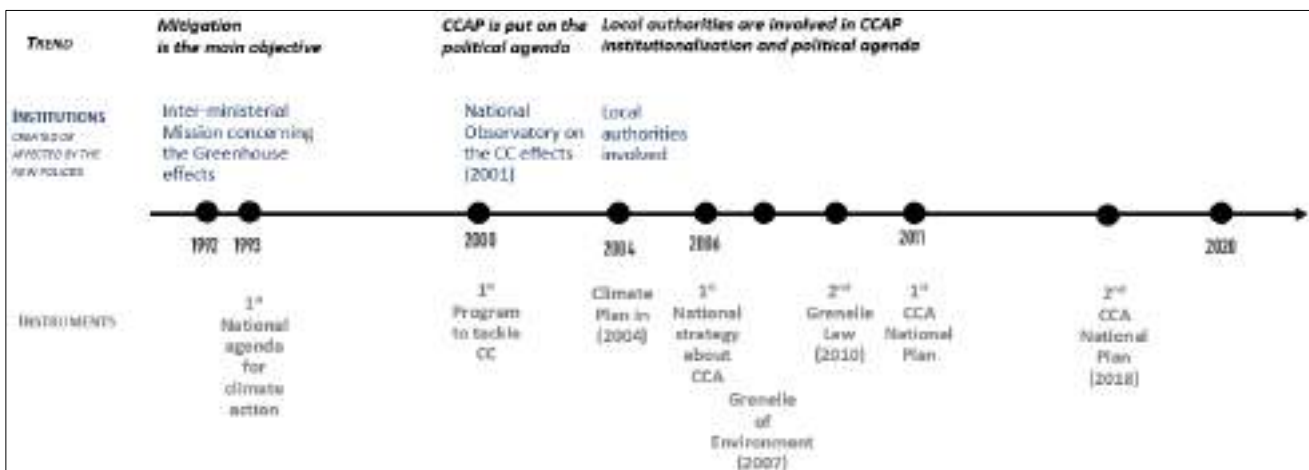


Figure 3. Summary diagram of public policies associated with climate change (Guevara 2022).

The implementation of Climate Change Adaptation Policy is based on very institutional, top-down, and normative approaches. However, these approaches are accompanied by concrete steps: capacity-building institutions, national strategies, local implementation, and binding regulations.

As climate policies are mainly frameworks, it is difficult to assess their implementation. Nevertheless, it is interesting to analyse how they have been framed in each sector. Based on the literature on the implementation of climate policies in areas such as defence (Estève 2022), aviation sector (Compagnon 2022), agriculture (Montouroy, Biabiany, and Massardier 2022) and risk submersion (Rieu 2022), it is possible to say that public policies can no longer ignore the climate warning. If the issue has become more normative in public policy (Hrabanski and Montouroy 2022), its implementation at the local level is heterogeneous in all policy sectors and all municipalities. Finally, this implementation does not necessarily imply a significant change in the practices, resources and interests of the actors (Hrabanski and Montouroy 2022).

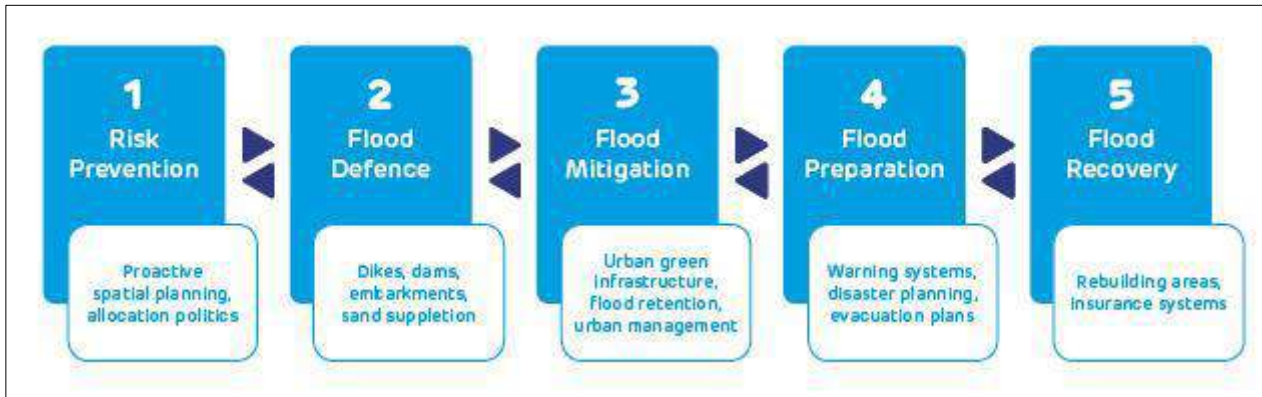
Flood Risk Management policies

The five flood risk strategies

France has been developing a public policy of flood risk management in particular since the 1980's. In fact, the Risk Exposure Plans (PER) were indeed established in 1982 by Law No. 82-600. These plans introduced a new zoning system to orient activities according to the risk (Guillier 2017; Reliant and Hubert 2004). The difference between these new PERs and the PSS (established in 1935) is that they take into account not only the spatiality of the flood (hazard), but also the vulnerability, understood as the presence of assets (presence of housing or activities) and the quality of their construction to face the flood (Ledoux 2006). In 1995, with the Barnier Law, aimed at strengthening environmental protection, the State created the **Natural Risk Prevention Plans (PPRN)**, which aim to bring together the existing tools (such as the PER and the PSS) and strengthen the obligation to stop development in flood-prone areas (Guillier 2017). In particular, through a specific instrument, a PPR specific to floods, the **Flood Risk Prevention Plan** (*Plan de Prévention des Risques d'Inondation - PPRI*). The application of the PPRI, formulated by the state's services, is a legal obligation for municipalities concerned.

In this section, we will present flood risk management following the approach and findings of the Starflood project (Larrue et al. 2016). The Starflood report for France, based on Hegger *et al.* (2014) provides a theoretical framework to analyse FRM through five strategies: flood risk prevention, defence, mitigation, preparation, and recovery (figure 3).

Figure 4. Overview of the five Flood Risk Management strategies. Source: Starflood (Larrue et al. 2016, 4).



Firstly, through the five Flood Risk Management (FRM) strategies, **prevention is a strong pillar in France**, in terms of political legitimacy. It has historically been **centralised** (table 3). The creation of the Department of Risk Prevention within the Ministry of the Environment at the end of the 1980s helped to strengthen its role in the management of natural hazards, of which flooding is a dominant theme. The national government, through its local services, plays an important role in the flood prevention strategy. It defines non-buildable areas through the Flood Risk Prevention Plans (*Plan de Prévention des Risques d'Inondation - PPR*). The guidelines for implementing the PPR are drawn up and adopted by the Risk Prevention Department of the French Ministry of the Environment. Municipalities are required to integrate PPR maps and regulations into their land-use plans. However, the role of the Ministry is increasingly challenged. There is a **diversification of actors in the flood prevention strategy**, as a result of both decentralisation and the European Floods Directive of 2007. The latter encourages the implementation of flood risk management plans at the scale of the hydrographic basins, as well as of flood risk management local strategies for high-risk areas, i.e. urban areas. These strategic instruments aim to bring together local actors of the same basin to agree on the exposure of activities, at a larger scale than just the municipal perimeter. Finally, as part of the prevention strategy, local actors, in particular municipalities, disseminate information on risks to citizens, through the Municipal Information Risk Document (*Document d'Information sur les Risques Majeurs – DICRIM*), which aims to raise social awareness of risks.

Secondly, the flood defence strategy is a dominant strategy in France, in terms of public investment. It concerns the maintenance of watercourses, dikes, and other hydraulic infrastructure such as retention basins, or run-off management. Historically, the national government played a central role in this strategy, in terms of controlling procedures and legislative initiatives. However, with the decentralisation process, the management of infrastructure is being devolved to the municipal level, which must find the skills and resources to maintain it. Currently, the main resources for the defence strategy are the River Plans and the Water Management Plans. Both documents explain the strategies and objectives, and provide the possibility of financing actions in line with them, such as projects contributing to the conservation of watercourses. In addition, the development of the

Action programme for Flood Prevention (*Plan d'Action pour la Prévention des Inondations* - PAPI) provides local authorities with the opportunity to set up defence infrastructure maintenance facilities. The PAPI is an instrument that encourages partnership between the various local actors (State, water agency, Municipalities, Departments, Regions), each of which contributes to the final cost of the actions.

Thirdly, the flood mitigation strategy in France is characterised by a **diversity of measures** (table 3) **and a lack of a coherent programme**. Another way of presenting a global view of mitigation would be to avoid considering it as a strategy in its own. The reduction of vulnerability could rather be considered as a **transversal strategy to the other strategies** related to the water sector, such as the defence and prevention measures already presented. To a certain extent, the mitigation strategy can be seen as a way to align all these defence and prevention actions in a transversal way. Its lack of autonomy is also what gives it a **bridging character** between the strategies.

Fourth, **flood preparation represents a well-defined strategy**. It is first and foremost civil protection, which does not mean "flood safety". The mission is **multi-risk** and remains one of the **main prerogatives of the national authority**. More precisely, a certain subsidiarity principle can be recognised in emergency policy: the national authority controls the major initiatives (forecast and management) while delegating "the day-to-day emergencies" to local authorities. Flood preparedness is **less linked to other flood strategies**. The main instruments are the National Emergency Plan (*Organisation des SECours* – ORSEC) and Municipal Rescue Plans (*Plan Communal de Sauvegarde* – PCS). The professional emergency actors are the fire-brigades. They will assist the victims of natural or industrial disasters (fires, earthquakes, pollution, explosions, etc), as well as floods. The multi-risk dimension of preparedness means that this strategy does not focus on flood risk, but on civil protection more broadly.

Finally, the **flood recovery strategy has its own independent existence**. Recovery policy is **an autonomous competence**. Since 1982, the national government has organised a national solidarity system to compensate damage caused by natural disasters (Cat-Nat regime), based on the principle of collective solidarity to compensate for the effects of events considered as exceptional, recognised as such by the public authorities. This principle of solidarity is implemented by means of a housing insurance tax paid by each citizen (uniform premium throughout the country). The taxes finance a national fund known as the Barnier Fund. The recovery system is thus based on an original collaboration between the insurance market and the national authorities, in which private insurance companies rely on a national public policy of solidarity and public interest. At first sight, the Cat-Nat regime is the embodiment of the cooperation between different actors: public and private, national and local, public interest and competitive market, acting for the sake of a single policy. But from a functional point of view, this cooperation ends where it begins and does not lead to links with other strategies.

Although the five strategies are presented separately, some comments should be made. Mitigation is hardly a strategy in itself, as it is a very cross-cutting strategy. The Starflood's results also highlight the links between prevention and recovery (through the sources of funding from the *Bamier Fund*), but also the process of bringing defence and prevention together (with actors working together and setting targets together through the PAPI). The results also highlighted the link between defence and preparedness. These two strategies are at the heart of the historical national policy on flood management, but with the implementation of recent legislation, such as the Law on the Modernisation of Territorial Public Action and the Affirmation of the Metropolis (*Loi de Modernisation de l'Action Publique Territoriale et d’Affirmation des Métropoles – MAPAM* in 2014), the links between these two strategies have been strengthened. In particular, the MAPAM law delegates the responsibility for defence installations to the mayor, who focuses on both the management of protection infrastructures and crisis management.

Table 3. Summary of the five flood risk governance strategies

Strategy	Actors	Types of actions
Prevention	National authorities Local authorities	Planning instruments : <ul style="list-style-type: none"> • <i>Plans de Prévention du Risque d’Inondation</i> (PPRI) • <i>Stratégies Locales de gestion du risque d’inondation</i> (deriving from the Floods Directive)
	State authorities (at departmental level)	Prevention through information procedures (some are mandatory documents when a PPRI is established): <ul style="list-style-type: none"> • <i>Departemental Document on Major Hazards (DDRM)</i>
	Local authorities	<ul style="list-style-type: none"> • DICRIM (when the municipality is constrained by a PPRI) • Annual information to citizens (when PPRI established on the municipality)
	Local authorities/notaries Local authorities and civil stakeholders	<ul style="list-style-type: none"> • Information to landowners and tenants (when PPRI is established) • Prevention through <i>ad hoc</i> information processes.
Defence	State administration Local authorities: competence for the management of the aquatic environment and flood prevention (gestion des milieux aquatiques et de prévention des inondations - GEMAPI)	Compartment dikes Quay walls Retention basins outside the area to be protected Watercourse maintenance Weirs and dams Dikes
Preparation	State Administration (Services de Prévision des Crues - SPC and SCHAPI) in coordination with the National Weather forecast institution (Meteo France)	National forecast system Vigicrue system (flood broadcast system accessible online) Crisis communication Community awareness-raising activities
Mitigation	Local authorities in partnership with the Regions, the departments, and technical institutions such as Water Agencies	Hydraulic retention of floods (channels, retention basins..) Resilient buildings (houses, shops, commercial centers, industries...) Measures for sustainable urban networks (drainage, water, electricity, transportation, etc.) River restoration projects

Recovery	State authorities (department level and Prefecture, Inter-departmental Service of Defense and Civil Security)	Security Plan (Plan ORSEC)
	Local authorities	Emergency plans/Municipal Rescue Plans (Plan Communal de Sauvegarde - PCS), compulsory when there is a PPRI
	State, Insurance services	National solidarity insurance system (Cat-Nat regime)

Links between CCAP and FRM

From the perspective of CCAP, **the link between climate change and floods is gradually being confirmed**. The issue is highlighted in various climate change adaptation plans, such as the First National Climate Change Adaptation Strategy in 2006 (ONERC 2007), the First National Climate Change Adaptation Plan (MEDDTL 2011) and the Second National Plan (MTES 2018a). For the first time, natural hazards are analysed from a climate change perspective in the First National Climate Change Adaptation Plan. Natural hazards occupy a predominant place, i.e the largest section. This shows the **growing interest of the authorities**. The First Plan advocates to integrate climate change in the field of natural hazard management, in particular in the preparation of of general and sectoral **land use planning documents**. In particular, the latter should consider climate change effects on natural risks. The Second Climate Change Adaptation Plan calls for flood risk prevention instruments to actively integrate the to climate change adaptation objectives.

From a flood risk management (FRM) perspective, the climate issue is directly present in the 2007 **European Floods Directive**. Furthermore, the second Grenelle act and the Floods Directive require that **FRM instruments include a section on climate change adaptation** (MEDDE 2013a). Climate change is thus considered as a physical phenomenon that has an impact on extreme hydraulic events. The different documents mentioned above (ONERC 2007; MTES 2021; 2018a) urge to consider the **effects of climate change during the flood risk assessment**⁵. The assessment must include low- probability floods , or extreme event scenarios. Consequently, it increases the reference to the highest known water levels through a long-term risk vision. For instance, documents encourage:

- to add at least 20 cm to the reference flood risk prevention plans since 2011;
- to model the flood risk for the year 2100 (DREAL Centre Val de Loire 2016) or according to a 100-year hazard formulation (MTES 2021) ;
- to add 60 cm of sea level in the case of the risk of marine submersion (MTES 2021).

⁵ In the Flood Directive, Members States (MS) must be undertaken Preliminary Flood Risk Assessment by December 2011.

However, in the documents consulted the link between FRM and CCAP is **more explicitly related to coastal risks such as marine submersion issues** than to flooding from overflowing rivers. The impacts of climate change on sea level rise and marine submersion are defined as rapidly foreseeable. The impact on river overflows is considered to be more uncertain (MTES 2018a; MEDDTL 2011; DREAL Centre Val de Loire 2016).

In short, based on public policy documents, the national analysis clearly shows the difficult link between CCAP and FRM. The dialogue between FRM and CCAP policies is difficult and so far based more on institutional political commitments than on concrete examples. The articulation between risk management policies and CCAP will be rather specified in each one of our case studies. As we shall see, this articulation is even more fragile when it comes to questions of justice.

Answering SOLARIS research questions from a national level perspective

Attention paid to justice/fairness/inequalities in policies (RQ1)

Background: how are inequalities taken into account in public policies in France in general?

In France, several policies address the issue of inequality and fairness, as required by the first article of the national constitution of 1958, i.e. the principle of equality of citizens before the law.

On the one hand, this principle is translated into a redistributive fiscal policy aimed at reducing **inequalities between citizens**, in particular through social minima (e.g. active solidarity income, social housing policy, disability allowance, solidarity allowance for the elderly, family allowances, etc...).

On the other hand, **the notion of equality between territories is also rooted in most public policies and promoted by** a specific ministry: the Ministry of Territorial Cohesion. For instance, a specific urban policy aims to reduce social inequalities between regions or municipalities in terms of social housing and urban well-being. More recently, especially after the pandemic, **health inequalities have come to the attention of the public authorities**, as the title of the ministry responsible ("the Ministry of Solidarity and Health") indicates. In this context, Objective 34 of the Public Health Act states as an important goal: "*To reduce inequalities in the face of illness and death by increasing the life expectancy of groups facing precarious situations: the gap in life expectancy at age 35 is currently nine years*" (Lang 2015). There is a strong link between health and environmental issues, especially after the 2003 heat waves in France.

The late formulation of environmental inequalities in public policy

According to the literature, **the formulation of environmental inequalities in French public policy is rare and late** (Laigle and Tual 2007). The issue of environmental inequalities did not appear in official documents until 2003, in the National Strategy for Sustainable Development. Later, a report by the General Inspectorate of the Environment (Bidou et al. 2005) made proposals to integrate the issue of ecological inequalities into sustainable development approaches (Laigle and Tual 2007). However, the term of “environmental inequality” does not appear in public policy documents until the second National Plan for Adaptation to Climate Change (MTES 2018b).

Traditionally, France, has been concerned with the social dimension of inequalities and the role of public authorities in relation to them (more precisely, the mechanisms that produce inequalities). Since the French Revolution, the idea of justice has been based on the equality of all citizens before the law rather than on the equality of the rights for each individual (i.e everyone is equal before the law, but the law is not equal to everyone). Since the 1980s, the national government has passed several laws on the social system. The rationale is to reduce public financial deficits. The aim is to achieve an economic balance in the public budget, while encouraging recipients to return to work rather than prolonging the long periods of inactivity during which they receive benefits (Théret 1991; Palier 2006). Nevertheless, these reforms of public policies continue to follow rather a more redistributive and corrective logic of the mechanisms that produce inequalities (Rousselon and Viennot 2020), rather than a reparative logic of the inequalities (Laigle and Tual 2007).

In general, national policies tend to focus on environmental protection in general, rather than on maintaining health and environmental benefits for the well-being of residents (Laigle and Tual 2007). There are very few links between urban regeneration projects in low-income neighbourhoods and sustainable development policies.

Finally, in line with its commitments, the French government has published a roadmap for the implementation of the 2030 Agenda (CGDD 2020), which is linked to the United Nations Framework for Sustainable Development Goals. In this document, actions are explicitly **targeted at the objectives of equity and justice in the context of climate change adaptation measures**.

Linkage between inequalities, CCAP and FRM

The National Strategy for Adaptation to Climate Change of 2006 states that adaptation to climate change is a challenge for all social actors, not just for the national government. Therefore, every stakeholder should be involved in social change, not just the national authority. A common goal for social changes should be achieved. Within these shared values and principles, equality is adopted as a principle for adaptation (ONERC 2007, 8), as well as the principle of disaster solidarity. This principle is particularly emphasised in the context of heatwaves, which affect not only the elderly, but also people with low incomes, poor housing, chronic illness or social isolation. The 2003 heatwave is mentioned in the 2006 National Strategy for Adaptation to Climate Change. The

crisis highlighted weaknesses in several policy areas in the face of extreme climate events. It also highlighted the need to rethink for new construction models to reduce the vulnerability of housing. It includes changes in materials, guidelines and skills to cope with climate events (actions 33, 37)⁶. The second Adaptation Plan integrates the concept of “climate justice” to refer to the issue of social and environmental inequalities. This notion highlights inequalities between those who contribute the more to climate warming, and those who are the most exposed to /affected by risks (Jouzel and Michelot 2016). Furthermore, as mentioned above, in France, since 1982, the national government has organised a system of collective solidarity to compensate for damage caused by natural disasters such as floods (Barnier Law). This system of collective solidarity can be considered as an implementation of a concept of justice related to flood issues.

Analysing the formulation: the technical view of FRM documents

By reading the relevant documents, both in the CCAP and in the FRM, we carried out an analysis of the vocabulary used to refer to inequalities in France. In particular, **the terms of solidarity** (solidarity between territories in the same catchment area, solidarity between urban and rural areas, solidarity of each citizen through the disaster compensation scheme) **and the terms of equality/equity** (“equal treatment of each territory”; “wealth inequalities” between citizens or territories at risk are used.).The term of “climate justice” is also mentioned in the Second Climate Change Adaptation Plan (2018). The term of vulnerability, widely used in the different documents related to flood risk management, is not linked to a notion of social justice, contrary to the definition of vulnerability mobilised in part of the disaster studies literature (Wisner 1977; Maskrey 1993). Its definition focuses on the exposure and resilience (or not) of activities (MDEM, Cerema, and Cepri 2018; ONERC 2007; DGPR 2014). Social issues are addressed implicitly, on the basis of certain indicators (see below).

Moreover, although the framework documents on climate change (ONERC 2007; MEDDTL 2011; MTES 2018a; 2018c) and FRM (DGPR 2014) explicitly formulate the idea of equality and justice in their principles, this idea of inequality in the face of risk is less integrated in the documents more directly related to flood risk management (MTES 2011; Cepri 2008; MDEM, Cerema, and Cepri 2018; DREAL 2018; MEDDE 2012b).The objective of justice in the CCAP is not reflected in all documents at the national level, in particular in FRM.

At the national level, documents such as the National Climate Change Adaptation Plan and the National Flood Risk Strategy (DGPR 2014; MTES 2018a) address the issue of risk inequality, the need to strengthen the capacity of residents, and the resilience of property to cope with shocks. However, the notion of social inequalities in the face of floods is less evident in the flood risk documents that operationalise these climate frameworks (MTES 2021; MDEM, Cerema, and Cepri 2018).

⁶ It also triggered reflections on means of transport (action 32) or on the dependence of nuclear energy production on water (action 31).

Thus, the consideration of climate change and adaptation strategies in flood risk management is first and foremost a question of risk definition. It is a physical phenomenon that increases the risk, and require new models for more long-term strategies. The notion of adaptation is used as a practical means of reducing the exposure of property and people in the face of increasing extreme events. It involves a question of adapting buildings to the risk of flooding, relocating activities, and developing appropriate crisis management plans. **Even though solidarity and equality are mentioned in the National Climate Change Adaptation Plan, adaptation to climate change in FRM is not framed in terms of justice and equality.**

Role of participation (RQ2)

French legislation introduced the notion of “citizen participation” in the construction of public policies during the 1980s and 1990s. Some legal mechanisms, such as the public enquiry, has been created and implemented since the 19th century. In 1983, the “Bouchardeau law” attempted to renovate the public inquiry procedure, which had been increasingly criticised since the 1960s. The procedure only informed tenants directly affected by public projects (Graber 2016). It was therefore designed to protect the interests of landlords rather than providing a procedure for debate and concern where citizens could express their environmental concerns.

In the 1990s, while several international texts stressed out the importance of citizen participation in environmental matters (Rio Convention, Aarhus Convention, etc...), some texts established the principles of informing and consulting residents in France. Among them, the 1995 law on the reinforcement of environmental protection, also known as the "Barnier" law, created the National Commission for Public Debate and introduced a "principle of participation" into French legislation: *“everyone shall have access to information relating to the environment [...] and the public shall be involved in the preparation of decisions having a significant impact on the environment or land use planning”*. With this new Commission, an extensive consultation process procedure is compulsory and is being implemented at national level to facilitate the debate on major planning and environmental projects. In the filed of flood management, one of these projects was the flood retention area project, upstream of Paris, which was the subject of Public Debate in 2012 (series of dikes at La Bassée). With this procedure, the legislator initiates discussion and deliberation before decision-making and public enquiries, which are still remain strongly criticised for their top-down coordination and decision-making (Blatrix 1999).

At national level, therefore, there has been an increase of public participation is visible, at least from the 1980s to the beginning of the 2000s. To define the general principle of public participation, the "Bouchardeau" law spoke only of "information" while the Barnier law evokes "participation" and "involvement"⁷ of the public in decision-making (Blondiaux & Sintomer 2002).

⁷ In French, the term used is “le public est associé” (Blondiaux and Sintomer 2002, 19)

Citizens' involvement in FRM

In the context of FRM, the French legislator has gradually created several instruments for citizen participation. The main objective is to inform and raise public awareness. The principle of the public's right to information on major natural risks was enshrined in the 1987 law on the organisation of civil security, the protection of forest against fire and the prevention of major risks. It states that “*citizens have the right to be informed on the risks to which they are exposed in certain parts of the territory and of the precautions taken to protect themselves against them*”. This right to be better informed has led to the creation of a compulsory document on major risks at both départemental and municipal level. However, their implementation is still complicated. The inhabitants are not aware of these documents (Ledoux 2006).

The 2003 law on the prevention of technological and natural risks facilitated new development (Veyret-Medkjian, Garry, and Meschinot de Richemond 2004). It also introduced new systems aimed at developing an awareness and a "risk culture" among the population, such as the obligation for mayors to inform their citizens about risks. Finally, at the national level, the government still considers that the “information” and “consultation” phases of the Flood Risk Prevention Plans (*Plan de Prévention des Risques d’Inondation - PPR*), and including the public enquiry, are valuable and important periods for public participation. At the local level, residents and professional associations together with researchers and artists have carried out local initiatives to explore innovative ways to strengthen the “risk culture” (Metzger et al. 2018).

What about the effectiveness of this “imperative” of public involvement in FRM? The discourses in the publications, briefs and methodological guidelines of the Ministry of the Environment formulate the idea that the public still does not have the right to co-decision but the right to be informed (Bayet 2005), i.e. to be heard, to be listened to. It is clear that official doctrine and legal procedures in France speak mainly of “informing” and “consulting” the public. The residents’ point of view has little impact (Ledoux 2006). Given the technical peculiarities often associated with FRM procedures, practitioners consider that the participation of residents - apart from top-down information - to be too restrictive (Fournier 2010). In fact, the literature on FRM points out a whole range of participatory processes, including more or less passive forms of citizen involvement, which should be studied more closely in order to accurately measure their impact or not (Mees et al. 2018). In fact, they are not procedures for the construction of co-decision. The National Commission for Public Debate provides time for discussion and deliberation at an early stage, before most decisions are taken, but it still remains limited in its ability to give “power to citizens” (Arnstein 1969).

The implementation of the Floods Directive should have strengthened the involvement of citizens in the preparation of policy documents, in particular the Flood Risk Management Plan (FRMP) at the scale of hydrographic basins (Drobenko 2010). Although FRMPs have been implemented in many areas, there seems to be a gap in the literature on the implementation of these processes. Publications are still at an advisory stage, highlighting the importance and challenges of participation (Massé et al. 2019). They also aim to propose

methods to overcome obstacles, rather than to provide critical feedback (Leenhardt, Voltz, and Barreteau 2020). Some publications highlight the challenge of the representativeness of the participatory mechanisms implemented and the difficulties for practitioners to easily organise the discussion with residents (Hassenforder et al. 2020).

Are there any innovations stemming from climate change adaptation? If citizen participation in the FRM remains limited, the national government has **recently introduced more innovative tools** to facilitate the debate on the CCAP.

Following a public debate on multiannual energy programming at national level (2018), Emmanuel Macron announced a citizens' climate convention in April 2019. 150 citizens were randomly selected at national level to participate. From October 2019 to June 2020, they received a rich and diversified information on climate change to be able to debate and formulate proposals. In June 2020, they presented 149 proposals “in a spirit of social justice” to reduce greenhouse gas emissions by 2030 (Pech and Pisani-Ferry 2020). At the national level, this convention raised great expectations among civil society. In practice, however, many of the proposals were partially adopted by the legislator or the government (Baeckelandt 2022). Thus, literature and think-tank reports remind us that such public processes may not empower citizens. At best, they make deliberation and decision-making easier for policymakers. At worst, they distract people from the most important justice issues and discourage communities from participating formally in public processes.

A "reluctance" of institutional actors to involve local populations in FRM

Academic research still reveals "reluctance" on the part of policy-makers , risk managers and more generally institutional actors to involve local people in FRM decision-making: " *The most common discourse among institutional risk actors is to present the local population only with solutions that have already been worked out and a unanimous and coherent position, even if this means waiting several years for technicians and elected officials to agree.* » (Duchêne and Morel Journal 2000, 225–26). A large body of literature questions both traditional and more innovative procedures.

