

WGF25 Workshop Report

[Risk awareness and communication in the
context of Flood Risk Management Plans]

2019



26th, 27th March

Lisbon

Risk awareness and communication in the context of Flood Risk Management Plans



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Status: This is the final report of the WG F thematic workshop on Risk Awareness and Communication in the Flood Risk Management Plans, held in Lisbon, Portugal in on the 26th and 27th of March 2019.

Disclaimer:

The views represented in this report do not necessarily represent the views of all participants or the organisations they represent.

Acknowledgment:

We would like to mention the fantastic work that the facilitators, note-takers and attendees carried out. Thank you to all of you.



Photo 1. General overview of the meeting room at The City of Lisbon Foundation.

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Abbreviations and Acronyms

| | |
|------|-----------------------------------|
| FRMP | FLOOD RISK MANAGEMENT PLANS |
| PFRA | PRELIMINARY FLOOD RISK ASSESSMENT |
| FHRM | FLOOD HAZARD AND RISK MAPS |

| | |
|----|----------------|
| AT | AUSTRIA |
| BE | Belgium |
| BG | Bulgaria |
| CY | Cyprus |
| CZ | Czech Republic |
| DK | Denmark |
| DE | Germany |
| EE | Estonia |
| ES | Spain |
| FI | Finland |
| FR | France |
| UK | United Kingdom |
| EL | Greece |
| HU | Hungary |
| HR | Croatia |
| IR | Ireland |
| IT | Italy |
| LV | Latvia |
| LT | Lithuania |
| LU | Luxembourg |
| MT | Malta |
| NL | Netherlands |
| NO | Norway |
| PL | Poland |
| PT | Portugal |
| RO | Romania |
| SE | Sweden |
| SI | Slovenia |
| SK | Slovakia |
| TR | Turkey |

1 Executive summary

The WGF 25 thematic workshop took place in Lisbon, Portugal, on the topic of “Risk awareness and communication in the Flood Risk Management Plans”, on the 26th and 27th of March as part of a set of workshops on the implementation of the Floods Directive.

The workshop was hosted by the Portuguese Government and co-organised by the Portuguese and Spanish governments, through the competent national entities, by Portugal, the Environmental Agency and, by Spain, the Ministry for the Ecological Transition, with the support of representatives of the European Commission.

79 participants attended the workshop, from 26 member states, the European Commission, associations, NGOs, universities, companies and other stakeholders.

The workshop focused on two key inter-related aspects of flood risk management, drawing significantly on the lessons learned by member states across the EU from a diverse range on flood communication:

- Risk Communication in Flood Risk Management;
- Awareness in Flood Risk Management;

For the preparation of the workshop, previous research was performed on the communication of flood risk in the management plans. Much of the information was obtained through scientific studies, based on articles and doctoral theses and / or using specialists in the field of risk communication. This task was fundamental to identify the key issues to address, and to design the questionnaire that was made available to the member states to stimulate debate and reflection on them.

The main objective of the work was to know the strategies and mechanisms of flood risk communication already put in place by each member state, or under development in the second cycle of the Floods Directive, and their effect on risk awareness, and to discuss lessons learned, ways of analysing and assess the effectiveness of communication, key tasks to carry out, importance of public-private partners, good practices, weaknesses and new challenges.

Workshop theme discussions

During the workshop the following themes and issues were discussed through a series of presentations and smaller group discussion sessions:

- Methodologies/tools used for the improvement of risk awareness (social networks/education system/drills/simulacrum...)
- How to deal with uncertainty on flood risk communication
- Understanding and enhancing public’s behavioural response to flood warning information. Hinders and drivers
- How to face training/preparedness. Identifying the most successful ways to get a good level of awareness, knowledge and expertise

- Forecasting and warnings as a communication tool. Taking into account the human factor (psychological aspects of forecasting and warning)
- Communication systems in each phase of the flood risk management cycle.
- Communication on emergency planning
- Communication on transboundary flood risk
- Risk reduction communication strategies
- Decision support systems
- Communication models

Overall workshop conclusions

The overall conclusion from this Risk awareness and communication in the Flood Risk Management Plans workshop is that in across EU member states we have found good preparation on this subject. However, it should be noted that the communication strategies are under development, especially in referring specifically to the food risk communication. Measures are also implemented with regard to climate change adaptation, although this aspect is less advanced.

There is an interesting and diverse set of experiences already implemented, and many cases of major importance to the level of best practices, which can be easily implemented in other member states. This type of workshop is highly beneficial, allowing sharing information, practices, mechanisms and cases of special interest in flood risk communication.

Overall workshop conclusions and recommendations - Risk Communication in Flood Risk Management

Key point 1

Although most of member states have a strategy in place or under development with respect to flood risk communication, general speaking, there is a need for improving the consistency of these mechanisms in order to achieve the target groups, namely managers, policy makers, local leaders,... who act as a conveyors of the messages, especially in populations most exposed at floods. Having a sound strategy also allow prioritise sectors and stakeholders to involve. This strategy should be provided not only with appropriate budget, but with practitioners to carry it out.

It is not enough to create a strategy, it is necessary to maintain and improve it. It can be recommended that the flood risk communicators should not be complacent in assuming that people are aware of issues after they carry out a flood risk awareness raising exercise or community engagement event, and therefore cease consultations or engagement with the communities; it should remain as an ongoing activity.

Overall workshop conclusions and recommendations - Risk Communication in Flood Risk Management (cont.)

Key point 2

It is recommended to strengthen collaboration between different agencies of the State such as, environment, agency, water agency, meteorological agency and civil protection. Many countries also consider essential the support of stakeholders and NGOs and the role of media in communicating the flood risk.

It would be interesting to establish protocols between the different organizations in order to promote an improvement in communication channels, establishing the hierarchy, type of information, informative moments, contents and general evaluation of the whole process.

It is important to strengthen partnerships between the responsible entities and the media. One of the ways to reinforce this synergy is to train them in the themes to be communicated, with focus on the concepts, target audience, moments of communication, etc. This will reinforce the impact of risk communication, as it improves the quality of the information transmitted and generates trust in the population. These media sources also need to be published widely so that people living in flood risk areas know where to look for the information they require.

Key point 3

Communication strategies are mostly based on recent flood events but historical information (flood marks, photos, videos, etc.) should be considered as important part of the strategy.

The flood hazard and risk maps are still considered the best tool to communicate. In this sense, it would be important establishing a mapping standards used in the communication process. With more fluid reading, noticeable, with only the information that is absolutely necessary to let people know whether or not they are at risk.

It is also recommended that flood risk communication strategies clearly publicise the roles and responsibilities of all relevant agencies.

Key point 4

It is important to focus attention on assessment of risk communication effectiveness at all stages of the process, preparation, communication and post communication and establish mechanisms for evaluating not only the contents but their effectiveness in the target populations. And if necessary to reprogram communication strategies, in order to make them increasingly effective.

Overall workshop conclusions and recommendations – Risk Awareness in Flood Risk Management

Key point 1

Drills and early warning systems are a key tool in communicating and preparing for the flood risk; There is a preference to communicate risk in the prevention and protection phase; Flood risk perception is considered the most important topic in increasing resilience;

It would be desirable to frequent performing of drills. It allows checking if the communication between the various actors is operational and if they know all the available tools. Real significant flood events happen very few so emergency drills can keep the knowledge about floods risk alive. Flood emergency drills are a good mechanism to improve cooperation of administrative bodies, improve training of information exchange, check the correctness of procedures, the ability to identify shortcomings, the ability to test your skills in a situation close to the real crisis;

Key point 2

The return period is a difficult concept to explain, even though all countries use it in their cartography, making it difficult to perceive by population; General acceptance of the need to use, in addition, other concepts more easily understood, such as probability of occurrence, flood heights, etc., in the risk communication in order to reduce misunderstandings. It is also important to improve the communication of uncertainties and to create a communications systems based on trust and credibility;

The knowledge of individual risk leads to an increased acceptance of the implementation of either public or private measures and hence, supports flood prevention;

The use of the above concepts, side-by-side/ beyond the return period usually helps to reduce misunderstandings, not only by the general population, but often by technicians and politicians who do not understand fully the concept of return period. It is advisable use together or adapting, at least in the maps that are used to communicate the risk of flooding. In this way, it not only increases the perception of the population, but also promotes the preparedness and knowledge of individual risk. According the experience, “probability of occurrence” or “water levels” are more straightforward terms to describe flood risk.

These include increasing the relevance of the warnings to people; providing estimates of the severity of likely flooding events and contact details for further information and assistance, and media selection. Further, it was observed that emergency services had valuable information on the potential areas at risk of flooding which could be more effectively shared with other agencies for improved flood risk communication.

Key point 3

Most flood risk communication already uses social networks as the main dissemination tool, so it is recommended to use social networks with caution and adjust risk communication according to the target population and type of social networks used by each one;

It would be very useful to create manuals of good practices for the citizens to apply before, during and after a flood event, and to give information about the impact of the citizen’s behavior in flood context;

All these actions contribute to a society that is involved, interested, reasonable, thoughtful, solution-oriented, and collaborative.

Overall workshop conclusions and recommendations – Risk Awareness in Flood Risk Management (cont.)

It is essential to study new channels of communication, addressed to the target population, taking into account the location, age, gender, religion, disability, special needs, etc. On the other hand, create policies to promote public participation in order to generate a "risk society", prepared to face the new challenges arising from climate change associated with natural hazards processes.

Key point 4

It is vital to increase, promote, facilitate and share information (hydrological systems and earlier warning systems) in all river basins, especially in cross-border river basins (Data, Discharge, Water levels, Forecasting data, Dam information, Joint transnational information and communication);

Improve the system of cooperation in transboundary river basins, not only generically with the exchange of information, but also communication before, during and after crises, influencing behaviours, aiding in decision making, increasing public knowledge.

This **report collates the many observations made during the workshop** and presents recommendations under these thematic sessions. All papers and presentations made at the workshop are available on the EU CIRCABC web site through CIRCA BC [hyperlink](#) (WG F contents).

Member state self-assessment matrix

The matrix below is a proposal to give a quick overview about the situation related to flood risk communication issues in your River Basin District, and how the main topics/concerns that come up in the WS are covered.

| Member state self-assessment matrix | | | |
|--|--|------------|-----------|
| | Question | Yes | No |
| 1 | Are river's flow or level information in real time available in websites? | | |
| 2 | Are there flood forecasts (based on hydrometric and meteorological information) with alerts in case of flooding? | | |
| 3 | Are there flood hazard and risk maps available in the websites of the competent authorities of FD implementation connected with flood forecast, alerts and warnings? | | |
| 4 | Are they specifically designed to be understandable for the public? | | |
| 5 | Are there any protocols with civil protection authorities? | | |
| 6 | Is there any flood risk communication Strategy adopted? | | |
| 7 | Is there a body of experts in flood risk communication specifically dedicated to implement the flood risk Strategy? | | |
| 8 | Is there any kind of collaboration/protocol with the media to spread key messages about flood risk prevention and preparedness? | | |
| 9 | Have you established a dissemination protocol through social networks, parameterized to the target audience? | | |
| 10 | Do you have manuals/guidance documents on how to act during and after a flood? | | |
| 11 | Do you organized drills as part of the flood communication Strategy? | | |
| 12 | Is there any system for assessment the communication and awareness process? | | |
| 13 | Are quantitative indicators in the Strategy established? | | |
| 14 | Do you usually place historical floods levels marks as a communication and awareness mechanism of flood risk? | | |

1.1 Introduction

Workshop title: Risk awareness and communication in the context of Flood Risk Management Plans
Date: 26 – 27 March 2019
Venue / host: The City of Lisbon Foundation, Lisbon
Organising committee:

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1.2 Background

At the meeting of Working Group F (WG F) of 16 October 2018 at Brussels, it was agreed that a workshop would be held in Lisbon on the topic of “Risk awareness and communication”, with the objective of

improving the coordination and interchange of knowledge of how the different countries deal with communication and awareness processes, participation and education.

It is important to define the concepts of communication and awareness even though they may generate some discussion and complexity; however we will take as reference:

RISK AWARENESS is the acknowledgment of risks and the active process of reducing or eliminating those risks. Is composed by the set of mechanisms through which people increase their perception and will learn how to prevent and prepare for risks. Maybe also ought to be defined as a capability of the organization to recognize risks before they threaten, mitigate them when they arise, and recover from the damages they may cause. (Sendai Framework for Disaster Risk Reduction 2015 – 2030, United Nations, 2015)

RISK COMMUNICATION is any purposeful exchange of information about health or environmental risks between interested parties (individuals, groups, or organizations). Risk communication covers a wide range of activities, such as stimulating interest in environmental health issues, increasing public knowledge, influencing attitudes and behaviour of people, acting in situations of emergency or crises, aiding in decision making, and assisting in conflict resolution. Risk communication should aim for a bidirectional exchange of information, emphasizing from a pedagogical approach to deliberation, dialogue, and public participation. (White paper on Risk Governance – Towards an integrative approach, IRGC, 2006)

According to the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the Assessment and Management of Flood Risks integrates flood risk communication into flood risk management plans, considering three perspectives: prevention, protection and preparedness.

DIRECTIVE 2007/60/EC (chap. IV, art. 7^o - 3 [...] Flood risk management plans shall address all aspects of flood risk management focusing on prevention, protection, preparedness, including flood forecasts and early warning systems and taking into account the characteristics of the particular river basin or sub-basin [...]), and (Annex A, II – 2 [...] a summary of the public information and consultation measures/actions taken).

Member States have already developed the Preliminary Flood Risk Assessment and the Flood Risk and Risk Maps for areas of potential significant flood risk and are developing the Flood Risk Management Plans in accordance with the Floods Directive. The workshop attempted to gather information and evaluate the results, improvements and challenges for the future and the importance of communication mechanisms and improvement of flood risk perception and preparedness.

