



Original paper

Involving public private partnerships as building blocks for integrated natural catastrophes country risk management - Sharing on the French national experiences of economic instruments integrated with information and knowledge management tools

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Abstract As a practitioner's testimony, this paper aims first at providing scientists with keys to expand their study horizons towards the "real life" spectrum of Integrated Disaster Risk Management (IDRiM). This means to investigate how IDRiM expands from the various structural and non structural measures, to be taken at all risk governance levels, from local to global and vice versa, according to regulatory and/or recommendation frameworks. It offers especially to explore the specific features and added values of public private partnerships (PPPs) or Public Public Partnerships (PuP²), through involvement of the insurance sector, as catalysts for integration, for main issues such as the risk financing/sharing and the risk information/data collecting and sharing ones.

This objective is mainly carried out by the means of the presentation of a country case study: the Natural Catastrophe (NatCat) IDRiM scheme progressively implemented in France during the last three decades. After a short profiling of the French disaster experience and Disaster Risk Reduction (DRR) policy progress, three main building blocks of this IDRiM policy framework are considered through their common feature of involving the national insurance industry in such schemes: risk transfer scheme coupled with DRR policy provisions, tax collected on the insurance cover and acting as the main DRR national policy financing scheme, risk data sharing platform as an Information and Knowledge Management System (IKMS), to support participative governance.

The reasons and drivers for the involvement of the insurance industry, as a main partner to each of these building blocks of the now integrated public DRR policy framework, are investigated and put in the broader perspective of relevant recent recommendations issued at international and European Union (EU) levels. Particular emphasis is drawn on the third most recent building block, acting as a powerful catalyzer for complete integration and more participative governance, from national to local levels. A concrete example of using indicators at the level of a French region is provided. Comparable situations

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² Although PuPs may involve civil society and private partners, as long as they are aimed at general interest objectives, i.e. without profit seeking activities

about the existence of these three building blocks in other countries, separately or combined, are briefly commented.

Key words Integrated Natural Risk Management; French Country experience; Risk Transfer; Information and Knowledge Management; Public Private Partnership

1. INTRODUCTION

The paper is not a research paper, but a practitioner's testimony based on an interdisciplinary professional experience and empirical findings, at international, European, national and local levels.

The purpose is to provide academics and young scientists with keys for:

- 1) Expanding the scope of their studies towards the “real life” spectrum of Integrated Disaster Risk Management (IDRiM):
 - a. At the different risk governance levels, from local to global and vice versa, involving regulatory and/or recommendation frameworks and subsidiarity effects,
 - b. Throughout the interactions between main dual issues of IDRiM such as the risk financing/sharing on one side and the risk data collecting and sharing on the other side: Who pays for what? What economic instruments are involved, from market to fiscal ones, and how do they complement? How can a risk data sharing agreement emerge from such a complex situation?
- 2) Exploring the specific features and added values of Public Private Partnerships (PPP) and especially the involvement of the insurance sector, as catalysts for integration in Natural Catastrophes (NatCat) IDRiM: what are the PPP buildings blocks in which the private insurance sector may be involved, in addition to its financial services core activity for the purpose of risk transfer? Incentive to risk reduction? Fund raising for public risk reduction policy? Risk data sharing arrangements?

This objective is mainly carried out by the means of a country case study: the NatCat IDRiM scheme progressively implemented in France during the three last decades.

France is a medium sized developed country located in South-western Europe, and a member of the European Union, with a rather low to medium natural risk profile. In spite of a long tradition of risk management policies implementation, France still experiences disasters.

Winter storms Lothar and Martin in 1999, resulted in more than 100 fatalities and more than 15 billion euros economic losses, out of which 12 billion insured losses. More recently in 2010, after the Xynthia event in February (storm surge and windstorm) and the Var area floods in June, the country numbered 80 fatalities and 4 billion euros economic losses, out of which 2.2 billion insured losses. Again in January 2014, the Var area experienced fatalities and losses from floods, challenging once more French Disaster Risk Reduction (DRR) policies. Besides these few extreme events, in the last three decades, the French society experienced in most regions many small but damaging events and a significant number of medium events, with higher economic and sometimes human impact.

As far as the economic impacts are concerned, the policy answer implemented was influenced by competing constraints of solidarity principles and budgetary limitations, in the context of deepening economic crisis. Therefore the answer arose in designing appropriate PPP schemes. The private insurance industry acts as the State's main partner, in order to implement progressively some of the core building blocks of an integrated risk management policy. The three building blocks of French NatCat IDRiM Policy which involve the insurance industry are the following, in their chronological order of appearance:

- (i) a national risk transfer scheme, linked to the national risk reduction policy, since a law passed in

1982,

(ii) a national financing scheme aimed at partly subsidizing the State contributions to risk reduction policy measures, which resources are collected by the means of the national risk transfer scheme, since a law enacted in 1995,

(iii) a National Observatory for Natural Risks (*Observatoire National des Risques Naturels*, ONRN), launched in 2012, as a partnership between the French government, the State owned reinsurer of French NatCat risk transfer system, *Caisse Centrale de Réassurance* (CCR) and the French insurance industry, aiming at supporting all stakeholders decision making, in particular national and regional participative governance instances.

Hence the following outline for this paper:

- To comment briefly on some indicators about the country's risk profile, its loss record experience in the recent past and on the progress in its disaster reduction policy (§ 2),
- To describe the three PPP building blocks of the French natural IDRiM policy, to analyze their respective drivers of implementation, in the context of the relevant drivers currently promoted at the international and European Union cooperation levels (§ 3),
- To explore an example at the regional level of the integrated application of these PPP building blocks, through indicators delivered from the third one, to support debate and decision making in participative governance on the French NatCat IDRiM policy (§ 4),
- To briefly identify similarities and differences between this national case and a few other typical ones, in order to draw some conclusions about the potential of replication in other countries or regions around the world (§ 5).

The only references known to the author of earlier or current research work related to similar holistic approaches to (NatCat) IDRiM at country level are:

- the “layered disaster risk management” approach (Mechler et al. 2014), which is concentrating to the risk transfer/reduction elements, without considering the issues of integrating into the scheme the two other major elements of risk reduction policy financing possibly supporter by risk transfer on one side and information and knowledge management as decision making support for governance on the other side,
- the EU project “ENHANCE³”. Involving the group of authors quoted above, this approach is applying its conceptual research on IDRiM and PPPs to 12 case studies at country or cross border levels to consider legislations and regulations that nurture the development of multi-sectoral/stakeholder partnerships (MSPs).

2. PROFILING THE NATURAL RISK EXPOSURE AND DRM POLICY IN FRANCE

Referring to INFORM INDEXES⁴, France is characterized with a rather low risk profile (2.3):

- Low to medium natural hazard profile (3.1)
- Low vulnerability profile (2.0)
- Rather good coping capacity profile (lack of coping capacity quoted: 2.2).

During its modern history, France has experienced significant damaging events: mainly storms, floods, storm surges, but also earthquakes, landslides, avalanches, etc. France's overseas territories, in the Caribbean and the Indian Ocean mainly, add to the country profile a significant exposure to hurricanes, more intense earthquakes and volcanic eruptions.