What are the consequences of such a limited role for participatory processes in FRM? At the local level, in order to improve public participation, local authorities sometimes launch additional participatory initiatives and actions.

A distinction can be made between:

- Initiatives designed and launched to better inform and raise awareness among the population. They are often defined in synergies between local authorities and civil society (artistic experiments for instance) and can lead to the development of participatory scientific projects.
- *Ad hoc processes* to reduce the difficulties and conflicts that may arise during the implementation of projects; as such, they are designed and implemented before public participation *procedures* (usually before public enquiries). Such processes are not mandatory but are used to enhance the political

legitimacy of policies and projects. They must be distinguished from the "procedures" mentioned above (public inquiry, public debate...). Nevertheless, they have become essential for the formulation of public action: *"The process is complementary to the procedures, and the legitimacy it confers "thickens" the legality of the resulting solution. »* (Vodoz, Thevoz, and Pfister 2008, 213).

Knowledge and capacity-building on social inequalities (RQ3)

Knowledge based on historical data and capable of modelling the future

What knowledge is used in climate change documents to mention risk and climate change? In policy documents, the knowledge about flood risks is framed in a **modelling and prospective way**, based on **quantified data** on climate phenomena (promotion of "climate services"). If we look at the **reports of insurance experts** advising decision-makers (Andre and Marteau 2022; CCR 2020), the knowledge is linked to geographical, climatological, and geomatic skills, as well as to the management of a large amount (Andre and Marteau 2022, 11). The aim is to model climate risks, costs and damages. This reflects a very technical approach to knowledge management, that ignores social and socio-economic data sources.

Several **observatories** have recently been established to collect, assess, process and map climate data. **Typologies of historical flood events** are also used to integrate historical data and their consequences on health, economy, the environment and cultural heritage. It opens a window to keep a memory of risks. Social sciences are also mentioned as increasingly important, especially in perception through cognitive sciences and more specifically in crisis management.

In addition, the Second Climate Change Adaptation Plan emphasises the need for "participatory" science, that mobilises a **"bottom-up" approach** with local actors in a co-building perspective. More specifically, **participatory science** is presented as a science that raises awareness and helps to disseminate results widely. It includes dissemination and education activities, but also participatory climate information forums and platforms. **Digital and online tools** are developed to facilitate access to scientific resources and information (climate information portals).

How are inequalities addressed in climate change adaptation documents?

Climate change adaptation documents clearly raise the issue of social inequalities. Reading the First and Second National Adaptation Plans, the link between adaptation and the challenge of social inequalities becomes stronger over time. The notion of vulnerability is broader than in the FRM documents. It refers not only to exposure, but also to the social situation of the population. It refers to the vulnerability of natural environments, regions and economic activities. **However, when it comes to identifying these social vulnerabilities and developing concrete actions, the frameworks lack detail.** Some general ideas are mentioned:

- strengthening participatory processes and consider citizen science and community knowledge of risks,

- strengthening knowledge production to better predict the impacts of climate change,
- encouraging local and innovative initiatives that aim to change social practices and behaviours,
- creating labels for sustainable projects.

In the Second National Adaptation Plan and in France's commitments to the Sustainable Development Goals, France offers to help other vulnerable countries address the impact of climate change on social inequalities, in particular by contributing to international funding. When the objective of poverty reduction is mentioned, the actions remain at a very general level:

- Strengthening "the social contract",
- leaving no one behind,
- to ensure a better distribution of wealth,
- eliminating discrimination and inequality between men and women,
- ensuring universal access to basic services.

The Second National Adaptation Plan also emphasises regulatory and financial tools to implement adaptation measures. France's commitment for the Sustainable Development Goals mentions the need for evaluation tools for projects aimed at transforming society: what would be their impact on poverty? The document thus implies that transformative actions will have an uneven impact on poverty levels.

In conclusion, these frameworks clearly emphasise the link between adaptation to climate change and the possible exacerbation of inequalities. However, the way in which this question is posed and the means of answering to it remain underdeveloped.

How do documents address inequalities in FRM?

The issue of **fairness is not formulated as such in Flood Risk Management** (National Strategy for Risk Management). There is no mention of the word "inequalities", "injustice", or "fairness" at all. However, it is possible to identify indicators that can **be associated with it**.

The National Vulnerability Framework mentions the **social level** of the population (approximated by the median income) to measure the ability to "**return to normal**" quickly after an event. The approach continues to focus on the concept of '**exposure**' (the intersection between a level of hazard and a level of vulnerability). Recommendations emphasise the need to relocate populations or protect them by reinforcing infrastructure. **There is no mention of the implications that such displacement may have for justice or equality.**

The National Vulnerability Framework also mentions 'light dwellings' (i.e. tents, caravans, mobile homes, slums...) and their vulnerability to flood risk. This can be interpreted as a way of considering inequalities in the

face of risk. Vulnerable populations are also to refer to people who cannot evacuate on their own (disabled, dependent on a medical equipment). **But again, these elements are not formulated in terms of reducing.**

Section 3. Blois (Case study 1)

The first case study, La Bouillie, is located in the city of Blois. During the first part of the 20th century, “La Bouillie” district expanded, first informally, behind a spillway. Since 2003, housing and economic activities in la Bouillie have progressively been delocated in order to re-create the flood retention area and improve protection level in the surroundings. 400 people in urbanized districts, 20 companies and numerous people in informal lightweight dwellings lives in La Bouillie which used to be a popular district. Once the de-urbanisation process has started, new propositions about the future of the project emerged. Several non-permanent uses have been proposed, in line with flood risk management. Planners ambition to address flood risk issue and build synergies between agricultural, recreative and contemplative uses. The ambition to de-urbanize will change thus the future of the district. From a semi-informal district, able to absorb marginal uses, la Bouillie became the scene of a national experimentation for flood retention area restoration. Public policies not neglect this neighborhood anymore. The local prefect described la Bouillie de-urbanisation as *"an exemplary operation elaborated in the name of the general interest"* (Doussin 2009).

By promoting a policy of deurbanization followed by a redevelopment project, the case study of La Bouillie represents a singular exemple of risk adaptation measures in a fluvial context in France. It allows to examine how public policies have evolved, from deurbanization to rehabilitation, and how the treatment of inequalities may have changed over time.

Introduction: narrative of the local context

Description of case study area: localization, socio-spatial indicators

Blois is a **medium-sized city** with about 46 000 inhabitants (INSEE 2019); it is part of the development axis of the Loire valley and benefits from the proximity of Paris (less than 200km) (figures 5 & 6).



Figure 5. Location of the department Loir-et-Cher (41). Credits : F.DELONIN et R.TORRENT. Source: background map ArcGIS



Figure 6. Location of Blois in the Centre-Val de Loire Region. Credits : F. DELONIN et R.TORRENT. Source: Géoportail

After a period of growth during the 1960s and at the beginnings of the 1970s, the city of Blois has experienced since the 1990s a **population decline** due to a negative net migration, whereas the other surrounding cities remained attractive, showing processes of peri-urbanisation, designing the extension of build areas away from agglomerations. Like in other Loire valley cities, urbanisation is sprawling in suburbs (Andrieu and Nowik 2011). This trend to a **development in the peripheries** is mainly on the plateau outside the flood plain, which is located

on the left bank of the city. Since the 2000s, urbanisation of the city of Blois has also **developed on the flood plain, in the south part of the city, even if the urbanization of the Vienne district and its surroundings is longstanding** (Figure 7).

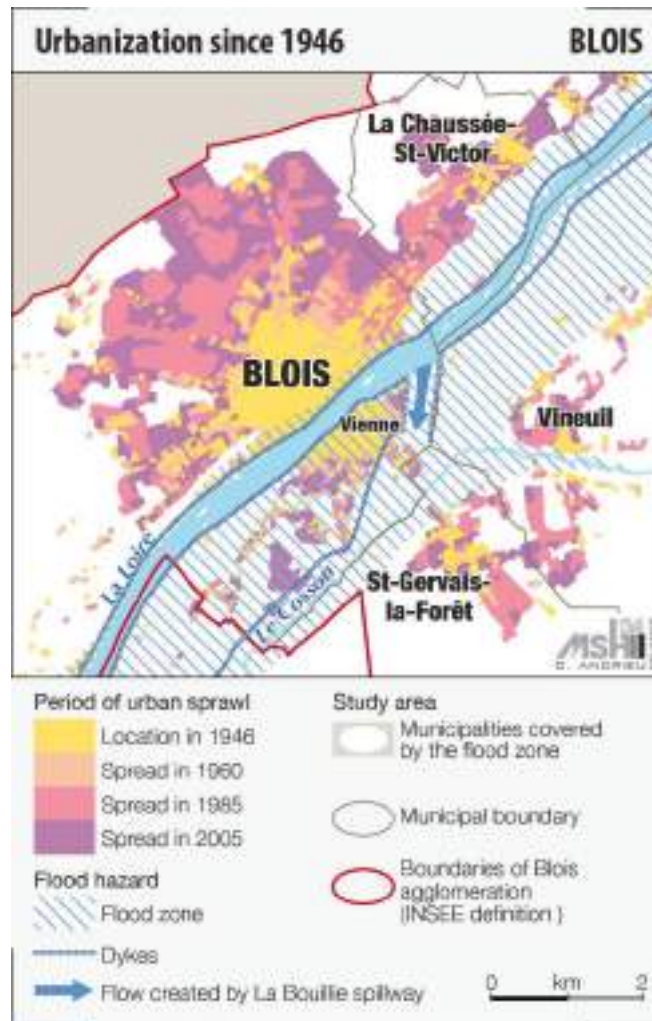


Figure 7. Evolution of the urbanisation of Blois between 1946 and 2005.

Credits: D. Andrieu. Source : Freude am Fluss Project

Since the end of the 1970s, Blois also **struggled to find an economic attractiveness**. The years 2010 were marked by industrial job losses (Pilote 41 2014): we speak of "*the net disappearance of nearly 740 salaried positions in 2013, after more than 1,000 in 2012, i.e., a total of 3.6 % of its workforce in 2 years*" (Pilot 41, 2013). Nevertheless, the indicators of demographic and economic activity in the agglomeration of Blois have increased significantly since 2017. The population is slightly but constantly increasing (+0,4% between 2013-2019, INSEE 2019). Marc Gricourt, the mayor of Blois, speaks of "**a positive thrill**" even if the latter remains "insufficient"⁸.

⁸ Nouvelle République, 7/01/2022, on line : <https://www.lanouvellerepublique.fr/blois/loir-et-cher-blois-et-agglompolys-continuent-de-grappiller-des-habitants>

The employment trend of Blois has also recorded one of the two best results in the region (+ 4%), even since the global COVID pandemic⁹ (Pilot 41, 2021). Not all sectors progress in the same way. Tourism and construction sectors continue to grow, while the manufacturing sector continues to lose jobs. This increase in tourism and construction significantly illustrates the local political ambitions and strategies in Blois.

The case study of Blois will focus especially on a district located in the south of the city, called the Vienne district (Figure 6 and 7), which used to be an important area for farming. This vocation was undermined after the post-war period and the consequences of agricultural modernisation. However, the agricultural vocation is re-emerging in the 2010s through a new branding "feeding the city" with allotments, agro-urban parks, market gardening, etc. Now, the agricultural vocation is combined with urban activities. It is also an answer to the presence of the flood risk.

Flood Risk Management background

Type of risk, chronology of the events

For centuries, the city developed along the Loire, the longest river in France whose basin accounts for one quarter of the French metropolitan territory. **Blois has not experienced any major flooding recently** (last flood in 1907). The last major floods happened in the middle of the 19th century in 1846, 1856 and 1866. The centennial flood of 1856 reached 6.78 meters in Blois. Water has not risen over 5 meters since the 1920s, nor has caused damage as serious as in the past. However, in 2016, a flood occurred in Blois and ended up in the spillway: it was due to the Cosson river, located in the south of the city. If this flood is not considered as a major flood, it provoked important material damages for the remaining inhabitants living in the spillway and accelerated the delocation process.

The Loire valley is protected from flooding thanks to a **system of dikes**. In addition, Blois benefits from another protection measure: a spillway, called the **Bouillie's spillway**. It is an old infrastructure, built to facilitate navigation and flood protection (Dion 1934). The spillway, stretching 570 meters long, was built in the 17th century, uphill from the city of Blois. This protection work aims to reduce the flow rate of the river when it reaches 3900 m³/s in case of flooding so that it can compensate for the narrowing of the Loire, caused by the construction of the Gabriel bridge. The Bouillie's spillway was overflowed four times in the past: during the floods of October 1872, March 1895, October 1907 and January 1924. Established on the dike, constructed with robust materials at an inferior level of the levee located upstream and downstream, the spillway is equipped with a "fuse wire". This element of ground stands the spillway at the same level as the dike, which will be destroyed by the water of the Loire during a flood, letting the water flow in the corridor located behind the spillway (figure 8 & 9).

⁹ Pilot 41, 17/09/2021, on line : <https://www.pilote41.fr/toutes-les-actualites/174-actualites-conjoncture/814-la-conjoncture-economique-s-eclaircie>

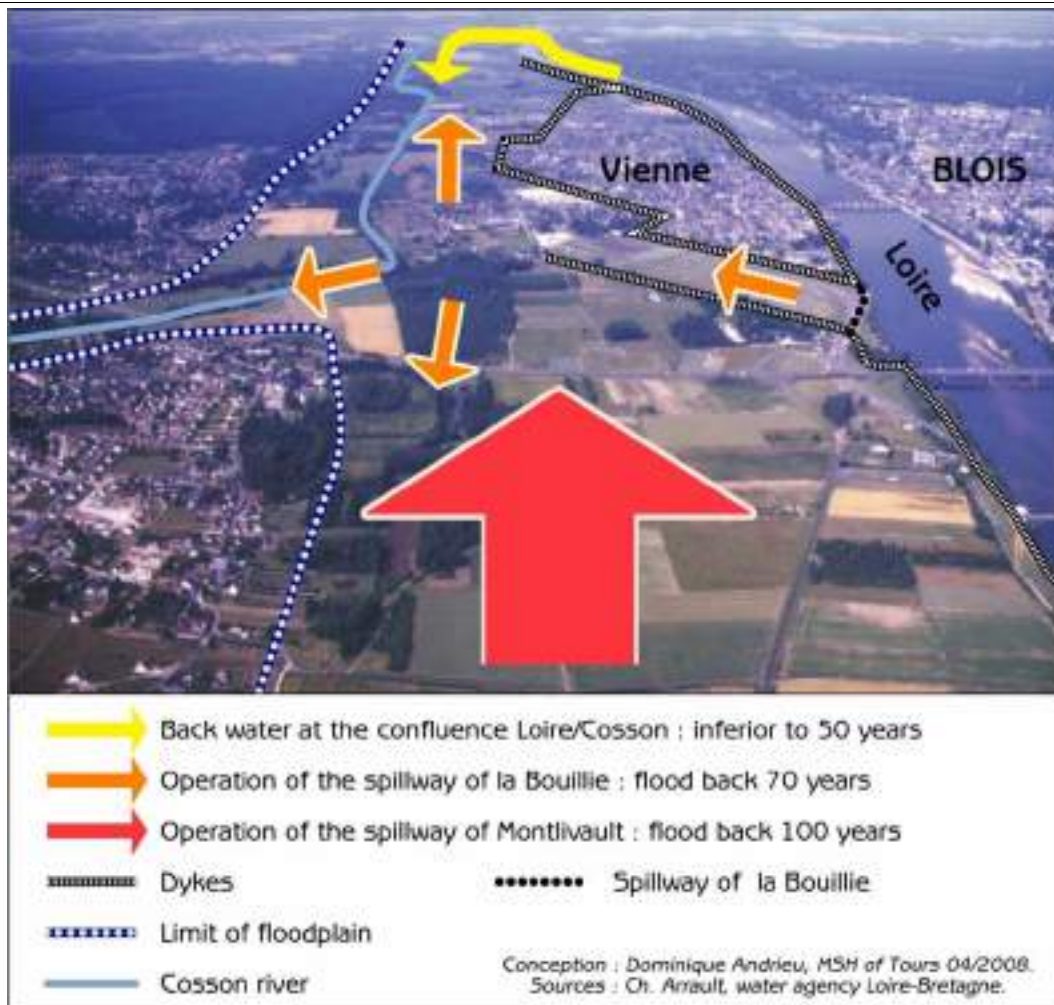


Figure 8. Working of the spillways of the Boullie and Montlivault in case of flooding.

Source: Andrieu, 2008

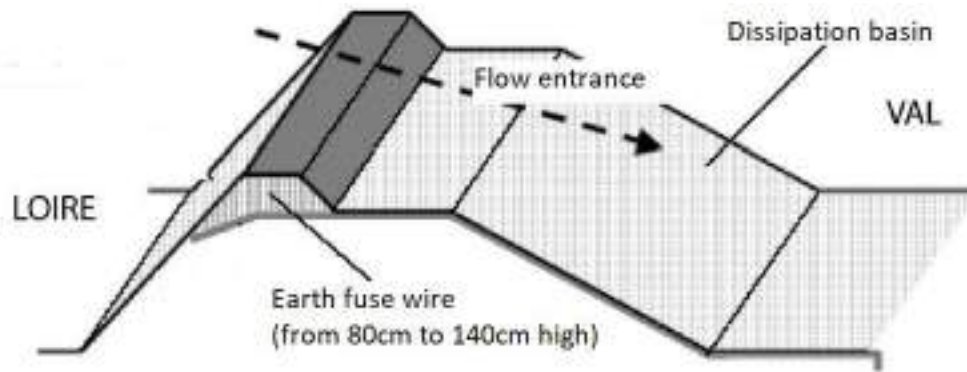


Figure 9. Technical operation of fuse wire on a spillway.

Source: Equipe pluridisciplinaire du Plan Loire Loire

Along the Loire River, the protection with dike and spillway comes from a spatial planning and strategy regarding navigation, but also from the will to develop agriculture, urban activities and communication networks across the flood plain. Nowadays, the development of the Loire's flood plain, in particular in Blois, raises the issue of the **high flooding vulnerability** (OCDE 2010).

The specific project at stake for SOLARIS

Timeline and main objectives

Our study will focus on the occupied space by the Bouillie's spillway, which used to be urbanised. It illustrates a change in the way of managing flood risk, and rehabilitating flood expansion area. The renewal **of the area of the spillway** and its surroundings is, today, a central question to integrate and conciliate local development and flood prevention (figure 10).

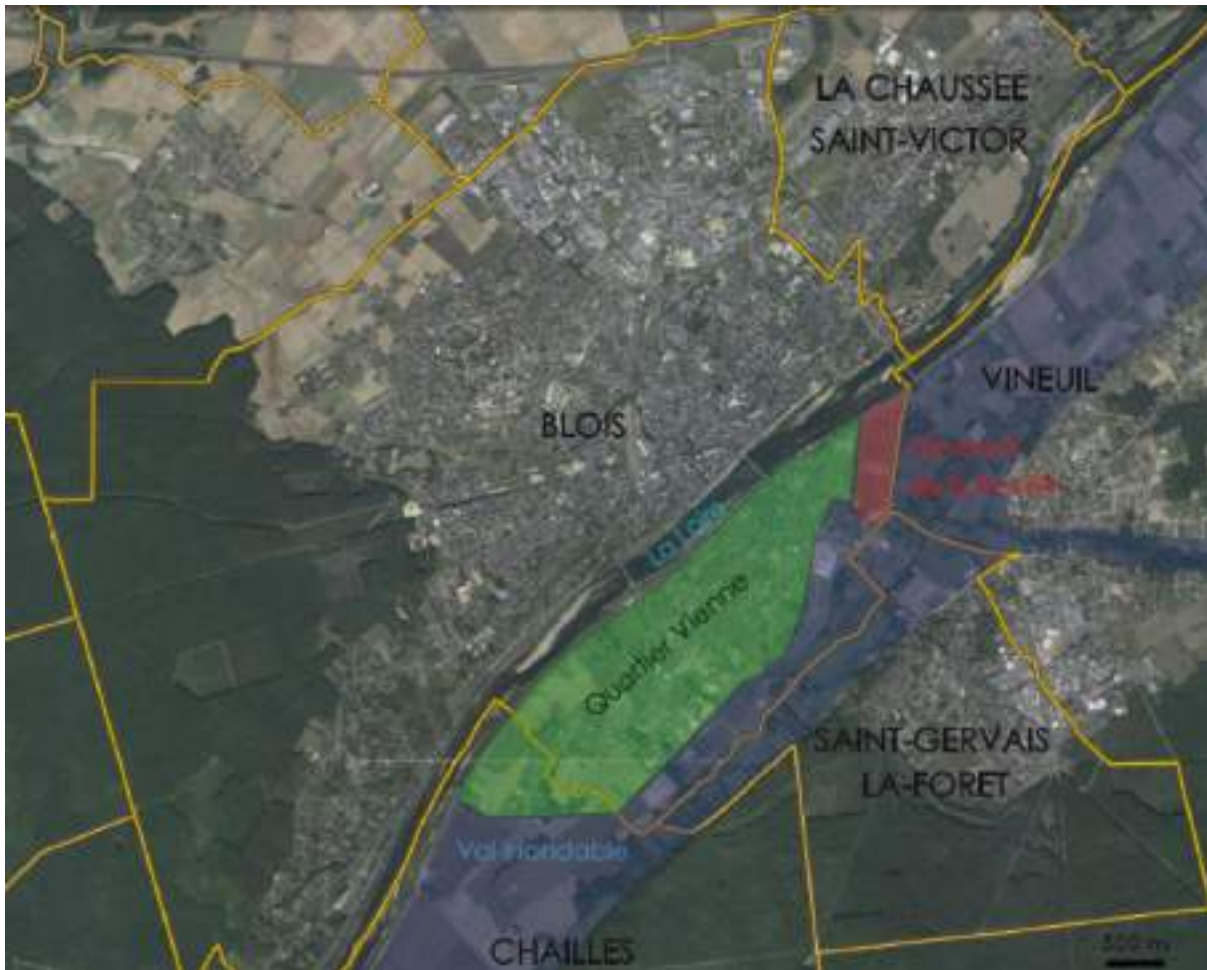


Figure 10. Location of the Bouillie's spillway and the Vienne district.

Credits: Delonin, Torrent 2016. Source: Géoportail 2016

A non-urbanized spillway, progressively contested (1783-1907)

The Bouillie district remained, for several centuries, without any planning, without wood plantation, without construction, forbidden by royal decree in 1783. Until the middle of the 19th century, prefectural orders were restricting and forbidding constructions. Only gardens and some huts occupied the area. However, in 1879, the spillway was raised higher after the 1866 flooding and the population started to question the prefectural orders. At the end of this century, constructions became possible after an owner complained to the *Conseil de Préfecture du Loire et Cher* (1878) and the *Conseil d'État* (1879). It is at that moment that urbanisation developed legally on the spillway.

The constitution of a popular district that has to be de-urbanized (1945-2003)

After the 1907 flood, and especially from 1945, la Bouillie district expanded, mainly informally. It officially stopped in 1968, when the Submersible Flood Plan (Plan de Surface Submersible – PSS : an older flood risk plan, less mandatory than the PPRI cited previously in the national section) came into force (Rode, Beucher 2009).

La Bouillie was a popular district, where working-class people used to live. Many “travellers”, designating people living itinerant lives mainly in caravans, have also been living on La Bouillie site for several decades. Vienne district and all the south part of Blois City is an historical urban edge. For many inhabitants, public policies intended on this patch of land are quite seldom and “*Vienne has always been neglected by the City*” (Interview, former inhabitants, June 2021). Moreover, in La Bouillie, over-exposure to the flood risk explains the low land prices (figure 11). Thus, this over-exposure offers the possibility to have access to an individual housing for the working classes. People living in the area are not aware of living in flood-prone area (MINEA, 2000).



Figure 11. La Bouillie district, surrounded by the ZAD perimeter before the de-urbanization process.

Credits: Picture from Blois Agglomeration, 2002.

In the 1990s, studies and reports carried out by the National authorities on the Flood Risk in the Loire valley pointed out the very high flood risk for the inhabitants in La Bouillie. Due to the presence of houses and economic activities, the spillway could no longer play its role of discharging the river during floods. It undermined the residential district of “Vienne”, hosting many inhabitants and businesses: in 2017, 8000 inhabitants are exposed to flood risk in Blois and 6000 of them are living in the Vienne district (PPRI, 2019). These new studies led to the ban of an urban project for Vienne district shaped during the 1980’s and the 1990’s to develop the South part of the city, through new facilities and infrastructures (Galepois, 2020). Since 2003 and the implementation of a 52

ha Deferred Development Zone (Zone d'Aménagement Différé, "ZAD") housing and economic activities in "La Bouillie" have progressively been delocated to re-establish the flood retention area and improve protection level. About 135 houses and 14 companies were built on these ZAD.

The ambition to de-urbanize will change the future of the district. From a semi-informal district la Bouillie became the scene of a national experimentation for flood retention area restoration. Public policies did not neglect this neighborhood anymore. La Bouillie project is integrated into discussions at the basin river scale, sometimes at the national scale and is seen as a pioneer operation. At that time, the goal of public policies is to reduce risk exposure and local authorities saw the space through a technical lens. We notice a top-down policy from the beginning. The lack of integration of citizens in the decision-making process shows a lack of appreciation of the inhabitants and former inhabitants of the area.

Turning the de-urbanized lands into a new green centrality for the Agglomeration (2006-2023)

On a third time, once most of the site has been de-urbanized -only a few families remaining -, la Bouillie became an opportunity for "regeneration" (Figure 12). This ambition is reinforced by a change of status during the progressive delocation process. Following the various demolition phases, it becomes a relegated area, according to many local stakeholders: "our president [The Agglomeration president] when he talks about the site he talks about *No Mans land* [laughs]" (Interview, local stakeholder, october 2021). The area is seen as a buffer zone, occupied by people claiming or suffering from forms of alternative ways of life and marginality on the riverbanks (Gralepois 2020; Rode et Sierra 2008; Sajaloli 2020).



Figure 12. The rehabilitation project perimeter. Source : Agglopolys (2021)

Progressively, Flood Risk Management became an opportunity to transform this historical urban margin into a new centrality of environmental and urban benefits for both inhabitants and tourists. The aim of local policy managers is to build up an area which can be easily appropriated by various categories of inhabitants, to build up an inclusive project. This appropriation would be encouraged by public participation tools that have been designed, through the definition of shared uses, and the involvement of various local associations as well. La Bouillie can be seen as a symbol of a shift the Agglomeration intends to design. The de-urbanisation process is an opportunity for a resilient city model framing a new urban project around sustainability.

After several phases of de-urbanization, non-permanent uses have been suggested, in line with the concept of nature-based solutions (NBS), even if the concept is not used as such by the local policy makers. Planners' ambition addresses the flood risk issue and intend to build synergies between agricultural, recreative and cultural uses. Since last February 2021, participatory workshops have been organised by the Agglomeration to include inhabitants and foster local appropriation of the rehabilitation initiative. After these workshops, uses and functions of la Bouillie will be transformed. The rehabilitation projects will bring out or strengthen contemplative, recreational, and agricultural uses.

The main objectives of this process are:

- To protect the inhabitants of la Bouillie districts, considered as highly exposed to massive flood risk ;
- To protect the inhabitants of the surroundings districts, especially the Vienne district: the flood retention area could no longer discharge the water from the river and threaten the rest of the city ;
- To regenerate the area. This project is part of a development, or redevelopment policy for local attractiveness. It gives a new centrality to la Bouillie and intends to transform this historical urban edge, this margin into environmental amenities.

These objectives are cumulative and have evolved since 2003 and the first ZAD. The risk has firstly been approached through a technical lens in a top-down approach, carried mainly by the National authorities' administration. More recently, Flood Risk Management has become an opportunity to transform this historical urban margin into a new centrality of environmental and urban benefits for both inhabitants and tourists. This Flood Risk Management objective is achieved through an urban greening project. The de-urbanized area can offer natural spaces and strong environmental benefits to the inhabitants while limiting urbanisation and (re)creating flood expansion areas (Sajaloli et al., 2008). Through this project, local authorities intend to turn the flood risk management into a new asset for the district and the Agglomeration. This policy is now a multifunctional tool, built as a "win-win solution". The goal is not only about hazard management anymore, it aims at conciliating on the site:

- Agricultural uses, to foster organic local production;
- Cultural and recreational uses, mainly for local inhabitants;

- Landscape identity: La Bouillie is the entrance of the city, closed to important French castles, and the Loire Valley in France has been listed by UNESCO as a World Heritage Site

The project and the main stakeholders

The administrative structure in charge of FRM and spatial planning in Blois typically illustrates the organisation of national and local authorities' administration in charge of risks in France.