1.3 Objectives and outputs

The core objectives of the workshop were:

- To share different lessons learnt in relation to flood risk communication and awareness;
- To share experiences to show how to improve strategies, mechanisms, applications on communication and awareness of flood risk management across Europe.

This report is the output of the workshop and incorporates:

- The papers presented at the workshop, including recent developments across Europe.
- A summary of the questionnaires responses
- Summaries of the discussions held and key issues and themes emerging from the workshop sessions

- The conclusions of the workshop.

1.4 Workshop structure

The agenda for the workshop is included in Appendix I. The workshop comprised two main sessions, the first on the afternoon of 26 March 2019, and the second in the morning of 27 March 2019, as follows:

- Session 1: Risk Communication in Flood Risk Management
- Session 2: Awareness in Flood Risk Management

Within each session, the format was similar, with each session being opened with a 'Setting the scene' presentation by a representative from the European Commission. Following this, there were several presentations covering different aspects of the topics to be covered in the breakout sessions and a special presentation with the conclusion of the questionnaire.

Firstly, the summary Risk awareness and communication in the Floods Directive.

- **Session 1: Risk Communication in Flood Risk Management.**
 - Presentations on experiences/good practices and lessons learnt in relation to risk communication in different MS:
 - ES, Social capacity building for flood risk mitigation.
 - PT, Flood risk warning and intervention in Portugal.
 - PT, The flood risk at Lisbon city: how to prevent and prepare.
 - FR, Réserve Communale de Sécurité Civile (Municipal Civil Protection Reserve)
 - Summary of Questionnaires in relation to the flood risk communication
 - Breakout session: Risk Communication statements :
 - Topic 1 – What kind of flood related information do you provide to communicate flood risk?
 - Topic 2 - Is there a distinct budget, funding scheme in place to support the communication?
 - Topic 3 - Are there trans-boundary systems and mechanisms in place?
 - Topic 4 - What kind of information are you planning to provide in future? What piece of information do you consider as especially important for communication flood risk and raising the awareness?
 - Topic 5 - Effective public consultation in 2nd FRMP. climate change scenarios and flood risk communication;
 - Topic 6 - Do you specifically provide explanations on risk, residual risk, uncertainty, return periods, etc.?
 - Topic 7 - Do you also have experience with social media?
 - Topic 8 - How is flood alerting organized in case of emergency?
- **Session 2: Awareness in Flood Risk Management**
 - Presentations on experiences/good practices and lessons learnt in relation to risk awareness in different MS:

- ES, Enhancing flash flood risk perception and awareness of mitigation actions through risk communication.
 - PT, Stakeholder participation in water management and planning: lessons from the WFD implementation.
 - AT, Information campaign self-protection and individual prevention.
- Summary of Questionnaires in relation to the flood risk awareness
- Breakout session: Risk awareness statements:
- Topic 1: Do you monitor or evaluate the effectiveness of applied communication tools after an event occurred?
 - Topic 2 - Role of the media, and how to convert them into allies for the dissemination of messages.
 - Topic 3 - Official mechanisms to improve actions of self-protection.
 - Topic 4 - Achievement in raising awareness and flood risk: memory historical flood levels and different groups.
 - Topic 5- Do you actively inform the population on potential tools or funding mechanisms in case of flood damage?
 - Topic 6 - How to report flood risk to the population, procedures, key messages?
 - Topic 8 – The communication process of different stakeholders and public in order to find and agree on an acceptable flood risk level.
 - Topic 9 - EU general data protection regulation and flood risk communication
 - Topic 10 - Systems to evaluate the effectiveness of communication strategies: changes and readjustments

Following each main session, there was a feedback and discussion session. After the end of session 2, there was a brief summary presentation, drawing together some of the key themes that had emerged during the breakout sessions, and some of the key conclusions.

1.5 Report structure

The reporting structure for the workshop broadly follows the “Guidance on the Structure of Thematic Workshop Report Formats and Content” (27 October 2009, WG F Meeting No.6).

Section 1 provides the introduction and background to the workshop.

Section 2 provides a summary of Session 1 “Risk Communication in Flood Risk Management”.

Section 3 provides a summary of Session 2 “Risk Awareness in Flood Risk Management”.

Section 4 draws together the workshop summary and conclusions based on the main learning from each of the sessions and the subsequent feedback and discussion.

References

The series of Annexes includes information such as the Workshop Agenda, List of Participants, Questionnaire and Useful Links

2 Session 1: Risk Communication in Flood Risk Management

2.1 Report on workshop presentations on Risk Communication.

During the first phase of the workshop, different presentations took place. Below is a summary of the presentations given, reflecting both EU and several national perspectives

2.1.1 Welcome and Introduction

Nuno Lacasta - President of Portuguese Environment Agency

OVERVIEW

The challenge of the water master plans is a strategic vision, especially starting in the last 2 years. Discussing a strategy of climate change and the water uses.

One has to look at the strange values of temperature that occur in March, which implies that a fire season is anticipated and results in a big problem.

In the last 2 years there has been a succession of two hurricanes, with several problems throughout the year on sea levels on land, especially south of Lisbon. This is not a distraction, it's happening now.

The magnitude of flood events tends to increase and it is also possible that these events will become more frequent.

The number of flood events reduced; however, the flash-floods increased causing a higher number of damages.

Very intense and a reduced scale very localized which implies an even greater challenge in order to take care of flood problems.

As a result of the preliminary flood risk assessment, Portugal has identified 62 APSFR, with the representation of a wider territory.

The actuation scales hamper the real perception of the problem, just as the phenomena coincide different from the political scale, resulting in a problem of strategic vision.

It is necessary to document the perspective of the study of floods and look at storms as a flood problem. Derived from increasingly frequent hurricanes.

Portugal initiated the implementation of public policies for climate adaptation that can also be used as flood issues.

2.1.2 Risk Awareness and Communication in the Floods Directive

Ioannis Kavvadas – European Commission

OVERVIEW

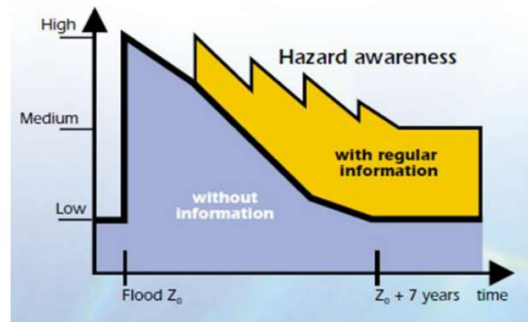
It is important to clearly define the concepts:

COMMUNICATION: a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior

AWARENESS: knowledge that something exists, or understanding of a situation or subject at the present time based on information or experience

Risk communication is critical in raising awareness and consequently reducing vulnerability and exposure.

Experience, communication and information, all in one graph*



* https://www.iksr.org/fileadmin/user_upload/DKDM/Dokumente/Fachberichte/EN/rp_En_0125.pdf



It is fundamental to improve the communication of certain concepts, to reduce the uncertainties, often difficult to understand even by the technicians. It highlights the concept of return period, and finds a better way to increase the risk perception by the population.

The concepts of risk and hazard, uncertainty, risk and individual risk; the definition of risk assessment, are major challenges in the flood risk management process.

Most challenging elements to explain to the public in FHRMs (2016)

- *Difference between hazard and risk*
- *Definition of uncertainty, risk, and/or residual risk*
- *Definition of return periods and/or probabilities*
- *Explanations for risk assessment, APSFR, significant flood event, combination of flood sources, inundation area behind flood defense infrastructure*
- *Relationship with already existing risk maps (e.g. insurance), consequences associated with making the maps available/relevance to individual householder/business (e.g. hazard level of buildings at the borderline, land value)*



Improving the communication from the cartography is another of the challenges, to make it more perceptible and understandable by all and not only of the technicians.

It is vital to promote and integrate stakeholder and public participation in flood risk management plans. An informed population is more cautious.

2.1.3 Social Capacity Building for Flood Risk Mitigation

Alba Ballester – *Universidad Autónoma de Barcelona*

OVERVIEW


For decades, Flood Risk Management’s (FRM) prevailing approach has been focused almost entirely on reducing the dangerousness of flood events, mainly by means of infrastructures such as dikes, levees and embankments, among others. The limitations of an engineering-focused approach became apparent, along with the recognition of the importance of reducing individual and collective vulnerability. This vulnerability is directly related to specific Social Capacities (SCs) that exist or are lacking in communities affected by floods.

“Social Capacities are considered as a wide variety of skills which enable a higher degree of self-management in relation to communities’ challenges. Their presence in a community depends both on the possibility of accessing certain resources and the existence, within the community members, of the abilities to use them” (Capflo, 2018)

Specific social capacities for flood risk management are:

- Knowledge: Awareness of flood risk; understanding the causes, characteristics, and current FRM system; operating in the administrative structure of FRM; disseminating knowledge about the FRM; exchange of knowledge between different stakeholders; investigation and development of FRM measures and policies.
- Motivation: Proactive attitude for self-protection; proactive attitude for group protection; proactive attitude of protection of the environmental values of the rivers; generation of social commitment in the FRM.
- Networks: Use of non-specific social networks for FRM; creation of specific networks for FRM.
- Participation: Access to information on FRM projects and public policies; provision of FRM perceptions and proposals to public administrations; deliberative participation in the FRM; proactive participation in FRM.
- Financing: Access to general financing for projects and investments related to FRM; access to specific financing for projects related to FRM; entrepreneurship in activities linked to FRM.

How do we measure social capacities?



Example:


| Capacities | Resource | Ability |
|---|---|--|
| Awareness of flood risk. | Publicly accessible flood risk maps. | Consult and interpret flood risk maps. |
| | Evacuation plans. | Know and be able to follow the municipal evacuation plan. |
| | Local knowledge and experiences generated by historical floods. | Evaluate, gather, and spread knowledge about local experiences in managing the risk of flooding. |
| Understanding of the causes, characteristics, and existing FRM system. | Good quality information about FRM in the formal education system. | Include quality information about local FRM in formal education. |
| | Publicly accessible scientific-technical information about FRM. | Provide access to, and understanding of, scientific-technical information about FRM. |
| | Information about infrastructures and strategies for mitigating the risk of local flooding. | Find out about the current model for handling risk of flooding in your surroundings. |

The assessment of social capacities is measured by the presence of resources and abilities. Abilities refer to skills held by individuals and groups, such as “using a flood risk map” or “deliberating about complex issues”. Resources include a variety of items needed to actually develop and profit from the related abilities, such as “local flood risk maps” or “ongoing deliberative participation processes”. Abilities depend greatly on the community members’ background and experiences, while resources are usually provided by public and private institutions in specific context conditions.

Factors influencing the degree of presence of SCs for FRM in a community include the community social structure and cultural background, as well as the experience and recurrence of flood events. In addition, the institutional and governmental context of an affected community plays a major role in the development of SCs for FRM as many resources enabling them are made available by public authorities (i.e. flood risk maps, real time information, good quality information about FRM in the formal education system, public events related to FRM, create spaces for active participation, etc.).

It is argued that a participatory bottom-up approach improves the social capacity building processes. A participatory social capacity building step-by-step guide is provided. During the participatory process different participatory actions and mechanisms can be combined, and they should be adapted to each affected community’s circumstances (financial possibilities, social composition, FRM motivation, previous capacities...).

How do we measure social capacities?



Example:

| Capacities | Resource | Ability |
|---|---|--|
| Awareness of flood risk. | Publicly accessible flood risk maps. | Consult and interpret flood risk maps. |
| | Evacuation plans. | Know and be able to follow the municipal evacuation plan. |
| | Local knowledge and experiences generated by historical floods. | Evaluate, gather, and spread knowledge about local experiences in managing the risk of flooding. |
| Understanding of the causes, characteristics, and existing FRM system. | Good quality information about FRM in the formal education system. | Include quality information about local FRM in formal education. |
| | Publicly accessible scientific-technical information about FRM. | Provide access to, and understanding of, scientific-technical information about FRM. |
| | Information about infrastructures and strategies for mitigating the risk of local flooding. | Find out about the current model for handling risk of flooding in your surroundings. |

Among different participatory actions tested, it is shown that experiential actions and higher degrees of public participation have a higher impact on social capacity building. It works best if the learning is part of the activities that are interesting in themselves. Further beyond, ongoing activity is needed to sustain awareness and public involvement.



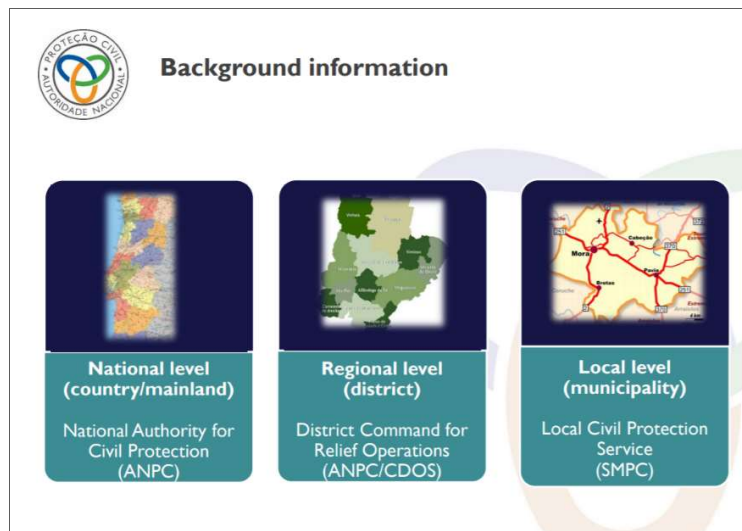
It is recommended to broaden the approach of public participation for decision making towards participation for social capacity building. The obligations of public participation in the Floods Directive are an opportunity for including social capacity building in Flood Risk Management. Moreover, including participatory social capacity building processes in flood risk management could increase efficiency of participation for decision-making. Beyond the participatory capacity building processes promoted by FRM public authorities, participatory SCB can also be implemented by NGOs, private sector, academia and municipalities, if public framework and funding is provided.