Over the last 25 years, the cumulated economic damage caused by natural events in France -

³ Enhancing risk management partnerships for catastrophic natural hazards in Europe. <http://enhanceproject.eu/>

⁴ www.inform-index.org

metropolitan and overseas territories - represents an average of nearly 4 billion € per year, out of which more than 2 billion € per year are insured losses, due to the high penetration rate of insurance systems, in both personal and commercial lines. Figure 1 indicates the annual cumulated insurance claims paid for the two categories of property damage insurance covers: storm & hailstorm (light blue bars) and “NatCat”, including floods and subsidence mainly (dark blue bars).

A significant part of this annual property damage cost is due to the accumulation of “low intensity - high frequency events”, mainly storms and floods, which could be avoided through no regret risk reduction measures (Nussbaum 2013).

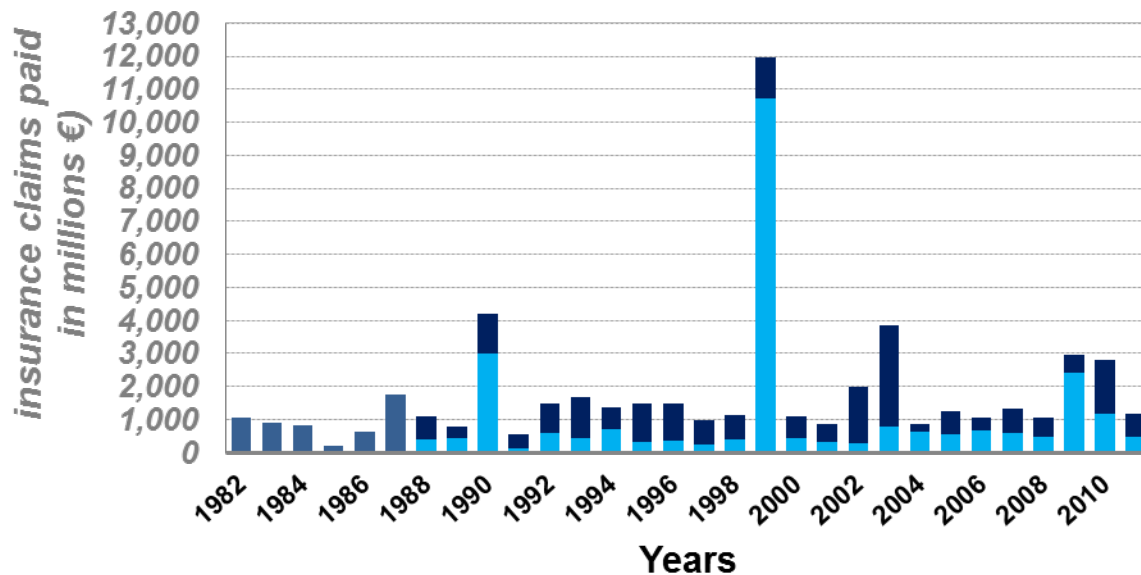


Figure 1. Evolution over the last 30 years of cumulated insurance claims payments for property damage losses due to natural events, mainly storms, floods and subsidence.

The implementation of risk reduction policies during the same period was significant, and can be monitored, in particular, through the progress of flood risk prevention plans (RPP) in place (acronym PPRI in French). The indicator reflecting this trend is the evolution of the number of municipalities covered by approved RPPs on each hazard to which they are exposed (source: French ministry of Ecology and Sustainable Development), displayed by an orange line, on the diagram in Figure 2, whereas the bars indicate the annual cumulated flood loss records (number of events, total insured damage⁵ – source: CCR).

The combination of the two categories of diagrams on Figure 2 demonstrate that there is no clear effect yet of the flood DRR policy on the stabilizing or reduction of flood damage⁶.

As a link to the next chapter, one should note that the presence of a RPP in a municipality is a trigger to:

- Insurability conditions, according to the RPP zoning (§ 3.1),

⁵ It is reported that these cumulated flood loss figures can be split according to the type of hazard into 45 % riverine floods, 45 % flash floods (urban and rural) and 10 % storm surge and ground water floods (source: CCR).

⁶ The stabilizing and reduction in the long run of flood risk damage is one of the main objectives of the French national strategy for flood risk management, adopted in July 2014

www.developpement-durable.gouv.fr/IMG/pdf/140509_SNGRIetAnnexes_approuvee_BAT_cle0459ad.pdf

- Eligibility for national funding to partly subsidize a DRR project introduced by a local authority (§ 3.2).

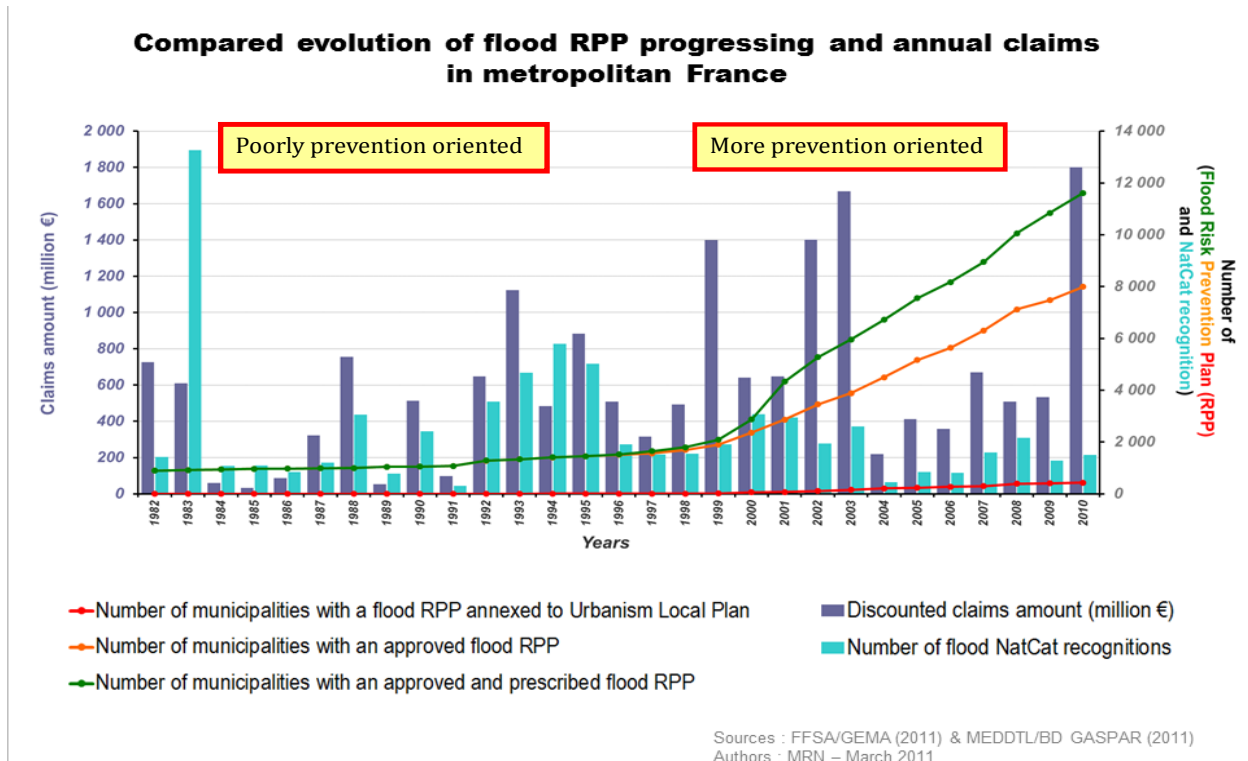


Figure 2. Evolution over the last 30 years of cumulated flood insurance property damage claims payments and NatCat recognitions, compared with the coverage on municipalities of a main DRR policy instrument (RPP), acting as a kind of trigger on insurability conditions.