National authorities' administration

First, the **National authorities' administration** is a key actor. Among the deconcentrated State services (State/central government administration which are present at regional scales), three administrations share responsibilities. The *Direction Régionale à l'Énergie, à l'Aménagement et au Logement Centre* (DREAL Centre) is in charge of flood modelling, but also studies the dangers coming from dike breach risk along with territorial prospective at large scale. Next, the *Direction Départementale aux Territoires du Loir et Cher* (DDT Loir et Cher) oversees mapping risks (PPRI) but also the follow-up of urban regulations with local authorities. Finally, the *Préfecture du Loir et Cher* is in charge of PPRI validation, issues concerning crisis management (warning signal, evacuation, emergency...) and is more generally the political intermediary between the national and the local authorities. National decentralized services have involved the local policy makers from the Agglomeration (inter-municipal institution) and the municipality directly, which both are impacted by the development project in La Bouillie district. They convinced them to set up a specific regulation tool (see later) through specific committees to gather the various stakeholders. The Agglomeration negotiated the Flood Risk Prevention Plan with the National services and set up urban planning documents. It is analysed as a vertical process of cooperation and coordination, far from the citizens (Reliant, 2004).

National authorities' administration and elective representant

In a second row, during the period of the regeneration process, the **local authorities**, and especially Blois Agglomeration has become a key actor and project manager. At the level of local authorities, two levels of competences share responsibilities. First, the Mayor is responsible civil security, risk management and urban planning policy. Regarding flood prevention strategy, the mayor is principally responsible for information, and for the application of public utility easements regarding risk in the *Plan local d'Urbanisme*. Moreover, the mayor works in coordination with the State services (*Préfecture*) for the evacuation of populations in case of emergency.

The next stakeholder is the *Agglomération de Blois (Agglopolys)*. This is a grouping of 48 local authorities around Blois that share the competences of territorial and economic development, urban services network, etc. In the case of the *Agglopolys*, the 48 local authorities have decided to transfer a competence regarding Wetlands

management and Risk Prevention (figure 13). For the specific regeneration project in la Bouillie, local representatives organized participatory workshops. They coordinated and designed the rehabilitation project of la Bouillie with private consultants and organised the participatory modules. During this process, some citizens got involved and others seemed to be made invisible.

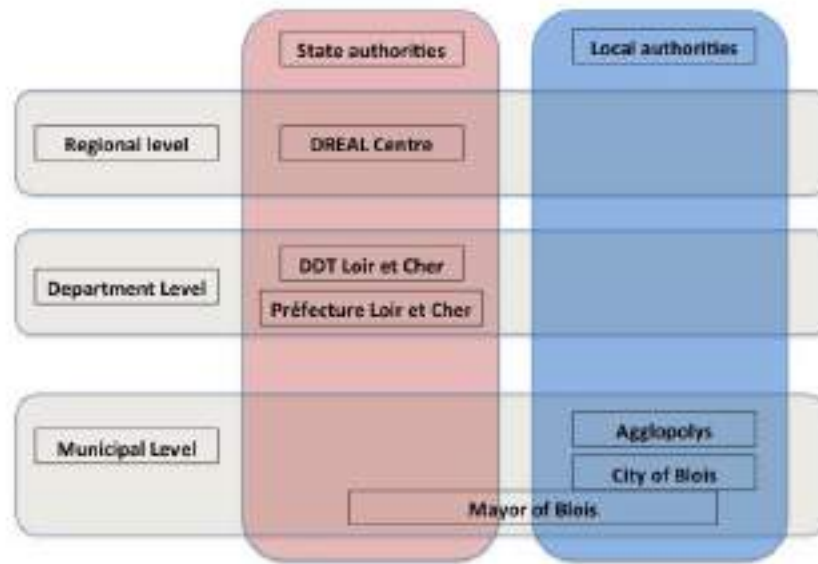


Figure 13. Map of local actors in flood risk management in Blois.

Credits. M. Galepois 2016. Source: StarFlood, Larrue et al. 2015

Inhabitants' role and local conflicts

Finally, and as a strong added value in the SOLARIS research, we study the central role played by the **inhabitants**. During the de-urbanization process, they became key actors. Mobilisations emerged as a reaction to the lack of recognition and participation (see later). An association was created by inhabitants several days after the launching of the ZAD. Their demands went from strictly contesting the project to negotiating the conditions of eviction and demanding consultation. They asked for an alternative technical solution to delocation, negotiated for equal and social relocation conditions considering the growing prices of local real-estate market in the Agglomeration. More broadly, these inhabitants criticized a top-down policymaking. The lack of integration of citizens in the decision-making process shows a lack of recognition of the inhabitants and former inhabitants of the area (Fournier 2010; Rode 2014). They negotiated, mainly with the Agglomeration of Blois. Meanwhile, the Agglomeration started, in 2006, to imagine a future that could be shaped on the de-urbanized land and new inhabitants get mobilised.

The socio-spatial issues raised by the policy/project

When implemented in 2003, the deurbanization project of La Bouillie led to significant social conflicts, prompting an examination of inequalities on various levels. Are pre-existing vulnerabilities of residents and users of the space considered? Similarly, understanding how the experiences and knowledge of these actors were integrated into the policy-making process is a crucial aspect. Furthermore, the deurbanization followed by the regeneration project offer a chance to explore the path of inequalities influenced by long-term policies. How local political players deal with these processes in light of the socio-spatial changes in the area over the past two decades?

Methods

The data collection is qualitative. We have carried out **24 interviews** with local stakeholders. We also collected documents produced such as reports, minutes of meetings, and analysed their communication supports such as their websites. Finally, we realised a press review from 2000 to 2022 (Table 4).

Table 4. Table of Interviews

Actors	Role	Interviews conducted	Documents collected
Agglomeration of Blois (the inter-municipal institution)	Manager of the de-urbanization and rehabilitation project. Responsible for collecting the taxes related to the aquatic environment management and flood prevention actions.	5 (One interviewee has been met twice)	Planning documents (PLU), risk management documents (PPRI), call for projects, reports
Municipality of Blois	Project manager of the main actions carried out in Blois in terms of urban development and risk management. Blois Municipality is a central actor during the discussions about deurbanization feasibility.	2	
National administration	Through its local services (DDTM and DREAL), the state its responsible for the elaboration of the natural risk prevention plan and for the management of the public fluvial domain. State services are key actors for the deurbanization decision.	2	Reports, call for projects and workshop proceedings on the subject
Experts (private and public)	Consultants providing knowledge for decision making through reports, or assessments. They can be public or private. In la Bouillie, they intervene at different scale: before the deurbanization process and to imagine the future design of the site	4	Reports, and meeting minutes
Former inhabitants	<ul style="list-style-type: none"> La Bouillie inhabitants association representative : Association that mobilised against the deurbanisation project. Other former inhabitants 	3 (Including a couple during a collective interview)	Communication documents, web site analysis, press archive, old pictures taken by inhabitants.
Current inhabitants	<ul style="list-style-type: none"> Inhabitants still living on the site. 2 families living in caravans on private lands A family renting a house in the deurbanized district 	3 (including two collective interviews)	
Current and future users	These stakeholders are mainly associations involved in the participatory workshops, and current farmers developing agriculture on lands bought by the Agglomeration	5	Flyers, analysis of social networks. Participatory observations with a farming association.

Empirical Results

Analysis of the local legal context

Administrative entities and relevant documents in FRM and CCAP at local scale

The figure below details the different documents consulted to write this section (table 5).

Table 5. Documents dealing with risk management at local scale in Blois

Documents	Publication	Scale	Subject
Flood Risk Prevention Plan (PPRI)	1999, 2021	Blois	Risk prevention. It establishes the risk zones, those forbidden for construction and defines prescriptions for building in flood-prone areas which are already built. This document is integrated in the local urban plan.
Flood risk management plan (PGRI)	2016-2021, 2022-2027	Hydrographic basin	It prevents and manages flood risks by defining strategic priorities at the scale of large river basins
The Water Management and Planning Directions for the Loire-Bretagne basin (SDAGE)	2016-2021, 2022-2027	Hydrographic basin	Provides a framework for the choices of all stakeholders in the basin whose activities or developments have an impact on the water resource.

First, these documents do not directly mention climate change. At local level, the PPRI deals with FRM before all. The PGRI insists on the fact that “*the first studies carried out in the Loire-Bretagne basin on the impact of climate change do not allow any conclusions to be drawn about the worsening of river overflows in the future*”. This is also indicated in the PPRI. No direct attribution is made to climate change in FRM documents implemented in Blois. Local authorities consider that climate change consequences will be more indirect.

Regarding CCAP, the Agglomeration of Blois has launched its climate plan (PCAET) in 2018. The PCAET is a planning tool, both strategic and operational, which enables local authorities to address the whole range of air-energy-climate issues. Considering the PCAET, flood risk is defined as a priority. However, the study does not report changes in total rainfall amount per year nor for extreme rainfall events. Consequences are more indirect, through droughts for instance, as they can have an impact on flood protection infrastructures: scouring phenomena, or dislocation of dikes. Finally, flood risk is a medium priority for the PCAET and is not directly addressed in the climate change plan.

We also analysed the Local Urban Plan (PLU), and its new version at the Agglomeration scale (PLUI), the Urban Planning Project for Sustainable Development (PADD) and the Territorial Coherence Scheme (SCOT) (Table 6).

Table 6. Documents dealing with environment and urban planning at local scale in Blois

Documents	Publication	Scale	Subject
Local urban plan (PLU), then Local intermunicipal plan for urban planning, housing and mobilities (PLUI-HD)	2013, then 2022	Blois (then Blois Agglomeration from 2022)	It establishes the rules for land use and development at the city scale (from 2022, at the Agglomeration scale).
Urban planning project for sustainable development (PADD)	2013, then 2022	Blois	Linked to the PLU. It presents the objectives and general guidelines for the urban, economic, social and environmental development of a municipality
Master Plan for Water Development and Management (SCOT)	2006, 2016	Blois Agglomeration + Grand Chambord Agglomeration	Urban planning document which determines the urban development at the scale of several municipalities

The PLU and the PPRI : re-building flood prone areas and imagining new uses

Flood Risk Management plans, limiting urban development in flood prone areas

In 1999, the implementation of the PPRI classified the flood retention area of la Bouillie as a very high-risk zone that could not be built and confirmed the ban for urbanizing in the South part of the city. More specifically, la Bouillie was considered as a flood expansion area. More generally, in the 1980s and 1990s, FRM policies carried out by the State administration have restricted urbanisation in flood-prone areas along the Loire river (Servain-Courant 2014).

Since the 2010's, at national level, PPRI consider the existing defence structures, and start to integrate progressively the levee breaching risk.

In flood prone areas, along the Loire River; the PPRI demand firstly the upper elevation of ground floors to at least 50 cm above the natural ground level. So, it can assure protection against the rise of groundwater levels. Secondly, the presence of a habitable refuge level¹⁰, and finally, a resilient electric installation¹¹. Moreover, in areas of medium risk degree, the total buildable surface on the ground must be inferior to 30% of the whole surface of the plot. And in areas of high-risk probability, this buildable surface must not go over 20%.

¹⁰ Level located at 30 cm above the reevaluated height of the highest water levels reference. It must possess an opening permitting the evacuation of the inhabitants, the dry stocking of valuable and vulnerable properties before evacuation. Finally, it must have a watering place with production of hot water for sanitary use and the presence of a sanitary.

¹¹ Electric Installations must be above the reevaluated height of the highest water levels reference. It must be protected by a watertight connexion between the arrival casket and the electricity protection distribution panel. A separation of the networks serving the areas liable to flooding and the non-liable to flooding ones is mandatory. Finally, it must be connected to a non-vulnerable meter (installed above the highest water levels reference).

This PPRI adopted in 1999 went against the new urban project carried out in the South of Blois, especially in the Vienne district in the 1990's. The urban planning document (Document de Planification Urbaine - DPU) imagined new facilities and infrastructure (Gralepois, 2020), such as a third bridge on the Loire river in the city. This new policy was imagined to develop the Southern part of the city, which had historically been perceived as different and marginalised from the urban dynamics of the North of the city. This urban project is a way to reincorporate it more clearly into the urban dynamism.

Then, going beyond this regulation frame, the implementation of the Plan Loire Grandeur Nature (PLGN) in 1994 went beyond the ban on the extension of urbanisation implemented by the PPRI. This plan was launched by the central government administration, the Etablissement Public d'Aménagement de la Loire et des Loire (E.P.A.L.A) and the Loire-Bretagne Water Agency (A.E.L.B). This plan developed at the Loire-scale, a 'counter-plan for the development of the basin' of the Loire river (Doussin, 2009): it was an answer to the environmentalist mobilisations against dikes projects introduced as protection against flood risk after the 1980 floods in the Haute-Loire department. It aimed at a balance between human safety, environmental protection and economic development in flood economic development in flood-prone valleys.

The PLGN illustrated the shift from "vertical" control, through dams or dikes, to a logic of more horizontal control. In the PLGN, flood safety and the re-creation of flood expansion areas were the two main objectives. Thus, the restoration of la Bouillie spillway, implying its de-urbanisation became one of the priorities of the PLGN. It became a symbol of this new doctrine in relation to risk. The Plan Loire Multidisciplinary Team, an expert body associated with the Loire Plan published reports about socio-economic vulnerabilities and sensitize local representatives, which influence the flood risk regulation acceptability of local representatives.

The PPRI has been revised since May 2010 and implemented from 2021. The main evolutions of the revision deal with **flood speed and the dike breaking risks** (*Préfecture du Loiret*, 2014). Two new areas with strong hazard were created: *Very high speed zone* (TFV) and *energy dissipation area* (ZDE). The other elements are on the one hand, the reconstruction principle after flooding except in strong hazard¹²; on the other hand, the determination of a "zone urbaine dense" which defines the buildable ground allowed depending on the level of hazard.. The new PPRI also integrated the Flood Risk Management Plan (PGRI) of the Loire-Bretagne basin 2016-2021, that local PPRI must respect. It stipulates new elements related to sensitive populations: settlement of people who are vulnerable or difficult to evacuate are now forbidden in flood-prone areas.

Local urban planning tools oriented towards the design of new vocations for la Bouillie

Through these urban tools, the constraint of flood risk management is transformed into a new resource.

¹² The reconstruction after a flooding is allowed outside the strong hazard areas. However, the reconstruction in areas subject to "Très Forte Vitesse" hazard can be done taking in consideration the historic, heritage and landscape aspects.

The new uses imagined for the site are included in local urban planning documents. *The Schéma de cohérence territoriale* (abbreviated to SCOT or SCoT) is an urban planning document which determines the urban development at the scale of several municipalities. Approved in 2006, it confirmed this new vocation of the site and its vocation to become a 'city entrance' (Rode, 2017). It makes it possible to strengthen touristic and residential attractiveness of the site around the idea of a metropolitan urban garden.

The issue of landscape enhancement strongly influenced the scenarios implemented in La Bouillie area: flood-prone areas changed in their status and became tools against urbanisation offering landscaping amenities (Morisseau, 2012). In 2016, the Agglomeration enacted a local landscape plan (« Plan d'action pour le paysage » in french). It enabled the promotion of a unique landscape and intended to create a specific local identity which extends the heritage of the Val de Loire and its inclusion on the UNESCO World Heritage List since 2000 (Voisin, 2013). This planning policy targets local residents but also tourists, to fit with the growing importance of service economy in the region.

The local urban planning (PLU) establishes the rules for land use. This document consists of a diagnosis of the territory and its territorial project. The PLU of Blois was voted in 2013. This document is now replaced by the PLUi, an inter-municipal urban plan defined in 2022.

As part of the revision of the PLU, the Sustainable Planning and Development Project (called PADD in french) mentions a "Natural Urban Agricultural Park" ("PANU" in french). This PANU was already mentioned in the previous local planning document of the city of Blois, approved in 2013. The PANU was a development and programming orientation ("OAP" in french) in the PLU, showing its importance in the orientation of the local territory project. This OAP constitutes a framework for the urban project desired by the local authorities. Moreover, the local policies decided afterwards to be compatible with these guidelines.

These tools intend to reconcile territorial attractiveness, greening of development policies and enhancement of the agglomeration's landscape identity. Landscape identity is the cornerstone of the local urban project. The new PLUi-HD describes it as a major objective for the coming years [...] to reconcile agricultural development, control of urbanisation, risk management and heritage valorisation in a small area”

Local public policies combine flood risk management and the greening urban projects, conciliating different public policy targets (Sajaloli and Dournel 2007). La Bouillie project now leaves aside the initial technical issue of risk management to emphasize the potential multi-functionality of this flood plain. It also makes it possible to guarantee the tourist and residential attractiveness of the site around the idea of a 'garden metropolis', gathering landscaping and farming functions (Voisin, 2013).

How are risk management and planning documents addressing inequalities?

Inequalities and solidarity issues in natural risk management documents

The vulnerability issue is raised by the PPRI implemented in 1999, through the identification of damages affecting property and goods. Material damages, indirect damages affecting urban networks and “unquantifiable damages” are identified in the document. They gather health effects, heritage damages, sentimental value. Mentioning “unquantifiable damages” illustrates an interest from the local policy makers, but the notion of sentimental values and its effects on vulnerability are not more developed into the document. These mentions remain in the PPRI implemented in 2021.

Vulnerability is mainly addressed through the number of inhabitants exposed and public equipments affected (retirement homes, schools, etc). Moreover, in this PPRI, the inclusion of a socio-economic diagnosis is only an answer to the State request to cross hazard data with knowledge of socio-economic issues to design regulatory zoning. A map of the assets exposed is attached in the final documents but is not used by the experts to define the zoning (Reliant, 2004). The zoning mainly made a distinction between urbanized and non-urbanized areas. For the previous reglementary document concerning flood risk, the PER, a more precise estimation of the damage has been developed. The vulnerability study was based on an estimate of the value of the exposed assets based on the intrinsic value of the built heritage in its current state and the value of public facilities and an approximate estimate of the damage based on the height of the water flowing into la Bouillie spillway (Reliant, 2004). For the State services in charge of the investigation, monetary evaluation of the damages is not needed to set up the regulatory zoning.

The new PPRI also integrates the Flood Risk Management Plan (PGRI) of the Loire-Bretagne basin 2016-2021, that local PPRI have to respect. It stipulates new elements related to sensitive populations: settlement of people who are vulnerable or difficult to evacuate are now forbidden in flood-prone areas.

Issues of solidarity or inequalities are not raised directly or indirectly by the local natural management document. In the PGRI, three solidarity principles edicted in the national strategy are re-developed.

The flood-prone areas upstream urban centres must be preserved so as not to increase the risk of flooding. The objective is also to reduce flood risk, through a **spatial solidarity based on upstream-downstream principles**:

- National insurance system to compensate for damages and encouraging back-to-normal.
- Individual actions led by households to reduce its own vulnerability
- **Financial solidarity** between municipalities welcoming defence works and the ones benefiting from them
- **Sectorial solidarity** towards farmers, considering the central role of agricultural land as flood prone areas

Inequalities and solidarity issues in planning documents

Planning documents must integrate natural risk management documents to set up the urban development of the territory. However, social inequalities related to flood risk are not more developed than in risk management documents.

In the PLUI HD and the PADD, the notion of solidarity is linked to social housing building, and oriented towards elderly people. Moreover, it is mainly addressed as a key aspect of the urban redevelopment project. The Agglomeration intends to promote an “ecological and solidarity-based transition” for the new urban development projects. By 2037, new housing production will meet quality living conditions (insulation, natural light, nearby recreational areas, etc.) and societal and environmental challenges, including:

- to promote a mix of urban functions and a diversified housing stock, including for social housing
- to protect water resources and not to increase the quantity of run-off water
- to produce green spaces having climatic and a recreational interest
- propose a facilitated waste management and treatment
- consider the archaeological potential of the areas in which they will be built.

To sum up, we can say the issue of solidarity is linked to:

- poverty and old age
- The description of a new urban project, towards the notion of transition. La Bouillie project, as a way to produce local food, green spaces and to preserve flood expansion area is part of this new urban project.

Analysis of the actor's game

The State: leading the de-urbanization decision process, supporting its execution

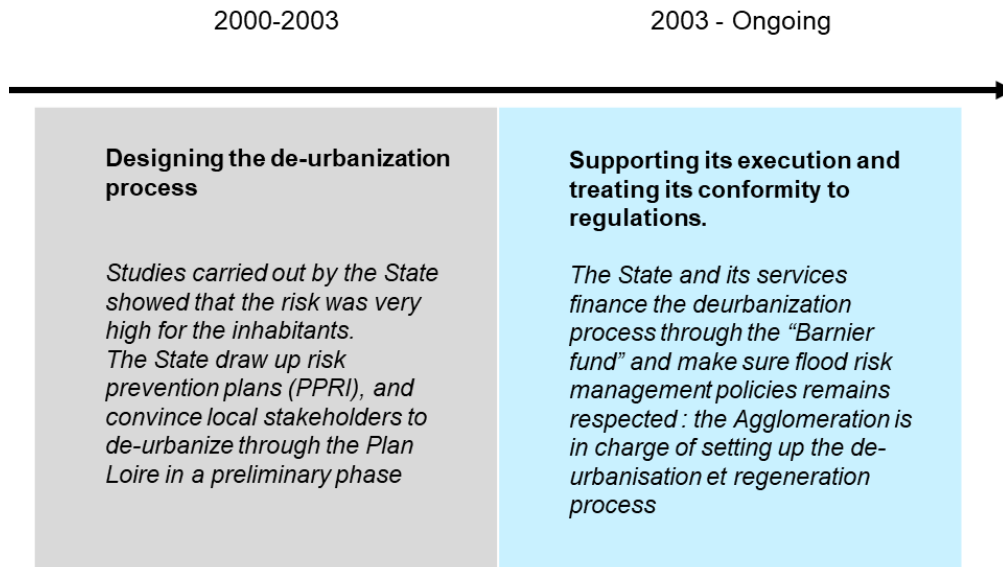


Figure 14. Timeline of the transformation of the state's positioning

The role of the State and its services is very important in shaping FRM regulations which have concrete consequences on la Bouillie project. In the 1990s, studies carried out by the State showed that the risk was very high for the inhabitants and that the spillway could no longer play its role in evacuating the river during floods. To enforce its natural risk management policy, the local State technical services (DDT and DREAL) drew up risk prevention plans (PPRI) (figure 14).

Then, the Plan Loire II was negotiated between the State services and the Plan Loire multidisciplinary team as part of the State-Region Plan Contracts (2000-2006) (Doussin, 2009). The debates surrounding the de-urbanisation process, its feasibility and relevance were opened and then closed within the arena of experts and State services employees. This attention given to la Bouillie in the report, and the singular nature of such de-urbanization process in France gave a national attention to la Bouillie project. Many policy makers saw the project as an innovative and exemplary de-urbanisation project, which was particularly innovative at the time.

This objective to de-urbanize is seen as an opportunity by the local policy makers, who considered also their potential responsibility if a disaster was to occur in the Vienne district (Doussin, 2009).

From 2003, the implementation of the ZAD stood in the long run, and the State remained a key actor for sustaining it. From 2005, 90% of the house prices was paid by the fund for the prevention of major natural

hazards, known as the 'Barnier fund'. Local State services were responsible for the activation of this fund (figure 14).

Then, regarding the regeneration process, the ambition was to make of la Bouillie a showcase area to integrate flood risk management (Beucher, Rode, 2009) into urban planning policies. From 2003, the beginning of the implementation phase led to a relative transformation of the State role: the State was not anymore leading the regeneration process, implemented locally, led by the Agglomeration. However, the State still made sure flood risk prevention policies remained respected. For instance, the PPRI frame was negotiated between the local elected representatives and the State services. For some specific aspects, the regulatory framework of this document can be interpreted differently between the various stakeholders, as an employee from the Blois Agglomeration illustrates: *"The local environmental organizations had suggested that we could build some slopes closed to water bodies for the nesting of birds, and the DDT did not agree... We weren't very confident, but with the fact that we were clearing the land, we thought it would be OK, but it was actually not."* (Agglomeration fellow, interview, October 2021). Some "negotiations" (employee of the design office, interview, January 2022) took place between the State services, the elected representatives and the design office. The rules governing these arenas were not defined during the participatory workshops and then, this process appeared to be shady for the inhabitants involved in the process.

Agglomeration: from ambiguity to a strategy oriented towards a Nature-Based Solution

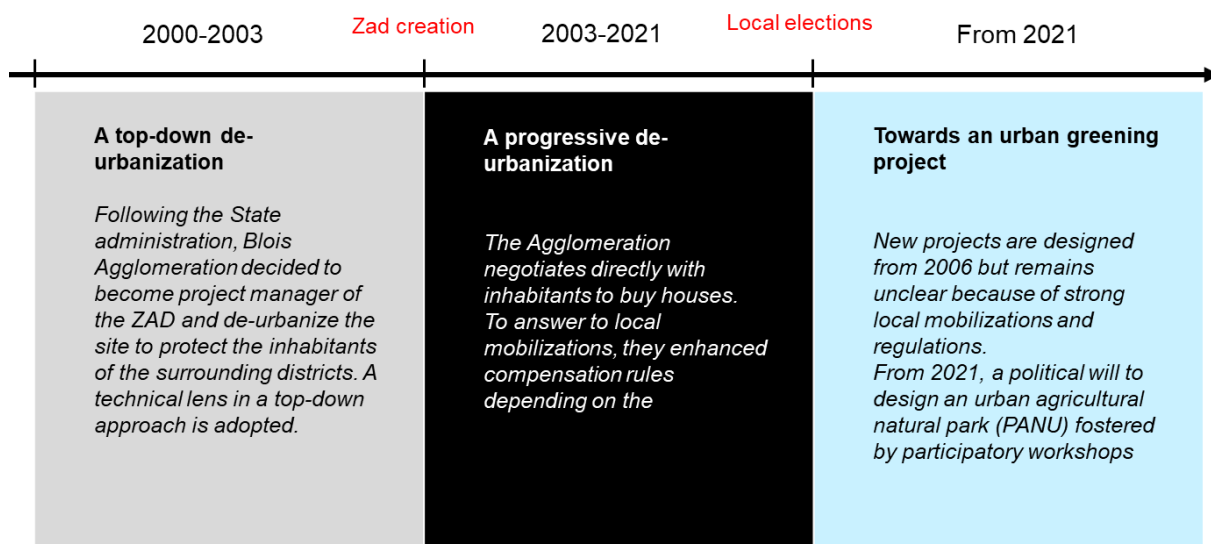


Figure 15. Timeline of the transformation of the Agglomeration's positioning

From 2003, the decision was made to give the project management of the ZAD to the Agglomeration (figure 15). Thus, the Agglomeration carried the project and was able to negotiate directly with local inhabitants during the ZAD process. It led to a total transfer of competencies between the designers of the public decision and the executors, leading to a loss of competences from the first time (the construction of the de-urbanization decision) to the second (the organization of the de-urbanization) (Doussin, 2009).

This change helped to address the controversies induced by the project development. The Agglomeration took several years to react to social consequences of la Bouillie transformation. From 2006, field visits and meetings with local residents were finally organised (Doussin, 2009). They re-focused on the importance of the lived experiences and specificities of the inhabitants. Local authorities set up social support initiatives. They enhanced and offered rehousing assistance and additional measures depending on the economic situation of the households (Valette, 2012). This support was possible through the financial support of the Barrier fund. Nowadays, specific Agglomeration services dedicated to housing, land use and social support are still in charge of discussing with the remaining inhabitants of the site.

Then, local stakeholders, with the expertise of consultancy firms, were in charge to imagine the new uses able to fit into the regulation frames formulated by the State actions. A "Natural Urban Agricultural Park" ("PANU" in french) was set up on the de-urbanized space. Agricultural uses integrated the strong ecological and landscape issues surrounding the neighborhood, and helped to make a link between the future and the past of the site: la Bouillie used to be an important agricultural area for the city and is designed to be so again in the years to come.

This re-development of urban agriculture in Blois is a key aspect of the local political will about the project. Indeed, urban agriculture is seen as a vector of ecological transition bringing out cohesion (Dumat, Sochacki, and Shahid 2018). A specific sub-part of la Bouillie project is dedicated to agricultural purposes, called "la Vacquerie". La Vacquerie is designed to be open, dedicated to professional farming and gardening in the middle of a residential area in a lively neighbourhood. There, more than 12 ha are dedicated to organic market gardening and have been the scene of the installation of agricultural project holders since 2013, supported by the Agglomeration.