2.1.4 Flood risk warning and intervention in Portugal

Carlos Mendes - Portuguese National Civil Protection Authority (ANPC)

OVERVIEW

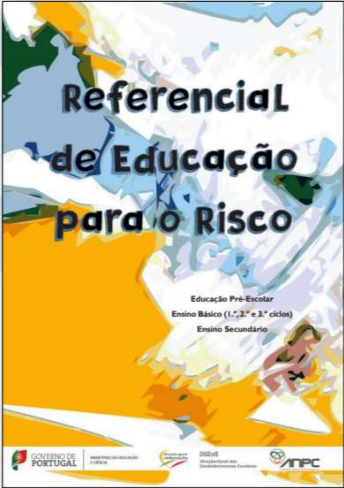
Flood risk is only behind forest fires and heat waves in the national risk assessment. By law, citizens have a right to information on risks and measures. The ANPC produces a range of materials:



- School materials for 4-15yr olds that teachers can use.
- Materials for Civil Protection Clubs in schools.

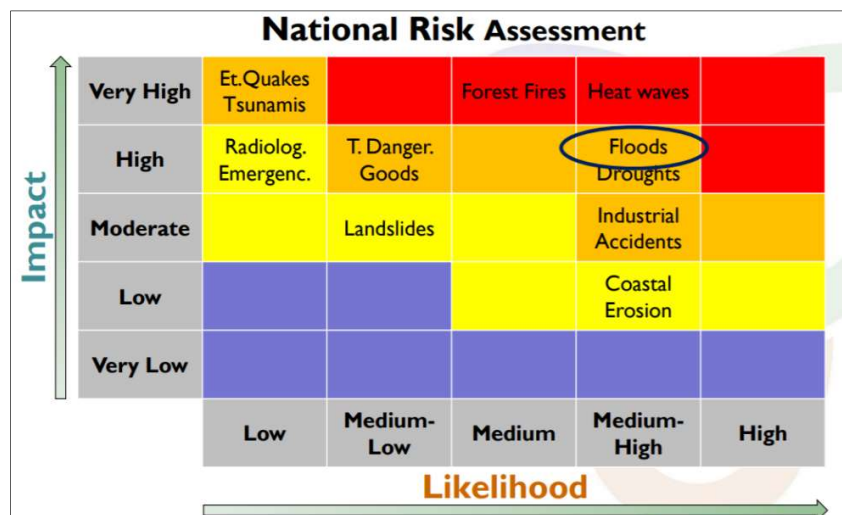
Guidelines for risk education at schools
(target: ages from 4 to 15):

- Increase student's knowledge on the existing risks, including floods.
- Promote awareness regarding self-protection actions ("how to behave in case of flooding").
- Partnership between Civil Protection and the Ministry of Education.



- Train the teachers programme. 500 teachers trained which also helps set example.
- More traditional brochures (also non-Portuguese), campaigns, exercises (local - national - international). May 2019: multinational exercise Cascade, including flood.

Floods in Portugal are considered a high priority risk



Flood Risk Warning

ANPC is hub for information –provided by different stakeholders. There is continuous monitoring, which produces a daily briefing, which then triggers a decision making process. Three tiers:

- Carry on with routine analysis (normally).
- If needed: operational notification to prepare for action, including level of the alert.

- If needed: warn the public. There is a wide range of communication channels: sirens, church bells, media, door to door, sms (forest fire only for now). General media have a voluntary role, but are very active and usually supportive.

ANPC's national role is only one part; most activity is performed by local civil protection services, depending on the Municipalities. There is positive collaboration, for example with Portuguese Environmental Agency (*APA*).

2.1.5 The flood risk at Lisbon city: how to prevent and prepare

João Telhado - Lisbon Municipality Civil Protection

OVERVIEW

The presentation aimed to illustrate how the approach for Lisbon has moved from civil protection to climate resilience. Lisbon is vulnerable to flash floods, tidal flooding and these two combined, as illustrated by historic events from 1967 to 2016. At risk is 14% of the area, 35% of residents, 40% of buildings. Flood risk management policy is aligned with international commitments such as Sendai, Sustainable Development Goals etc., and takes account of climate change projections.

A pictographic communication mechanism was created using the civil protection color scheme in order to reach the population about the risks and to avoid and minimize the damage caused.

Communication and awareness raising plays an important role in Lisbon's approach. Various EU projects (POP ALERT, RESILENS, RESCCUE) have developed icons and images; there are films and other materials to support learning, including at schools; combined with training for professionals.

WGF25
Risk awareness and communication in the **FLOOD RISK** Management Plans

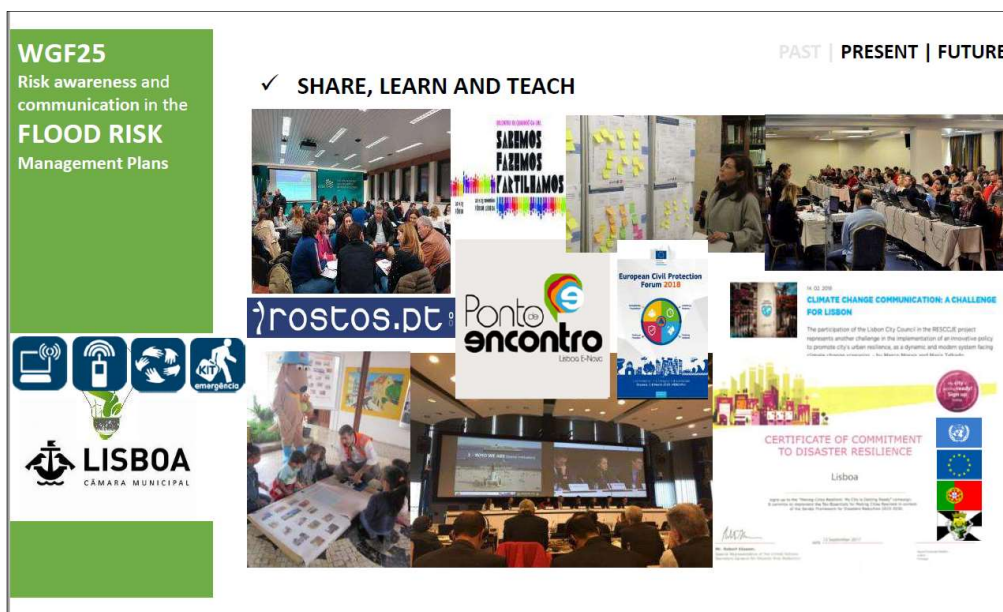
✓ Design icons, pictograms as an universal language

✓ HAZARDS

Icons/pictograms CML, 2016 EU Project POP ALERT

| | PAST | PRESENT | FUTURE | |
|------------------|--------|---------|--------|--|
| ✓ AWRNING LEVELS | [Icon] | [Icon] | [Icon] | SISMOS EARTHQUAKES |
| | [Icon] | [Icon] | [Icon] | CHEIAS E INUNDAÇÕES FLOODS |
| | [Icon] | [Icon] | [Icon] | TEMPO FRIO COLD WEATHER |
| | [Icon] | [Icon] | [Icon] | TEMPO QUENTE HOT WEATHER |
| | [Icon] | [Icon] | [Icon] | TROVOADA THUNDERSTORM |
| | [Icon] | [Icon] | [Icon] | TSUNAMIS TSUNAMI |
| | [Icon] | [Icon] | [Icon] | VENTO FORTE/RAJADA STRONG WIND |
| | [Icon] | [Icon] | [Icon] | INCÊNDIO FLORESTAL FOREST FIRE |

A risk communication strategy was also developed in schools in order to improve the perception of risk of the youngsters.



They are working on training mechanisms for teachers and the population. Emphasizing the importance of drills in perception improving and reduction of flood risk in the city.

In order to improve the management of flood risk, the municipality acts on several perspectives, databases, drainage mechanisms, and floods caused by tidal variation, urban floods, etc.

Lisbon is hosting the 4th European Climate Change Adaptation conference, 28-31 May (www.ecca2019.eu)

2.1.5 “Réserve Communale de Sécurité Civile (Municipal Civil Protection Reserve)”

Rodolphe Pannier - *CEPRI*

OVERVIEW

The French 2004 Law of modernization of civil security gives the possibility to the Mayor of a municipality to create a Municipal Civil Protection Reserve. Goal: providing support to populations in each phase of the risk management continuum (from preparation to response and recovery) and increasing risk awareness of the population.

Examples of tasks performed during the preparation phase: Increasing risk awareness: relaying messages of authorities and advices about appropriate behavior’s, advocating for familial protection plans; Training and exercises; Visiting inhabitants in flood area, identifying vulnerable persons and people with disabilities; Updating phone and mail warning listings; Participation in public meetings and events.

Examples of tasks performed during the preparation phase :

- ✓ Increasing risk awareness: relaying messages of authorities and advices about appropriate behaviours, advocating for familial protection plans
- ✓ Training and exercises
- ✓ Visiting inhabitants in flood area, identifying vulnerable persons and people with disabilities
- ✓ Updating phone and mail warning listings
- ✓ Participation in public meetings and events



They act in different phases, performing a varied set of tasks, for example, Participation in the warning and alert messages dissemination, Preparation and management of emergency shelters, Assistance for evacuation operations, Support for road traffic management, Listening to the victims, help in identifying people in social and psychological distress, Cleaning of and repairing support.

Roles:

- During preparation stage: relay messages (more trusted than officials); exercises; identify vulnerable people; update listings; support events.
- During crisis: reduce workload of primary responders – monitoring; dissemination; assistance for evacuation and first responders; sheltering goods; water/food supply.
- During recovery: listen to victims; clean & repair; re-assessment of population; procedures; manage donations.

The reserves work best if they reflect local needs; have clear tasks; receive training; and have team building.

Examples of tasks performed during the flooding phase (1) :

- ✓ Water-level monitoring
- ✓ Participation in the warning and alert messages dissemination
- ✓ Support for road traffic management
- ✓ Support for the laying of flood protections
- ✓ Guiding first responders on the field



Its success is reflected in the needs of the municipality Tasks clearly identified, consistent and complementary to other organizations and services tasks. Included in crisis management plans; Training and periodic exercises; Regular social events for keeping the Reserve "living" between crisis periods, and team building.

2.2 Summary of questionnaire responses: Risk Communication – Status of Communication in the Flood Risk Management Plans

2.2.1 Introduction

In order to structure the workshop and analyze the current situation, in the context of flood risk communication in the 28 member states, a questionnaire was designed, divided into 3 parts. The first one related to Risk Communication - status of Communication in Flood Risk Management Plans; the second to Risk Awareness - Levels of Communication in Flood Risk Management Plans and the third to Global Approach to Flood Risk Communication.

The structure and foundation of the questions proposed were based on different sources, mainly specialized PhD thesis in flood risk communication; reports of international organizations highly recognized in the context of flood risk management; experts consultation on flood risk analysis and management; and community legislation in force.

The questionnaire was sent to responsible and/or Member State organisations with the task of flood risk management. In total were sent to 28 Member States and in addition to Turkey. The Organizing Committee received 29 replies, being noted that correspond to 23 Member States, figure 1. Some Member States have subcommittees responsible representatives of internal administrative subdivisions, such as: United Kingdom (Wales, England, North of Ireland, Scotland) Belgium (National, Wallonie, Flanders); and Turkey.

The preparation of the questionnaires and their response was fundamental to the organization of the workshop held in Lisbon. It allows organizing the agenda, the type of approach in the invited communicators and the strategy to follow in the breakout sessions.

The geographic range of the answers, provides an overview within the European Union, allowing perceive the approaches and strategies that are being followed by different countries in the second phase of Flood Risk Management Plans in accordance with the EU directive 60/2007.

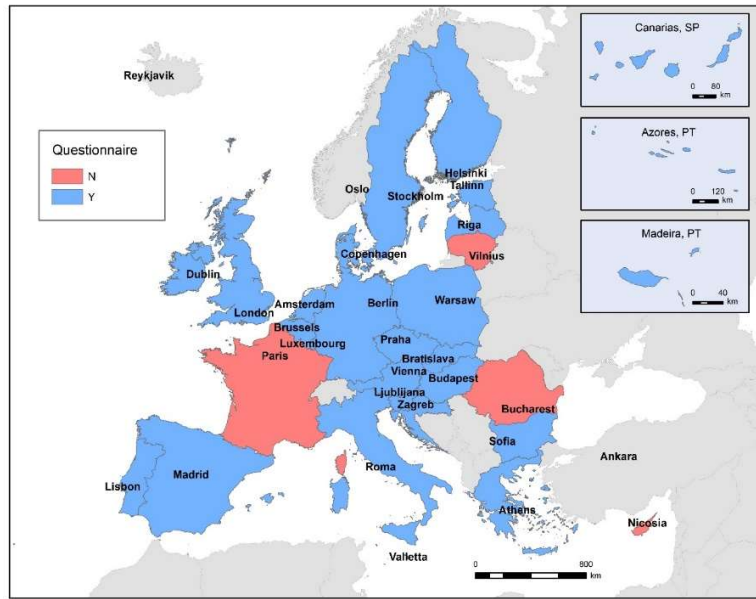


Figure 1. Member States which replied to the questionnaire

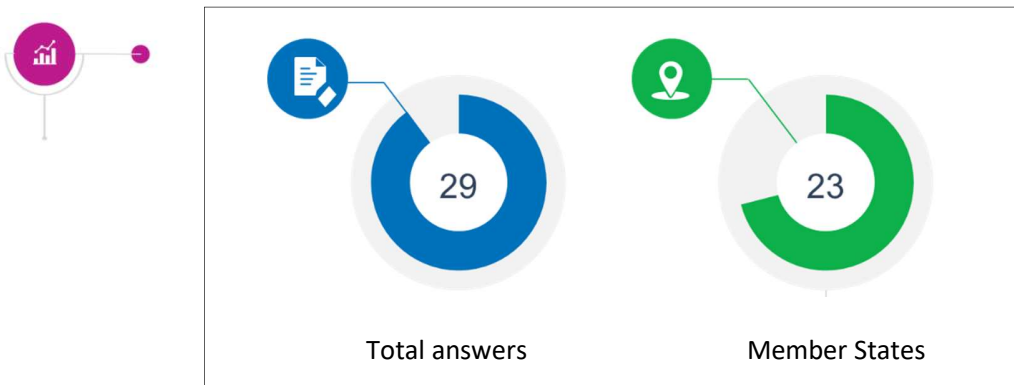


Figure 2. Resumes of replies of questionnaires

It is important to note that the member state Malta informed the Organizing Committee that would not respond to the questionnaire because the information being requested does not reflect the current flood risk situation in the Maltese islands.