Furthermore, the ONRN project, as an Information and knowledge management for disaster risk reduction (IDM4DRR) national tool⁷ aims, among other things, at monitoring the influence of DRR policies on loss record at all governance levels, in order to support the national and regional strategic planning of these efforts (§ 3.3.).

3. BUILDING BLOCKS OF THE FRENCH NATCAT POLICY INVOLVING THE INSURANCE INDUSTRY

The holistic French DRM scheme involves, for the time being, three main building blocks, which can be described as PPP-4-DRM arrangements, (PuP-4-DRM for the last one), where the insurance industry is playing a central role. As indicated in the introduction, these PPP/PuP arrangements are:

- An **economic instrument aimed at risk transfer**: the French NatCat insurance regime managed by insurance companies in partnership with public authorities. This risk transfer scheme was coupled from the beginning with DRR policies as insurability triggers (§ 3.1.),

⁷ <http://www.preventionweb.net/english/professional/networks/public/ikm4drr/>

- b) Another **economic instrument aimed at providing the national funding for local DRR policies, under eligibility conditions** (in particular for flood risk reduction). A legal provision stipulates that insurance companies collect, a levy to cover most of the national public risk reduction financing resources. This levy is embedded inside the NatCat premium. to the insurance companies trade associations are also involved in the management committee of the fund and in the governance decision process for the allocation of these resources to public risk reduction projects proposed by local authorities (§ 3.2.),
- c) An Information and Knowledge Management for DRR (**IKM4DRR**) **platform**, as a PuP arrangement, where insurance undertakings trade associations are directly participating, to share part of their loss data with other public and private stakeholders, for the sake of risk knowledge improvement activities such as events lessons learnt reports, as well as calibrations of hazard/loss modeling tools and/or cost benefit analyses to support DRR projects., etc. Ultimately all these developments improve significantly the decision making in participative DRR governance fora, from the national to the local scale (§ 3.3).

In describing them, the objective of this chapter will be to analyze their respective drivers at the time they were implemented and to situate these achievements in the broader context or perspective of the current relevant standards or (draft) recommendations, at the international and EU levels.

3.1 The French risk transfer scheme and its links to risk reduction policy

The French risk transfer scheme came up in 1982 with the following main drivers:

- a) Significant flood losses during the winter 1981-82, at the beginning of an economic crisis (first oil crisis),
- b) Budgetary constraints, for the new government elected in 1981, which saw insurance as an alternative economic instrument to the public funding of losses experienced by citizens and economic actors (end of the State of Welfare),
- c) A “PPP compromise” in referring to the “solidarity against national calamities” principle of the French Constitution, as a justification for introducing by law a compulsory extended coverage to every property damage insurance policy. This choice made at the parliament level provided for two fundamental advantages:
 - a. To avoid adverse selection, which still remains a challenge for insuring against space dependent natural risks - such as floods for instance - under pure market conditions,
 - b. To seek for the State as a reinsurer of last resort, considering the limited capacity of private of insurance and reinsurance markets to cope with low probability/ high impact events such as river Seine flooding or a seismic event on the French Riviera

Some of the main features of this compulsory extended NatCat coverage on all property damage insurance contracts, linked with the national risk reduction policy (NatCat Law passed July 1982), are⁸:

- State acts as a reinsurer of last resort via a reinsurance program operated by CCR, a reinsurance company owned by the French State, but direct insurers are free to reinsure on the private reinsurance market, then without the State guarantee,
- Direct insurance companies take a limited share of the risk and can therefore build equalization reserves, similarly to CCR and other reinsurers.
- Contract conditions are fixed by law, such as the premium rate (currently 12 % for all lines of business and whichever the exposure or vulnerability of the asset) and the deductible level (380 € for personal lines, proportional for commercial lines, with a minimum), with no possibility of deductible reduction, to avoid moral hazard;

⁸ See as well www.ccr.fr

- The State administration is in charge of:
 - o Recognizing the municipalities affected by damaging events where their hazard intensity becomes abnormal (NatCat recognition);
 - o Implement the DRR policy tools at the municipality level (cf. § 3.2) aiming at improving insurability: new assets on risky zones would not be accepted under the NatCat coverage, existing assets on risky zones would have to comply with recommendations, defined according to the zones, to avoid a significant increase of the deductible after a given timeframe;
- At the level of national IDRiM policy governance bodies, such as the Conseil d'Orientation pour la prévention des risques naturels majeurs - National Council for prevention of major natural hazards (COPRNM), the French State, (CCR and the direct insurance market co-pilot the PPP arrangement and its three main components (fig. 3)

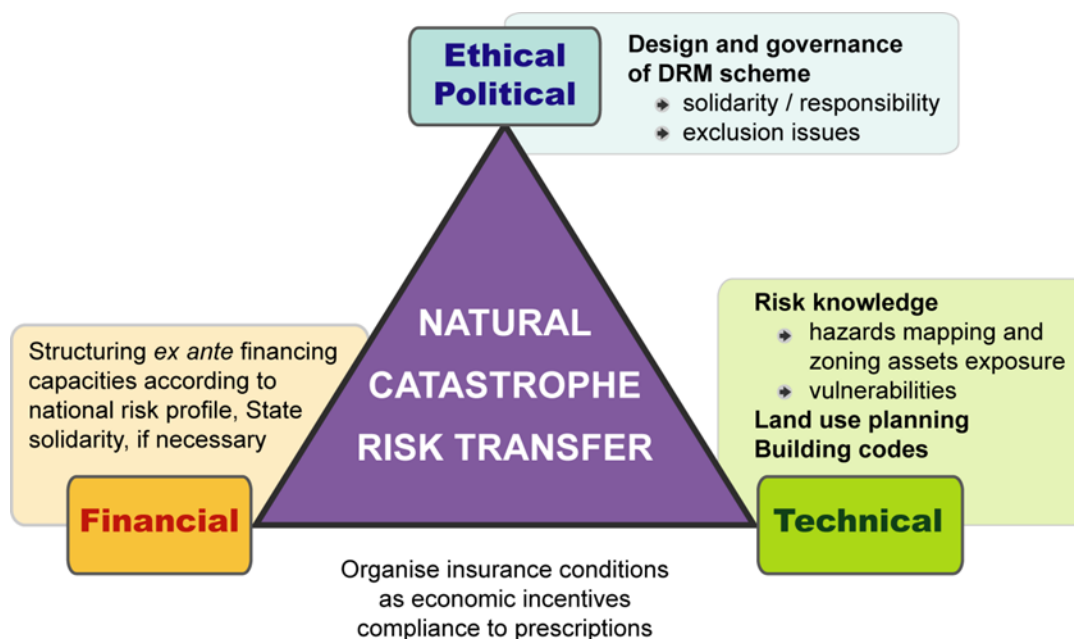


Figure 3. The three main components of the French PPP Arrangement for natural catastrophe risk transfer: the financial one already described at the bottom left of the triangle, the technical one at the bottom right of the triangle (traditional concept of prevention conditions as preconditions of insurability) and ultimately the ethical/political component, at the top of the triangle. This less non usual component (in purely market based risk transfer) deals with the necessary balance between solidarity and responsibility principles and contributes to provide a practical solution to market exclusion issues, the latter being tackled with a specific and original ombudsman-type mechanism

This national risk transfer scheme combined with DRR policies is consistent with the following policy recommendations or communications (insofar that it preexisted to all of them and does not enter into contradiction with them, providing a body of empirical evidence to their general assumptions):

- From an international perspective:
 - o the United Nations (UN) Hyogo Framework for Action (UNISDR 2005) Objective 4⁹, « Reducing the underlying risk factors »,
 - o the International Panel on Climate Change – Special report on Extremes (IPCC / SREX

⁹ HFA - Objective 4 (m) Develop and promote alternative and innovative financial instruments for addressing disaster risk.