Figure 16. The agricultural renewal in la Vacquerie district. Credits : Cardinal (2021)

Above the agriculture issues, la Bouillie project is part of an important territory project for the new political term of the Agglomeration which has started in 2020 (figure 15; figure 16). In this project, public participation is promoted through specific workshops and is seen as a condition for the emergence of solidarity (IPCC 2022; Lioubimtseva and Da Cunha 2020). An Agglomeration employee explains it: "*When the development scenarios were proposed by the consultancy firm, the elected representatives wanted to organise a consultation process so that people could really be committed into the project*" (Interview, Institutional stakeholder, October 2021).

Local inhabitants and users: from an opposition of inhabitants to a support of future users

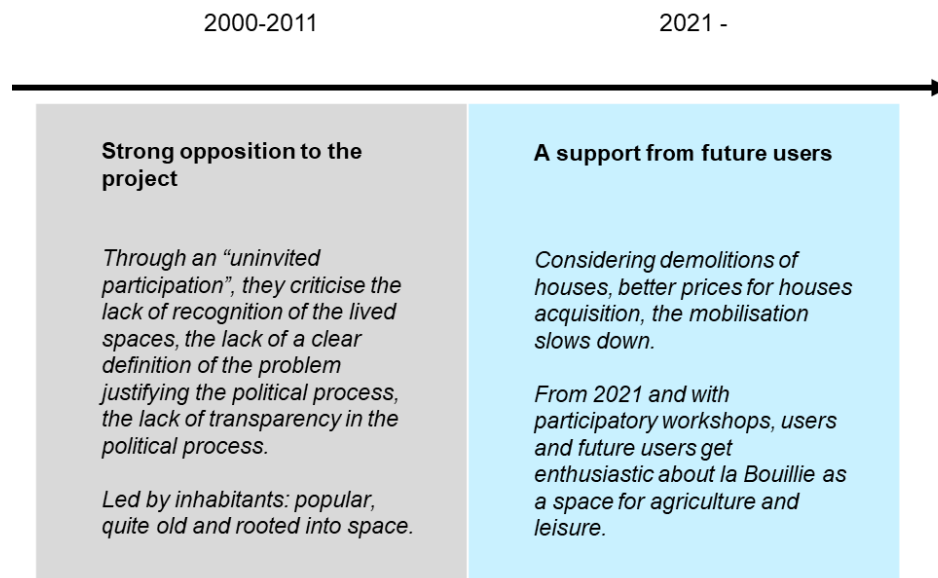


Figure 17. Timeline of the transformation of the Inhabitant's positioning

Local inhabitants have been involved in different ways during the process.

Firstly, it was only a few weeks before the ZAD implementation (Zone d'Aménagement Différé, Deffered Development Zone) that the local inhabitants living in the districts learnt about it. In this first phase, the responsibility issues surrounding flood risk management projects tend to limit the openness of participation processes (Fournier, 2010): 'The so-called 'concertation' or 'participation' mechanisms are implemented to reconcile the different institutional stakeholders involved in the area, to inform or anticipate oppositions that may emerge among institutional actors, civil society, and local populations' (Fournier, p.271, 2010). The lens embraced by local stakeholders was dominated by a technical prism around risk and safety issues, which prevents the implementation of participatory workshops. This absence of citizen participation fostered the development of strong conflict in La Bouillie (figure 17).



Figure 18. The historical house of the Association still remained with a protest banner. Sources : Cardinal (2020)

Few days after the creation of the deferred development zone (ZAD), some inhabitants created an organization of La Bouillie's inhabitants. A form of 'uninvited' participation (Wagenaar, 2014) developed and took part in the process of construction of the area through social conflicts (Bobbio and Melé 2015). They criticized the lack of recognition of the lived spaces, the lack of a clear definition of the initial problem justifying the political process, the lack of transparency in the political process. They also challenged the relevance of the de-urbanisation operation, asking for alternatives and questioning the project implementation methods in general. The impossibility of rehousing under equivalent conditions in a context of rising property prices was also criticized, as a blog led by inhabitants expressed: *"The valuation of the property by the State services are 40% below the market value, it does not allow for "any" similar rehousing. No compensation for re-employment, no compensation for moving, nothing for notary fees. In short, no compensation at all !"*¹³

Through collective action, local inhabitants retreated from bilateral negotiations with the Agglomeration for the purchase of individual properties. They hijacked neighbourhood committees to use them as a forum. The inhabitants involved in the association intervened loudly in the debate, going beyond conventional institutionalized participation: they wrote very vindictive banners, they propagated rumours about supposed hidden intentions of local authorities for la Bouillie project, etc.

¹³ « Blois : de l'autre côté du Miroir : les élus blesois atteints de Surdit  et bient t de C cit  !! » : <http://blois-citoyensbouillie.blogspot.com/2006/12/blois-de-lautre-ct-du-miroir-lettre-des.html>



Figure 19. Banners deployed during public meeting by the inhabitants. The first claimed la Bouillie deurbanization project is an “impostor”. The second one makes a parallel Ingrid Bettancourt, former french hostage in Colombia, and la Bouillie’s inhabitants defined as hostages as well by the banner. Credits: personal press archives of an inhabitants

The inhabitants’ mobilisation led to the improvement of the eviction conditions and the support of the inhabitants of the site and reduced the inhabitants participation from 2011 (figure 17). However, the slow degradation of the living conditions in the district and the absence of a participative mechanism contributed to the feeling of abandonment of the territory. Moreover, the ‘technical’ arguments highlighted by few opponents promoting alternative solutions to de-urbanization did not find a space in the debate in a context of flood risk management policies transformation. The opponents-inhabitants of La Bouillie were assimilated to special interests promoters by the local authorities, going against the general interest. These criticisms are common in the conflicts surrounding PPRI negotiations, linking the struggle of the inhabitants-opponents to a ‘NIMBY’ fight to delegitimize it (Bayet, 2005).

In a second time, the process of rehabilitation of la Bouillie territory, emerging in its current form in the 2020s tried to integrate inhabitants and associations into “invited participation” (figure 17). Participatory workshops were set up and had two goals : to put an end to the conflictual trajectory of la Bouillie and to impulse a dynamic of socio-ecological transition.

In contrast to the first phase, the setting up of participation mechanisms now legitimises the operations of territorial redevelopment and intends to leave a large place for the inhabitants' proposals.

Large signs are displayed around the project perimeter, inviting residents to participate. Flyers were distributed in the three cities of the Agglomeration impacted by the project perimeter (Blois, Vineuil and Saint-Gervais la Forêt), which also disseminated the information on their websites, social networks and in communal and inter-communal newsletters.

A few months later, between the end of May and the beginning of June 2021, participatory workshops were organised. On the basis of observations made during the 6 participatory workshops and confirmed by interviews with participants, we can distinguish common features with participants. They are mainly individuals from 35 years old to 45 or retired, who have related associative activities linked to the territory are in the majority among the participants. No "target public" had been defined by the institutional actors before the organisation of the participatory workshops. According to an Agglomeration employee, the goal is to broaden the panel of inhabitants involved. "*Our objective was this: to reach all categories of the population*" (Interview, Agglomeration employee, October 2021). About 1400 answered an online survey about their wishes for the site, before the participatory workshops. Then, about 100 people participated to these meetings.

Even if public participation tools are promoted, participants regret not being more integrated into the project design. Local inhabitants involved into the participation process do not deal directly with the risk issues: flood risk regulations frame the admissible proposals for the territory. These planning possibilities are heard as scenarios: they are designed by a consultancy firm which carried out a series of interviews with different professional, associative or institutional actors who participate in the making of the territory.

Thus, these scenarios are used as filters and frame the real possibilities available for the participatory workshops: they integrate the flooding constraint and the political ambition for the space by limiting the planning possibilities suggested during the workshops. The desire to "manage" the space through the implementation of a NAPU detailed by local policy makers becomes the main orientation for the future of the space.

This project relies on some of the existing uses of the territory (mainly agricultural and recreational activities, through hiking or cycling purposes). According to local policy makers, these uses are part of a future co-management of space: inhabitants and associations are asked, through their uses of the territory, to be part of the changes imagined for the space.

Finally, even if participatory workshops are limited, we can say that the inhabitants show a strong enthusiasm for the reappropriation of the territory – through the workshops - on a space that "deserves it": "There is material to do something, and something historic" (Participant in the participatory workshops, June 2021).

	2000-2003	2003-2021	2021- ongoing
	Discussion before the de-urbanization	The de-urbanization process	A rehabilitation project
<i>The project</i>	<i>La Bouillie, as a space to de-urbanize</i>	<i>The de-urbanization process is ongoing, no clear project for the future</i>	<i>The project is presented as a regeneration project. Flood risk is not introduced as a key aspect, but as a modality for an urban greening project</i>
<i>The State</i>	<i>The state promotes a de-urbanization strategy</i>	<i>The state supports local Agglomeration treating its conformity to regulations.</i>	<i>The state supports local Agglomeration treating its conformity to regulations.</i>
<i>Blois Agglomeration</i>	<i>The Agglomeration follows the State strategy</i>	<i>The Agglomeration organises de-urbanization and deals with inhabitants</i>	<i>The Agglomeration drives the process of rehabilitation with a local landscape consultancy firm and participatory workshops</i>
<i>Local inhabitants / users</i>	<i>La Bouillie is a popular district : none of the inhabitants are aware of the project</i>	<i>La Bouillie becomes a margin in the city. Strong spontaneous mobilisation of local inhabitants</i>	<i>La Bouillie, a future new centrality ? Through participatory workshops, future users are enthusiastic to co-create the project</i>

Figure 20. Synthesis of the transformation of main's stakeholders positioning

Answering the research questions

Attention attributed to justice/fairness/inequalities (RQ1)

Considering specificities of delocation processes related to flood risk management, our analysis about the issue of fairness in this process is based on the framework suggested by Singto et al. for delocation processes and compensation during dam building projects. They developed three variables that should be crossed to foster the acceptance of proposed project (Singto et al., 2022):

- Socio-economic impacts of delocation should be taken into account in negotiations for compensation. To recognize people specificities, it should go beyond a simple monetary approach to integrate other elements such as the living environment;
- Stakeholders should be encouraged to participate in the decision-making process, from the delocation negotiations to the resettlement and the rehabilitation process;
- Specific practices and livelihood lost through the process should be compensated.

These three variables will be discussed along the following elements.

De-urbanization, as a solidarity measure for Blois city

The decision to deurbanize the district through a deferred development zone (ZAD) in 2003 was justified through two main arguments:

- The probability of floods threatens directly the inhabitants living in the district. This argument addresses directly inhabitants' vulnerability.
- It could no longer play its role of discharging the river during floods. It undermined the residential district of "Vienne", located downstream which is the focus of many human and economic issues

Then, the delocation project appeared as a solidarity measure for the rest of the city, but the decision was never introduced as such: la Bouillie urbanization was more considered as a planning error that the deurbanization process was supposed to fix.

Former over exposition of vulnerable people in la Bouillie

As expressed before, la Bouillie used to be an historical popular district. The recognition of this overexposure, which could have led to restorative forms of Justice, was not discussed. On the contrary, the issue of the former flood risk overexposure of the most deprived households is invisibilised by the « general interest » of collective security in front of major flood risk prevention and the technical lens, followed by local authorities.

In the local flood risk management policies (PPRI), **the notion of vulnerability is addressed through the number of inhabitants exposed and public and strategic equipment (retirement homes, schools, etc) that might be affected by a flood.** They are not considered to define urbanization zoning rules. Moreover, no specific data are produced on social vulnerabilities.

The PPRI also integrates the Flood Risk Management Plan (PGRI) of the Loire-Bretagne basin 2016-2021, that local PPRI must respect. It stipulates new elements related to sensitive populations: settlement of people who are vulnerable or difficult to evacuate are now forbidden in flood-prone areas.

During the de-urbanization process, inhabitants were depicted in some situations as driven by vested interests. For instance, in 2004, the local prefect described la Bouillie de-urbanisation as "an exemplary operation elaborated in the name of the general interest" (Doussin, 2009). In this conception, local inhabitants who first refuse to leave were undermining it by contesting some aspects of the project.

Progressive definition of a "fair compensation" for the inhabitants Later, the concept of fairness is read through the "fair compensation" issue. The "fair compensation" issues emerge as a response to the local protests, and to the social issues inhabitants were facing.

In 2005, Nicolas Perruchot, the deputy mayor of Blois, asked a question to the Minister of the Environment, Serge Lepeltier, illustrating the growing importance of the local protest. He campaigned for "fair and adequate compensation", so that the inhabitants would be able to "rehouse themselves in equivalent conditions". Indeed, it appeared that the first houses bought by the Agglomeration were from young households, whose property values were quite high, and who had arrived recently on the territory (Doussin, 2009). Moreover, people living in the de-urbanized districts wanted to stay in the south of Blois because "the mentality is better there than in the north" (MINEA, 2000). During the rehousing process, the most deprived households were afraid to go back to the north districts, considering the house price growth (MINEA, 2000; Rode, 2008). In the 2000's, the real estate market prices were increasing around Blois and former inhabitants were afraid not to be able to find equivalent living conditions and be excluded from a right to centrality for low-income inhabitants (Rode, 2008).

Local authorities enhanced compensation rules and offered rehousing assistance and additional measures depending on the economic situation of the households (Valette, 2012). It seems it has led former inhabitants to re-house in relatively better conditions and pacified the local situation. However, the hypothesis that the modulation of compensation may have enabled the inhabitants to be rehoused in equivalent living environments (Rode, 2014) can be discussed. Without having an exhaustive vision of the trajectories of the former inhabitants of the district, the fieldwork allows us to identify different strategies:

- Leaving the city to join family members, who live outside the region
- Leaving for a rental house, which allows for rehousing in the Vienne district to which many inhabitants are attached
- Leaving for cities further away from the centre, to keep an equivalent property (with a garden, similar surface area, etc.).
- A move to specialised care facilities for the elderly

Although it is not possible to determine the respective quantitative importance of each of these strategies, several of them mark a renunciation of certain amenities they could benefit from in their previous home: its centrality, its presence in the Vienne district, the qualities of the building, etc. Spatial justice is then a central issue in la Bouillie case-studies.

Financial equity only: the issue of recognition

Compensation for housing delocation and care support are considered as forms of financial fairness: the debate over justice for la Bouillie inhabitants is reduced to this financial dimension.

Also, these social support programs are set up for the former inhabitants, thought of as a mechanism of institutional solidarity. It also justified the absence of openness of these groups to participatory mechanisms to design the future of the site: these procedures are parallel.

However, considering Singto et al. (2022), the compensation does not concretely consider the other damages generated by the relocation (loss of living environment, loss of sociability of the neighbourhood). Thirdly, the compensation does not reflect (financially) the benefits of deconstruction, i.e. the fact that deconstruction allows for better protection of neighbouring districts (solidarity between districts).

It brings about a more enhanced fairness but reduced to a financial form of fairness. Compensation for housing delocation and care support are here considered as forms of financial fairness. In this context, there was no space for recognition of the loss induced by demolition of houses, which are also losses of ways of life and social networks surrounding it.

“When you don’t have money, all your life, you are despised. You are in a situation of disability. So you escape as best you can. All these people from the Bouillie, obviously, they weren’t the cream of the crop, but they were good, honest people. They had worked all the time, small jobs, and then at the end of the day, they were thrown out, like dogs”. (Interview, former inhabitant, January 2022)

If there is a consensus about the lack of recognition and social support of the inhabitants, it seems the memory of the violence of the process for the former inhabitants remain globally forgotten. Nowadays, la Bouillie is an example for policy makers who want to see the implementation of a long-term de-urbanisation policy followed by a rehabilitation process: Blois policy-makers are often solicited by official delegations from France and foreign countries to organize site visits.

Rehabilitation process and fairness

The space is now almost de-urbanized. In a second time, planning documents have to integrate natural risk management documents to set up the urban development of the territory. In the local urban plan voted in 2021, the notion of solidarity is turned into into a key aspect of the urban redevelopment project. The Agglomeration intends to promote an “ecological and solidarity-based transition” for the new urban development projects. Local public policies implemented combine flood risk management and the greening urban projects, conciliating different public policy targets (Dournel, Sajaloli, 2007).

The new uses imagined for the site are included in local urban planning documents. The Schéma de cohérence territoriale (abbreviated to SCOT or SCoT) is an urban planning document which determines the urban development at the scale of several municipalities. Approved in 2006, it confirmed this new vocation of the site and its vocation to become a 'city entrance' (Rode, 2017). It makes it possible to strengthen tourist and residential attractiveness of the site around the idea of a metropolitan urban garden.

Local public policies implemented combine flood risk management and the greening urban projects, conciliating different public policy targets (Dournel, Sajaloli, 2007). La Bouillie project now leaves aside the initial technical issue of risk management to emphasize the potential multi-functionality of this flood plain. La Bouillie in these documents is a support-space to imagine a new urban project. The inequalities induced by the delocation process are not discussed, as the discussion about who will benefit from the site, once rehabilitated. This point is analysed in the RQ2.

Role of participation (RQ2)

Various forms of participation, invited or not, occurred on the space and have influence on inequalities.

The uninvited participation of la Bouillie former inhabitants: contestation, a response through conflict

From 2003, the activism of local inhabitants is motivated by the lack of recognition of their lived spaces in la Bouillie, of the losses induced by demolition, and for not being part of the decision-making process. They constitute a form of 'uninvited' participation (Wagenaar, 2014).

The difficulty for the opponents of the project to be heard is the result of a double phenomenon. First, the de-urbanisation process is oriented towards a risk and safety approach, constituting a technical lens. The focus on 'safety issues prevented the promotion of participatory workshops. Moreover, during the peak of the protest movements, some opponents formulated technical arguments to suggest a counter proposal to preserve the housings from floods without deurbanization.

These suggestions, strongly counting on hard infrastructure, are discordant in a context of transformation of the policies of management of the risk of flooding. The opponents-inhabitants of La Bouillie were then assimilated to defenders of vested interests by local authorities, against the public authority that represented the general interest.

Finally, this mobilization leads to the development and the enhancement of compensation and social support policies from 2008. Afterwards, we notice regrets expressed by local policy makers for the lack of concertation and social support.

Formal participation processes as a cornerstone to legitimize the redevelopment project



Figure 21. A banner in la Bouillie calling for public participating for the workshops to come: “what future for la Bouillie ?”. Credits: Cardinal (2021).

In contrast to the first phase, when uninvited participation dominated the debates, the implementation of participatory mechanisms is the backbone of the political process of la Bouillie regeneration (Figure 21). Giving more space to the inhabitants' proposals now legitimises the operations of redevelopment. In this second phase, formal participation processes become a cornerstone to legitimize the redevelopment project from 2021. They have two goals:

- to put an end to the conflictual trajectory of la Bouillie
- to impulse a dynamic of socio-ecological transition. It does not question either the de-urbanisation of the site or its conflictual heritage.

The analysis of the profiles of the inhabitants who answered the questionnaire illustrates a spatial diversity. 56% of the individuals live in the city of Blois, 14% in Vineuil and 10% in Saint-Gervais: these three cities have some lands on the project and are directly concerned by the project. Almost none of them are former inhabitants or current inhabitants of the de-urbanized space. Living close to the project is a structuring factor for the individuals who responded to the questionnaire: 53% of the Blois residents who responded are from the south of Blois.

Participation is only about the regeneration of the site and does not question either the de-urbanisation of the site or its inconstructibility. In contrast to the first phase of de-urbanisation, the issue of flood risk is not the topic anymore and is absent from the debates.

In the end, by setting up renewed participation mechanisms, La Bouillie policy makers are trying to increase the legitimacy of a project. It now leaves aside the initial question of risk to enhance the field of possibilities and the potential multi-functionality of this flood plain. However, the participation mechanisms remain limited and symbolical.

A symbolical participation processes

Several participants themselves underline their awareness of their small influence over the final orientations. For example, a former agglomeration employee and a mobilised inhabitant says: "[the inhabitants] always have different ideas, so they enter into the discussion, but it is still the Agglomeration that will make the final decisions, at least" (Participant in the participatory workshops, interview, October 2021).

On the other hand, the weak participation culture of the inhabitants is put forward by the elected representatives and Agglomeration technicians to explain the low number of proposals suggested by the citizens, and the weak adjustments to be expected from the final arbitration, which will be made by the elected representatives: "*They [i.e : The citizens who participate] know how to say when it's OK or not, but when we ask them "OK, it's not suitable for you, but what would you like to see? They find it difficult to imagine it. We thought we'd have a few more proposals, we do not so many in the end."* (Interview, Institutional stakeholder, October 2021). Finally, more than a strong expectation of really developed co-creation process, numerous inhabitants show a strong enthusiasm for the reappropriation of a space that "deserves it": "There is material to do something, and something historic" (Interview, participant in the participative workshops, June 2021).

Symbolical exclusion in participation processes

However, participation processes are only thought as a future-building process that have selective barriers. Considerations about Justice and equality are thought through the frame of these prospective workshops and then, can strengthen pre-existing inequalities.

The participation process, in this second phase, is used to pacify the relationship between the inhabitants of the Agglomeration and the territory of La Bouillie. The rehabilitation process of la Bouillie spillway is seen as a multidimensional "reconciliation". The project, through participation, is an opportunity for a collective re-possession of the site for every use: local authorities speak about a "space reconquest" and a need to "free up" the space¹⁴.

This "liberation" is implemented in the name of flood risk management and the restoration of the spillway, which requires the demolition of modes of living rooted in the space. It also aims at an evacuation of the travellers remaining on the space. They are thus seen as being "not very compatible" (elected official, observation of the participative workshops) with the future under construction of La Bouillie, with strong environmental and

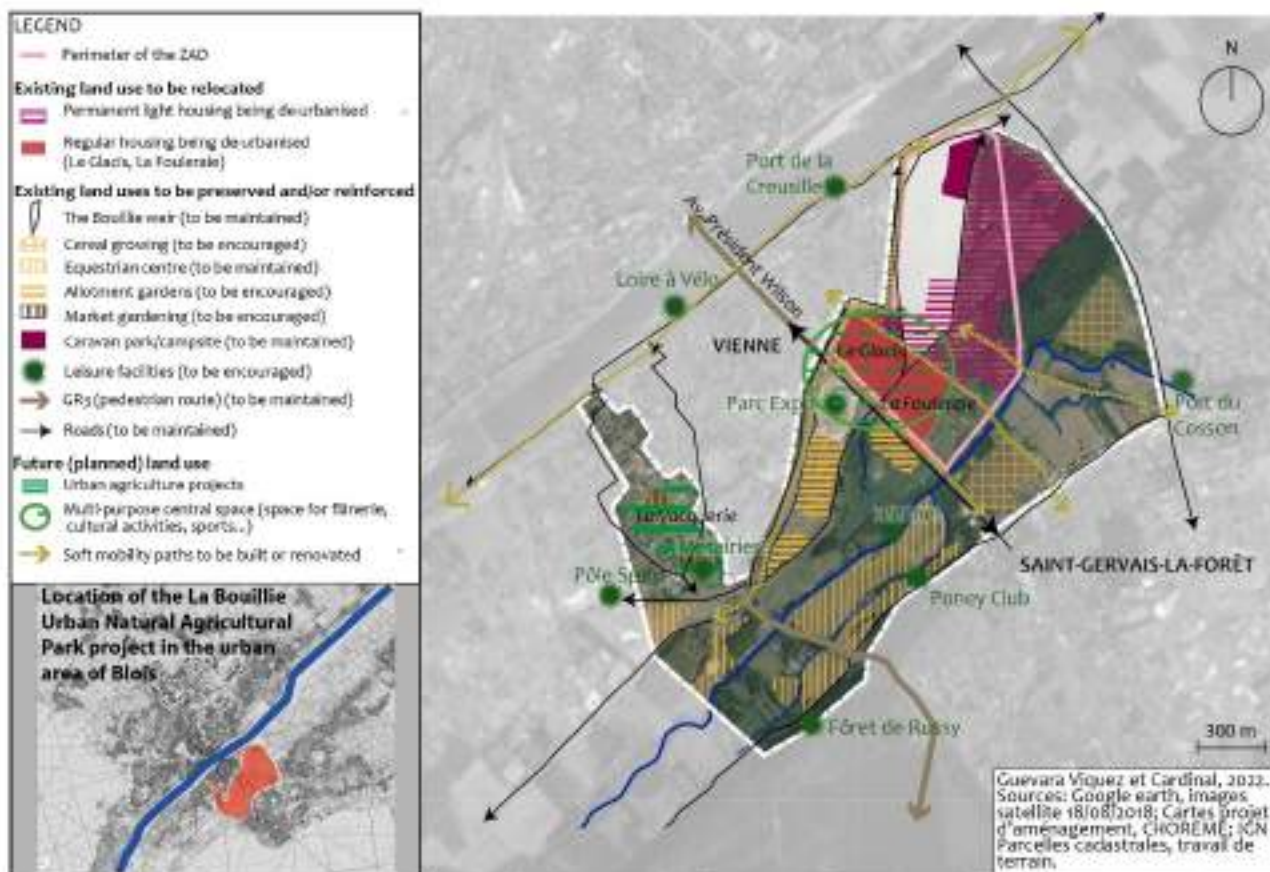
¹⁴ « " Libérer le secteur de la Bouillie " », la Nouvelle République, 5 avril 2019.

landscape amenities for the inhabitants and tourists (Figure 22). This feeling of being illegitimate for other reasons than flood risk prevention is described by some Travellers: "*Maybe they don't want the travellers to stay, that's all*". (Interview, current La Bouillie inhabitant, June 2021).

Their long-standing presence does not give them legitimacy. The land status of these inhabitants, most of whom are "Travellers", is varied: some live on family plots that belong to them, others occupy municipal plots without the agreement of the City, while some occupy the large passage area dedicated to the temporary reception of convoys during large gatherings. To prevent new illegal installations on purchased lands, trenches are dug, embankments and rocks are laid down. The Blois City also provides specific social support for the travellers. It draws the contours of a form of institutional solidarity, which emerges outside the collective processes of territorial transformation of La Bouillie.

However, these solidarity mechanisms are thought as a parallel process of the site's rehabilitation actions and participatory arenas. The travellers are not associated with them. Institutional solidarity is seen as a parallel emanation, which justifies the fact that no steps have been taken to include the travelers in the participatory workshops: "*We thought that, normally, they would not be expected to stay on the site, and that we were already working with them in parallel*" (Agglomeration employee, interview, October 2021).

Participation processes are not aligned with recognition of past or existent uses of the space and are designed to renew the space. The former and current inhabitants from neighbourhoods do not participate in the workshops. The participation implemented in the second phase of the project does not take into account the consequences of the conflictual inheritance of the territory: without a specific lens on recognition, users and inhabitants singularities is carried out in a selective way, in the service of a socio-spatial transformation of the territory.



The landscape project of La Bouillie is located in the centre of the urban area of Blois. The purpose of this map is to show the future land use in relation to the existing land use in the area. We won't go into detail about the plots.

Figure 22. Current and future uses for la Bouillie. Credit : Guevara Viquez, Cardinal, 2022.

Knowledge and capacity building on social inequalities (RQ3)

The notion of vulnerability is understood in several ways, mobilising various types of knowledge to integrate it in political decisions.

A will to embed social vulnerability in more integrated risk approach

From the beginning, the delocation project is formulated as a measure to reduce the flood risk exposure of the inhabitants of the surrounding districts, and the individual exposure of la Bouillie's inhabitants. Vulnerability here is only seen and quantified as the concentration of upstream human and economic issues.

But, to better understand the social vulnerabilities induced by a delocation process, the state services ordered a report. The motivation was to reduce trauma and avoid very virulent or even inextricable conflicts" (MINEA, 2000), fostered by the State and Plan Loire experts. The consultancy firms MINEA led a group of experts and was in charge of a social analysis from 2000. It outlined the social composition of the inhabitants of la Fouleraie

and le Glacis neighbourhoods located in the flood retention area. It showed people living there were mainly old, from the working classes, strongly rooted in the area. 67% of the panel was over 55 years old, and 70% of the inhabitants came from the working classes. Because of their low-income, 17% of the inhabitants built their house themselves (mainly in Rue de la Fouleriaie) (MINEA, 2000). They were mainly from the surrounding areas: 46% previously lived in the Vienne district and 25% in Blois - Nord (among them, 50% were from the social housing district, locally known as “north district”). Many of them were strongly rooted in the district: 80% of the inhabitants had been living in their district for more than 10 years, 40% for more than 30 years (MINEA, 2000). The proximity to nature and to the city centre, the quality of local services and the social ties of a neighbourhood life were reported as the main advantages for the area (MINEA, 2000; Rode, 2009). Risk awareness was weak: only 13% of the inhabitants interviewed knew that they were in a spillway, and 64% believed flood risk has disappeared with the development work (MINEA, 2000).