2.2.1.1 Objectives

The objectives of these preparatory questionnaires were:

- to give a high level perspective on the status of Member States with regard to Risk Communication and Awareness,
- to capture experiences and lessons learnt from recent floods,
- to capture actions arising from the Floods Directive which have made a difference to risk communication and awareness
- To shape the discussions at the workshop.

2.2.1.2 Structure of the questionnaire

The preparatory questionnaire were divided into two main groups of questions, which cover all the key points to be discussed during the Workshop, namely:

1. The first one related to Risk Communication - status of Communication in Flood Risk Management Plans;
2. Global Approach to Flood Risk Communication.

The responses to the following questions were intended to give a perspective on the status of Member States with regard to communication on risk management plans and the effectiveness of measures.

2.2.2 Results

2.2.2.1 - Status of Communication in Flood Risk Management Plans;



Does your member state have a communication strategy in place?

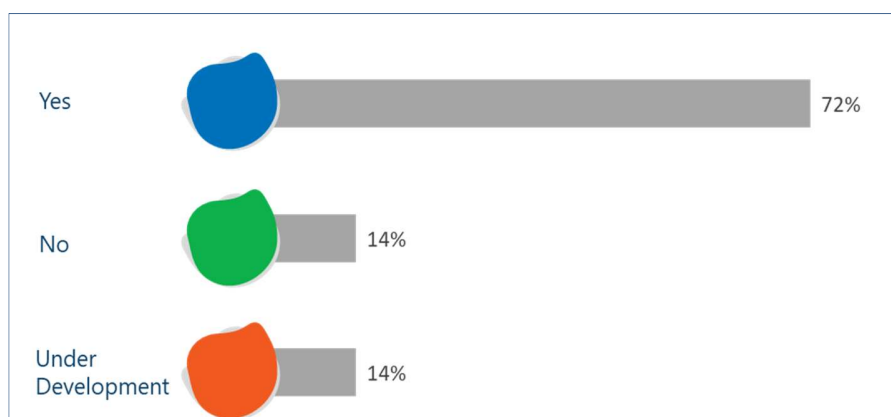


Figure 3. Does your Member State have a communication strategy in place?

In summary, 72% of the Member States indicates that has a communication strategy of flood risk put into practice; 14% do not have; and 14% indicates that is under development now.

Communication strategies are developed at two different levels: national, regional and local, through information exchange platforms and discussion forums for the affected population;

In some countries, the consultation process was initiated from the first stage of FRMP development. As part of the campaign, the website dedicated to flood protection and to the plans under development was updated on an ongoing basis, using for the active involvement of stakeholders, including planning groups and steering committees at different levels and a national stakeholder conferences, such as Poland, Italy or Sweden.

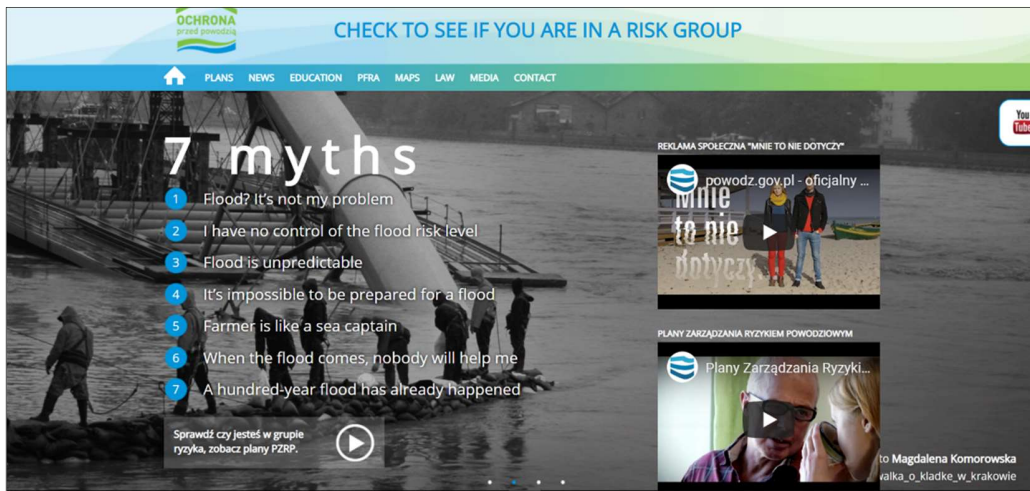


Figure 4. Polish flood risk communication website page <http://www.powodz.gov.pl/en>



Figure 5. Italian flood risk communication webpage www.iononrischio.it

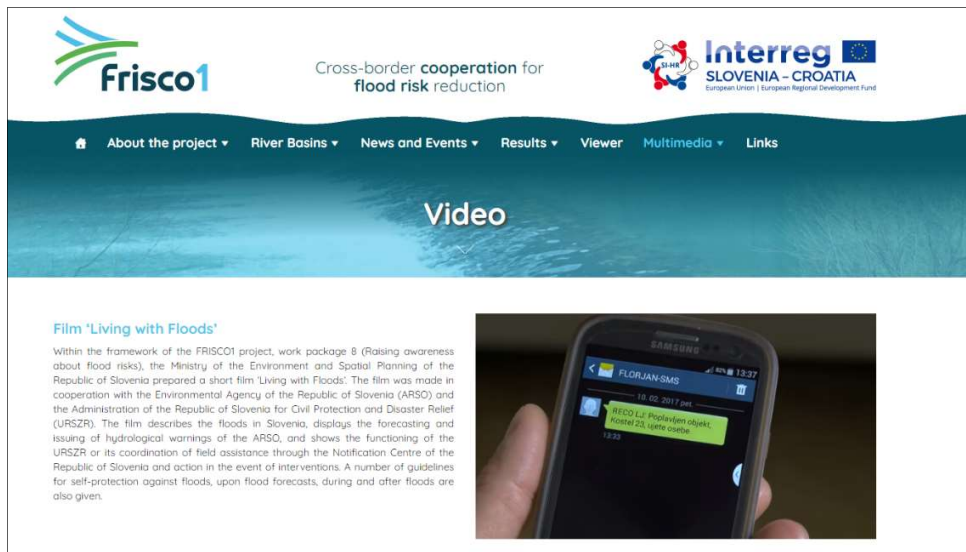


Figure 6. Swedish national plan and regional plans for flood protection and rescue, FRISCO project <https://frisco-project.eu>



Who is responsible to develop communication strategies?

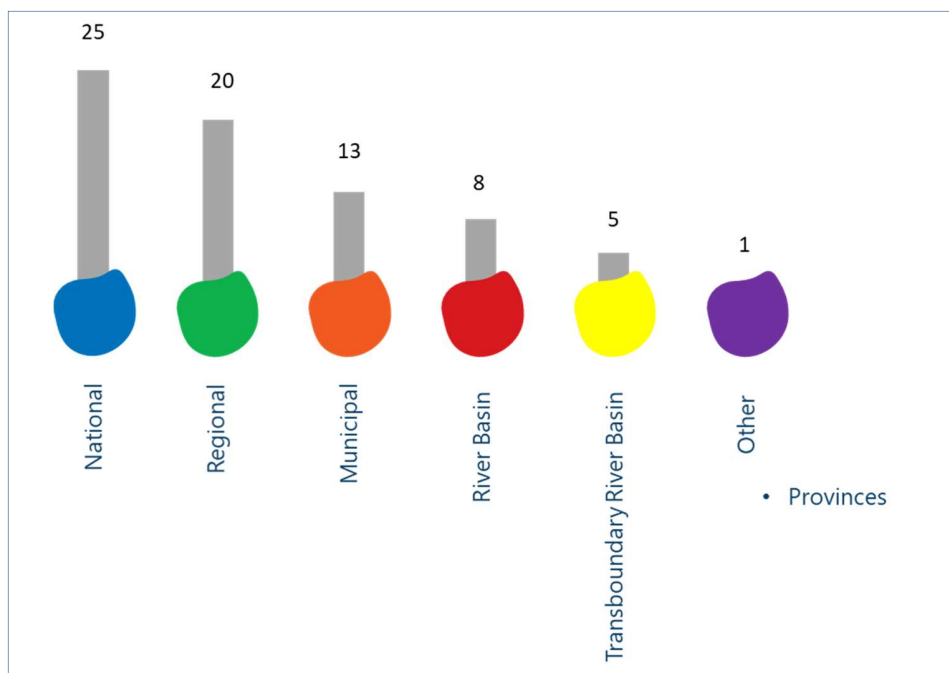


Figure 7. Who is responsible to develop communication strategies?

In most Member States the communication strategy is made at national level. However, those responsibilities tend to be distributed in different administrative levels, enhancing the regional and municipal levels. It should be noted the risk communication strategies at the level of transboundary river basins and a special case in Belgium at the level of the provinces.



Which stakeholders are the relevant ones to ensure a sound communication strategy?

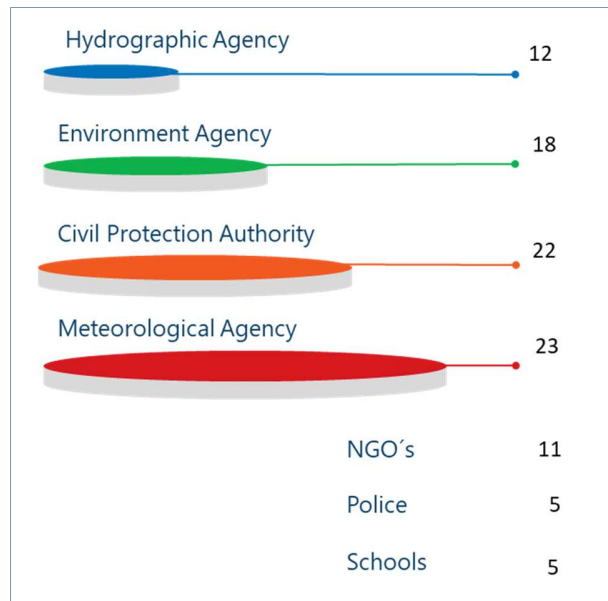


Figure 9. Which stakeholders are the relevant ones to ensure a sound communication strategy?

The Meteorological Agencies and Civil Protection Authorities are of the utmost importance in flood risk communication; likewise have the support of stakeholders and NGOs.

It is important to note that in many member states, there is not only one responsible entity; the flood risk communication strategies are distributed. Yet most of them follow a pre-established hierarchy.



How often should be flood risk communication strategies planned in your member state?

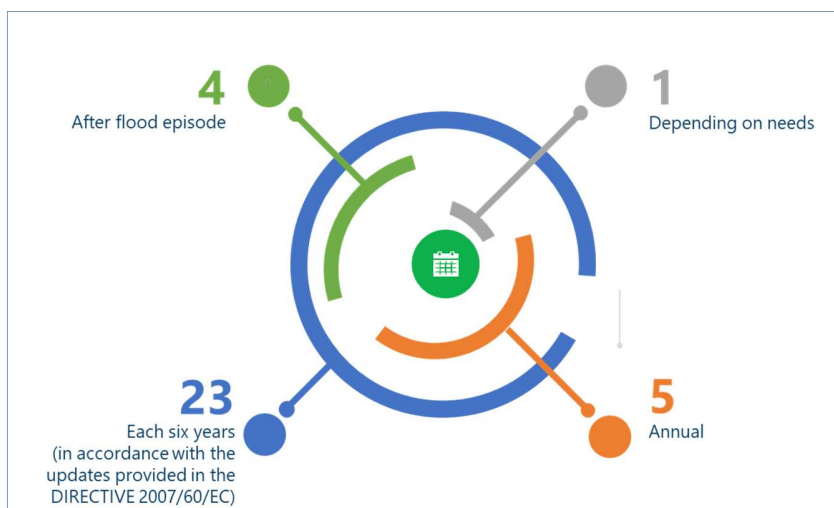


Figure 10. How often should be flood risk communication strategies planned in your member state?

For most Member States, the risk communication strategies should be established according to the period defined by the directive, every six years. Although, consider that may vary according to the recurrence of significant events.

Some countries, such as the Netherlands, try to maintain the process of permanent communication.