- report (IPCC 2011), *etc.*
- From an EU perspective:
 - o Green/white Papers and Communication for an EU Climate Change Adaptation (CCA) Strategy (2007, 2009, 2013), with a specific reference to insurance products in Action 8;
 - o Green Paper on Insurance against Natural and Man-made Catastrophes (European Commission 2013b).

In order to ascertain the impacts of microinsurance programs in the region, the study undertook interviews of current clients (also known as “the treatment group”, the “insured”, or “beneficiaries”) and non-clients (also known as “the control group”). In the absence of a recent disaster where clients could be directly interviewed on their experience with the microinsurance scheme, or without a baseline for which to compare the present findings with an earlier one, this was thought to be the most suitable study methodology. A control group was used to better determine the impact of microinsurance programs. If, for example, the amalgamated results of the insured population showed a trend in a certain factor, comparing with the control group could yield analysis if this trend was normal for the socio-economic distribution or if it was specifically attributable to the impact of involvement in the microinsurance scheme. The aim of this process was to keep all variables the same so that any differences could be ascribed to the microinsurance program itself with much greater confidence. The insured group survey took, on average, between 30-45 minutes each while the control group took, on average, between 20-30 minutes. Completing the work involved over 85 people in participating organizations with 54 people involved in training, 85 people in field surveying, and 15 in online survey inputting.

3.2 The French national DRR policy financing scheme

A major shift in the French national DRR policy financing strategy occurred in 1995, when a dedicated fund¹⁰ was introduced to subsidize specific risk reduction measures. At the beginning it was limited to situations of imminent events potentially dangerous to human life, for the benefit of individual built properties and their content, which are eligible through the fact they are insured. Later on, eligibility to the Fund was progressively extended to partly subsidize a wide range of collective risk reduction policy measures, such as the PPR studies and more recently under procedural eligibility conditions, significant DRR risk reduction projects submitted by local authorities in order to study and implement a whole set of non-structural and structural measures: the *Programmes d'action pour la prévention des inondations* (PAPI, see figures 4 and 5 below). Now, most of the national financing resource for the national DRR policy is leveraged through this dedicated fund whose exclusive resource is a levy on NatCat insurance premiums (fixed by law). Due to the continuous evolution of needs, the levy increased from 2,5 % at the beginning, to 4 %, then 8 % and presently 12 % of the NatCat premium, with a fund raising of about 200 million euro per year.

The direct insurance companies are not only the collectors of this funding resource, but also involved, through their Trade associations, both in:

- The Management Committee of the Fund,
- The national participative Governance Committees, such as COPRNM (already mentioned) and more specifically the Commission Mixte Inondations (CMI) of the national Strategy for flood risk reduction, in charge of labeling the flood DRR projects (PAPI) submitted by local authorities.

In these capacities, they may express their concerns about the prioritization of resource allocation to risk reduction projects, in order to comply with an equity of treatment principle for territories and citizens, with respect to their respective objectives in increasing the level of protection of exposed housing and/or activities. One should indeed consider the overall resources available for a certain period of time.

¹⁰ FPRNM: *Fonds de prévention des risques naturels majeurs* (FPRNM), also called Barnier Fund.

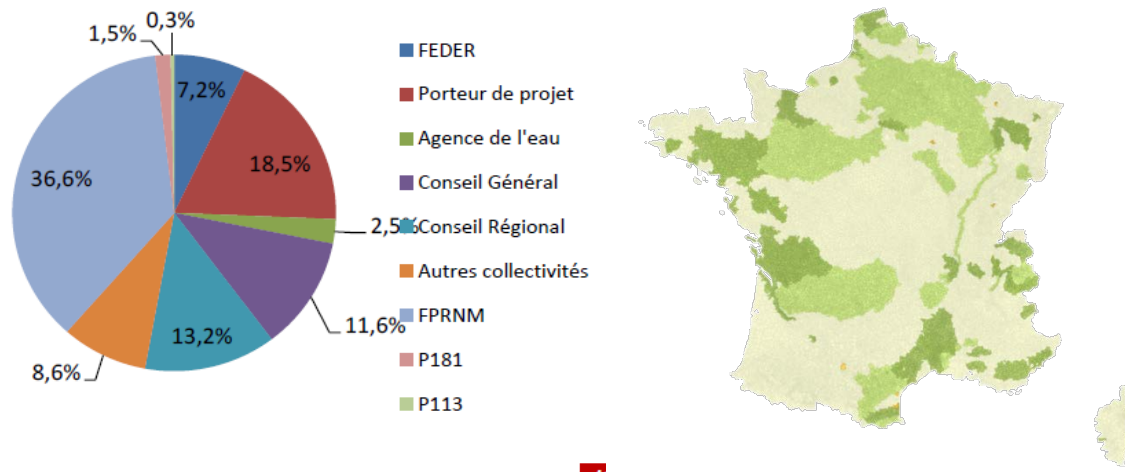


Figure 4. (left): Contributors to the financing of PAPI projects. The diagram details the share of each category of contributors (European Union, national, regional and local public authorities) to the financing of all PAPI projects so far. One can see that EU (FEDER) has contributed at the level of 7.2 %, national support (mainly FPRNM, plus national budgets: P181 and P113) has contributed to a total of 38.4 % and local authorities, including those acting as project coordinator, have contributed to a level of 54.4 %.

Figure 5. (right): Coverage of metropolitan France by PAPI projects (170 projects in total, as of mid 2014), the difference in color intensities indicates the two generations of PAPI so far. Areas in medium green represent PAPI of 1st generation. Areas in dark green represent PAPI of 2nd generation. Other areas are not covered by any PAPI project so far. The amount invested is in a range of 20 to 170 €par unit of exposed population, depending to the needs and maturity of the project, with an average of 80 % of the investment affected to structural measures (Nussbaum 2015).

This financing scheme has been designed and progressively extended/upgraded since, under national budgetary constraints, again as main drivers. Fund eligibility has been extended along the years to finance different public risk reduction policy tools at the municipality or river basin levels, such as PPR, PAPI, etc.

This national DRR financing scheme, subsidized through a levy on the risk transfer scheme, may refer to the following policy recommendation / research contexts:

- At the International level:
 - o SFDRR (2015): recommendations and objectives relative to cross cutting issues such as PPP, IKM & governance at the forefront,
 - o OECD reports, in particular River Seine scenario of major disaster, seeking for alternative ways to finance DRM policies (OECD 2014).
- At the European Union level:
 - o EU Regional policy considering DRR investment, as a cross cutting issue for each project submitted to EU subsidizing,
 - o EU Research and Innovation policy, with current research projects addressing cross cutting issues such as PPP, IKM & governance.