The report produced by MINEA in 2000 made strong recommendations on the issues of support, anticipating the strong social vulnerability of the district. In a working document, it was stated that "to reduce trauma and to avoid very virulent or even inextricable conflicts, it is necessary to involve these people in a process that includes the following stages:

- Risk awareness and the effective means to control it;
- Consideration of the need to leave, and of the favourable conditions for doing so now;
- Participation in the relocation/resettlement process.

Flood vulnerability heard through a dominant technical lens

However, **these knowledges are lost and not taken into account**, for various reasons:

- The Blois Agglomeration became the project-leader and the State services were not as proactive as during the design phase;
- a step-by-step approach replaced the transversal approach initially desired by the actors and illustrates the domination of technical prism;
- the de-urbanisation operation was a pilot projet at the national scale and stakeholders could not rely on previous examples.

This top-down policy from the beginning did not give a central role to the collected knowledges about social vulnerability of the inhabitants, during the MINEA studies, even if some debates existed among the State services, as a State employee explains:

I remember trying to warn my director about the social aspects, saying, well, it would be good to help these people find housing, things, etc. There might be solutions... And the answer I got at the time was : " [...] it's not 150 people who have, who are going to bother us, we'll know how to manage

that". So we certainly underestimated the social aspect, compared to a very emblematic operation which was carried out at the same time.

Rediscovering social vulnerability, to answer to the social mobilization

From November 2005, a "special contact" already working in the social support for the inhabitants of a social housing district in the north of the city, was in charge of monitoring the inhabitants of La Bouillie. It shows the awareness of the difficulties encountered and their importance on the local political agenda. The social support enables individualized support and to help the individuals in their departure process: contacts with estate agencies, search for equivalent properties in the city, etc.

In 2006, the Agglomeration decided to enhance compensation rules for the most deprived, after social mobilisations.

Finally, these knowledges collected in the 2000's were mobilized and enhanced, through compensation rules for the most deprived and field trips by local policy makers are organized.

The understanding of vulnerability based on social criteria is rediscussed in the context of de-urbanisation: The political consideration of vulnerabilities mainly comes into play after the initial conflicts have erupted. Demands formulated by the local inhabitant's organization adapted over the years. Thus, the demand for the cancellation of the ZAD, which was recurrent in the first years, was gradually put aside by the members of the collective, who noted the inflexibility of the institutional actors on the subject. Demands aimed at improving social support, and more generally, the struggle for recognition, gradually took over: "We were obliged to adapt our demands, we had no choice, we had to find solutions for the people, to support them" (Interview, former resident, November 2022). These demands were financial and symbolic: they made visible the lived space, to negotiate fairer conditions of displacement. This new policy, taking more into account people specificities, pacified the local situation.

Thus, the delay before its implementation or the non-retroactivity of certain financial aid granted from 2008 onwards tainted the operation, increased the feeling of lack of recognition experienced by the inhabitants and raised questions in the minds of certain institutional actors: 'the earlier we are mobilised, the more we can do things [...] At La Bouillie, the trauma was already there' (interview, institutional actor).

Most of the institutional stakeholders mobilised during the establishment of the ZAD and interviewed recognised the brutal nature of the policy and the lack of consideration for the spaces they had lived in: "Perhaps we didn't realise that we were breaking the memory of people who had lived there for years, who saw themselves ending up there [...] it was a modest population, which had built up through mutual aid... A real neighbourhood life, a

real social life" (Interview, institutional stakeholder, April 2022). These critical shifts in the actors' views remain individual positions that do not lead to specific action.

The notion "landscape vulnerability" as a symbol

The weak conception of social vulnerability is symbolized by the emergence of the concept of "landscape vulnerability", suggested by the landscaping consultancy firm chosen by the Agglomeration to rehabilitate the site. It designated the "impoverishment and degradation of the site" (MINEA: 69, 2000)". From the beginning of the project, local authorities wanted to design quickly a new project for the site to fight against "the risk of impoverishment and degradation of the site" (MINEA: 69, 2000).

Eventually, ZAD process and progressive demolition of the houses disrupted the area and degradations occurred: some lands were occupied, used as informal landfill, etc. Then, the project to rehabilitate the site by implementing a park became the expression of a desire to reduce this vulnerability and, at the same time, participating in the 'landscaping reclamation' operation (Morisseau, 2012). The dominant landscaping approach in La Bouillie overturns the conception of vulnerability, leaving aside knowledge about social vulnerability.

Conclusion

La Bouillie is one of the first experiences of deurbanisation in France. The case shows that questions of justice are complex and cannot be reduced to their monetary dimension, although this is a crucial issue in the debate. The issues of justice that emerge in La Bouillie are also linked to the social resources and networks associated with living in a particular place, as well as to the symbolic attachment to it. Moreover, through the question of recognition, the case allows us to consider the spatial and temporal scales of justice. The fieldwork shows that the paths of those who left were often disrupted. The interviewees tended to experience a deterioration in their living conditions. Their departure is also not mentioned in the new project. There is no recognition of the history of those who have left. The analysis of the participatory processes that took place for the conception of the new project also shows that some current marginal uses of La Bouillie are left out.

Section 3. Ault (Case study 2)

The second case study is Ault, a coastal town in the *Baie de Somme*, located on the cliffs and subject to the **phenomenon of coastline erosion**. In this case, flooding (due to marine submersion and urban run-off) is one factor among others in the dynamics of coastal erosion. As in the case of Blois, Ault is generally cited as an example in institutional documents that highlight experiences of retreat in the face of natural risks (CEPRI 2023). In 2012, the town council, with the support of the intermunicipal actor (*Syndicat Mixte*) responsible for the urban planning of the area, embarked on a withdrawal strategy which publicly announced the possible relocation of 80 houses. It generated strong reactions from the inhabitants (Mineo-Kleiner 2017). If today the project announced in 2012 is still ongoing from a planning perspective (through actions in the public infrastructure, among others), the term “relocation” is no longer mentioned. The possible housing demolition is not a short-term issue. By promoting the strategy of retreat from the coastline, **the project is undoubtedly a pilot of measures that could be implemented within CCAP framework**. It also sheds lights on the social reactions that this type of project can generate.

Introduction: narrative of the local context

Description of case study area: localization

Ault is located on the coastline, in the Somme department (Hauts de Seine Region) at the North of France (Figure 23). Its surface area is 6 km² and has a population of 1697 residents (Agence Urbanités 2017, 93). Urbanisation has taken place on the valleys along the coastline. Figure 24 shows the different neighbourhoods. The oldest - the town centre - has the highest concentration of houses and buildings.



Figure 23. Ault in the Somme department at the North of France. Credits Ault Commune



Figure 24. Neighbourhoods of Ault (INterland, 2012, p. 25)

Urbanisation in Ault has taken place on the valleys along the coastline. The map shows the different neighbourhoods. The oldest, the town centre, has the highest concentration of houses and buildings. To the north of the town is Onival. To the northeast, in the hinterland, the Moulinet district. To the East, Bellevue. Finally, to the south-west, the Bois de Cise, a residential area of villas.

Socioeconomic and demographic characteristics

According to the PLU of Ault, the town is characterised by a lack of socio-demographic dynamism. According to planning documents, the municipal population is declining since the 1970s (Agence Urbanités 2017). These planning documents were published in 2017, based on 2007 data. Recent data shows that the

tendencies have not significantly change since¹⁵. The phenomenon has become more pronounced recently. Between 2009 and 2020, the village lost 335 inhabitants (19,4% of its inhabitants). The migratory balance is negative in the period (-1,8 between 2009 and 2014 and -1,1 between 2014 and 2020), as the natural balance (-0.3% between 2009 and 2014; -0,7 from 2014 to 2020). Less than 30% of the population is under 30 years old in 2020. The most represented age group in 2009 is 45-59 years, to become 60-74 years category in 2020 (28,9%). The number of people per household is also falling (less than 2 in 2020, compared to 2.3 in 2006)¹⁶. In the Local Urban Plan (i.e. PLU in French), **the Municipality wishes to change these trends** and to attract young people to settle in the area.

Analysis of the data over the last decade shows that the housing stock is evolving in favour of second homes. In 2009, 38% of the housing stock is made up of primary residences, falling to 32.9% in 2020. Over the same period, the proportion of secondary residences rises from 54% to 60.5%. In addition, the proportion of empty dwellings is 8% in 2009 (the regional average being 6.7%)¹⁷, which increases by two points between 2006 and 2014 but then falls in 2020 (6,6%). In general, official documents (Agence Urbanités, 2017; SMBSGLP, 2019) and reports (INterland, 2012) underline poor housing in Ault. 80% of houses were built before 1974. Villas are not kept-up, existing houses do not meet senior population needs, there is no social housing, and there are not enough houses for young couples with children interested in settling in Ault.

Based on incomes, one can say that there is still a lot of social diversity within the seafront in Ault. If the houses with direct sea view, located near the cliff edge, are indeed big ancient villas; the second and third rows of houses are more heterogenous.

Figure 25 shows this social diversity (expressed here only in income ranges) in the town centre, Onival and inland areas (Bellevue).

¹⁵ Source INSEE: Statistiques et Etudes, Dossier complet, Commune de Ault. URL: <https://www.insee.fr/fr/statistiques/2011101?geo=COM-80039#consulter-sommaire>.

¹⁶ Source INSEE: Statistiques et Etudes, Dossier complet, Commune de Ault. URL: <https://www.insee.fr/fr/statistiques/2011101?geo=COM-80039#consulter-sommaire>.

¹⁷ Source: DREAL Picardie (2015)



Figure 25. Proportion of poor households in Ault in 2017. Source: Géoportail.

In terms of qualification, almost half of the population has no diploma or primary school certificate. Only 20% of the population aged 18-24 attend school¹⁸.

Despite these characteristics, which reflect little socio-demographic dynamism (predominantly elderly, poorly qualified population, high percentage of second homes), Ault, like the rest of the coastal communes of the region of Picardy, is subject to **land pressure**. The fieldwork and the public data base DVF¹⁹ suggest that market dynamics in Ault are similar to other cities or town nearby. It remains high. Figure 26 below illustrates that there is still a lot of selling.

¹⁸ Source INSEE: Statistiques et Etudes, Dossier complet, Commune de Ault. URL: <https://www.insee.fr/fr/statistiques/2011101?geo=COM-80039#consulter-sommaire>.

¹⁹ Database on real estate transactions in France produced by the General Directorate of Public Finance.

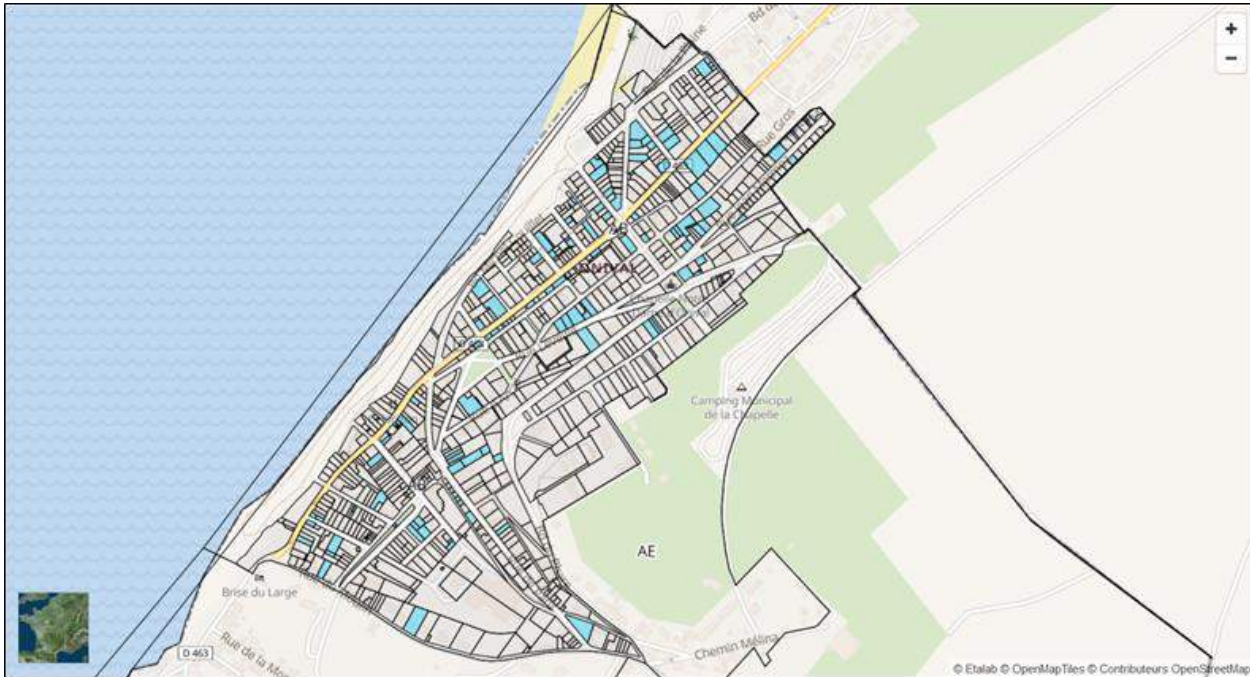


Figure 26. Property transactions registered by DVF from 01/01/2020 to 30/06/2022 in neighbourhood of Onival. Blue properties are the ones sold.

According to the data base DVF, property prices seem to remain the same as in 2010-2011: they go from 1600euros/m² (bad quality housing) to 3000 euros/m² (good quality housing).

The risk erosion and the legal obligation to preserve natural environments in the littoral (coastal law) does not give a lot of opportunity to real estate development. That is why, as we can see in Figure 24, **the Moulinet site is an opportunity for local authorities (Municipality and the Syndicat Mixte) to local planning ambitions** (Agence Urbanités 2017). This site has been identified a land reserve that can provide space for development.

In terms of economic activities, the current Local Urban Plan (i.e. French PLU) intends to preserve the existing activities and in particular to increase tourism. Indeed, there is tourism in Ault (hotels and restaurants) in the centre of the town and in the Bois de Cise. There is also an industry in the region (metal and glass industry), small-scale fishing, hunting (in particular in the polder area at the North of the town), farming and agricultural activities in the inland (flaxen, potatoes, wheat).

Risk management background

Type of risk and chronology of the events

Ault is exposed to coastal risk, mainly cliff erosion, additionally -but to a lesser extent - to the risk of flooding by marine submersion and by rising groundwater tables. The chalk cliff on which the municipality of Ault is located

is retreating at a rate of 10 to 70 cm per year (DDTM 80 2015, 10,16-17). Several streets have disappeared during the last century (Figure 27). According to the natural risk prevention plan (DDTM 80 2001; 2015), the phenomenon of erosion now threatens between 80 and 240 houses.

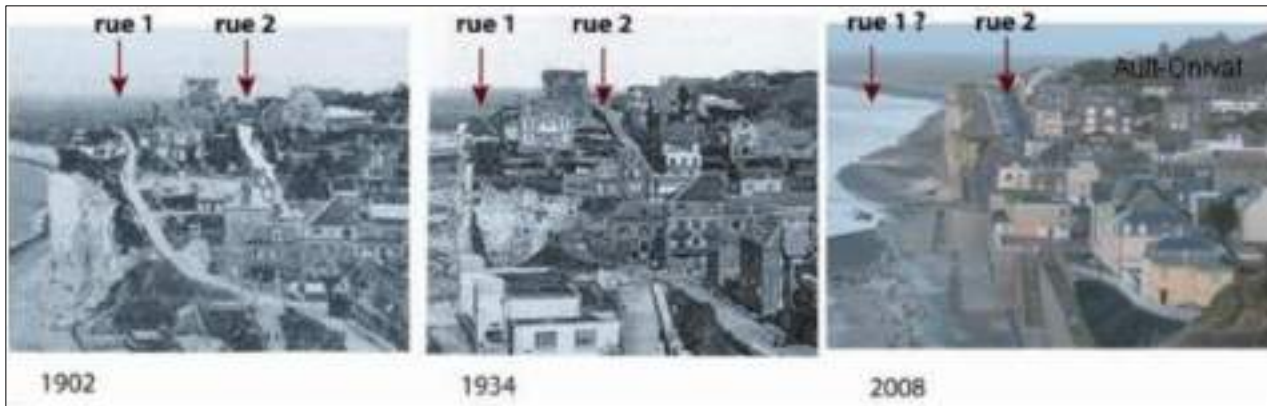


Figure 27. The evolution of coastline erosion in Ault (Agence Urbanités 2017, 24)

According to the Urban Local Plan (Agence Urbanités 2017), the wave activity is the main factor contributing to the erosion of the cliff. However, erosion is accentuated by other natural factors such as climatic (freeze-thaw action on rock faces), mechanical (run-off, circulating groundwaters), chemical (ocean spray), biological (lithophagous animals, seaweed), geological (structure of the cliff).

Human activities also accentuate risk erosion, through agricultural activities (run-off) and urbanisation (concentration of run-off and infiltration).

The myth of the sunken village and the romantic ties at risk

During the empirical fieldwork, several interviewees mention that Ault had been completely sunken in the Middle Ages. This legend is only partly true. It is based on the fact that a storm destroyed the port, part of the fishing village and its church in 1579 (DDTM 80 2001, 11). Amongst the famous personalities who have fed this myth, Victor Hugo wrote about a bell tower which would have been visible at low tide. During the interviews, it was surprising to see that both the inhabitants and the institutional stakeholders mention this myth, as well as the whole history of the town, to express a spatial attachment. Despite the social conflict²⁰ between residents and authorities over the withdrawal strategy announced in 2013, local stakeholders share a common narrative based on the same elements: the palaeontological origin of the cliffs, the history of the architectural heritage (casinos, old port, villas), and the history of the sea defences.

²⁰ The concept of conflict is to be understood in a broad sense: it can refer to disagreements between actors on a specific issue (disagreements visible in public statements, public demonstrations, interviews, written complaints). In the case of Ault, the conflict also took place in court.

The city has a long history of sea defences. We understand these sea defences in a broad perspective: it refers to all the technical interventions in the space, financed by the local authorities, but not only, to try to slow down or stop the erosion caused by the wave activity. According to historians, the battle against the sea dates back to the 13th century (Hoeblich 2013, 23). More recent reports (Sogreah-Antea 2011; Bawedin 2013) remind the multiple actions carried out to fight sea erosion across the 20th century (see figure 28).

Summary of sea defence measures carried out between 1939 and 1980 in Ault

1939: A reinforced concrete perimeter wall with one or two storeys was built over 166 metres from north to south.

1948: Post-war maintenance work that aimed to reinforce all existing defence infrastructures.

1955: Construction of a mushroom-shaped slab on the north side as an extension of the longitudinal structure slab. It is laid on cylindrical posts descending into the chalk.

1966-1967: Emergency interventions after the great tides of 1967 and the winter 1966-1967.

1968: Safeguarding work on the promenade platform.

1976: Following the storms of January 1976, reconstruction of the dike crest washed away over 18 m between groynes 1 and 3.

1978: Extension of the sea front to the south between groynes 2 and 4 over a distance of 164 m following the storms of February 1974.

Figure 28. History of sea defence measures between 1939 and 1980 in Ault (Sogreah-Antea 2011)

The most emblematic defensive structures were built in the 1980s. The first is the "*casquette*" (the cap or hat), a kind of balcony in the continuity of the cliff (Figure 29). Secondly, an artificial seawall, also called "Dike 83" by the inhabitants ("*Digue 83*" because it was built in that year), which is 500 metres long and 17 metres above sea level (Bawedin 2013, 15). This work cost 5.5 million euros and, due to lack of funding, the dike was never fully completed. There are 150 metres missing, close to the town centre. Groynes are also being installed. A groyne is a hydraulic structure built perpendicular to the sea that interrupts the flow of water and limits the movement of sediments (pebbles). Here, they retain the pebbles near the dike and near the *Bois de Cise* neighbourhood, a residential area on the south of Ault where a landowner built an access to the sea at the end of the 19th century by cutting into the cliff (Figure 29).

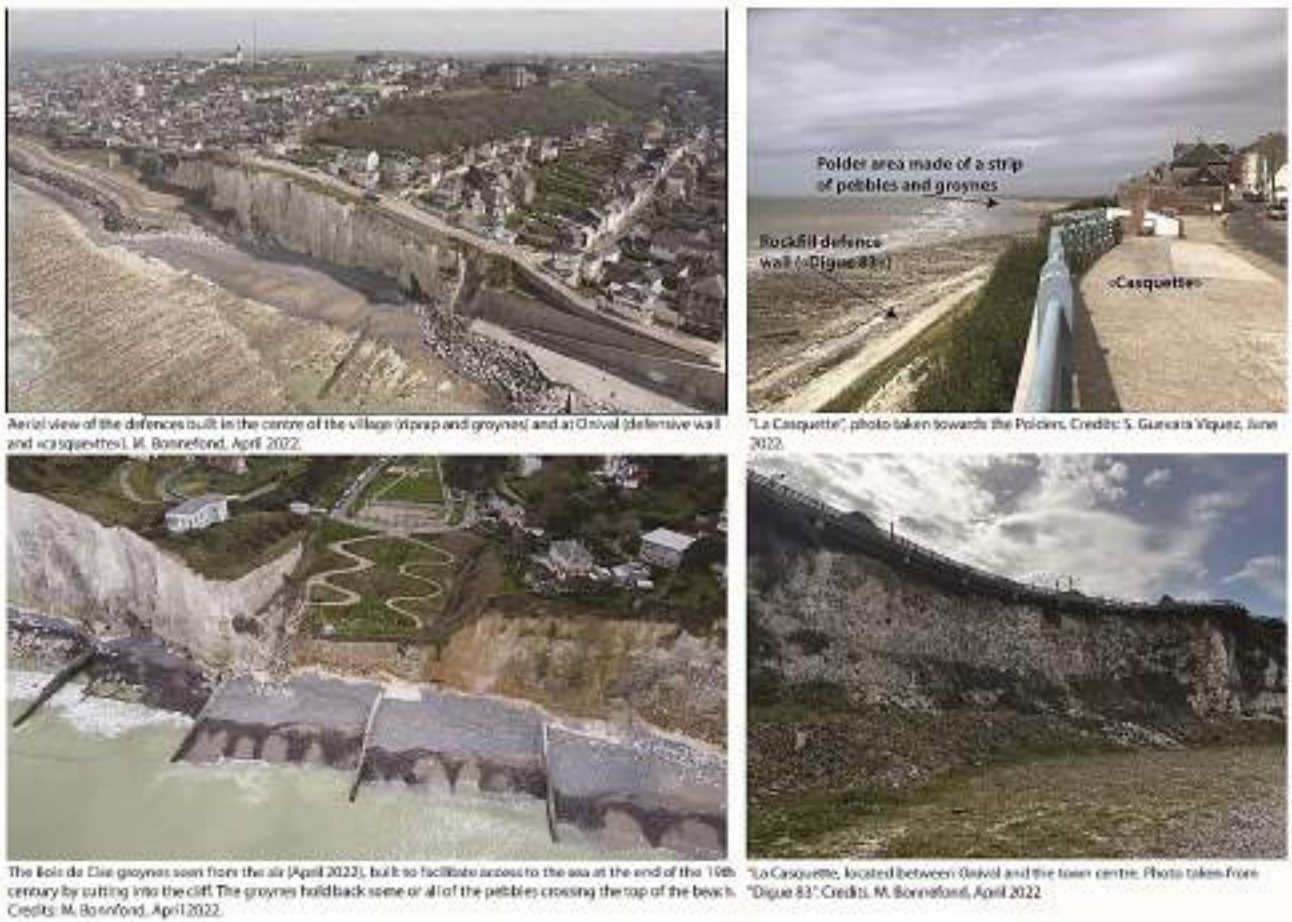


Figure 29. Defensive works in Ault

Moreover, Ault covers part of the *Bas-Champs* area (Figures 30 and 29), to the north, where there is a polder that stretches for 16 km until it reaches the municipality of Cayeux.

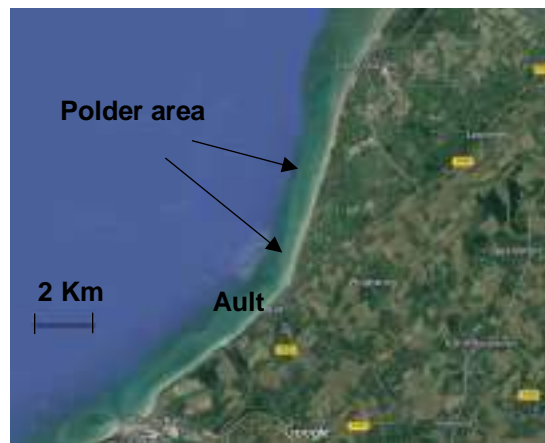


Figure 30. The polder area on the north of Ault

This polder has a dual origin (natural and man-made) from its south-western part. It appears to be a natural pebble beach, which has been reinforced by the creation of a dike. The pebbles of that beach are the result of the erosion phenomenon of the coastline (Figure 31). There is a geological link between these natural dimension of the polder of the *Bas-Champs* area, and the erosion of the cliffs located to its South (Bawedin 2013). Figure 32 gives an overview of Ault and its cliff.

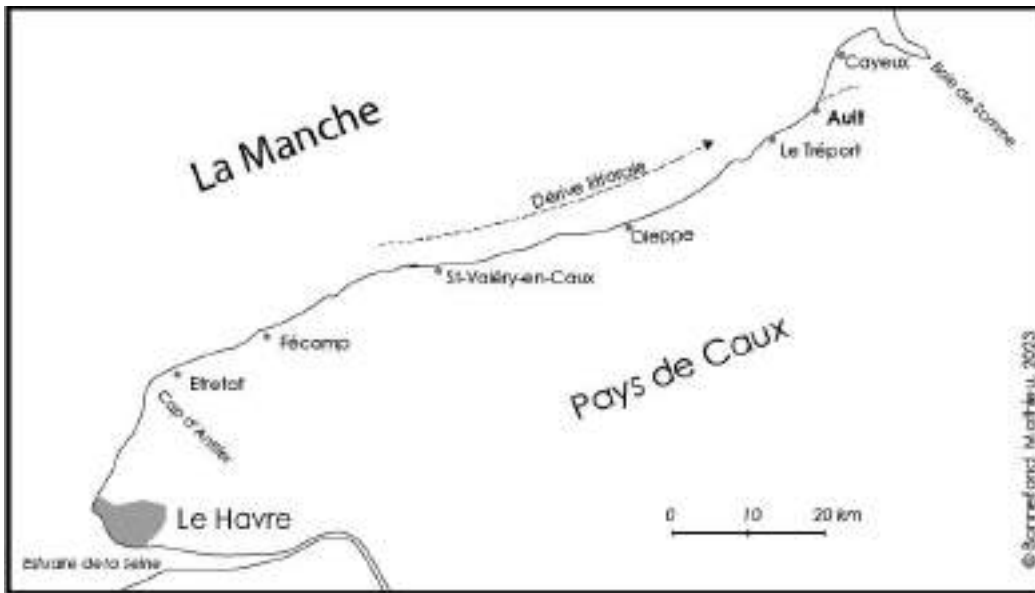


Figure 31. Longshore drift in Ault



Figure 32. Global view of Ault and its cliff

The specific project under study for SOLARIS

Timeline and main objectives

The development project at stake in Solaris sets a change in the way of managing risk erosion in Ault. It stands out from the defence infrastructure strategy that has shaped the city's history. It can be considered as a pilot project of the fallback strategy to manage coastal risk.

Some background information to better understand the project

As in Ault, we are in a coastal erosion context, the risk management instrument is not a *Flood Risk prevention plan* (in French: PPRI), **but a Natural Risk Prevention Plan** (in French: PPRN).

In 2001, a first Natural Risk Prevention Plan was drawn up by the national authority's services in Ault. This prevention document is the first to set out planning and building restrictions based on risk erosion. It sets the start of a new way of managing risk, beyond hydraulic engineering, through preventive planning. It defined several risk zones along the coastline: unbuildable area (red zone), restricted building zone, and conditionally buildable area (blue zone). **This document can be considered the first to introduce a retreat strategy to manage risk erosion, in the sense that restrictions recognised the erosion phenomena. The document did not consider that it could be stopped by infrastructure, but called for adaptation in the existing building zone.**

In 2010, **the Xynthia Storm** strikes the West coast of France, causing 47 casualties. This event was widely covered by the media and taken up by the political spheres (Mercier and Chadenas 2012). A trial followed, in which the mayor of La Faute sur Mer was condemned because his office had granted building permits without considering the available knowledge on the risks of marine submersion. **This storm marks the beginning of a new national doctrine on coastal risks**²¹. From that moment, the State encourages the relocation of activities to prevent risk of coastal erosion and will not systematically finance the construction or maintenance of sea defence infrastructures.