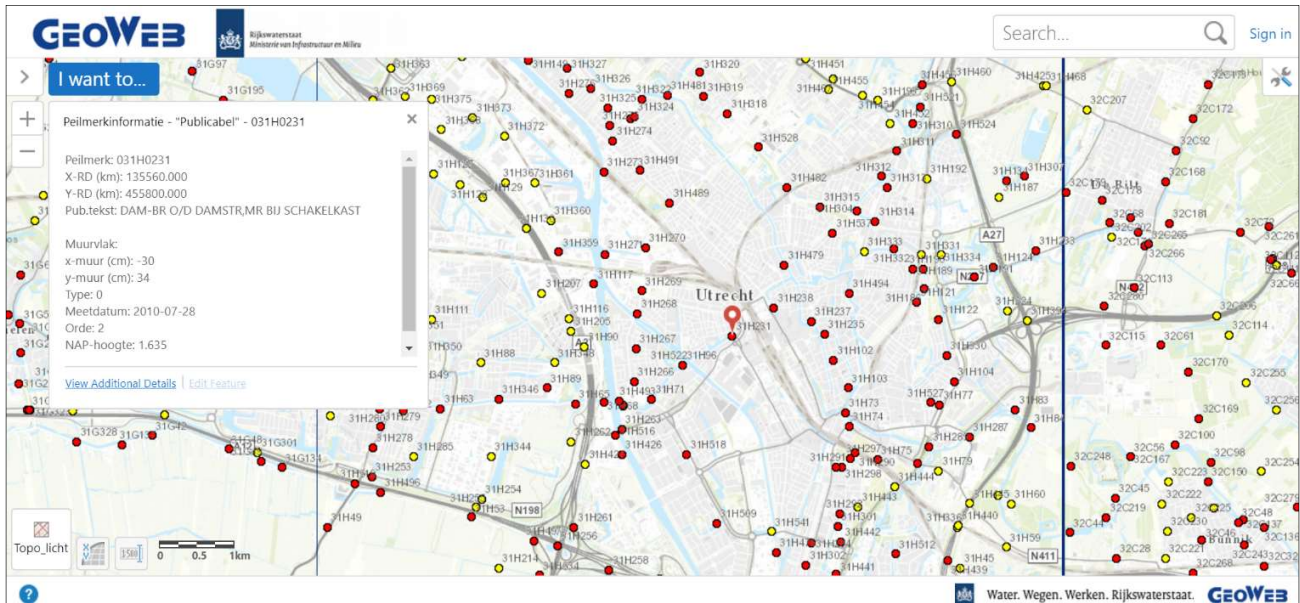


Figure 11. Netherland Flood levels web geo service <https://www.onswater.nl>

On the other hand, the transposition of the Directive into the national legislation of each member state allows the frequency of communication strategies to be readjusted, and the need to reinforce communication strategies in a post-flood period has been repeatedly mentioned.

2.2.2.2 - Global Approach to Flood Risk Communication



Do you consider flood emergency drills as a good mechanism to improve flood risk perception?

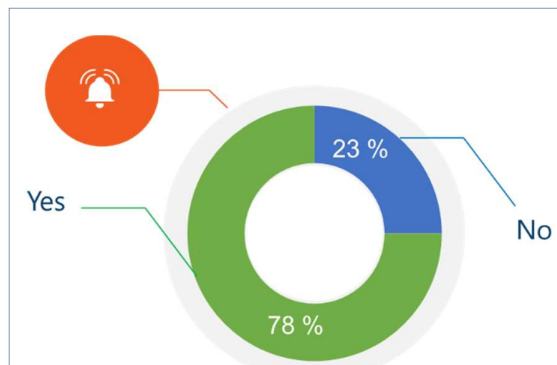


Figure 12. Do you consider flood emergency drills as a good mechanism to improve flood risk perception?

In summary, 78% of member states consider drills as a good communication mechanism for flood risk. However, there are many barriers, technical difficulties and lack of effective legislation that require them to be implemented.

The main advantages are It allows to check if the communication between the various actors is operational and if they know all the available tools; Real significant flood events happen very few so emergency drills can keep the knowledge about floods risk alive; keeping flood awareness mainly among politicians representatives;

Still, it is a possibility to show and to provide some training of self-protection mechanism during floods; improving the ability to identify shortcomings, the ability to test your skills in a situation close to the real crisis.

In order to increase its intervention capacity, the *Emergency Military Unit (UME)* of the Spanish Earth Army's, held a flood drill of national interest during the 4th, 5th and 6th April 2017, called "*Cantabria 2017*".

The main purpose of the Exercise is the training of the Headquarters of the UME, as well as of the participating entities and all the units involved in the execution of the Special Plan for Flood Risk of the Autonomous Community of Cantabria and the National Plan for Flood Risk, for an emergency scenario at levels 2 and 3.



Photo 2. Flood Drill Exercise- Cantabria 2017. Emergency Military Unit. Spain Source: <http://www.ume.mde.es/Internacional/Cantabria2017.html>

Drill scenario: The continuous and intense rains that affect the north of Spain have caused significant increases in the flow of the rivers, especially the Besaya River. Attached to the rains, the thaw of the snow accumulated in the mountains has aggravated the situation, which in turn, is accompanied by strong coastal storms that are causing flooding. The emergency mainly affects the northern peninsular zone and is expected that particularly affects the entire Cantabrian coast, especially the areas of Asturias, Santander and Bilbao.

The overflow of Besaya, in its passage through different populations, has affected many homes and businesses, especially in the towns of Torrelavega and Corrales de Buelna. The authorities of the Government of Cantabria have been overwhelmed. Being forced to activate the "*Special Emergency Flood Plan*" (*INUNCAT*) and declaring the "*Level 2 Emergency*", the *Military Emergency Unit (UME)* has been deployed to the area in support of the Cantabrian Autonomous Community. The event has caused fatalities. The authorities report at least 15 dead and 130 injured, 50 of them would be in serious condition, and the number may increase in the following hours.

Another good example of a drill that promotes risk communication and awareness was held in Paris in 2016.



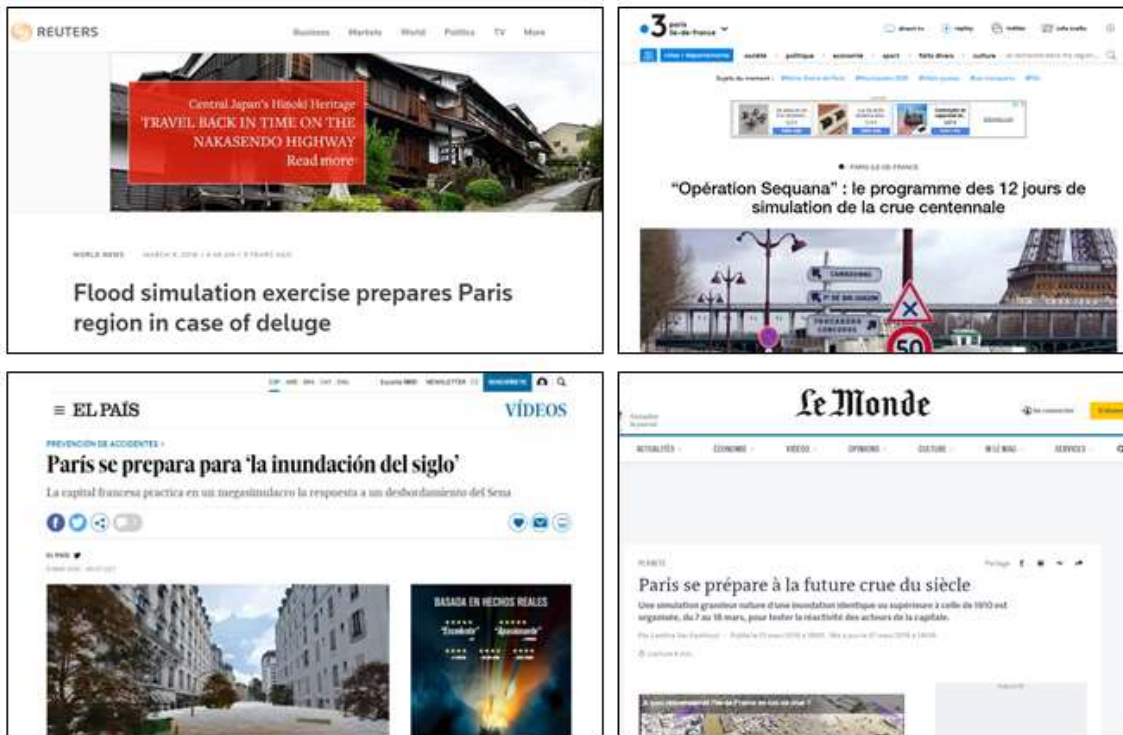
To fully prepare for flooding and aftermath, as Parisian authorities conduct an exercise between March 7 and 18, 2016 called “*Operation Sequana*”. This test allows police and utilities to anticipate better damage, fully support systems that are currently operating, and work in response times. The operation was tested at the highest level. The European Union was included in the decisions of the operation, as well as in the Interministerial Crisis Center, up to local authorities and private institutions.



The predicted scenario that 435,000 homes will be flooded if the river bursts its banks, creating lakes that will cover urban areas. This means that twenty percent of social housing will be devastated, and the costs may run as high as 30 billion Euros. Two areas in particular, Hauts-de-Seine and Val-de-Marne, will be the worst affected.

Several flood simulations were performed using digital animation. This exercise was instrumental in improving people's perceptions, but also in integrating heritage protection such as exists in the Louvre and D'Orsay museums that prepared to evacuate pieces of art.

This drill had a major impact on the media around the world. This benefits and functions as the best information transmission tool. Be present in all media, it helps people to be alert and understand what they have to do in case of flooding.



After two years of exercise, Paris had a major flood. the damage was minimized, as people and authorities were prepared for their occurrence.

All information on this drill can be found at: <https://www.prefecturedepolice.interieur.gouv.fr/Sequana/EU-Sequana-2016>

"Paris 2011 La Grande Inondation" documentary. <https://www.youtube.com/watch?v=g4AISKfh3uM>



Do you think that the communication of the flood risk in return periods can be misinterpreted and thus reduce the real perception of it? (For example 100 years of return period)

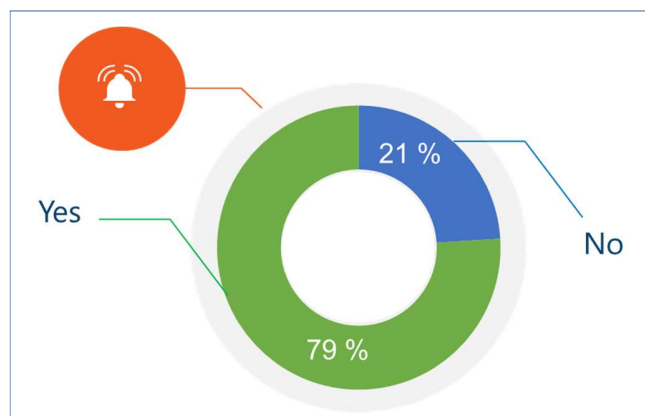


Figure 13. Do you think that the communication of the flood risk in return periods can be misinterpreted and thus reduce the real perception of it? (For example 100 years of return period)

This was considered one of the most important issues. 79% of member states consider that the use of the term return period in reporting flood risk can lead to misunderstandings, including reducing the perception of individual risk of people in flood risk areas.

There is widespread agreement on the need to change the return period concepts on maps by others that are more noticeable on the part of the population, such as probabilities, water levels or others. As for example already happens in the Netherlands.

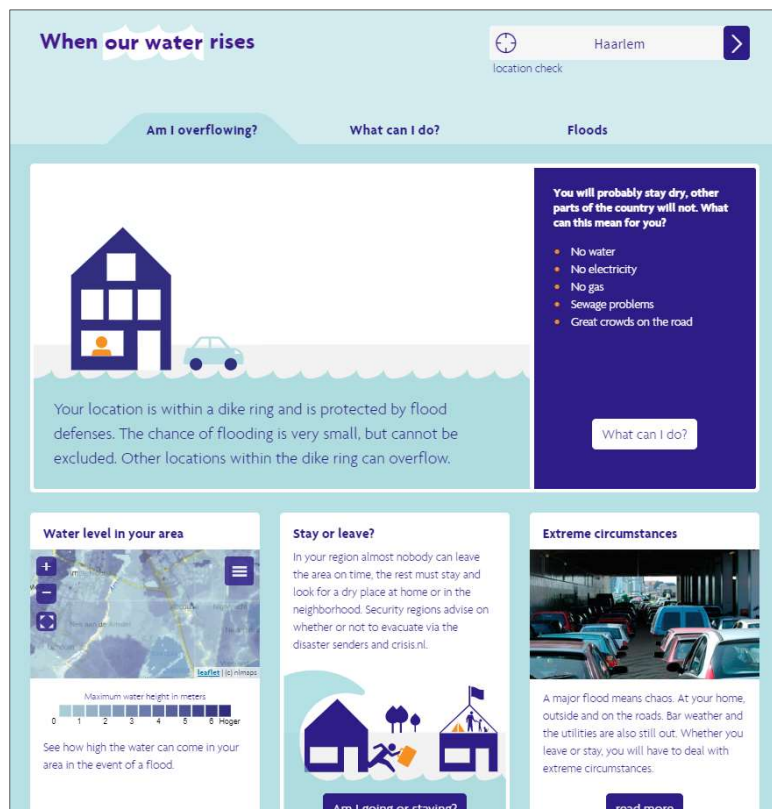
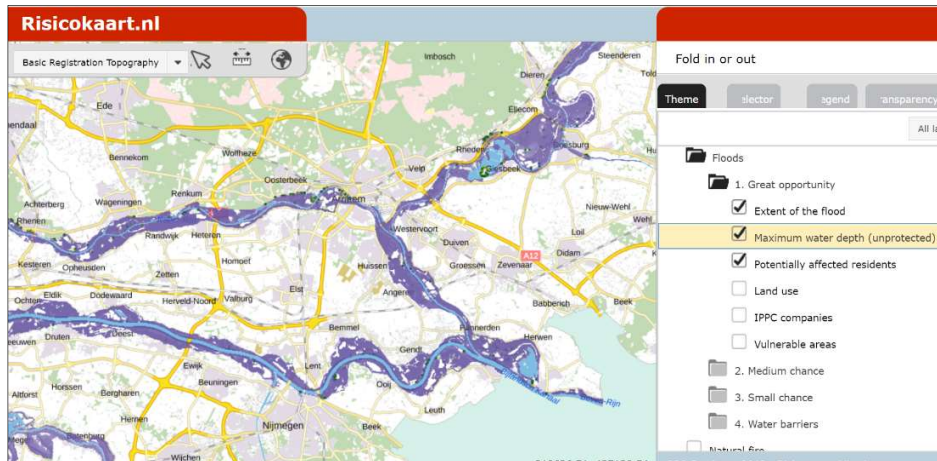


Figure 14. Example of the Netherlands flood risk communication: occurrence probability and water levels. <https://flamingo.bij12.nl/riscokaart-viewer/> <https://overstroomik.nl>



Which improvements do you consider important relating cross-border warnings and data exchanges on flood events?