3.3 The French national observatory for natural risks (ONRN) as a risk sharing platform

The request for improved disaster risk management information, “particularly information on disaster risk”, is advocated “to generate a social demand for disaster risk management” and emphasized as one of

the new priorities in the draft Post-2015 framework for action (ISDR 2013 a, b and c). Similarly, at the EU regional level, two most recent policy papers, respectively a Green Paper on the insurance of natural and man-made catastrophes on the one side and a Communication on the EU Climate Change Adaptation Strategy on the other side, not only pinpoint such information “on past and possibly projected/future disaster risk” as “key knowledge gaps to bridge”, but also advise “to improve the access and the interaction between information platforms”, “involving the stakeholders, in particular encouraging dialogue between insurance industry and policy makers” (European Commission 2013a).

Besides already existing scientific observatories or data clearinghouse mechanisms set out by international or regional organizations (e.g. Global Risk Data Platform & Disaster Loss Datasets portal at the United Nations level, Climate-Adapt Platform at the EU Commission services level), partnership based projects for knowledge sharing and dissemination platforms appear here and there, at various geographic scales, local and national. Their scope of activities, in terms of data collected, indicators and related meta-data produced, may encompass themes such as hazards and assets exposure, vulnerability and resilience, loss records and lessons learnt, players and their projects, evaluation of the progress and efficiency of risk reduction policies and tools... Whereas public partners can be State administrations and/or local authorities, together with State agencies, the private partners, at least at the national level, are expected to be the (re)insurance industry, for them to provide past loss and exposure data. End users involved are the different other stakeholders, mainly professionals, but also associations of victims. Although difficult to establish, the governance type may be participatory, involving public-private-civil society and/or societal-academic circles.

When a partnership platform meets with their end users committee, challenging “stakeholder dialogues” (Callon *et al.* 2001) take place in addressing the formulation, the prioritization of the users’ needs and their adequacy with the information offered “from the shelf”. Specific communication efforts have to focus on the understanding of the indicators, their limits of use, the uncertainties related, etc.

Other challenges arise with the partnership enlargement process between existing observatories in order to compromise between the expectations for subsidiarity from local or specialized platforms, able to contribute in a bottom up scheme and more normative top-down oriented approaches from national partnership or existing international/regional platforms.

As a result of one of the lessons learnt from the Xynthia event (French National Assembly 2010) and other recent disasters, major stakeholders in France, including the State Authorities, the Mayors Association, the insurance market associations and the CCR have decided to join forces in launching a National Observatory for Natural Hazards (www.onrn.fr). This unique public-private-civil as well as societal-academic partnership agreement signed in May 2012 is now open for other stakeholders to step into, in order to implement other and new thematic indicators (ONRN 2013 a, b, c and d ; Nussbaum and Pigeon, 2015).

The ONRN is a national PuP agreement for an open source data platform to share the country’s DRR information and knowledge. In addition to the data already made available by the different producers and accessible through organized links to their websites, users can download standard indicators, many of them based on highly localized data. This integrated knowledge management platform can assist in DRR decision making and monitoring, for better DRR participative governance at the national and local levels, in line with HFA requirements and anticipating those of Sendai Framework for DRR (SFDRR) (UNISDR 2005, 2015).

Again launched under public and private budgetary constraints, an IKMS platform such as the ONRN tries to stress solutions implying more DRR policies co-constructions, increasing the acceptance of uncertainties by DRR prevention actors.

As a specific added value, the ONRN platform gives open access to 26 core indicators on exposure, losses and the situation of prevention policies, derived from the founding partners’ databases. Most of the

indicators reach the municipal scale. The following maps (fig 6 and 7) display two examples of flood loss indicators calculated at municipality scale. Information on each indicator is provided in a downloadable fact sheet which specifies the conditions and limits for use. It also comments, if necessary, the possible heterogeneity of the collection methods used and associated uncertainties, but also discrepancies in the mapping coverage.

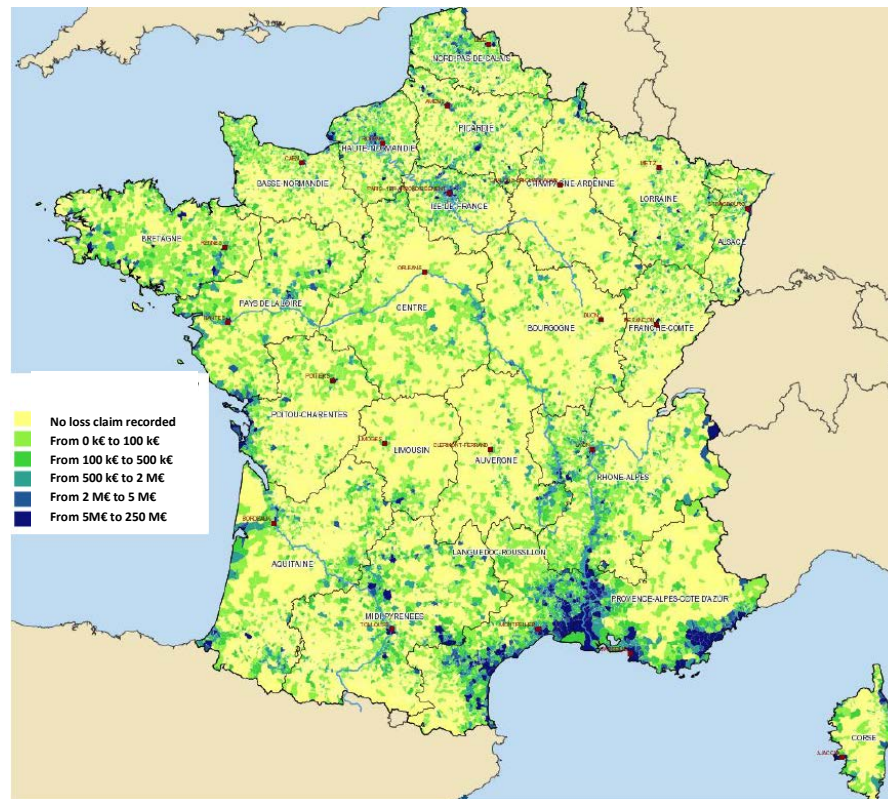


Figure 6. Map of the ONRN indicator: “Cumulated flood insured loss to properties (personal and commercial lines) at municipality grid for the period 1995-2010” (Source: www.onrn.fr). Areas in yellow represent municipalities which did not experience any flood loss to properties. Green/blue areas represent municipalities affected by flood losses to properties situated under their jurisdiction. The darker the color, the higher the level of cumulated flood loss (see legend of map), with a peak of more than 5 million euro per municipality, for a few municipalities only, mainly in the South-East of metropolitan France.

According to the project partners and observers, such an initiative shall not only provide a necessary tool for “monitoring, evaluation and review” of national and regional risk reduction policies, but also “contribute to a shift towards a general culture of disaster risk prevention and mitigation, and bring in further data and information”, as advocated in several most recent EU policy papers addressing among other things, the issue of risk data sharing and dissemination (European Commission 2013). It also displays an example of good practice towards integrated disaster risk information management, as recommended at United Nations level in the post-2015 (Sendai) framework for action: “A growing convergence between the insurance and risk modeling companies, governments and the international community, promises to deliver new risk information platforms that will inform investment decisions by governments, businesses and cities alike » (Key Policy Message N° 8, UNISDR 2015).