Ault, belvedere city

In 2010, several months after the Xynthia Storm, the Municipality of Ault, with the support of the *Syndicat Mixte Baie de Somme - Grand Littoral Picard* (SMBSGLP), inter-municipal actor, in charge of water management at the basin level, engages **a call for consultation** with two objectives. The first one is to study the sea defence works and the second one is **to define a sustainable strategy and a spatial development plan to manage coastal erosion** (Mairie de Ault 2010). Based on the latter (INterland 2012), Ault candidates successfully to an experiment launched within the framework of the national strategy for managing the coastline²² (MEDDE 2013b).

²¹ Site web : *Stratégie nationale de gestion intégrée du trait de côte* : <https://www.geolittoral.developpement-durable.gouv.fr/strategie-nationale-de-gestion-integree-du-trait-r434.html> [consulted on september 2022]

²² Call launched in March 2012 and closed in September 2012 (MEDDE 2012a).

The project presented by the Municipality of Ault aimed to implement **a strategic urban withdrawal to manage risk erosion**. In comparison with other experimental national cases selected, the local authorities in Ault could have a specific area in which to relocate residents. This place is called the development zone (ZAC) of Moulinet (Figure 34). The retreat strategy, presented as less expensive and more sustainable in the long term, supposes that Ault would abandon its seaside identity to assume the role of a belvedere city (INterland 2012).



Figure 33. The “ZAC du Moulinet”, a specific area to relocate housing and activities from the coastline. Credits: Syndicat Mixte de la Baie de Somme/DRI

The Municipality and the SMBSGLP announced the implementation of the Moulinet project in a press conference in January 2013. In this public presentation, relayed by the local media²³, it was announced that 80 households located on coastline would be demolished.

This message was not well received by residents. Soon, these statements will be denied by the Town Hall and the SMBSMGLP²⁴.

Today, after many years of conflict between stakeholders (inhabitants, national and municipal authorities) over the retreat strategy, the development project on the Moulinet area continues. However, it is no longer presented as a relocation project, but rather as a **development project that contributes to the revitalisation of the town of Ault**, which helped to ease the social conflict. Indeed, the development of this area remained for a long time a subject of debate. Minutes of the public meetings related to the project²⁵, as well as the fieldwork, suggest that although the authorities denied rather quickly any intention to move the houses, the development of the Moulinet was seen as a way of abandoning the seafront, as part of the withdrawal strategy.

²³ Courrier picard, 22/01/2013, p. 9.

²⁴ Courrier Picard, 16/02/2013, p.

²⁵ Bilan de concertation 2011-2019

At the same time, the municipality, in partnership with the SMBSGLP, is carrying out actions to revitalise the town centre in order to reduce the risk of erosion (waterproofing of public spaces, adaptation of sewage networks, soft water works in agricultural fields). These actions are part of the Littoral Strategy.

The littoral strategy in the Bay of Somme

Indeed, in 2011, the State services asked the **Syndicat Mixte Baie de Somme - Grand Littoral Picard** (SMBSGLP), to implement a **Flood Prevention Action Programme** (in French : PAPI) to develop an integrated strategy for the management of the coastline in the short, medium and long term (50 years) (SMBSGLP and ARTELIA Eau et Environnement 2015, 12). This program extends from the Authie estuary to the Bresle via the Somme (Figure 35).

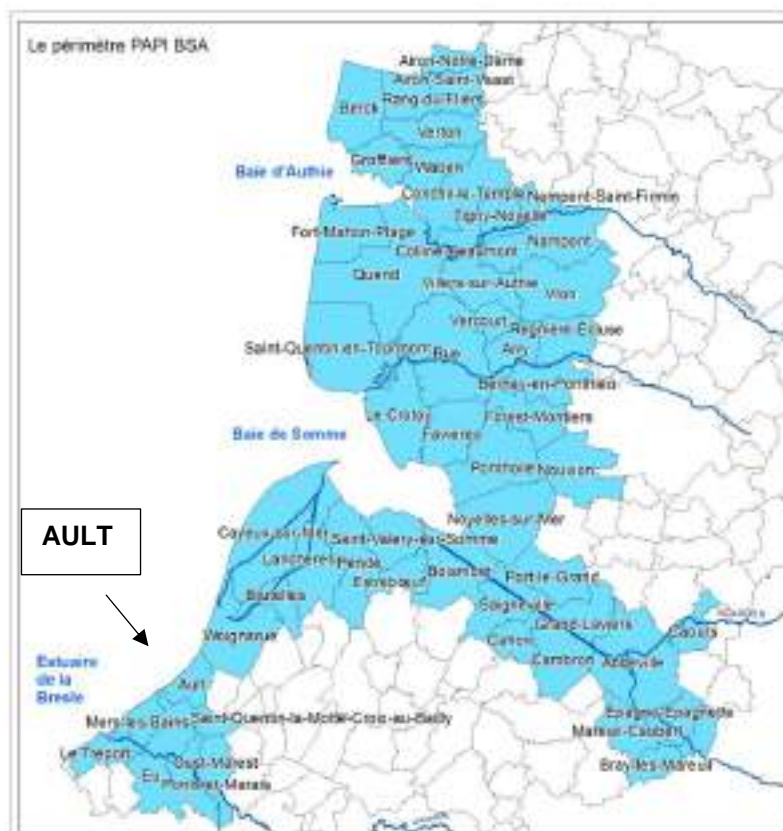


Figure 34. The perimeter of the PAPI (SMBSGLP and ARTELIA Eau et Environnement 2015, 21)

The SMBSGLP chooses to integrate the PAPI actions within its littoral strategy, called “Stratégie littorale Bresle Somme Authie” (defined at the scale of the bay of Somme). The strategy articulates three level of actions:

1. **The PAPI actions**, among which, it is possible to note:
 - a. The soil sealing in the city centre, which results in an urban rehabilitation of the city.
 - b. The readjustment of the sewage system on the coastline in order to adapt it to the risk. If a building falls, the rest of the system should not be involved.

2. **Reduction of erosion:** sedimentary study of pebble transit, groynes...
3. **Actions to prevent infiltration.** In this section, for instance, the SMBSGLP, with the support of the Water Agency (funder), is building soft water works in agricultural fields to reduce runoff.

The coastal strategy is interesting because it takes action at different spatial levels, funded by different public actors that shape each measure (the Water agency, the state, the department...). **It reflects a transversal action on the territory of Ault based on the issue of risk. The idea is to focus not only in what it's immediately exposed, that is to say, in what it is near the cliff, but to also tackle social processes that accentuate risk erosion and its impacts:** by building retention basins (soft hydraulics) in the agricultural fields; by waterproofing the town centre to avoid infiltrations; by adapting the sewage system near the cliff. **This strategy makes it possible to postpone the withdrawal strategy and invest in preserving the historic centre of Ault.**

The project and the conflict with local stakeholders

Since 2013, an association of local residents, "Ault-environnement", gradually rework the projects and challenge them. This association is reactivated in particular after the announcement of the relocation project in 2013. Its position is that the Municipality, with the support of the SMBSGLP, is abandoning its inhabitants and the seafront, which in their view means surrendering the emblem of the town and the foundation of its identity.

During many years, the association organises meetings, actions, street demonstrations, artistic events. They even carried out in 2015 (with the support of the Municipality) a legal battle against the Natural Risk Prevention Plan (PPRN), but they were defeated in 2020. Although today the association has lost a lot of its members, it remained for a long time a major opposition movement in Ault. Every interview we made in Ault mentioned it. **This opposition changes** with the election of the new mayor in 2020, Marcel Le Moigne. The latter participated in the re-launch of the association in 2013 and was on the board of directors during the municipal elections of 2020.

The socio-spatial issues raised by the policy/project

The project enlightens the social reactions and debates that relocation measures could generate. Literature on climate change underlines the importance of taking into account individual and collective pathways when implementing adaptation actions (IPCC 2022), otherwise projects could accentuate social inequalities and injustice. How these social of individual pathways were taken into account through this relocation project in Ault? How the situations of inhabitants living within the risk perimeter were considered when formulating and reformulating the project?

Moreover, the actions driven by the Littoral Strategy, by engaging the whole Bay of Somme, raise the questions of the scales of risk. It introduces the issue of spatial links between levels of authority and power when engaging solutions to face risk, the relationship between the State and local authorities (municipalities and inter-municipal actors). In this case, it highlights the link between the hinterland and the coastline, as well as between upstream and downstream sea currents.

Methods

The data collection strategy is qualitative. We have carried out 32 interviews with local stakeholders. We also collected documents produced by those institutions (such as reports, minutes of meetings, films of run-off) and analysed their communication supports (such as their web site). Finally, we realised a press review from 2013 to 2022 (Table 7).

Table 5. List of interviews

Actors	Role	Interviews conducted	Documents collected
Municipality	Owner of the development project	3 (including one collective)	Local Urban Plan (PLU), Natural Risk Prevention Plan (PPRN)
Syndicat Mixte Baie de Somme-Grand Littoral Picard	Project manager of the main actions carried out in Ault in terms of urban development and risk management	4*	Strategic documents (related to the PAPI and the Littoral Strategy), assessment of the consultation process
The association of Municipalities (Communauté de Communes) of Villes-sœurs	Responsible for collecting the taxes related to the aquatic environment management and flood prevention actions (called GEMAPI competence)	1	-
State services	National level, in the Ministry of Environment, and through its local services (DDTM and DREAL). The state is responsible for the elaboration of the natural risk prevention plan and for the management of the public maritime domain	8* (including a collective one)	Reports, call for projects and workshop proceedings on the subject
Financial Partners	Actors that have an important role in deciding actions carried because they are financing them. As funders they participate in the steering committees and they frame the fields of possibilities	1 (Water Agency)	-
Experts (private and public)	Consultants providing knowledge for decision making through reports, or through assessments. They can be private, but also public. For instance, the association SOMEA, created by the Chamber of Agriculture, offers support to municipalities in the territory of the department for the management of agricultural runoff.	5	Reports, and meeting minutes
Association Ault Environnement	Association involved against the relocation project.	8	Communication documents (flyer, book of the exposition), web site analysis.
Le Petit Musée association	Association that collects any type of documents related to Ault (post card, photos, books).	1	
Economic actors (the Cise restaurant)	Restaurant and Hotel at the Bois de Cise. The owner was obligated by the State to close to the public one room of its lodges located at the edge of the cliff. He received an official declaration of endangerment.	1	

Empirical results

Analysis of the local legal context

Administrative entities and relevant documents in risk management and climate change at local scale

At local level, we can find several documents referring to natural risk management (table 8). They deal with risk erosion and flood risk (a small part of Ault is indeed exposed to flood, at the North, near the polder area). The figure below details the documents consulted to write the report. The report essentially focuses on the PPRN and the PAPI, but we also consulted other regional documents such as the Master Plan for Water Development and Management and the Flood risk management plan (PGRI).

Table 6. Documents dealing with risk management at local scale in Ault

Documents	Publication	Scale	Subject
Natural Risk Prevention Plan (PPRN)	2001, 2015	Ault	Risk prevention. It establishes the risk zones, forbidden to construction. This document is integrated in the local urban plan. Elaboration: State services
Prevention Action Programme (PAPI)	2015 (updated in 2019)	The entire <i>Baie de Somme</i>	To develop an integrated strategy for the management of the coastline in the short, medium and long term. It focuses on Flood risk related problems. Elaboration: all municipalities in the perimeter under the coordination of the <i>Syndicat Mixte Baie de Somme Grand Littoral Picard</i> .
Master Plan for Water Development and Management (SDAGE)	2016-2021	Hydrographic basin of Artois -Picardie district (2466 municipalities, 4.8 million inhabitants) ²⁶	It aims to provide a framework for the choices of all stakeholders in the basin whose activities or developments have an impact on the water resource. Elaboration: The Basin committee (all stakeholders involved in water management)
Flood Risk Management Plan (PGRI)	2016-2021	Hydrographic basin	Based on a risk assessment (build on historical event data, geographical data, social indicators), it aims to provide a view of what is at stake at the scale of the hydrographical basin from a flood risk management point of view. Its perimeter goes beyond the SLGR perimeters, it aims to have a global view of the hydrographic basin. Elaboration: stakeholders among which the municipalities.
Local Flood risk management strategy (SLGR)	2016	Areas at high risk of flooding	It translates the PGRI goals at the scale of the areas at high risk of flooding (TRI). The latter were defined by a previous assessment based on historical event data, geographical data, and social data on what is at stake in areas at high risk of flooding. Elaboration: stakeholders among which the municipalities.

²⁶ See Map in Annexe

These documents mention climate change as a phenomenon that will increase sea-level rise, and therefore that will **increase extreme hydraulic risk**, such as of flood events (run-off, marine submersion), but also coastal erosion. Climate change is also presented as a driver to more **uncertainty in risk projections**, and therefore to risk management.

As for local documents that deal with environment and climate change (table 9), we consulted the Local Urban Plan (PLU), the urban planning project for sustainable development (PADD) and the recently approved the inter-municipal Local Urban Plan currently in discussion (PLUi).

Table 7. Documents dealing with environment and urban planning at local scale in Ault

Documents	Publication	Scale	Subject
Local Urban Plan (PLU)	2017	Ault	It establishes the mandatory rules for land use and spatial development at precise scale to allow or not building permits. Elaboration : Municipality.
Urban planning project for sustainable development (PADD)	2017	Ault	Linked to the PLU, it presents the objectives and general guidelines for the urban, economic, social and environmental development of a municipality. Elaboration : Municipality
Master Plan for Water Development and Management (PLUi)	Working version of 2020	Hydrographic of basin	It aims to provide a framework for the choices of all stakeholders in the basin whose activities or developments have an impact on the water resource. Elaboration: the intermunicipal actor <i>Communauté de communes Villes Sœurs</i> .

Several administrative bodies participate in the elaboration and in the implementation of these documents:

- **The Municipality** is responsible for elaborating the PLU and PADD. It is also responsible for financing the coastal defence, but it has given this competence to the association of municipalities **Syndicat Mixte Baie de Somme Grand Littoral Picard**. This intermunicipal actor has an expertise able to carry out actions at the scale of the whole bay and not just the territory of Ault. The *Syndicat* carries the PAPI.
- **The state services** elaborate the Natural Risk Prevention Plan (PPRN), that is supposed to be incorporated in the local planning documents, such as the Local Urban Plan (PLU) and the upcoming inter-municipal Local Urban Plan (PLUi, an urban plan designed at the inter-municipal level).

The PLU and the PPR: the reinforcement of the retreat strategy

The Local Urban Plan (PLU) **establishes the mandatory rules for land use**. This document consists of a diagnosis of the territory and its spatial project. The PLU of Ault, finalised in 2017, establishes a development strategy for the ZAC of Moulinet, located in the hinterland (Agence Urbanités 2017). However, this document will soon be replaced by the PLUi, an inter-communal Local Urban Plan defined at the level of the association of municipalities (*Communauté de Communes*) of Villes Sœurs (currently under discussion). **The Natural Risk**

Prevention Plan (PPRN), drawn up by **the State services**, establishes the risk zones, forbidden to construction. This document is annexed to the PLU. In Ault, two PPRN were approved, in 2001 and then in 2015.

The 2001 PPRN considered existing defence structures, in particular the presence of the "83 dike" along the cliff to reduce coastal erosion. Thus, the 2001 PPRN defines a red zone forbidden to construction, a hatched zone for restricted constructability, and a zone that can be built under conditions, in particular the sustainability of the protective structure. Finally, the document also defines two coastlines to indicate the evolution of erosion. The cyan line indicates the projected coastline for 2050, and the light blue line indicates the projected coastline for 2100 (Figure 36). In total, adding up all the zones of the 2001 PPRN, there would be about 80 houses affected by the risk zone.

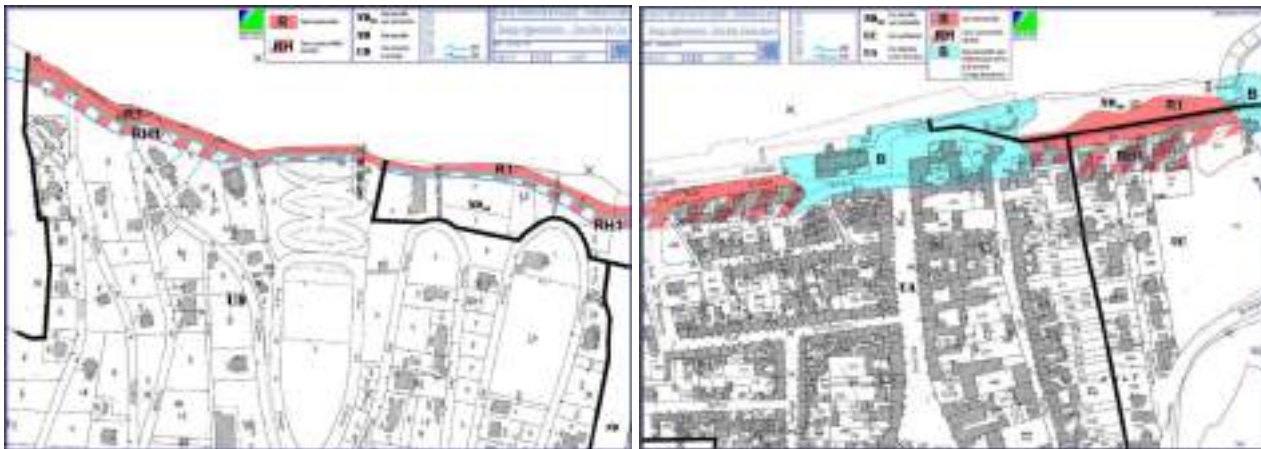


Figure 35. PPRN 2001

In line with the new national doctrine, **the 2015 PPRN** did not include sea defence works and argued that risk zones had to be enlarged considering climate change (Figure 36). **This high-risk zone is further extended to prohibit construction.** It thus defines a single red zone, based on the recession of the coastline over a 100-year horizon. Because the risk is perceived as unpredictable and irreversible, this red band defines a high-risk zone. It covers nearly 240 houses. The document nevertheless allowed for repair and maintenance work on houses, provided that it is approved by an expert and paid for by the owner (art. 2.2).

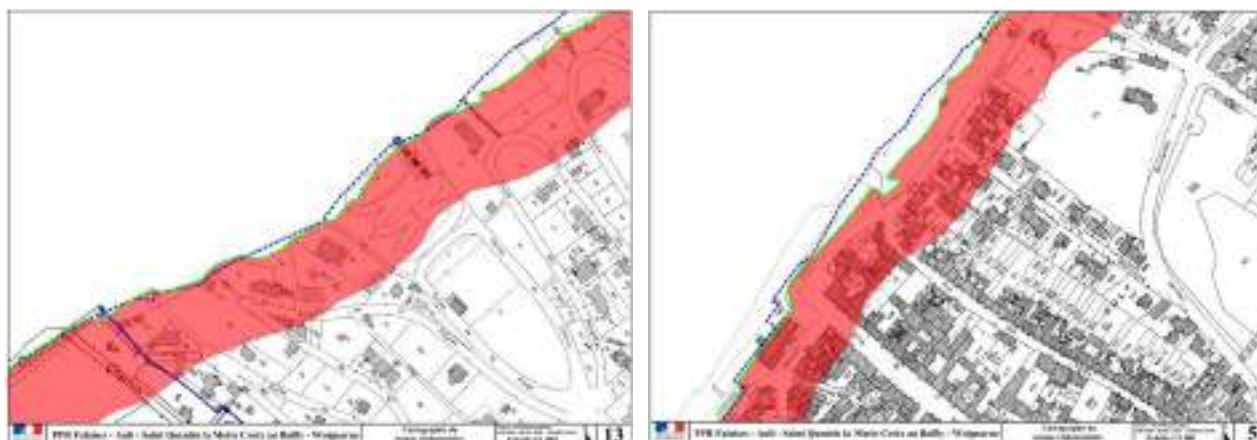


Figure 36. PPR 2015

The documents now in effect in Ault have been contested by local partners. Controversies focused on the restrictive nature of the regulations, reinforced in time. Regulations are said to stop of the seafront development, in favour of the hinterland. **The 2015 PPRN was indeed challenged in court** by the Association *Ault Environnement* and the Municipality of Ault. The Amiens administrative court ruled in favour of the plaintiffs and gave the State a time limit to redefine the risk zone in 2018. The State then appealed to the Douai administrative court, which ruled in its favour in 2020. The *Conseil d'Etat*, the highest court in administrative law, refused the appeal lodged by the inhabitants and the Town Hall, but confirmed the cancellation of the obligation to carry out studies by an expert for maintenance and repair work on the houses.

This series of events demonstrates the vigour of the stakeholders involved in risk management, and in particular their opposition to the government's withdrawal strategy. The position of the Municipality is particularly interesting. The latter is carrying the retreat project in 2013. But the conditions imposed by the new PPRN of 2015 are not aligned with its objectives. These conditions are considered too restrictive for the development of the territory.

How are risk management and planning documents addressing inequalities?

As in the national context, **local documents of FRM, such as PPRN of 2001 and 2015, consider vulnerabilities based on the distance and exposition to hazard.** The criteria are to qualify the activities that are within the coastal band alongside the coastline. The idea is to identify whether the area is inhabited or not,

and if there are any economic activities. The zone where hazard might affect determine thus what is at stake. There are **no social indicators** characterizing inhabitants within this coastal band, such as their level of wage, or their social trajectories.

In documents of the PAPI, the Flood Risk Management Plan (PGRI) and the Local flood risk management strategy (SLGRI), the issue of social inequalities is dealt through the expression “social development”. It is interesting however to point out that the document mentions the **notion of solidarity, but not in its social dimension**. The notion, here, has four perspectives that explain why risk management responses cannot be the same in each one of the municipalities of the bay of Somme:

- **Two geographic meanings of solidarity:**
 - Solidarity between inland and coastline: the document, within its actions, aims to consider “*at the same time the vulnerability of the inland zones, but also the economic potential of coastal activities*”
 - Solidarity between municipalities at the scale of the bay in terms of defence strategy. In other words, bad defence choices might cause a failure in the protection of a broader perimeter: “*Only continuity and coherence allow the effective protection of the bay territory. Due to the topographical configuration any very localized failure is likely to generate damage on a much larger scale*”
- **A temporal meaning of solidarity**: the document insists on thinking about the future risks while developing today’s activities. “*It is about organising the redeployment of current and future issues at risk*”
- **An ecological solidarity**, emphasising the need to take actions that will not accentuate other environmental risks: “*the project partners have declared themselves in favour of an environmental solidarity allowing the mutualisation of possible compensations at the level of each perimeter.*”

In the PAPI, the PGRI and the SLGRI documents, the notion of solidarity is framed by a multi-dimensions vision of risk: spatial, temporal, dynamic, and ecological. Nevertheless, the vision of risk remains very physical, it does not mention the accentuation of social inequalities.

Planning documents are supposed to integrate natural risk management documents to establish the urban development of the territory of Ault. One could think that the issue of solidarity and social inequalities would be further developed than in risk management documents.

PLU, PADD and PLUI mention the issue of climate change and its social challenges. Climate change is mentioned as a physical phenomenon that will increase risk erosion. However, the issue of social inequalities **is mainly mentioned through housing targets**. These are particularly important as Ault does not currently meet national housing guidelines. According to the 2000 SRU law²⁷, all municipalities should have at least 20% of their housing destined to socially deprived populations. This is not the case in Ault (4% of social housing).

²⁷ Loi de solidarité et renouvellement urbain

To conclude, **even though institutional documents mention Climate Change Adaptation, the social dimension remains unclear.** At least, the issue of inequalities and solidarity seem to be linked to the issue of poverty and social housing; and the answer is to build more social housing. The question of relocating residencies is not mentioned. Actions that are specified are those aimed at limiting erosion (PAPI actions).

Coastal law: can nature conservation facilitate risk management?

The law on the coastline dates from 1986. It aims to safeguard natural sites and fragile areas along the coastline. It is supposed to guarantee access for all to the coastal path (parallel to the coastline). It establishes thus a 100-metre strip of undeveloped land. In this respect, **the Coastal Law is consistent with the rationale of the 2015 PPRN.** It can be a tool to stop the coastal development and preserve population from risk erosion. However, during the interviews, the national services **underlined the difficulty of applying this law.** They emphasised the failure to comply with the regulations at the scale of the seafront and warned against any tactics by local councils or residents to continue building on the seafront.

In Ault, the **Coastal Law becomes a tool for the inhabitants** to succeed in contesting the PLU of 2017 and to stop the development of the Moulinet ZAC. The Municipality had to negotiate with the National authority in 2022 so that the PLU becomes valid again and the Moulinet project can continue.

Thus, if the coastal law is supposed to guarantee a sustainable spatial management, it is also a constraint for the municipality of Ault which wishes to pursue a real estate development on the Moulinet site.

Climate resilience law: a nuance in the State's doctrine?

The law on combating climate change and strengthening resilience, known as the "Climate and Resilience Act", comes into effect in January 2022. **This law introduces certainly a nuance in the State's retreat doctrine.** Within this legal framework, new construction will be prohibited in the "30-year return period" risk zones, but with exceptions for the extension of existing buildings or the development of commercial activities. In addition, the "100-year return period" risk zone remains buildable, unless the threat gets closer, in which case demolition will be required. **So, restrictions are not applied on the basis of a projected erosion rate (as in the 2015 PPRN) but on the basis of actual erosion.** A law's decree establishes a list of 126 municipalities that will benefit with first priority from support measures for coastal risk management. The town council votes unanimously in January 2022²⁸ to be part of the list of vulnerable municipalities. As a consequence, Ault will have its own PPR in the future, not included in a larger perimeter and less restrictive. This law is celebrated by both the town council and the inhabitants of Ault, who hope that it will enable them to extend the "83" dyke and to carry out maintenance and renovation work on the sea front buildings. They consider it adapts better to the risk erosion dynamic.

²⁸ Minutes, Town Council Meeting of 13 January 2022, Ault.

Analysis of the actor's game

The State: a governmental power difficult to apply to coastal management

The legal and technical resources of the State to manage coastal risk.

In terms of resources, **the State is the guarantor of the national safety, property and people, and therefore of protection against natural risks**. National authority defines risk areas through the PPRN, which is annexed to the Local Urban Plan; and establishes the coastal risk management doctrine. Following the Xynthia storm of March 2010, the State established a **new coastal line management doctrine**, aimed at supporting coastal municipalities in the face of natural coastline retreat in a context of climate change. This new strategy therefore explores actions to relocate activities, rather than actions of "systematic defence against the sea" (MEEM 2017). Sea defences are considered to be too expensive (Bawedin 2013) and not enough efficient in the long term.

To enforce its natural risk management policy, the State has its local technical services (DDTM and DREAL), which draw up Natural Risk Prevention Plans. The State also has the legitimacy to frame hazard assessments notably through the BRGM (the French geological survey²⁹). This long term expertise is difficult to contest. In Ault, an outbuilding of the hotel restaurant Le Cise was placed in danger by the prefecture following a BRGM expertise. Although the owner of the business called in a counter-assessment which did not comply with the latter, the high-level risky exposition was maintained. Part of the building concerned becomes uninhabitable³⁰.

Difficult support for people exposed to the risk of coastal erosion.

With the Barnier fund, the State can (in principle) compensate victims of natural disasters. The fund can also support the expropriation process when the risk is considered imminent. However, it does not finance the expropriation process when the risk is foreseeable, which is the case for the risk of erosion. The Moulinet development project and the setback strategy formulated in 2013 was elaborated based on the possibility of seizing the Barnier Fund (INterland 2012). We will see below that the possibility of using the Barnier fund (or not) is not so evident. The figure 37 illustrates the State's coastline strategy over the years.

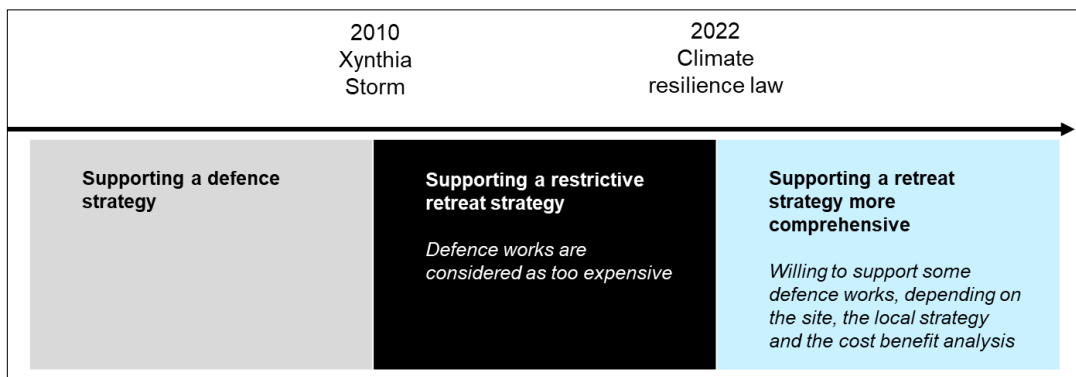


Figure 37. Timeline of the State's position

²⁹ <https://www.brgm.fr/en/identity/brgm-glance>

³⁰ *Courrier Picard*, 6 juin 2013, p. 7, « Péril imminent sur la villa Lumen ».