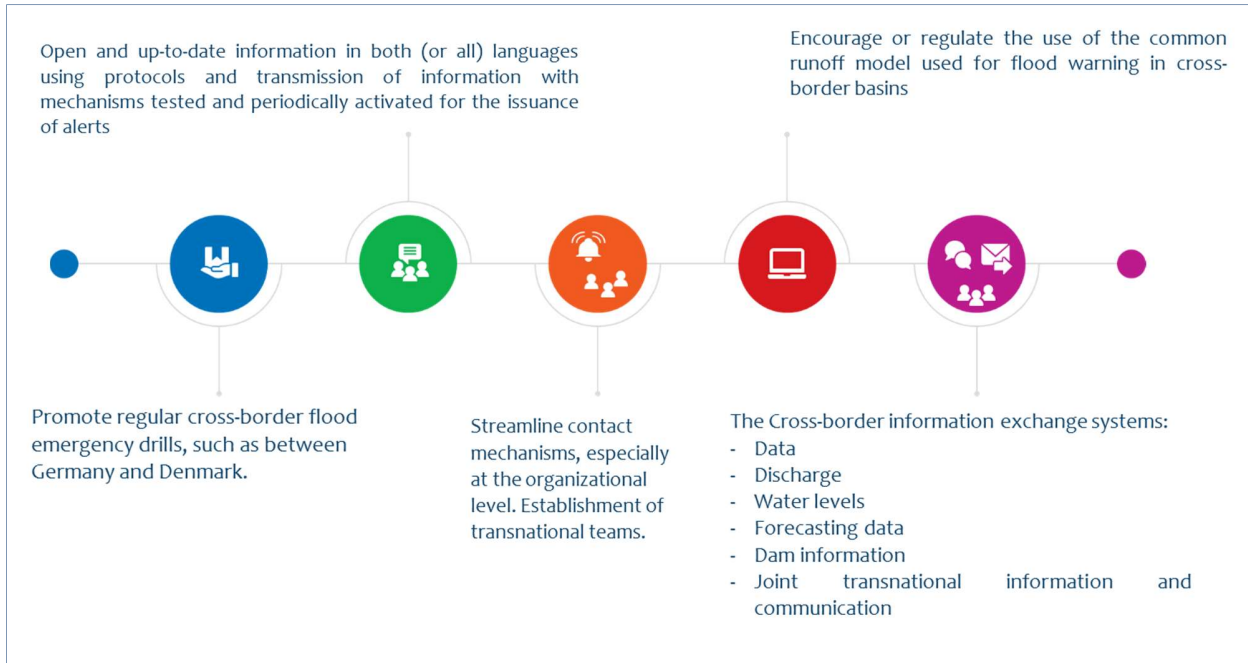


Figure 15. Which improvements do you consider important relating cross-border warnings and data exchanges on flood events?

In general, there is a consensus on the need to improve partnerships in transnational river basins. These exchanges are important in order to anticipate the management of major rivers. It makes it possible to anticipate the stopping of the navigation, the recall of the team for the management of the locks. For the small streams, the exchange of data is essential for the forecasts of the floods.

In other hand, there is a need of regularly meetings to exchange knowledge and cross-border flood emergency drills, such as the emergency drill which was performed between Germany and Denmark in 2010;

Sharing information about past floods, sharing monitoring data of river basins during heavy rainfalls. We also implement many cross-border non-structural projects, where we try to improve cooperation and communication.

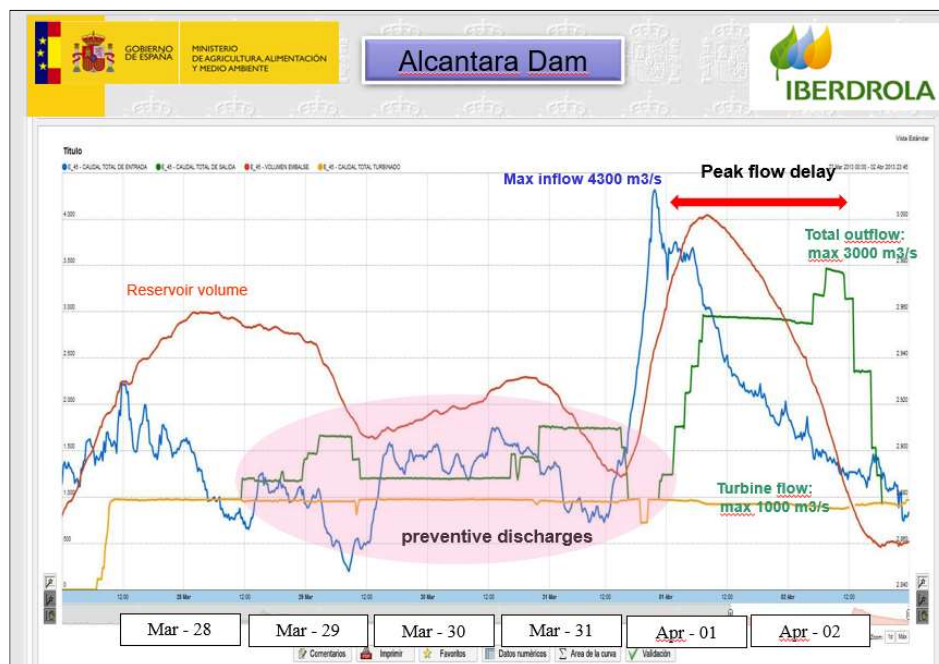
A good example of cross-border cooperation is the agreement between Portugal and Spain. The first relations began in the year 1864. Resulting in the "*Albufeira Convention*" on the co-operation for the protection and sustainable use of the waters of the Portuguese-Spanish river basins 1998-2008.



One of the objectives of this agreement is related to flood risk management. A good example of the operationally of the convection was the result of the Tagus River flood management in 2013.

Through the cooperation of both countries, it was possible to reduce flood levels in the Portuguese part.

The Spanish authorities anticipated, during March 29 and April 1 of 2013, several discharges to increase the storage capacity of the *Alcantara* dam that within the next two days it could store the flows that would cause severe flooding in the Portuguese territory.



2.2.3 Breakout Sessions Day 1 – Communication in Flood Risk Management

An introduction was given to the break out session. Communication in Flood Risk Management for MSs is a very significant point of approach and consideration. The conclusions and challenges are:

What kind of flood related information do you provide to communicate flood risk?

- In general MS provide good information in FRM through web pages; Risk and Hazards maps, etc.; There are some good examples at local level;
- Most MS don't know if the information reaches the target; many MS don't have strategies on risk communication;
- Importance of the communication by drills and educational programs (behaviour in flood events).

Is there a distinct budget, funding scheme in place to support the communication?

- No, in general there is not a distinct budget;
- Clarify specific social media for different population targets, for example: by age;

Are there trans-boundary systems and mechanisms in place?

- Some MS have a shared system, but it is at the administrative level;
- Rhine Commission has trans-boundary campaigns.

What kind of information are you planning to provide in future? What piece of information do you consider as especially important for communicating flood risk and raising the awareness?

- Visualisation using videos, 3D-animation, TV and films;
- Apps or homepages can be used for reporting. It is, however, not clear, how authorities use and react to information reported by the public;
- The objective of communication at different levels is to make people more resilient to flood risk.

Effective public consultation in 2nd FRMP. Climate Change Scenarios and Flood Risk Communication

- Some MS mentioned that public awareness of climate change is not high at the moment. A large group of MS do indicate that public awareness of climate change is high;
- The difficulty lies in how to get across uncertainty in the FHRM and FRMP;
- Some MS have included climate change in PFRA, flood modelling and mapping, however communication of climate change impact or communication strategies can be less developed/used.

Do you specifically provide explanations on risk, residual risk, uncertainty, return periods, etc.?

- Most MS provide information about Risk, Residual Risk, Uncertainty and Return Periods, although some are misunderstood by the population;
- Need to use clearer concepts to effectively communicate flooding risk, for example: Water levels associated to Return Period.

Do you also have experience with social media?

- Most MS use Social media;
- There are some target-group focused mechanisms in place, in particular social media for school children.

How is flood alerting organized in case of emergency?

- Most MS have an organized Alert system/ EWS;
- Most of Early Warning Systems use color scheme. Maybe using “Names associated to Storms and/or Flood events” (as for hurricanes and typhoons) could be better to maintain population awareness by memory.

3 Session 2: Awareness in Flood Risk Management

3.1 Report on workshop presentations on Flood Communication.

During the second phase of the workshop, different presentations took place. Below is a summary of the presentations given, reflecting both EU and several national perspectives.

3.1.1 Welcome and Introduction

Paulo Alexandre Marques Diogo - Portuguese Environment Agency

OVERVIEW

A summary of the first day sessions.

Briefly presenting the results of the previous day.

The agenda for the second day was summarized, presenting the communications that would be made in the context of awareness in risk management.

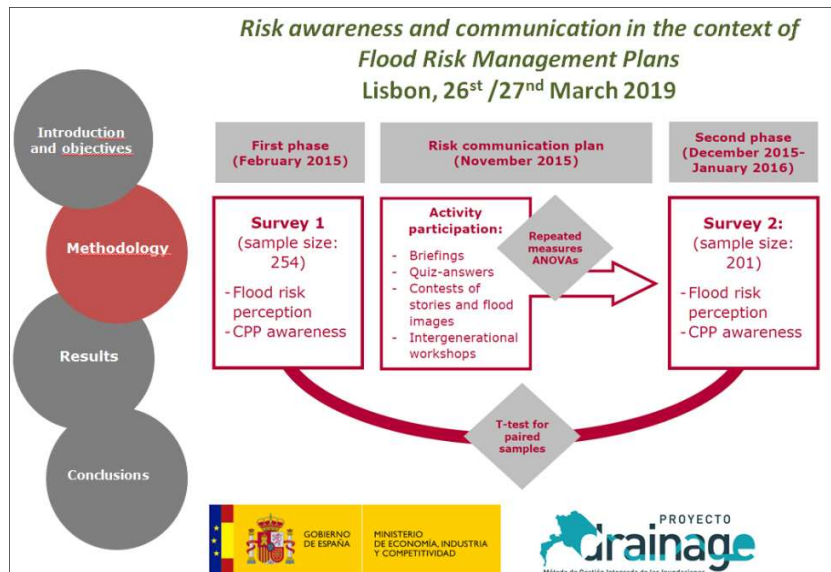
3.1.2 Enhancing flash flood risk perception and awareness of mitigation actions through risk communication

José Maria Bodoque - *Facultad de Ciencias Ambientales y Bioquímica. Universidad de Castilla-La Mancha (UCLM)*. Spain

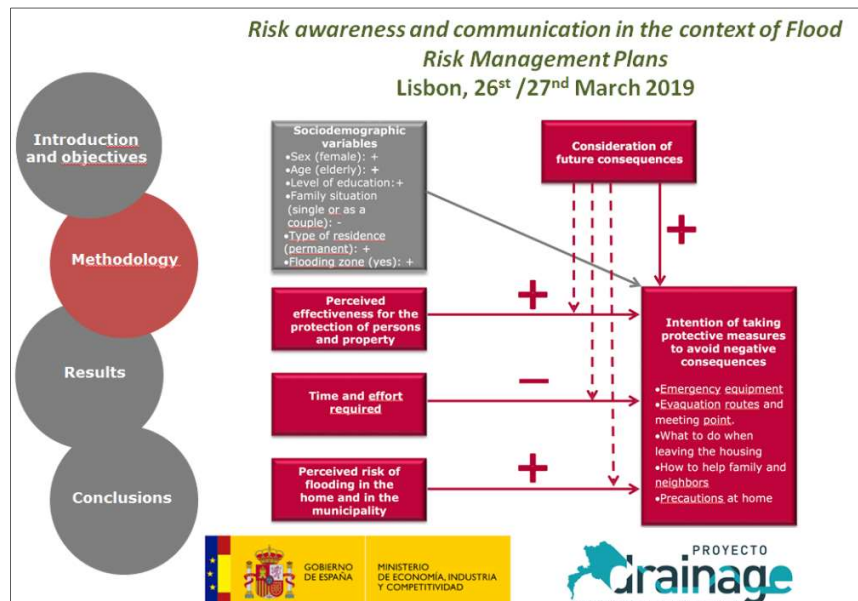
OVERVIEW

The presentation reports on a case study from the ‘*DRAINAGE*’ project, funded by the Government of Spain. In the context of the global move from ‘resistance’ to ‘resilience’ based flood risk management, the study investigated a town on the river *Alberche* (central Spain):

- local perception and awareness of flash flood risk.
- how these were influenced by implementation of a communication strategy.
- and how these vary spatially through the flood hazard zones.