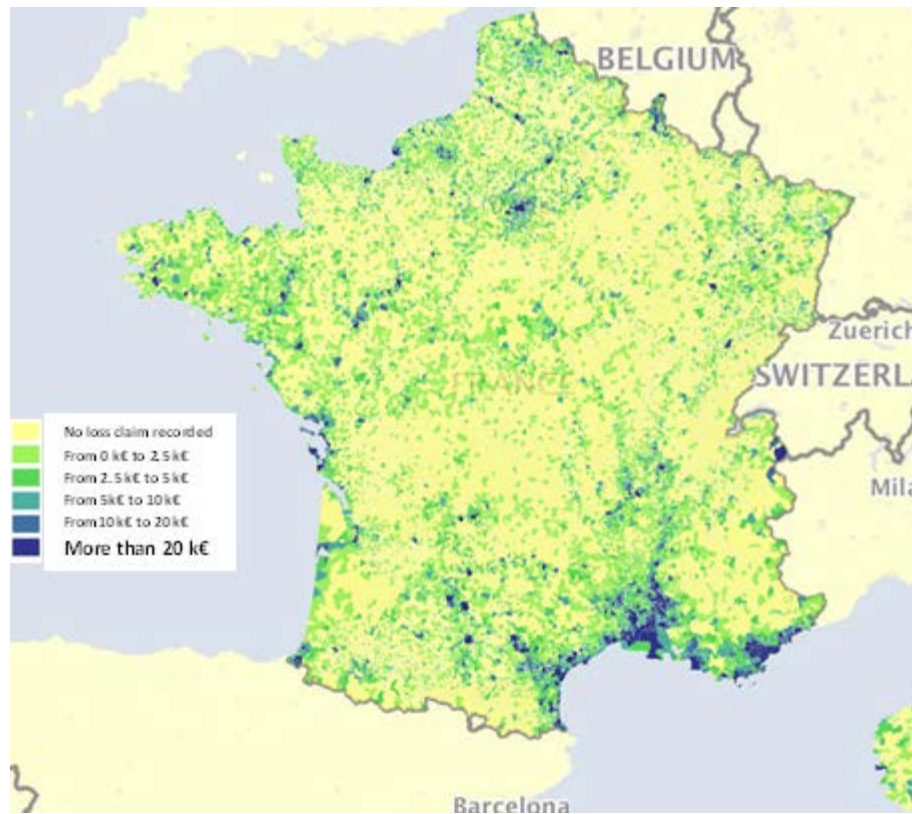


Figure 7. Map of the ONRN indicator: “Average cost in k€ of flood property insurance claims at municipality grid for the period 1995-2010” (source: ONRN). The amount of this average flood loss per insured property is influenced by: the type of flood (eg. Higher average cost for storm surge than riverine flood), the intensity of the hazard or series of hazards experienced by the municipality during the period, the proportion of commercial lines properties affected in the municipality, etc.

To summarize, this national PuP project came out of the following drivers:

- 2010 major events (Xynthia and Var floods),
- A Parliamentary report on lessons learnt: testimony of the insurance federation chairman
- Further national budgetary constraints, which did not allow for creating a specific organization, but rather to join forces on the basis of a partnership agreement, with contributions in kind of the partners.

This initiative can be placed in the broader context of recommendations such as:

- In an international perspective:
 - Sendai Framework for DRR (UNISDR 2015), in all its objectives, targets, and planned follow-up indicators, more specifically:
 - Objective 1 (Risk knowledge) with respect to the Loss data collecting, recording and sharing issue,
 - Objective 2 (Governance) with the issue of monitoring the implementation and efficiency of DRR policies at all levels.
 - UNISDR IKM4DRR network, as a unique international cooperative environment to develop international experience sharing on information and knowledge management,
 - OECD: Policy handbook on risk awareness and education on natural catastrophes (OECD 2008). As an example, among other on this topic where many recommendations have been produced by many international agencies.

- In an EU perspective:
 - Humanitarian Aid, Civil Protection and Risk Management policies (DG ECHO) supported by Joint Research Center (JRC) ongoing project and reports on EU Loss Data (since 2013) interlinked with UNISDR and International Research for Disaster Reduction (IRDR) joint initiative on “Data”;
 - Environmental policy: flood directive and its implementation in EU Member States, providing new geodata layers of flood risk zoning at three occurrence scenarios for the selected highly exposed territories,,
 - Climate policy: Communication on a EU CCA Strategy (EU Commission 2013 a): Actions 4 (Bridging the knowledge gap) and 5 (ClimateAdapt Clearinghouse Mechanism), to organize information and knowledge management and sharing among stakeholders and Member States,
 - Internal market policy: Green Paper on Insurance against Natural and Man-made Catastrophes (European Commission 2013b), already quoted in § 3.1 and supported by a JRC report on Risk exposure and coverage of EU Member States (2012).
 - Information society policy: Inspire Directive, providing a framework for open source environmental data platforms, including on natural risks,
 - Research and Innovation policy, especially through current research projects such as ENHANCE (mentioned in § 1), KNOW-4-DRR (mentioned in § 4 below), STAR-FLOOD implementing an analysis of flood risk governance arrangements in various Member States, etc.

4. AN EXAMPLE OF INTEGRATED APPLICATION USING A CROSS ANALYSIS OF ONRN INDICATORS IN THE GOVERNANCE OF THE FRENCH NATURAL DRM POLICY

This section reports on first experiments with stakeholders, at different governance scales, of the ONRN tool, as a new multiscale and shared IKMS, for the DRR decision making process in French territories. An application example is provided on the *Provence Alpes Côte d'Azur (PACA)* region (Nussbaum and Pigeon 2014).

Relying on both its institutions networking and the specific indicators, the ONRN allows local stakeholders to access information on damage costs and risk assessment at the local scale. Such information can be used as a support for further discussing how to live with risks and relevant uncertainties, at the local scale, implying local authorities, landowners or citizens. Methodologies behind the indicators are given, with their limitations. It should help increasing the confidence level in DRR policies. This ONRN platform website aims at answering the questions: How to contribute to increase a risk culture? Why and how deciding to take action? In order to achieve such goals, it would also be necessary to allow local information coming from local stakeholders to be more integrated into the decision process, and into the IKMS itself. This “bottom up” enrichment of the IKMS, mainly through the involvement of local and regional observatories, according to the subsidiarity principle, is of course a priority for the years to come. The general methodology of the cross analysis approach using ONRN indicators is displayed in Figure 8.

The ONRN indicators used can be for instance: the amount of populations living on flood-prone areas, the cumulated insured losses from floods experienced during the last 15 years, and the coverage degree of risk prevention tools such as land use planning regulations (PPRI) or risk reduction projects at the risk basin level (PAPI). This has been performed in close partnership with a regional observatory on disaster prevention: “*Observatoire régional des risques majeurs en région Provence Alpes Côte d'Azur* ” (ORRM-PACA).

The results of this collaboration gained stress on such gaps as between loss record and DRR policies

coverage. They also prove that a high level of exposure does not necessarily match a high loss record level, at least during the period considered. In spite of such limitations, they contribute to optimize the DRR decision making process and display clearly where the most disaster-prone areas are to be found (Figures 9 and 10).