The Town Hall: a small municipality overwhelmed by its territorial challenges

The municipality of Ault is the **political project manager** for all the actions currently being carried out in terms of local development and risk management, such as :

- The development project of Moulinet,
- The updating of the urban sewerage system to reduce run-off,
- The waterproofing of the soil in the town centre to prevent infiltration,
- The implementation of soft hydraulic works in the agricultural fields to reduce runoff from the hinterland.

The Moulinet project designed in 2011-2012, which generated a huge conflict between local stakeholders, continues today, but it is no longer presented as a relocation project. It is now presented as a project for the local development of Ault, i.e. to boost activity in the local area.

Even if Ault needs to engage all these actions to reduce risk erosion, it stays a small size municipality. Thus, this public actor relies on the SMBSGLP, which supports the city council in carrying out public contracts or in conducting expertise reports and studies.

The defence infrastructures built on the 1980s (the *casquette* and the Dike 83) has cost the municipality dearly. Public finances were in a deficit for a long time and were not consolidated before the 2010s. This issue came up in interviews as a subject of conflict between the inhabitants and the town hall. Many residents complain that Ault was completely devastated, that nothing was done to maintain either the defence facilities, either the roads and the public buildings. For the local municipality, the priority was to bring public finances back into balance.

Empirical research shows that the town council formulates the issue of equity in social terms, with the aim of achieving social mix in terms of housing (for low-income households, the elderly and young couples) and in terms of preserving the seafront (defence works must be maintained).

For several decades, therefore, the municipality had no resources [due to the debt undertaken to build the defensive works], [...]. As a result, we find ourselves with an abysmal level of upkeep! Everything there is to do is enormous (Interview, Town Hall representative1, June 2022)

[With the increase in second homes] our residents who work in the area can no longer afford to live in Ault. And it's the people who work in industry who are poorer (Interview, Town Hall representative1, June 2022)

On the one hand, we have an ageing population here who want to be rehoused, because you've seen the housing, it's all high up, [...] it's very difficult to live to old age in these dwellings. [...] and in the other hand the younger population, this time, who could come and live here, because the housing programme includes 25% so-called social housing (Interview, Town Hall representative2, June 2022)

Figure 38 illustrates the Municipality's position in time.

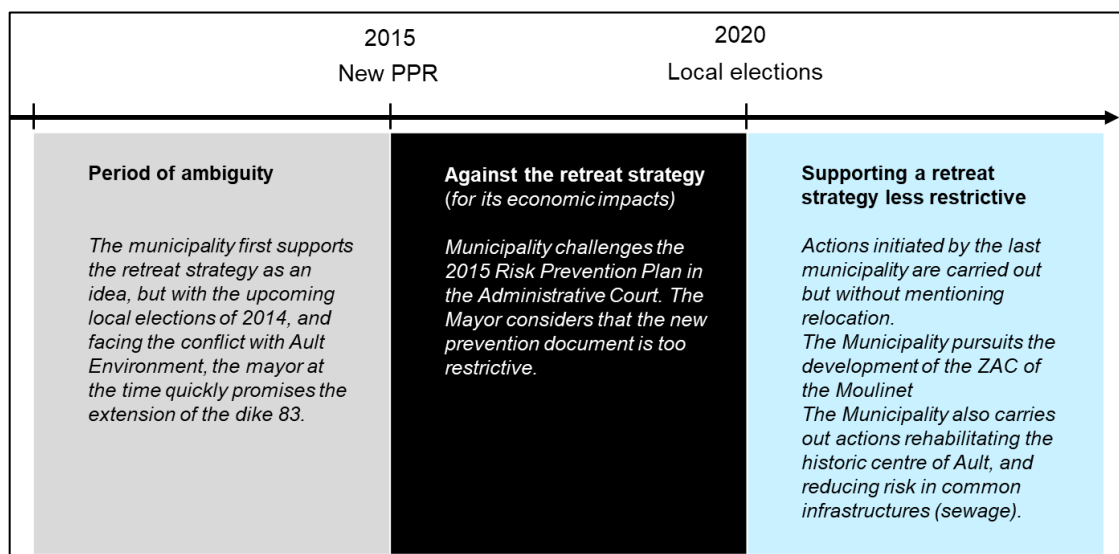


Figure 38. Timeline of the Municipality's position

Other players in the conception of planning action in Ault

- **Syndicat Mixte Baie de Somme - Grand Littoral Picard, "the key player »**³¹

Through **its spatial expertise and engineering skills**, the *Syndicat Mixte Baie de Somme Grand Littoral Picard* is an essential partner for the implementation of the actions mentioned above. With its technical team, this inter-municipal player can provide project management assistance to the municipalities on its institution. The call for consultation for the development of a spatial strategy in 2010 was carried out by the *Syndicat* as main partner of the Municipality. The **geographical perimeter** of the *Syndicat* also leads the Flood Prevention Action Programme (PAPI) at the scale of the entire *Baie de Somme*. This actor has a geographical vision that goes beyond municipal borders. The decision-making process at this level forces local actors (communes) to take a broader view of the projects carried out elsewhere in the Baie de Somme, as they have to negotiate with other communes to get their own projects on the agenda. The discussions are then based on negotiations between the municipalities.

³¹ Interview, State services, April 2022.

- **Financial partners**

Role of Financial partners on the PAPI and the coastal Strategy

During the interviews, the issue of funders came up. Their tools and their conditions framed a lot of the way solutions could be formulated. That is how the coastal strategy was built. First, the State frames the dialogue by making any funding for the reinforcement of a defence system must be conditional on a PAPI strategy. The State's objective is to ensure that all the local players talk to each other at bay level :

And so they [municipalities] arrive with this will [to reinforce the defence system] , we caricature a little, we, the state, agree, “we want to finance you at 40% but it must be part of a PAPI”. And then we get out the little specifications, we say “well here we have a little specification. And so there you have it, a PAPI, that's what you need”. [...] (Interview, State services, April, 2022).

There is a tool that was not mentioned in the PAPI, but it does not necessarily have an impact on Ault, but it is what we call the cost-benefit analyses [...] these analyses must be positive or almost positive for us to be able to grant funding to the BARNIER fund. If these works turn out to be too costly in relation to an ineffective protection strategy, it means that there may be other actions to be implemented... (Interview, State services, April, 2022).

Secondly, after seeing what kind of action can be fundable by a PAPI, local actors engage a more global reflexion on how to take over actions to deal with risk erosion. Consequently, actions taken within the PAPI only concern flood risk, and not risk erosion. Local actors have then to go and negotiate with different other funders (Water Agency, Region, Department, EU) to build up what will become the whole Coastal Strategy. Within the latter, the SMBSGLP conceive actions aiming to limit erosion: such as adapting the sewage system and waterproofing the town centre.

Questions about the Barnier Fund

Is it possible to use Barnier Fund to compensate owners facing risk erosion? This question came up frequently in the interviews with both inhabitants and the State services. It seems indeed that **depending on the type of erosion**, maritime or continental erosion, Barnier Fund could compensate owners. For the Fund, **erosion coming from the sea is not a risk**, because it cannot be formulated as a *probability*: this erosion is presented as inevitable. The question is not “**if**” it will happen, but rather “**when**” it will happen.

On the other hand, according to the Fund, continental erosion is accentuated by different factors such as the poor condition of sewage system or rain network. This “land” erosion can be defined as a hazard because it can be formulated in terms of *probability*. **Thus, for the Fund, to be considered as a risk, the phenomenon has to be presented as a probability.**

We don't finance everything related to maritime erosion because in fact the BARNIER fund finances what is generally considered to be a major risk, and in the end, a major risk is a risk that must be insurable. [...] there is a certain insurance logic in the balance of the fund, but maritime erosion is an inevitable phenomenon, not a probabilistic phenomenon such as a flood which has a one in a hundred chance of occurring [...] On the other hand, continental erosion, in this case cliff erosion, we could also have this on a cliff in the mountains, by the sea, will be eligible because [...] there is a notion of unpredictability, and then of a hazard that can occur [...] (Interview, State Services, April, 2022).

As a consequence, erosion in sandy coast is not considered as a risk and cannot benefit from Barnier Fund. Other funding channels need to be found. Erosion in coast of cliffs, such as in Ault, might or may not fulfil the criteria. It depends on what type or side of risk causes is being evaluated. As cliff erosion is a multi-causal phenomenon, it all depends on what type of cause we're referring to.

The residents' association Ault Environnement

The *Ault Environment* association was re-launched in 2013 by a group of residents concerned about the decline of the city. This NGO becomes particularly active after the public announcement of the development project of the Moulinet, presented in January of 2013 by the Municipality as a relocation project.

Characteristic of the members of the association

One may think that many active members of the Association are concerned by the risk zone, and therefore by the relocation project. This is not exactly the case. Many of the members of the Association do not live in the risk zone. The first president of the Association, long-time leader of the ONG, was not even in the perimeter. Among the active members of the association, we can find:

- 1) **Those who were not born in Ault**, who bought their house before the announcement of the relocation project. Usually, they were looking for a place to live near the coast, often for their retirement. The real estate prices at Ault allow them to pursue this project in the 1980-2010s. Many of them come from the North of France and were seeking for place to live near the sea. They are not seen by native Aultans as “non-Aultans”, as “Parisians”, regardless of their place of origin. Among them, we can find
 - a. Those who lived in the coastal risk perimeter.
 - b. Those who do not live in the coastal risk perimeter.

- 2) **Those who were born in Ault**. Among these we can find:
 - a. Those who do not live in the risk perimeter but who are concerned about the poor condition of the town and the abandonment of the seafront.
 - b. Those who were born in Ault and that live in the risk zone. They seem to be a minority within the active members of the association.

Is Ault Environnement an association that is alien to the concerns of native-born Aulthians?

During the fieldwork, we could collect different “discourses” regarding “Ault Environment”. Because of the economic and social characteristics of many of its members, the association is sometimes seen as an actor that does not incarnate the historical inhabitants of Ault, as people that live in the risk zone because they are not native-born Aultans, “the bobos of the coast”³², i.e. those who lead to coastline gentrification.

We could not elaborate a detail survey of each one of the members of *Ault Environnement*, but the analysis of the events and the empirical workfield led to conclude that the mobilisation of the association generated a social movement that went beyond its members. **The local elections of 2014 illustrate its power of commitment, in a time where the association had been active for less than two years.** One of its members presented himself as candidate, without success, but he lost for only 25 votes³³. Then, he was part of the opposition within the municipal council and presented himself again in 2020, winning by a smashing majority (71,93%). Even though the association did not want to be seen as a political movement and tried to stay out of the elections, this results in the two elections illustrate how the battle to maintain a seaside activity has reached the people of Ault.

Resources of the association

Among the resources of its members, we can name:

- *The cultural capital of its members:* many of them are artists and retired teachers. These socio-professional categories have a flexible schedule, allowing them to devote time to mobilisation, attend public meetings and read the reports published by the different stakeholders. In 2016, a retired urban planner, who had been working on public participation for a long time, joined the association. In 2020, he becomes the president. The arrival of this person makes it easier to clarify all the regulatory documents. Moreover, the members have cultural and artistic knowledge that can be used for mobilisation (producing visual supports, concerning the cultural history of Ault). They can build a sensitive relationship with hydraulic risk and the sea through exhibitions and the creation of a sound trail along the coastline (figure 39). They organise artistic events, playful games, open to all (such as bingo).
- *Activist capital:* many of the members of the association are also activists or former activists (trade unions, left-wing political parties), with a sense of social commitment. The former president of the association (2013-2020) is a left-wing party activist, who worked for a long time as a trade union representative. In other words, many of the members have already worked for collective mobilisations.
- *An ability to take advantage of audiovisual media:* At last, the members of the association know how to make use of multiple communication media: use of social networks, internet, graphic production (tee-shirts).

³² Courrier Picard, 23/06/2013, p.2

³³ Ministry of the Interior website: <https://mobile.interieur.gouv.fr/Elections/Les-resultats/Municipales/> [consulted on April 2023]



Figure 39. Modes of action of 'Ault Environment

The *financial resources* to go into legal battle against the State include donations from members and the sale of T-shirts (Figure 39). Figure 40 illustrates *Ault Environment's* position in time.

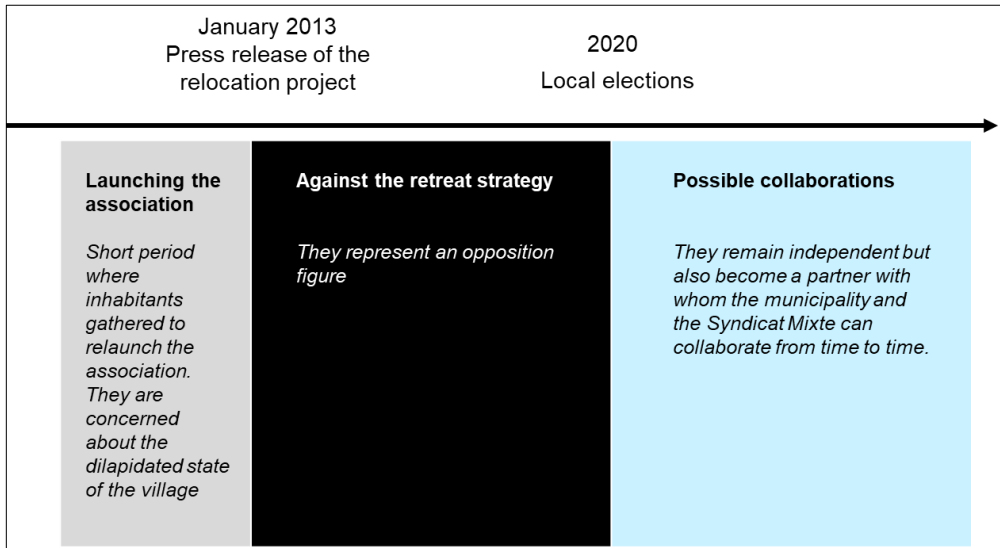


Figure 40. Timeline of Ault environment, from opposition to a collaborator in the project

The table below summarises the actors' position in time (Figure 41).

Timelines of actors' positions



Figure 41. Timeline of the project

Answering the research questions

Attention attributed to justice/fairness/inequalities (RQ1)

At the time the project was made public, no social study had yet been produced on the people affected by the risk or the relocation. The question of socio-spatial impacts is limited to: the conditions of expropriation; and the financial compensation of properties. The retreat project **does not integrate the individual pathways** impacted by displacement when the Moulinet project becomes public in 2013.

During the empirical fieldwork, the analysis reveals different notions of justice used by actors. Some of them seem difficult to reconcile with each other. In this section, we first present these different notions of distributional justice and procedural justice identified during the fieldwork. Then, we underline how these notions may not be compatible, if applied rigidly.

Two versions of distributional justice

We could identify two notions of justice directly linked to differences in wealth among citizens. They can thus be associated to distributional justice.

a. Justice criticising the maintenance of actual inequalities: This argument is used by some inhabitants and some public actors (Town Hall) to criticise the funding of defence facilities to ensure that some villas can have a sea view. As the defence facilities are financed by the citizen taxes, this solution is presented as only keeping actual inequalities:

And then, you have those who live in the seafront that tell you « What I want is to have a view »; and those who live uptown (in the inland) say “But us, we couldn’t care a damn [...] about the m and their sea view. We are all paying with our taxes for their sea view”. It is not easy. (Interview, Representative of the Municipality of Ault, November 2022).

b. Justice linked to social housing when thinking in future actions. The issue of Justice and inequalities is often linked to the existence or not of a social policy in Ault. In planning documents, it is usually pointed out that the municipality does not meet national guidelines in social housing quota. The answer in this case is to build more. This issue becomes a priority after observing that property prices have risen slightly since the pandemic. There is a priority to offer accessible housing to local populations, and to compensate the existing bad quality housing stock.

To start, studies say that Ault have 12% of bad quality housing [...] We have an aging population that aspire to find a new house, because you see housing here, is very vertical, with small rooms, so it is very difficult for the elderly to live in these houses, so we will propose to them new houses. And then, you have young population that could move here. So the housing program is 25% or social housing. . (Interview, Representative of the Municipality of Ault, June 2022.)

If increasing social housing is an objective of the actual Town Hall, to meet the social needs of Ault’s population, it also serves as an investment tool for development of the ZAC of Moulinet. Indeed, developing a minimal rate (25% rate) of social houses is an obligation from the State. **The institutional rules imposed by the French housing system frame therefore the debate on Justice locally.**

Two versions of procedural justice

We could identify two notions of justice directly linked to the law and decision-making process. They can both be associated to procedural justice:

a. Justice as equality before the law. This vision is mobilised by property owners living near the coastal line, in particular the owner of a hotel, who had to close one of its rooms after receiving an endangerment notification from the State. He believes he should be compensated because he made an investment on the basis of an existing PPR document that gave him 100 years before erosion affected his property. He does not understand why some inhabitants have been compensated for risk in other municipalities and why he cannot receive such compensation. This is directly linked with Bamier Fund. The jurisprudence seems to suggest that risk erosion is not covered by it, but that ground movement could. We will develop the ambiguity of this compensating tool further. What we point out here is the inhabitants’ arguments mobilising a notion of Justice:

The Barnier Fund has been used not long time ago to compensate the relocation [of several houses] in [the municipality of] Criel [...]. (Interview, Shop keeper, Ault, November 2022).

This notion of Justice before the law has a spatial dimension, also pointed out by inhabitants when they compare the national actions in other municipalities. **This notion is used by many residents and by the association Ault Environment to criticize that the State is willing to invest in some territories on defence facilities, and not in Ault.**

It [The PAPI strategy] does not intend to reinforce the actual defence facilities to protect the cliff [in Ault] [...] Nevertheless, it is intended to reinforce the stability of the strip of pebbles at the Hable d'Ault [polder area] and [to reinforce] protections in other coastal stations. (Ault Environment website, consulted in January 2023.)

b. Justice as the right to participate in a decision-making process that concerns the place where citizens live. This notion of justice is linked to democracy and participation process and will be developed further in section dedicated to RQ2.

In conclusion, **there are four notions of justice that could be linked whether to distributional or procedural justice.** If applied strictly, **these different notions of Justice may not be compatible** with each other. For instance, if the State decided to respond equally in terms of defence facilities, and therefore to fund a sea wall in Ault, this will maintain actual inequalities locally in Ault (distributional justice). This tension between different notions of justice constitutes a political challenge in Climate Change Adaptation Policies (CCAP).

Different notions of spatial justice or spatial solidarity facing risk

Fieldwork suggests that the notion of justice and injustice facing risk erosion has a spatial dimension; it is frequently pointed out by the stakeholders. We develop here these spatial notions of Justice.

The first version is related to a notion of solidarity between the inland and the coastline. This concerns the effects of agriculture on costal erosion. The PAPI strategy proposes to deal with this effect by reducing agricultural run-off, and by installing soft hydraulics facilities in agricultural fields. These works have an impact on the economy of farmers and their land:

It's like if someone went into your apartment to tell you [...] "well here, for the collective interest of the building, we are going to build an additional bearing wall" and so, your living room will be cut in two. But that is what collective interest is. The analogy is a bit exaggerated, but it's just to point out that yes,

it's like going into people's property to say "we are doing this". (Interview, Representative of the SMBSGLP, April 2022)

This solidarity between inland and coastline is also visible through the inter-municipal action which collects the taxes for Flood Risk Management (*Communauté de communes de villes soeurs*):

It's only at the level of the Community of Municipalities (Villes Soeurs) that it was going badly, because you have communes inland who say, like the Aultois who are not on the seafront, who say to you: "I don't care. [...] I don't have to pay for the commune of Ault". (Interview, Representative of the Municipality of Ault, November 2022.)

As pointed out before, spatial solidarity is mentioned by the PAPI document. It develops the notion of **solidarity between the upstream and downstream sea currents** and the **ecological solidarity between territories of the whole Bay of Somme**. **These senses of solidarity** explain why actions cannot be the same everywhere. These notions of **solidarity are linked to an idea of coherence**. In other words, as all the places in the bay are linked ecologically and geographically, the responses in terms of Flood Risk Management must be coherent. According to the PAPI, it means that the responses cannot be the same everywhere. Within PAPI and the coastal strategy documents, the notion of solidarity is linked to a **notion of spatial coherence at the scale of the bay**. Within these documents, solidarity is not linked with social criteria. People are implicated in the safety objective and in actions linked to "information". **There is clearly a barrier between what it is technical (decisions in defence strategy) and what seems to be social (right to be informed, not part of the decision)**.

This notion of solidarity is not shared by the inhabitants, who perceive these differences in defence actions as inequalities. How can we explain that public actors choose to implement defence actions differently at the level of the bay, while elsewhere they choose to withdraw? It is interesting to read that both institutional documents and citizens' discourses use the concept of solidarity, but not in the same way. The PAPI defines different levels of spatial solidarity between areas in terms of flood risk management to explain why responses to risk cannot be the same everywhere. Citizens, and sometimes local actors such as the municipality, also mobilise these meanings of solidarity, but criticise actions taken elsewhere and not in Ault.

Notions of justice linked to the temporality of risk and risk projections

There is a sense of justice linked to the time scale. This vision opposes long term erosion and the instability of reglementary documents when referring to this risk. Based on long term quantitative projections and their sensitive experience, inhabitants do not understand the rigidity of reglementary documents when they deal with erosion:

I know that my house, probably in 60 or 70 years, it will not be habitable anymore. In the meantime, there you go. If you go up there on the cliff, you'll see the view that you have on the Somme valley
[Inhabitant, April 2023]

This feeling of injustice exacerbates after the publication of the 2015 PPRN. Inhabitants then criticise the fact that the 2001 PPRN gave them 100 years' time to live and enjoy their property: *“And we had 100 years when we bought, on the deed of purchase, the services of the prefecture and the land registry gave us 100 years without any problem with the cliff”*³⁴. Changes in the time scale of the PPRN are seen as a sign of incompetence and inconsistency on the part of national government departments. In other words, there is a mismatch between the temporality of the right to benefit from a property at the moment of purchase and the (short) validity of the document granting this right.

Role of participation (RQ2)

The project raises indeed issues about inhabitant's participation in public policies.

The analyses of official public concertation transcriptions suggest that there was a consultation process for the development of the project³⁵. But, what strikes while studying institutional grey documents of the period 2010-2019 is that there is little mention of a strong conflict with inhabitants. It is on the contrary very evident in the research interviews and in the press. In the project presentations during these meetings, there is no mention of the idea of relocating residences. This fear is formulated once, in the record of the discussions, in the section dedicated to “other comments about the project”, reporting the words of a resident: *“When will you be honest enough to reveal the plan to demolish the houses? I bought on the seafront, not to go to the Moulinet”* (SMBSGLP, 2019, Bilan de concertation, Annexes II, partie 3. 31 octobre 2014).

It seems that the record of the consultation process chooses to forget the social conflict. The activism of Ault Environment is motivated by the resident's feeling of not being considered or consulted during the formulation of the project, when defining a public measure that will affect them. The way the project was publicly announced (an article in the local press) exacerbated this sense of injustice. Difficulties in accessing the expert reports on which the project was based also played a role.

We made a complaint to the CADA (Commission for Access to Administrative Documents), then to the administrative court, then um... Well, the administrative court gave formal notice to the local authority to provide us with the documents. First the local authority refused, so the administrative court sent a reminder... [...] So all this took a year, a year and a half... [...] To obtain the basic document, the study which had served as a basis for the decision-makers... [...] So the... The political question of

³⁴ The Cise, Noevember 2022

³⁵ Bilan de concertation 2011-2019.

transparency in the... Not to mention democracy and... and consultation or co-construction, because that's fashionable now. (Interview, Ault Environment, April 2022).

During the empirical fieldwork, there was a consensus - among institutional actors - about mistakes made in the past concerning the relocation project in 2013. Many of the institutional stakeholders mentioned above are distancing themselves from the latter. They acknowledge the mistakes in terms of communication strategy and in terms of how to address the resident's situation. They point out as well the lack of social approach at the time to deal with this issue. In this matter, we are currently witnessing a semantic shift. The term of resilience is widely preferred rather than relocalisation.

Knowledge and capacity building on social inequalities (RQ3)

When analysing the legal tools implemented to assess the Natural Risk Management in Ault, it is possible to point out the evolution in knowledge to deal with erosion.

Knowledge on Flood Risk Management

There is clearly an **evolution between the methodology implemented in PPRN of 2001 and 2015, and the new Climate Resilience Law**. The latter is not based on projected erosion, but on the erosion actually observed. The actions implemented today to reduce risk erosion also reflect a change on the knowledge. Before 2010, public actors focus on the implementation of engineering measures to fight the sea. **The sea was the main cause of risk**. Today the objective is to reduce erosion by reducing run-off and by regulating urbanisation. **The approach is looking at the planning and economic activities**.

The question of how inequalities will be considered remains unanswered. As the relocalisation project is no longer promoted, the question of how it will be handled when risk will be imminent remains postponed. Actors are hoping that the new Climate Resilience Law will introduce new elements in this matter.

A plurality of lay knowledge

In terms of lay knowledge, we can mention Ault Environment's capacity to structure and articulate different knowledges about the cliff. The association can build some knowledge about the cliff to even discuss experts' sayings about erosion. Now, this lay knowledge does not exclude expert knowledge. The association integrates expert reports in its productions, in particular those that underline the effect of urban and rural runoff on erosion. Moreover, through its productions, Ault environment articulates this kind of knowledge to other kind of knowledge such as knowledge in history, in heritage, folk knowledge (coming from fishers), or artistic knowledge. This can be observed in the audio route or in the travelling exposition they conceived.

The objective of this pluralisation of knowledge is to present the cliff not only through the question of risk, but as structuring element in the landscape in terms of aesthetics and heritage. This broadening of the debate meets one of the objectives of its democratisation:

We wanted to retrace the whole history of the constitution of the cliff, of the sea level which descends and rises, [...] of the cliff which erodes and the human history of Ault, to say to ourselves: let's understand the evolution of the history of this place in order to take part in the debate which, we hope, will take place in a democratic way in the future [...] So the history of Ault is the history of the cliffs, it's also the history of the rise and fall of the sea level, and the history of the future is, with global warming, the sea level rise by approximately 20 metres... (Exposition, Ault environment, April 2022)

Moreover, during interviews we could identify that inhabitants mobilise an empirical knowledge about the risk erosion based on their sensitive experience : by their observations, their everyday walking, they witness if the cliff has moved or not. Some of them even measure the erosion from their garden. Based in this sensitive experience, they take distance from the expert's projections about erosion, in particular the one that appears in the 2015 PPR, affirming that the chalk cliff is retreating at a rate of 10 to 70 cm per year:

If it was 70 cm per year, the beach would be white with limestone [...] In a meeting at the town hall, I went mad, when they started talking about the 70 cm rate. I said: "But have you already been there? I have lived here for 10 years now, that would mean 7 meters" [...] Even as an average, it is not credible, because if it hasn't changed here, that would mean that in some places the cliff would have retreated 100 metres. In no place has the coastline retreated by 100 metres. (Interview, Shopkeeper, November 2022).

Conclusion

The case of Ault provides lessons on the urgent need to involve citizens in climate change adaptation policies, especially when the action is as radical as relocalisation can be. The project also provides important elements on the complex interactions and circulations between expert and lay knowledge. If Ault Environment was an actor of opposition for many years, it has also become an actor of cooperation with the community.

By comparing the two case studies, we can draw attention to the institutional arrangements put in place to carry out relocation or de-urbanisation projects, and to the relationship between residents and this type of institutional solution.

The development projects analysed in this report are not at the same stage of completion. Similarly, the populations involved in each case study do not have the same sociological profile. Consequently, the resources

mobilised to deal with these transformations are not the same in each case, which certainly influences the final form of the projects analysed. In both cases, however, the challenges point to the same shortcomings in the way we think about the social and symbolic implications of relocations.