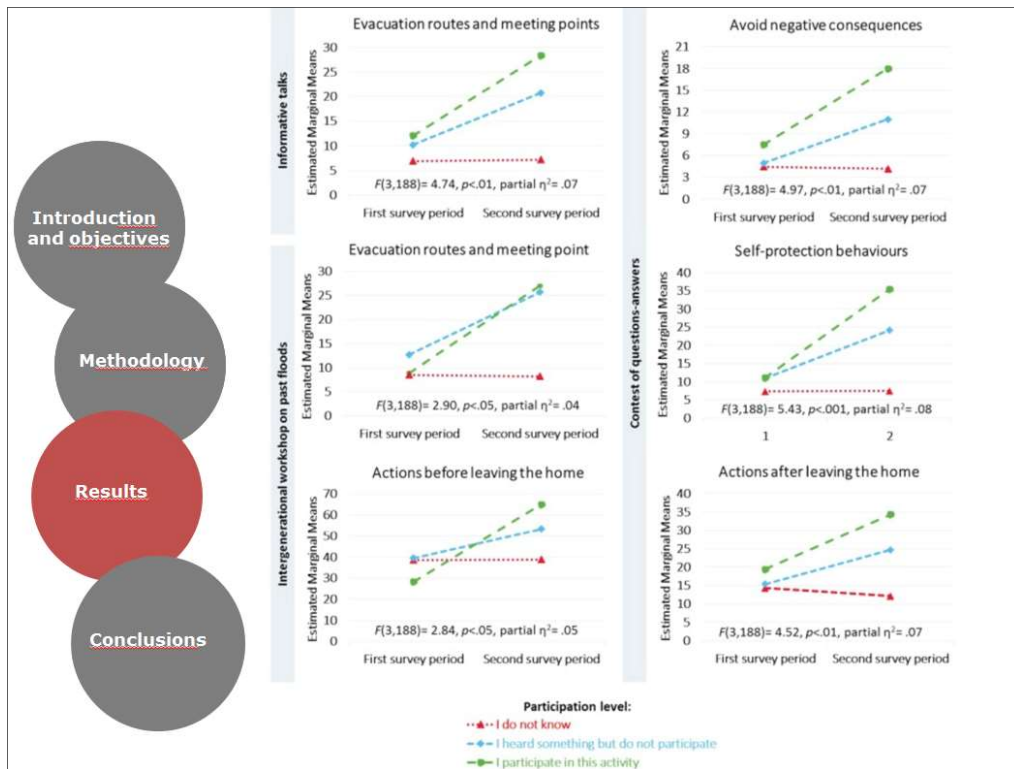


The study used questionnaires for socio-demographic background, plus risk perception and effectiveness of measures. These were carried out before and after the communication campaign. The campaign took a risk dialogue approach and included briefings, quiz, stories & images competition, intergenerational workshops. The results were compared through geostatistical analysis, distinguishing 3 respondent groups defined by risk perception and by knowledge.



Results:

- Overall risk perception increased more for those who participated.
- Understanding of specific measures improved most for those who participated, but also for those who only heard of the campaign.
- Geospatial relationships - perception found to be lowest around the intermittent stream (rather than the permanent river).



Conclusions: risk dialogue approach can improve awareness; the methodological research approach can help generalise communication strategy; this should be an essential step in FRMPs.

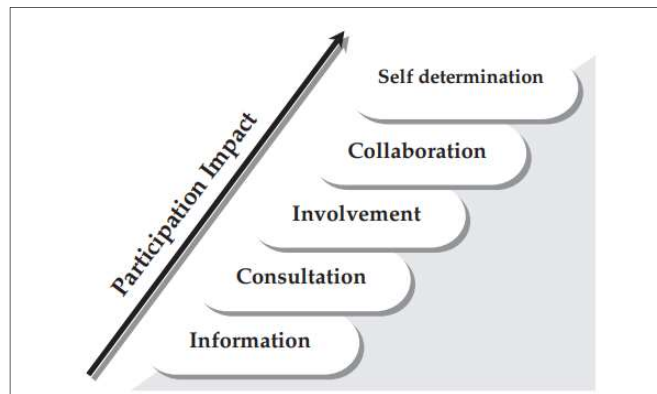
3.1.3 Stakeholder participation in water management and planning: lessons from the WFD implementation

Nuno Videira - Faculty of Sciences and Technology, New University of Lisbon. Portugal

OVERVIEW

The presentation sets out the importance of and ambitions for participation in EU Water policy; lessons from research of WFD implementation; snapshots of FD implementation; and future challenges.

Participation is essential for achieving the economic / environmental / social aims of IWRM. Review shows that before WFD, projects had a narrow technical / economic focus in terms of benefits, decision makers and options considered, with limited one-way information flow. WFD article 14 prescribes 'active involvement'.



Participation:

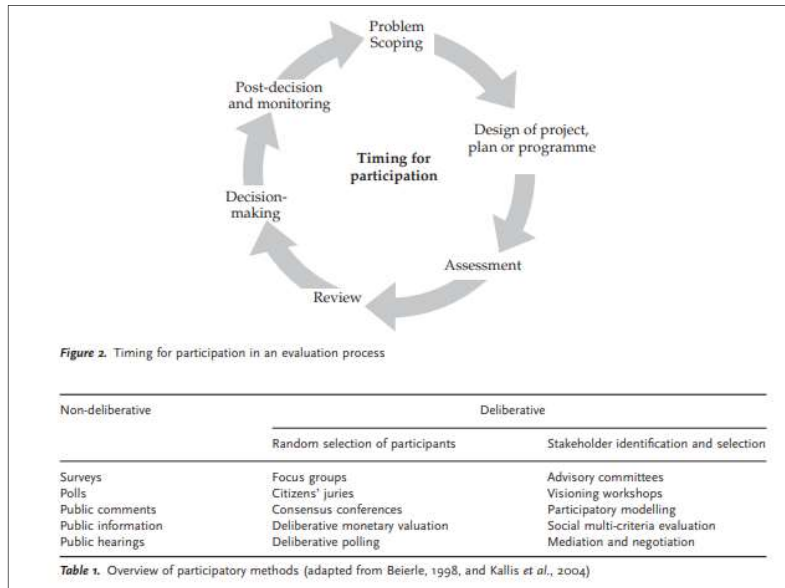
- What: Organised process – transparency - two ways – active.
- Why: Normative (right thing to do) – substantive (combine knowledge) – instrumental (higher chance of success). Also, no single organisation is in charge of WFD / FD issues. ‘Messy issues’, i.e. this need a ‘post normal science approach’ including uncertainty, value loadings, plural perspectives.

Lessons from WFD: how to promote participation:

- Processes & tools: information – consultation – involvement – collaboration – empowerment (‘we implement what you decide’).
- Multiple approaches – visioning and scenario workshops, participatory mapping; deliverable monetary valuations, citizens’ juries, etc.
- Example: Integrated Deliberative Decision Processes framework – 8-step process, from 1. set-up organisational scheme to 8. Evaluation; Procedural guidance (Kallis et al, 2007).

Floods Directive snapshot:

1. Article 10 – “make information available”, “shall encourage active involvement”.
 - Case Portugal: review of key stakeholders – participatory processes – tools. SWOT analysis: lack of resources, lack of engagement of citizens & groups, mostly public sector.
 - Case Poland: review of tools: interesting website, brochures, ‘7 myths’, “youtube”, family flood plans.
 - EC Implementation Report for WFD/FD found that it is not always clear how engagement influenced the plan. Room for improvement with regard to active involvement, and reporting back on how it influenced the plans.



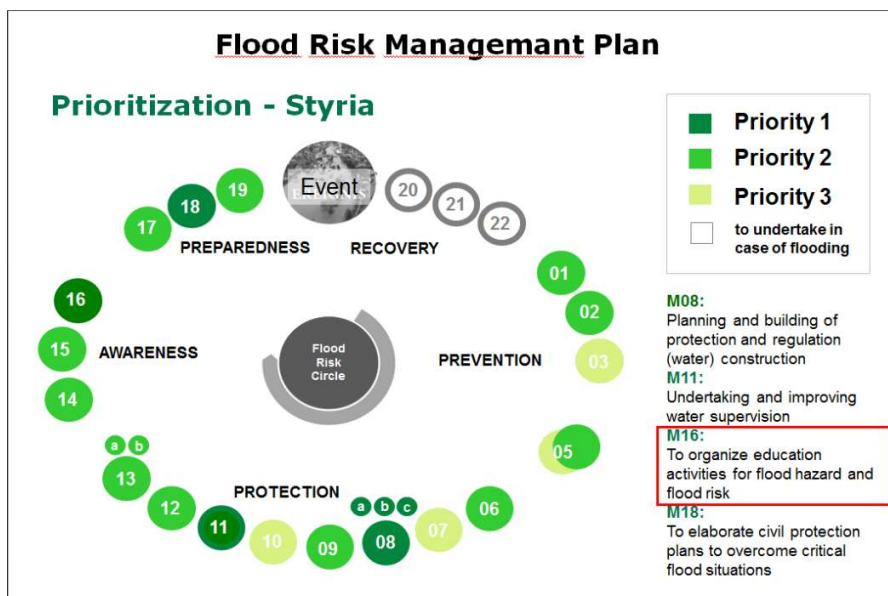
Future challenges relate to achieving SD Goals, 6 on Clean Water & Sanitation. Many risks identified for SDG6 are also relevant for FD and indicate increased need for sustainable water management. But the opportunities (behavioral change, societal involvement, participatory processes) will also support flood risk management.

3.1.4 Information campaign self-protection and individual prevention

Rudolf Hornich, Regional Government of Styria. Austria

OVERVIEW

Steiermark (Styria), as a regional government, is responsible for FRM. There have been many recent floods – very local, heavy rainfall, 50/50% fluvial / pluvial. The public expects from the public sector to resolve the issue with schemes and to be helped during floods (by calling fire brigade) – there is low willingness for self-protection. This is why Styria's FRMP identified 'education about self-protection' as 1 of 4 high priority measures.



A campaign was organised, targeting all citizens, 290 municipalities, over 2017-2019. Goals: create awareness, increase capacity, transfer know-how. Activities concerned media and community events; 80 events, 4000 persons reached. Information was provided on personal flood risk (including uncertainty), how to prepare, roles, flood stories. Personal Flood Folder and check-list

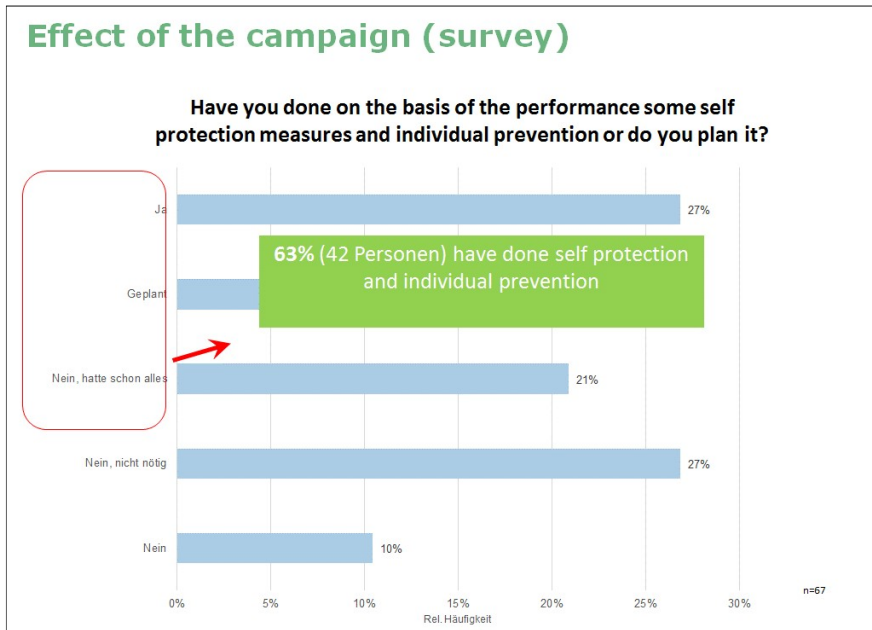


Typical questions were collated and FAQ established on website. Survey of effect of the campaign: 63% did or planned to prepare. The campaign runs on one website that combines all the information (civil protection office). The campaign will continue; originally 2 years, now at least till 2020.



Awareness for self-protection measures. For the fact that firefighters are not a cleaning service but should be used in real emergency situations.

Use training, sensitization and knowledge assessment mechanisms as a key tool in increasing risk perception and reducing exposure.



3.2 Summary of questionnaire responses: Awareness in Flood Risk Management

3.2.1 Introduction

The analysis of this questionnaire has been very useful, and it shows how the MSs are implementing the awareness strategies in flood risk management. The analysis has 14 points, starting from the status of the levels of communication as awareness mechanism.

Finally, 28 member states have sent the completed questionnaire, a lot of them with many references, hyperlinks and very useful information.

3.2.2 Results

3.2.2.1 – Risk Awareness – Levels of Communication in Flood Risk Management;



Rate the importance that should be given to communication in each phase of the Flood Risk Management in your member state?

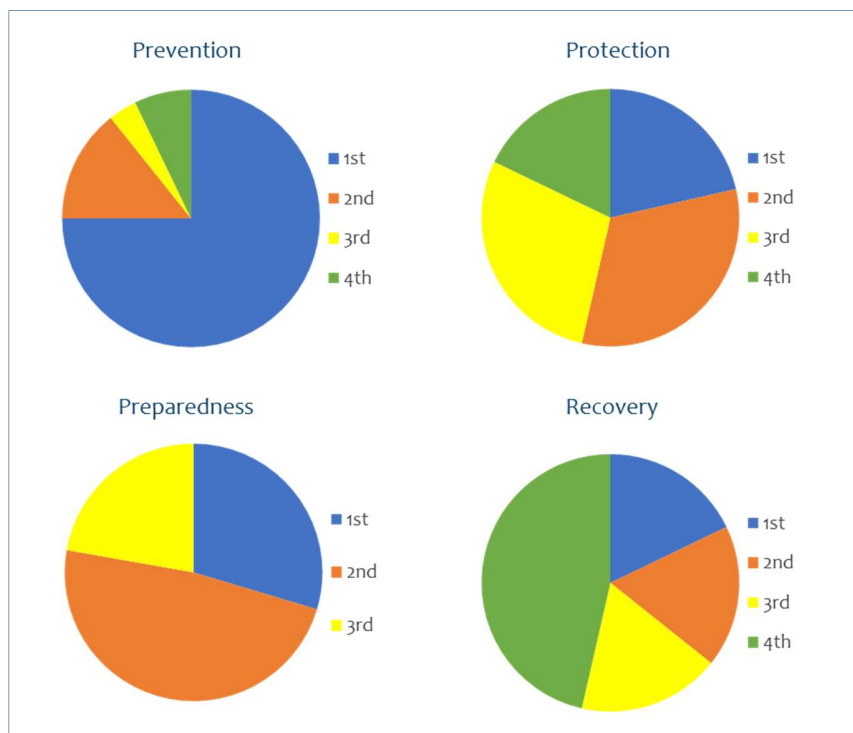


Figure 16. Rate the importance that should be given to communication in each phase of the Flood Risk Management in your member state?