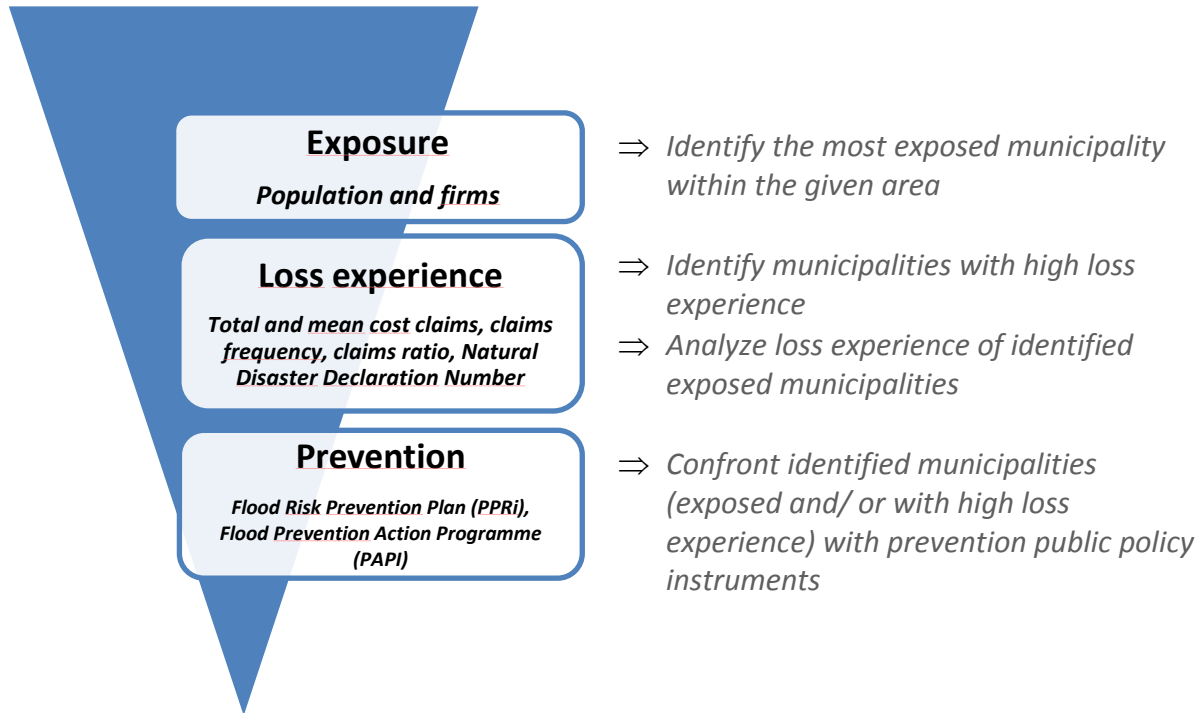


Figure 8. Methodology for crossing ONRN indicators to support participative governance on DRR policies from national to local scales.

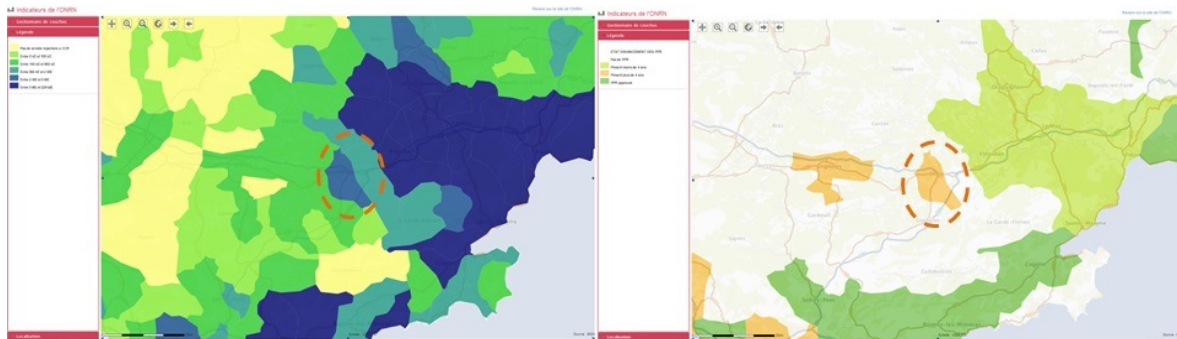


Figure 9. Detailed maps of a sector (Var area) in the PACA Region, at municipality grid, displaying on the left the cumulated flood damage to insured properties over the period 1995-2010 (see explanations about this indicator on figure 6) and on the right, the progress of flood risk prevention plans (RPP/PPRI), as of the end of 2013. The red circled municipality shows a high loss record, whereas its RPP is still in progress (*Sources: screenshots of interactive maps, www.onrn.fr by MRN*)