Finally, both cases confirm that the political framing of climate issues cannot be limited to a technical formulation of risk, understood here as a situation of potential danger. Nor can it be framed solely in terms of monetary compensation. These perspectives often frame the political view of compensation and the way in which challenges are framed exclusively in monetary and procedural terms. The two cases show that what is at stake are symbolic attachments to places and ways of life. Tables 8 and 9 summarise the two stories.

Tables summarising the comparison on the two case study

Table 8. Comparative table of the two cases studies

	AULT	BLOIS
Temporality (both are pilotes)	2010 - today	2003 - today
Actions to deal with risk	Withdrawal strategy, relocation, Revitalisation	De-urbanization (accomplished) Redevelopment of de-urbanised land, landscape project (2021)
State devises	Barrier Fund (possible?) Climat and Resilience Law	Barrier Fund for the de-urbanization process
Any social impact assessments carried out?	No	Yes (2000)
Vulnerability	As exposition and fragility of property and people	As exposition and fragility of property and people
Participation	Source of conflict. Inhabitants do not feel they were part of any participation process	Source of conflict. Inhabitants do not feel they were part of any participation process
Mobilisation of residents against the project	Yes	Yes

Table 9. Comparative table on the two mobilisations

	AULT	BLOIS
Those who mobilise (characteristics, resources)	<ul style="list-style-type: none"> • Retirees, artists, qualified professions (teachers, public finance inspector) • Activist pathways, • Property defence kit, counter-assessment, information dissemination, audio-visual support, heritage enhancement • Property titles 	<ul style="list-style-type: none"> • Low-income, elderly people with long-standing ties to the area • Lack of social resources, neo-militants • Counter-expertise and strategies of contestation through nuisance • Some informality
Did the mobilisation have an impact beyond the population directly concerned?	Yes (new Mayor is an old member of the association)	No

Notion of risk mobilised by inhabitants	Aware of the risk at the time of purchase Dedramatisation of risk/counter-expertise	Many did not know Dedramatisation of risk/counter-expertise
Reasons to mobilise	Lack of consultation/transparency process Lack of access to technical information on which the project is based (reports)	Lack of consultation process Lack of transparency Low prices offered in the ZAD Feeling of lack of recognition

References

- Adger, W.Neil. 2001. 'Scales of Governance and Environmental Justice for Adaptation and Mitigation of Climate Change'. *Journal of International Development* 13 (7): 921–31. <https://doi.org/10.1002/jid.833>.
- Agence Urbanités. 2017. 'Plan Local d'Urbanisme. Rapport de Présentation'. Ault: Mairie de Ault.
- Andre, Gilles, and Romain Marteau, eds. 2022. *Livre Blanc Covéa, Changement Climatique et Assurance. Quelles Conséquences Sur La Sinistralité à l'horizon 2050 ?* Covéa et RiskWeatherTech.
- Andrieu, Dominique, and Laurent Nowik. 2011. 'La Dynamique Du Peuplement Dans Le Centre-Ouest de La France: Quel Rôle Joue Encore La Loire ?' *Espace Populations Sociétés*, no. 2011/3 (December): 603–16. <https://doi.org/10.4000/eps.4735>.
- Arnauld de Sartre, Xavier, Vincent Baggioni, and Christine Bouisset. 2021. 'Dossier « Politiques Locales de l'énergie : Un Renouveau Sous Contraintes » – Potentialité et Réalisations Des Politiques Climatiques Locales : Vers l'institutionnalisation Des Plans Climat Territoriaux Dans Les Villes Moyennes Françaises'. *Natures Sciences Sociétés* 29 (1): 23–35. <https://doi.org/10.1051/nss/2021028>.
- Arnstein, Sherry. 1969. 'A Ladder of Citizen Participation'. *Journal of the American Planning Association* 35: 216–24.
- Baeckelandt, Simon. 2022. 'La Convention Citoyenne Pour Le Climat, Théâtre d'affrontements Entre Groupes d'intérêt'. *Métropolitiques*. <https://metropolitiques.eu/La-Convention-citoyenne-pour-le-climat-theatre-d-affrontements-entre-groupes-d.html>.
- Bawedin, Vincent. 2013. *Baie de Somme: Des Falaises d'Ault Au Marquenterre, Actes de l'atelier EUCC-France 18-19 Octobre 2013*. France: Réseau Européen des Littoraux.
- Bayet, Cyril. 2005. 'Riverains Inondables et Défenseurs de l'environnement - Mobilisations et Contestations Associatives Dans Le Domaine de La Prévention Des Inondations'. Ministère de l'Ecologie et du Développement durable.
- Beaud, Stéphane, and Florence Weber. 2003. *Guide de l'enquête de terrain: produire et analyser des données ethnographiques*. Nouv. ed. Guides grands repères. Paris: Ed. Découverte.
- Begg, Chloe. 2018. 'Power, Responsibility and Justice: A Review of Local Stakeholder Participation in European Flood Risk Management'. *Local Environment* 23 (4): 383–97.
- Bidou, Dominique, Georges Crepey, Wanda Diebolt, and Annick Helias. 2005. 'Les Inégalités Écologiques En Milieu Urbain'. IGE/04/022. Conseil General des Ponts et Chaussées, Inspection Générale de l'Environnement, Ministère de l'Ecologie et du Développement Durable.
- Blatrix, Cécile. 1999. 'Le Maire, Le Commissaire Enquêteur et Leur "public. La Pratique Politique de l'enquête Publique'. In *La Démocratie Locale. Représentation, Participation, Espace Public*, by CURAPP/CRAPS, 161–76. Presses Universitaires de France.
- Blondiaux, Loïc, and Yves Sintomer. 2002. 'L'impératif délibératif'. *Politix* 15 (57): 17–35. <https://doi.org/10.3406/polix.2002.1205>.
- Bobbio, Luigi, and Patrice Melé. 2015. 'Introduction. Les relations paradoxales entre conflit et participation'. *Participations* 13 (3): 7–33. <https://doi.org/10.3917/parti.013.0007>.
- Bobo, Lawrence D. 2006. 'Katrina: Unmasking Race, Poverty, and Politics in the 21st Century'. *Social Science Research on Race* 3 (1): 1–6. <https://doi.org/10.1017/S1742058X06060012>.
- Bryman, Alan. 2016. *Social Research Methods*. Fifth Edition. Oxford ; New York: Oxford University Press.
- Byskov, Morten Fibieger, Keith Hyams, Poshendra Satyal, Isabelle Anguelovski, Lisa Benjamin, Sophie Blackburn, Maud Borie, et al. 2021. 'An Agenda for Ethics and Justice in Adaptation to Climate Change'. *Climate and Development* 13 (1): 1–9. <https://doi.org/10.1080/17565529.2019.1700774>.
- CCR. 2020. *La Prévention Des Catastrophes Naturelles Par Le Fonds de Prévention Des Risques Naturels Majeurs, Bilan 1995-2019 France*. Caisse Centrale de Réassurances, Direction des Réassurances et Fonds Publics.
- . 2021. *Les Catastrophes Naturelles En France, Bilan 1982-2020*. Caisse Centrale de Réassurances, Direction des Réassurances et Fonds Publics.
- Cepri. 2008. 'Les PAPI 6 Ans Après Leur Démarrage'. Centre européen de prévention du risque d'inondation.
- CEPRI. 2023. *La Récomposition Spatiale et l'intégration Du Risque Dans l'aménagement*. Fiches-Projets. Orléans: Centre européen de prévention du risque d'inondation.
- Cerema. 2016. *Évènement Des 3 et 4 Octobre 2015 Dans Les Alpes Maritimes Retour d'expérience « dommages »*. Direction Territoriale Méditerranée du Cerema.

- CGDD. 2020. *Agissons Pour Un Monde plus Durable et Solidaire : Les Acteurs Français s'engagent Pour La Mise En Oeuvre Des ODD*. Délégation à l'information et La Communication, Commissariat Général Au Développement Durable.
- Chailleux, Sébastien, and Renaud Hourcade. 2021. 'Dossier « Politiques Locales de l'énergie : Un Renouveau Sous Contraintes » – Introduction. Politiques Locales de l'énergie : Un Renouveau Sous Contraintes'. *Natures Sciences Sociétés* 29 (1): 3–12. <https://doi.org/10.1051/nss/2021018>.
- Compagnon, Daniel. 2022. 'L'instrument de Marché CORSIA: Un Compromis Politique Pour « climatiser » Un Secteur Aérien International Réticent'. *Gouvernement et Action Publique* VOL. 11 (3): 33–53. <https://doi.org/10.3917/gap.223.0033>.
- DDTM 80. 2001. 'Plan de Prévention Des Risques Aturels Falaises Picardes, Note de Présentation'. Somme: DDTM 80.
- . 2015. 'Plan de Prévention Des Risques Aturels Falaises Picardes, Note de Présentation'. Somme: DDTM 80.
- DGPR. 2014. *Stratégie Nationale de Gestion de Risque Inondation*. Direction générale de prévention des risques, Ministère de l'Écologie, du Développement durable et de l'Énergie.
- . 2017. 'Rapport Du Délégué Aux Risques Majeurs 2015-2017'. Direction générale de la prévention des risques, Ministère de la Transition Ecologique et Solidaire.
- Dion, Roger. 1934. 'Le Val de Loire : Étude de Géographie Régionale'. Doctorat en Géographie, Paris: Université de Paris.
- Doussin, Nicolas. 2009. 'Mise En Œuvre Locale d'une Stratégie Globale de Prévention Du Risque d'inondation : Le Cas de La Loire Moyenne'. Doctorat en Géographie, Paris: Université de Cergy-Pontoise.
- DREAL. 2018. *Évaluation Préliminaire Des Risques d'inondation Du Bassin Loire-Bretagne, Addendum 2ème Cycle*. Direction régionale de l'environnement, de l'aménagement et du logement du Centre Val-de-Loire.
- DREAL Centre Val de Loire. 2016. *Plan de Gestion Des Risques d'inondation Du Bassin Loire-Bretagne 2016 – 2021*. Direction régionale de l'environnement, de l'aménagement et du logement du Centre Val-de-Loire.
- DREAL Picardie. 2015. 'Les Logements Vacants En Picardie En 2013'. *Les Dossiers de La Direction Régionale de l'environnement, de l'aménagement et Du Logement de Picardie*, 2015.
- Drobenko, Bernard. 2010. 'Directive Inondation : La Prévention Impérative'. *Revue Juridique de l'environnement* 35 (1): 25–35.
- Duchêne, François, and Christelle Morel Journel. 2000. 'Riverains de Cours d'eau et Gestionnaires Du Risque, Un Dialogue Impossible ?' *Géocarrefour*, 2000.
- Dumat, Camille, Liliane Sochacki, and Muhammad Shahid. 2018. 'Les Projets d'agricultures Urbaines: Des Vecteurs de Transitions: Introduction'. *Vertigo*, no. Hors-série 31 (September). <https://doi.org/10.4000/vertigo.20986>.
- Estève, Adrien. 2022. 'Intégrer Les Enjeux Climatiques Dans Le Secteur de La Défense En France: La Climatisation Comme Changement Graduel de l'action Publique'. *Gouvernement et Action Publique* VOL. 11 (3): 55–73. <https://doi.org/10.3917/gap.223.0055>.
- FFA. 2019. 'Les Inondations Qui Ont Touché Le Sud-Est de La France En Novembre et En Décembre Ont Occasionné Des Sinistres Pour Un Coût Total Estimé à 390 Millions d'euros'. *Communiqué de Presse*, 2019, Fédération Française de l'assurance edition.
- . 2020. 'Inondations Dans Les Alpes-Maritimes 14 000 Sinistres Estimés Pour Un Coût Évalué à 210 Millions d'euros'. *Communiqué de Presse*, 2020, Fédération française d'assurance edition.
- Fournier, Marie. 2010. 'Le Riverain Introuvable! La Gestion Du Risque d'inondation Au Défi d'une Mise En Perspective Diachronique Une Analyse Menée à Partir de l'exemple de La Loire'. Doctorat en aménagement, Tours: Université François Rabelais.
- Graber, Frédéric. 2016. 'Enquêtes publiques, 1820-1830. Définir l'utilité publique pour justifier le sacrifice dans un monde de projets'. *Revue d'histoire moderne et contemporaine* 63–3 (3): 31. <https://doi.org/10.3917/rhmc.633.0031>.
- Guillier, Flora. 2017. 'Évaluation de La Vulnérabilité Aux Inondations: Méthode Expérimentale Appliquée Aux Programmes d'Action de Prévention Des Inondations'. Doctorat en aménagement, Université Paris-Est.
- Hassenforder, Emeline, Anne Pressurot, Nils Ferrand, Melaine Aucante, and Nathalie Sureau-Blanchet. 2020. *Quelle Stratégie Participative Pour La Gestion Locale de l'eau Avec Les Citoyens? Retours d'expérience et Questions à Se Poser*.

- Hegger, Dries L. T., Peter P. J. Driessen, Carel Dieperink, Mark Wiering, G. T. Tom Raadgever, and Helena F. M. W. Van Rijswijk. 2014. 'Assessing Stability and Dynamics in Flood Risk Governance: An Empirically Illustrated Research Approach'. *Water Resources Management* 28 (12): 4127–42. <https://doi.org/10.1007/s11269-014-0732-x>.
- Hoeblich, Jeanne. 2013. 'La Falaise d'Ault-Onival: Observations'. In *Baie de Somme: Des Falaises d'Ault Au Marquenterre, Actes de l'atelier EUCC-France 18-19 Octobre 2013*, by Vincent Bawedin, 22–25. France: Réseau Européen des Littoraux.
- Hrabanski, Marie, and Yves Montouroy. 2022. 'Les « climatisations » Différenciées de l'action Publique: Normaliser l'étude Du Problème « changement Climatique »'. *Gouvernement et Action Publique* VOL. 11 (3): 9–31. <https://doi.org/10.3917/gap.223.0009>.
- INterland. 2012. 'Etude Stratégique Du Développement Communal et de Gestion Durable de l'érosion Côtière - Lot 2. Rapport Final'. Paris.
- IPCC. 2022. 'Climate Change 2022: Impacts, Adaptation, and Vulnerability'. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Lösschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press.
- . 2023. *Synthesis Report of the IPCC Sixth Assessment Report*. https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf.
- Johnson, C, S Tunstall, S Priest, S McCarthy, and EC Penning-Rowsell. 2008. 'Social Justice in the Context of Flood and Coastal Erosion Risk Management: A Review of Policy and Practice'. *Defra, London*.
- Johnson, Clare L, Sylvia M Tunstall, and Edmund C Penning-Rowsell. 2005. 'Floods as Catalysts for Policy Change: Historical Lessons from England and Wales'. *Water Resources Development* 21 (4): 561–75.
- Jouzel, Jean, and Agnès Michelot. 2016. *La justice climatique: enjeux et perspectives pour la France mandature 2015-2020, séance du 27 septembre 2016*. Paris: Journaux officiels.
- Laigle, L, and M Tual. 2007. 'Conceptions Des Inégalités Écologiques Dans Cinq Pays Européens: Quelle Place Dans Les Politiques de Développement Urbain Durable?' *Développement Durable et Territoires*, 2007. <http://journals.openedition.org/developpementdurable/4262>.
- Lang, Thierry. 2015. 'Inégalités Sociales de Santé': In *Dictionnaire Critique de l'expertise*, 187–94. Presses de Sciences Po. <https://doi.org/10.3917/scpo.henry.2015.01.0187>.
- Larrue, Corinne, Silvia Bruzzone, Lisa Lévy, Mathilde Gralepois, Thomas Schellenberger, Jean Baptiste Tremorin, Marie Fournier, Corinne Manson, and Thomas Thuilier. 2016. *Analysing and Evaluating Flood Risk Governance in France: From State Policy to Local Strategies*. Tours, France: STAR-FLOOD Consortium.
- Ledoux, Bruno. 2006. *La gestion du risque inondation*. Paris Londres New York: Éd. Tec & doc.
- Leenhardt, Delphine, Marc Voltz, and Olivier Barreteau, eds. 2020. *L'eau En Milieu Agricole: Outils et Méthodes Pour Une Gestion Intégrée et Territoriale*. Collection Synthèses. Versailles: Éditions Quae.
- Lioubimtseva, Elena, and Charlotte Da Cunha. 2020. 'Local Climate Change Adaptation Plans in the US and France: Comparison and Lessons Learned in 2007-2017'. *Urban Climate* 31 (March): 100577. <https://doi.org/10.1016/j.uclim.2019.100577>.
- Mairie de Ault. 2010. 'Réglement de Consultation. Développement Communal et Gestion de l'érosion Côtière'. Syndicat Mixte Baie de Somme-Grand Littoral Piccard.
- Massé, Simon, Thomas Buffin-Bélangier, Pascale Biron, and Julie Ruiz. 2019. 'La Portée et Les Limites Des Approches Participatives Pour La Gestion Intégrée Des Inondations'. *Revue Des Sciences de l'eau* 31 (4): 341–62. <https://doi.org/10.7202/1055593ar>.
- Massey, Eric, Robbert Biesbroek, Dave Huitema, and Andy Jordan. 2014. 'Climate Policy Innovation: The Adoption and Diffusion of Adaptation Policies across Europe'. *Global Environmental Change* 29 (November): 434–43. <https://doi.org/10.1016/j.gloenvcha.2014.09.002>.
- Mazzotta, Matthew. 2022. *SOLARIS-ART: Engaging with Solidarities in Flood Risk Management Through Community Art (Artist and Community Engagement On Site: Aug 11-31 2022)*.
- MDEM, Cerema, and Cepri. 2018. *Référentiel National de Vulnérabilité Aux Inondations*. Ministère de l'environnement, de l'énergie et de la mer.
- MEDDE. 2012a. 'Appel à Projets 2012. Expérimentation de La Relocalisation Des Activités et Des Biens: Recomposition Spatiale Des Territoires Menacés Par Les Risques Littoraux'. Stratégie Nationale de Gestion Intégrée du trait de côte, Ministère de l'Ecologie, du Développement Durable et de l'énergie.

- . 2012b. *Première Évaluation Nationale Des Risques d'inondation. Principaux Résultats - EPRI 2011*. Ministère de l'Écologie, du Développement durable et de l'Énergie.
- . 2013a. 'Plans de Gestion Des Risques d'Inondation à l'échelle Du District : Des TRI Aux Stratégies Locales. Premiers Éléments de Cadrage'. Direction Générale de la Prévention des Risques Service des Risques Naturels et Hydrauliques Bureau des Risques Météorologiques, Ministère de l'Écologie, du Développement durable et de l'Énergie.
- . 2013b. *Vers La Relocalisation Des Activités et Des Biens. 5 Territoires En Expérimentation. Séminaire National de Lancement Du 14 Février 2013*. Ministère de l'Écologie, du Développement durable et de l'Énergie.
- MEDDTL. 2011. *Plan National d'Adaptation Au Changement Climatique*. Ministère de l'écologie, du développement durable, des Transports et du Logement.
- MEEM. 2017. *Stratégie Nationale de Gestion Intégrée Du Trait de Côte, Programme d'actions 2017-2019*. Ministère de l'Environnement, de l'énergie et de la mer.
- Mees, Hannelore, Meghan Alexander, Mathilde Gralepois, Piotr Matczak, and Heleen Mees. 2018. 'Typologies of Citizen Co-Production in Flood Risk Governance'. *Environmental Science & Policy* 89: 330–39. <https://doi.org/10.1016/j.envsci.2018.08.011>.
- Mercier, Denis, and Céline Chadenas. 2012. 'La Tempête Xynthia et La Cartographie Des « zones Noires » Sur Le Littoral Français : Analyse Critique à Partir de l'exemple de La Faute-Sur-Mer (Vendée)'. *Norois*, no. 222 (February): 45–60. <https://doi.org/10.4000/norois.3895>.
- Metzger, Alexis, Franck David, Philippe Valette, Sylvain Rode, Brice Martin, Jérémy Desarthe, and Jamie Linton. 2018. 'Entretenir La Mémoire Des Inondations via Les Repères de Crue ?' *Développement Durable et Territoires*, no. Vol. 9, n°3 (November). <https://doi.org/10.4000/developpementdurable.12937>.
- Mineo-Kleiner, Lucile. 2017. 'L'option de La Relocalisation Des Activités et Des Biens Face Aux Risques Côtiers : Stratégies et Enjeux Territoriaux En France et Au Québec'. Thèse de doctorat en géographie, Brest: Universitéde Bretagne occidentale.
- Montouroy, Yves, Océane Biabiany, and Gilles Massardier. 2022. 'La Mise En Œuvre Locale Des Instruments Comme Vecteur de Déclimatisation Des Politiques Publiques: Le Cas de La Politique Agricole et de La Filière Banane En Guadeloupe'. *Gouvernement et Action Publique* VOL. 11 (3): 127–52. <https://doi.org/10.3917/gap.223.0127>.
- MTES. 2018a. *Deuxième Plan National d'Adaptation Au Changement Climatique*. Ministère de la transition écologique et solidaire.
- . 2018b. *Fiche Recommandation Adaptation et Préservation Des Milieux*. Concertation Du Deuxième Plan National d'Adaptation Au Changement Climatique. Ministère de la transition écologique et solidaire.
- . 2018c. *Fiche Recommandation Prévention et Résilience*. Concertation Du Deuxième Plan National d'Adaptation Au Changement Climatique. Ministère de la transition écologique et solidaire.
- . 2021. *Cahiers Des Charges PAPI 3 2021*. Ministère de la transition écologique et solidaire.
- ONERC. 2004. *Êtes---vous Prêt ? Guide Pour l'adaptation à l'attention Des Collectivités Locales*. Observatoire National du réchauffement climatique.
- . 2005. 'Un Climat à La Dérive : Comment s'adapter ? Rapport de l'ORNEC Au Premier Ministre et Au Parlement'. Observatoire National du Réchauffement climatique, La Documentation Française.
- . 2007. *Stratégie Nationale d'Adaptation Au Changement Climatique (2006)*. Observatoire National du réchauffement climatique, ministère de l'Écologie du développement durable et de l'aménagement durables: La Documentation française.
- Owen, Gigi. 2020. 'What Makes Climate Change Adaptation Effective? A Systematic Review of the Literature'. *Global Environmental Change* 62 (May): 102071. <https://doi.org/10.1016/j.gloenvcha.2020.102071>.
- Palier, Bruno. 2006. 'Chapitre 5 : Un Long Adieu à Bismarck ? : Les Évolutions de La Protection Sociale'. In *La France En Mutation. 1980-2005*, 197–228. Presses de Sciences Po. <https://doi.org/10.3917/scpo.culpe.2006.01.0197>.
- Pech, Thierry, and Clara Pisani-Ferry. 2020. *Convention Citoyenne Pour Le Climat : Quelques Enseignements Pour l'avenir*. Terranova, le think-thank progressiste.
- Pilote 41. 2014. 'Les Chiffres Clés de l'arrondissement de Blois'. *Les Chiffres de l'observatoire* 128: 12.
- Reckien, D., J. Flacke, R. J. Dawson, O. Heidrich, M. Olazabal, A. Foley, J. J.-P. Hamann, et al. 2014. 'Climate Change Response in Europe: What's the Reality? Analysis of Adaptation and Mitigation Plans from 200 Urban Areas in 11 Countries'. *Climatic Change* 122 (1): 331–40. <https://doi.org/10.1007/s10584-013-0989-8>.

- Reliant, Claire, and Gilles Hubert. 2004. *Politique de Prévention Des Risques d'inondation et Expertises Socio-Économiques : Exemple de l'Angleterre (Rapport Final)*. Programme de recherche 'Risque Inondation 2', Ministère de l'Écologie et du développement durable - Centre d'Enseignement et de Recherche Eau Villes Environnement (CEREVE).
- Richard, Elsa. 2013. 'L'adaptation Au Changement Climatique, Nouveau Critère de Développement Durable Des Territoires'. In *La Mise En Œuvre Du Développement Territorial Durable : Déclinaisons Franco-Roumaines*, by Jean-Paul Carrière, Christophe Demazière, Rodica Petrea, and Luminita Filimon, 231–52. L'Harmattan.
- Rieu, Guillaume. 2022. 'La « climatisation » Limitée et Différenciée Des Politiques Locales de Gestion Du Risque de Submersion Marine En Charente-Maritime': *Gouvernement et Action Publique* VOL. 11 (3): 75–98. <https://doi.org/10.3917/gap.223.0075>.
- Rode, Sylvain. 2014. 'Chapitre 1. Une Zone d'Aménagement Différé pour rétablir un champ d'expansion des crues'. In *Urbanisme et inondation : outils de réconciliation et de valorisation*, edited by Helga-Jane Scarwell, Guillaume Schmitt, and Pierre-Gil Salvador, 127–48. Presses universitaires du Septentrion. <https://doi.org/10.4000/books.septentrion.17411>.
- Rousselon, Julien, and Mathilde Viennot. 2020. 'Inégalités Primaires, Redistribution : Comment La France Se Situe En Europe': *La Note d'analyse n° 97* (7): 1–16. <https://doi.org/10.3917/lna.097.0001>.
- Rudolf, Florence. 2016. *Les villes à la croisée des stratégies globales et locales des enjeux climatiques*. Sociologie contemporaine. Paris] [Québec (Canada): Hermann Presses de l'Université Laval.
- Sajaloli, Bertrand, and Sylvain Dournel. 2007. 'D'un Orléans, l'autre : Étalement Urbain et Risque d'inondation En Val de Loire'. In *Actes de Colloque 'Étalement Urbain et Ville Fragmentée à Travers Le Monde'*, 129–39. Orléans.
- Servain-Courant, Sylvie. 2014. 'Chapitre 4. L'aménagement des villes et la gestion des risques d'inondation post 1950. L'exemple de la Loire'. In *Urbanisme et inondation : outils de réconciliation et de valorisation*, edited by Helga-Jane Scarwell, Guillaume Schmitt, and Pierre-Gil Salvador, 95–124. Presses universitaires du Septentrion. <https://doi.org/10.4000/books.septentrion.17447>.
- SMBSGLP, and ARTELIA Eau et Environnement. 2015. 'Programme d'Actions de Prevention Contre Les Inondations (PAPI) Bresle Somme Authie. Document Principal Du Dossier PAPI Complet Vg'. 8420078. Syndicat Mixte Baie de Somme - Grand Littoral Picard.
- Sogreah-Antea. 2011. 'Lot 1 : Pre-Diagnostic Des Ouvrages Maritimes de Défense Contre La Mer. Phase 1 – Recensement et Analyse Précis a Partir Des Documents Existants'. 171 3089 R1.
- Thaler, Thomas, Sven Fuchs, Sally Priest, and Neelke Doom. 2018. 'Social Justice in the Context of Adaptation to Climate Change—Reflecting on Different Policy Approaches to Distribute and Allocate Flood Risk Management'. *Regional Environmental Change* 18 (2): 305–9. <https://doi.org/10.1007/s10113-017-1272-8>.
- Théret, Bruno. 1991. 'Néo-Libéralisme, Inégalités Sociales et Politiques Fiscales de Droite et de Gauche Dans La France Des Années 1980: Identité et Différences, Pratiques et Doctrines'. *Revue Française de Science Politique* 41 (3): 342–81.
- Tradowsky, Jordis S., Sjoukje Y. Philip, Frank Kreienkamp, Sarah F. Kew, Philip Lorenz, Julie Arrighi, Thomas Bettmann, et al. 2023. 'Attribution of the Heavy Rainfall Events Leading to Severe Flooding in Western Europe during July 2021'. *Climatic Change* 176 (7): 90. <https://doi.org/10.1007/s10584-023-03502-7>.
- Veyret-Medkjian, Yvette, Gérald Garry, and Nancy Meschiné de Richemond. 2004. *Risques naturels et aménagement en Europe: [actes] du colloque, Grande Arche de la Défense, [Paris], 22-24 octobre 2002*. Paris: A. Colin.
- Vodoz, Luc, Laurent Thevoz, and Barbara Pfister. 2008. 'Processus Participatifs de Décision Au Service Du Développement Territorial: Conditions D'engagement et Implications Pour Les Médiateurs Environnementaux'. In *Territoires de Conflits. Analyses Des Mutations de l'occupation de l'espace*, by Thierry Kirat and André Torre. Paris: L'Harmattan.
- Walker, Gordon, and Kate Burningham. 2011. 'Flood Risk, Vulnerability and Environmental Justice: Evidence and Evaluation of Inequality in a UK Context'. *Critical Social Policy* 31 (2): 216–40. <https://doi.org/10.1177/0261018310396149>.

Annexe



Source : Agencede l'eau Artois-Picardie (<https://www.eau-artois-picardie.fr/file/3351> [consulted on april 2023])

Partners