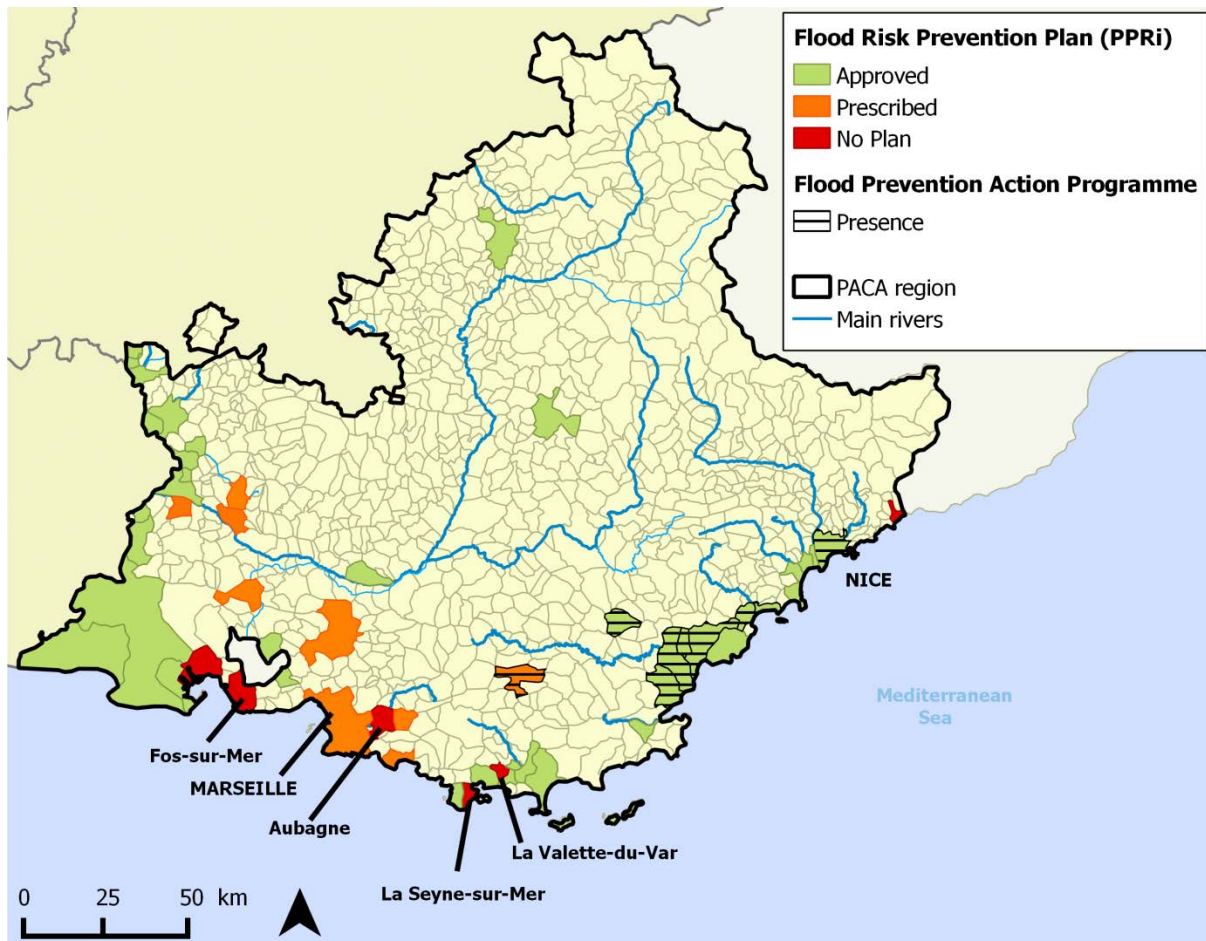


Figure 10. Map of the entire PACA region, displaying the municipalities characterized by high exposure and/or high loss experience of insured properties during the known loss record period (1995-2010) and their respective situation with respect to the progress of relevant local flood DRR policies (RPP and PAPI): suboptimal situations appear for the municipalities in orange (prescribed but not yet approved plan i.e. the studies procedure has not yet reach to an end and the document has not yet legal enforcement value) or red, where no RPP has been prescribed at all. (*GIS design by MRN*)

5. HOW DOES THIS NATIONAL APPROACH COMPARE WITH OTHER ONES AROUND THE WORLD?

National schemes integrating more or less risk transfer solutions to public disaster risk reduction policies exist in an increasing number of countries, with the general idea of conditioning insurability to risk reduction measures, which might need, in the case of flood peril for instance, to be taken both at community and individual level. Updated monographs and analyses of these are available from many institutional (World Bank, OECD, US GAO, Munich Re, Swiss Re, Insurance Europe, etc) as well as research authors.

The second building block considered (the levy on insurance NatCat premiums to contribute to the prevention Fund (FPRNM) which operates in coordination with representatives of the insurance industry as a main financing source for the national DRR policies) seems to be so far a unique feature around the world for NatCat DRR funding. Similar approaches of levies raised on insurance premiums to subsidize a

public DRR policy and in particular rescue services are reported for another peril such as Fire (called “fire services property levies” in Australia and New Zealand, with heavy debates on possible “free riders” leading to recent changes towards fiscal funding in some parts of Australia)

With respect to the third building block as a holistic national knowledge management system to share data and support participative governance, only few other national initiatives¹¹ have been identified as comparable to some extent to the ONRN (without having opted so far for open source data sharing, which is a key point for increasing risk prevention culture) :

- The Atlas of Natural Disaster Risks in China by Beijing Normal University, integrating hazard, exposure and loss data at the national level, available on paper only. This Atlas is used by the Chinese Government for DRR policy making and to some extent by (re) insurers and relevant stakeholders in the industry¹²,
- The Spatial Hazards Events and Losses Database for the United States (SHELDUS), hosted by the University of Northern Carolina, the scope of which is limited to the “Loss Data” segment of the ONRN larger scope and where a contribution is required to access raw data. But the hosting academic institution combined this tool to a Social Vulnerability Index (SoVI), calculating a vulnerability score for individual counties across the United States. This combination of tools has a significant impact on policy and practice in planning, assessment of communities’ crisis management and response capacities and on resources allocation for recovery¹³,
- December 2014 a Disasters segment was launched within the portal of the “White House Strategy for Open Data¹⁴”, providing open access not only to disasters data, but also apps and tools which might be useful for stakeholders in practical disaster preparedness, crisis and post crisis management, with a stimulating call to “Data Stewards”: “Help Build a Culture of Open Data”.

With respect to the important Loss Data segment, as one of the core objectives of SFDRR, one should also mention the combined IRDR and EU Commission DGs ECHO / JRC initiatives, to develop standard definitions and good practices exchanges on a voluntary basis¹⁵.

With reference to UN and EU international initiatives regarding international cooperation level, there are also potential replicates at lower and upper governance scales, in order to achieve a holistic integration through the subsidiarity principle. For instance in France, some Regional Councils (and Departemental Councils¹⁶, at the prefectural level) have already taken such an initiative at their respective governance scales, in partnership with their counterparts from the regional/departmental State services (cf. § 4 ORRM-PACA in *Provence Alpes Côtes d’Azur* Region or *Observatoire des risques en Languedoc Roussillon*). The ONRN aims at progressively networking with all the existing (or developing) regional and thematic observatories (e.g. climate change adaptation, coastal zones, etc), through a series of project partnership agreements.

6. CONCLUSIONS

¹¹ Although very active in the area of PPP4DRR, the examples presented do not introduce here the initiatives restricted:

- either at the level of an insurance company or group, such AXA, member of the UNISDR DRR PSP network,
- or at the level of national insurance markets, with dedicated associations:
 - o Between insurance companies, such as Institute of Business and Home Safety (IBHS) in USA and Institute of Catastrophe Loss Reduction (ICLR) in Canada,
 - o Between insurance trade associations, such as MRN in France.

¹² Case Study 8 in UNISDR STAG Report 2013 http://www.unisdr.org/files/32609_stagreport2013assembled.pdf

¹³ Case Study 2 in UNISDR STAG Report 2013 http://www.unisdr.org/files/32609_stagreport2013assembled.pdf

¹⁴ <http://www.data.gov/disasters/> & http://catalog.data.gov/dataset?groups=disasters#topic=disasters_navigation

¹⁵ EU Commission DG JRC, 2014, **Current status and Best Practices for Disaster Loss Data recording in EU Member States**, http://drr.jrc.ec.europa.eu/Portals/0/Loss/JRC%20SOTA%20Loss%20Report_11182014.pdf

¹⁶ Previously called « *Conseil général* »

Based on a single country case, this paper has developed a structured methodology to analyze integrated PPP/PuP-DRM approaches at the national level, contextualized within relevant international and regional (EU) frameworks.

It has highlighted how to consider the role of the private insurance industry, as a main PPP stakeholder, not only for risk financing (risk transfer instrument), but also for risk sharing (fiscal resource collector for public risk prevention policy financing) and even as promoter of a risk data sharing arrangement at national level, with expectations to network with local risk data sharing platforms.

Limited comparative information on similar approaches identified in other countries around the world has been put into perspective, but it is too early to take conclusions on international trends.

Nevertheless the paper emphasizes and illustrates with already concrete examples the huge potential of integrating IKM4DRR PuP activities at the national to local levels, in consistency with risk transfer and DRR policy financing tools, to leverage involvement and decision making in participative governance fora and probably also more interdisciplinary research.

Such integrated national/regional/local observatories will be necessary for countries as well as local communities to monitor their achievements and to report how they comply with the targets of Sendai 2015 Framework for DRR, as already suggested by a new “Guidance for Recording and Sharing Disaster Damage and Loss Data” in the European Member States (EU Commission DG JRC 2015).

Such a holistic and integrated disaster risk management approach should be recommended for strategic planning at any governance level and probably implemented as a further step of the “layered disaster risk management” scheme, as referred to in the introduction.

As a more general conclusion from the case study, one may notice that budgetary constraints, especially in a context of economic crisis, can still operate as a main driver for innovation and alternative positive action, rather than being considered as a reason for inaction.

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