From the point of view of flood risk management, the concepts of prevention, protection, preparedness and recovery assume an 'automatic' logic regarding to the importance assigned by each member state, essentially due on the procedures adopted by the civil protection. This perception is more noticeable, respecting to prevention and recovery, presenting itself as the assumed to be the start and end of processes in most of the answers.

The process of risk communication and awareness often faces a problem, lack of information. The most classical approaches are based on fully institutional information based on previous studies.

Nowadays and with a future perspective it is possible through dynamic spatio-temporal analysis to analyze large volumes of information and summarize them so that a real time decision process can be adopted.

Applying BIG DATA, it is possible to do this kind of analysis and integrate it into the communication process. Following is a project where this type of analysis is applied.

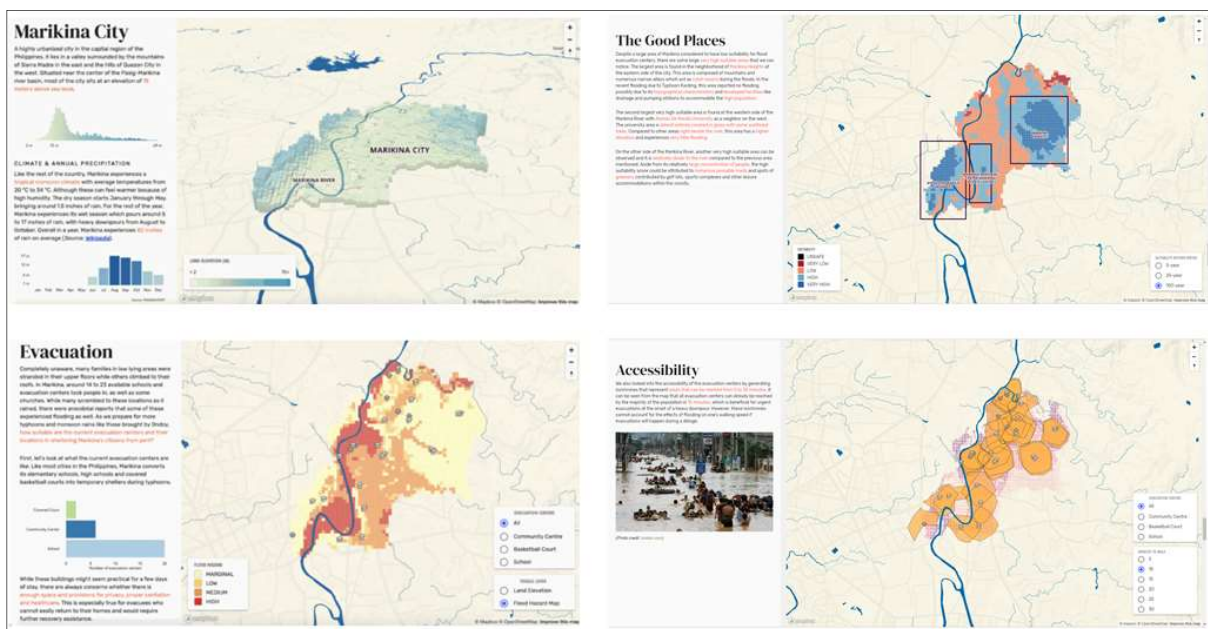
Imagine you live in a beautiful city in the Philippines, in a lush river valley. You know that the area has a history of seasonal floods and typhoons, but how well do you understand and talk about the risk that these natural hazards pose? Where is your nearest evacuation point? How will you get there? How do local officials plan for evacuations to ensure everyone has somewhere safe to go? These were the key questions at the heart of *RIESGO*, the grand prize winner of the 2019 *VizRisk Challenge*, hosted by the World Bank’s Global Facility for Disaster Reduction and Recovery (GFDRR) and the Understanding Risk Community, in partnership with Mapbox and the Data Visualization Society.

How could we use maps and data visualization techniques differently to more creatively and effectively communicate the risk of natural hazards and disasters?

Background:

The idea stemmed from a research project called “*Riesgo*” with the aim of identifying suitable areas for evacuation centers for floods in Marikina City. Due to the rainy season and the location of Marikina City, it was considered to be one of the most devastated areas during Typhoon Ketsana back in September 2009.

Through the crossing of a large set of information (real-time population location by crossing mobile phone gps data, simulating possible flooded areas, road network, DEM, accessibility, Critical building structures such as residential areas, schools and healthcare, etc.), it was possible to develop an interactive tool, where you can only view evacuation routes, affected population, ability to receive hostels, optimal location of each route and hostel according to the location of the population, etc.



The big advantage of BIG DATA in the process of flood risk communication and awareness is that it allows not only to analyze all information in real time, but also to share all information with the target population easily and quickly, via mobile phone, social media or official channels, reaching the maximum possible population.

You can consult all the information about this project: <https://comet.dlsu.edu.ph/riesgo-vis/> and <https://medium.com/dlsu-comet/vizrisk-flooding-in-marikina-city-a-case-study-2a59cf0dd1ba>



What kind of information exists regarding flood risk communication in your member state?

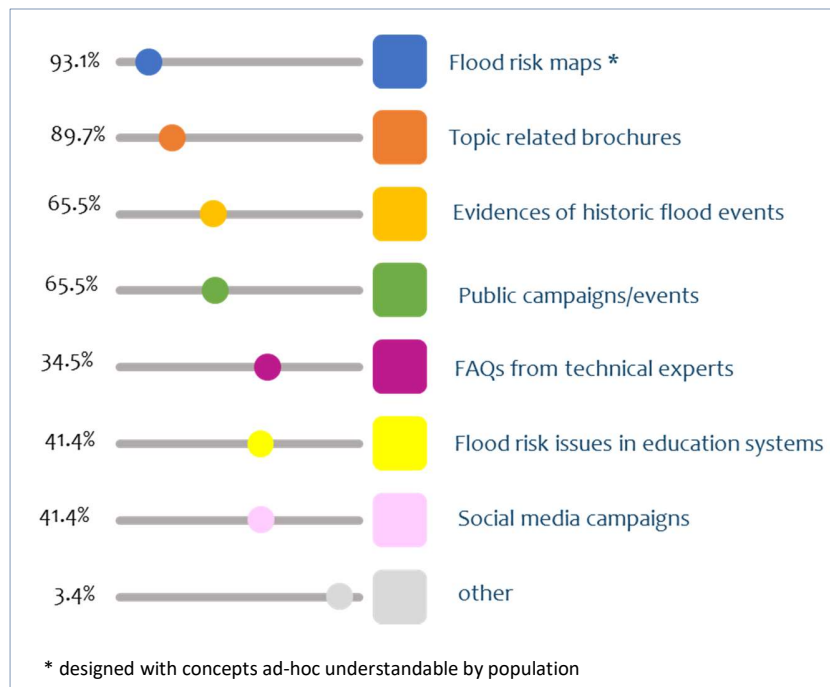


Figure 17. What kind of information exists regarding flood risk communication in your member state?

The main flood risk awareness tools used by most Member States are the hazard maps. However, it is important to emphasize that the type of maps used in communication strategies will have to be translated and / or simplified in order to increase individual perception. Topic related brochures, Evidences of historic flood events and Public campaigns / events remain the most widely used strategies, although classical conceptions continue to be effective on risk communication. Almost half of the member states already include in the educational systems in a didactic form the communication of the flood risk.

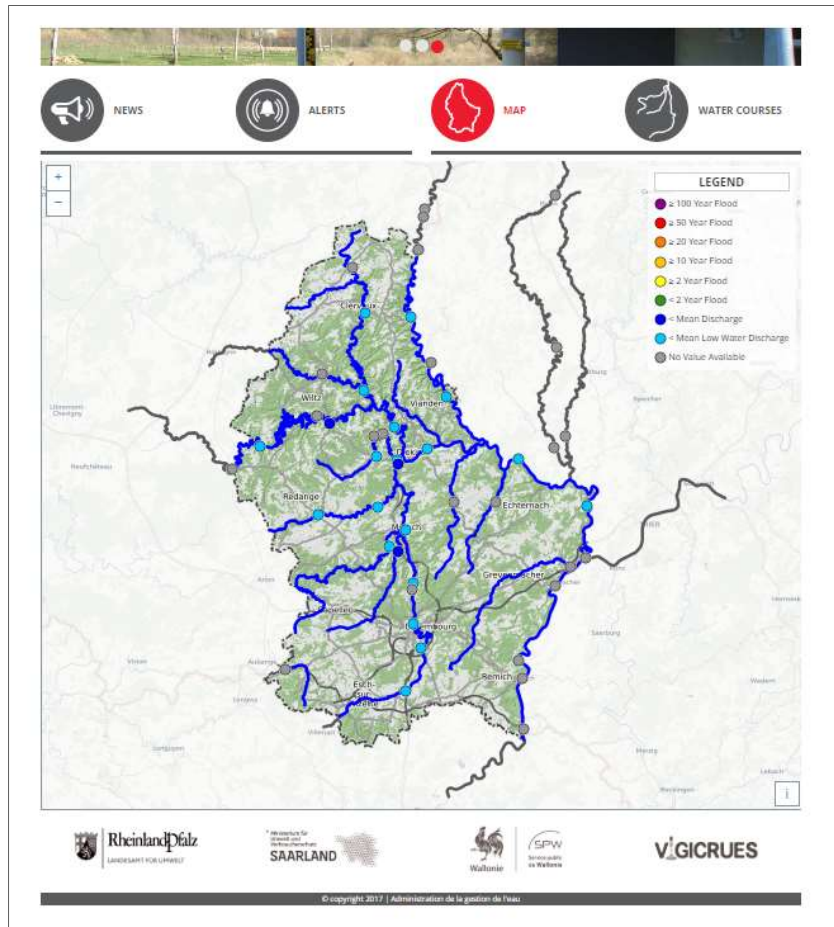


Figure 18. Luxembourg flood warning system <https://www.inondations.lu/map>

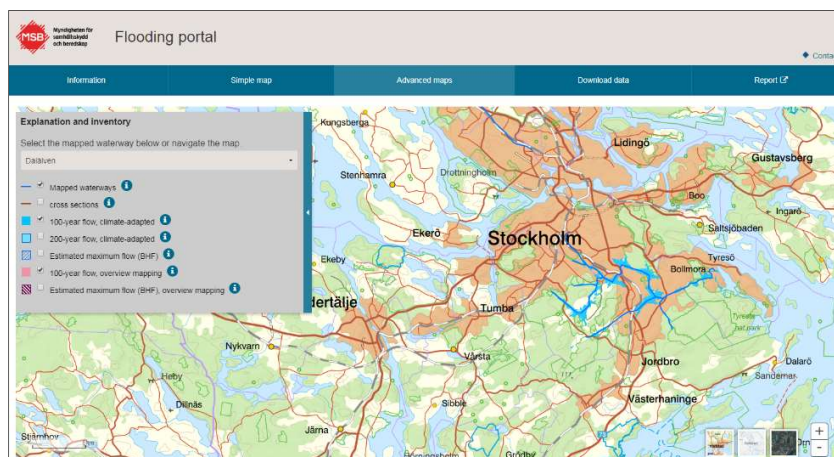


Figure 19. Sweden flood warning system <https://gisapp.msb.se/apps/oversvaminingsportal/avancerade-kartor/oversvaminingskartering.html>



Are there mechanisms in place to evaluate and assess the effectiveness of the information provided?

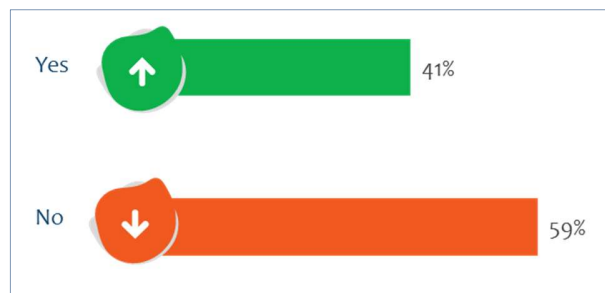


Figure 20. Are there mechanisms in place to evaluate and assess the effectiveness of the information provided?

Almost half the Member States have not mechanisms for evaluation of the effectiveness of the information made available to the population. However, specifically on the theme of risk communication there is no official mechanism for evaluation. Some Member States have locally or pilot experiences integrated in research projects to assess this effectiveness. Some of the MSs use official website access statistics as a mechanism for assessing awareness systems.

On the other hand, most evaluations are done in local studies. It is easier to encompass the entire process due to scale (mainly scientific projects).



Do you consider that the information contained in flood risk communication meets the standards of:

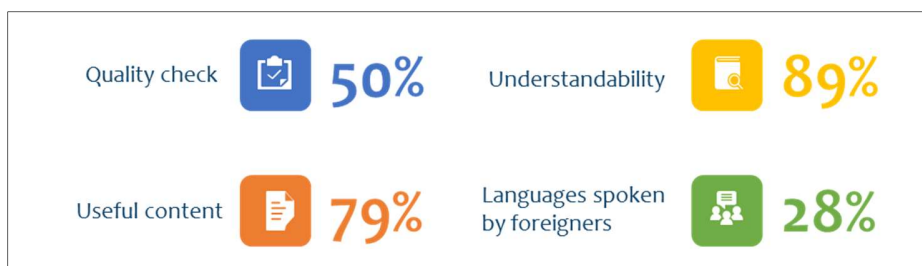


Figure 21. Do you consider that the information contained in flood risk communication meets the standards of:

The information that is transmitted to the population to improve their perception of flood risk should fulfill some assumptions. Most Member States, 79% consider their information have a useful content, 89% that meets the standards of understandability, 50% quality standards and only 28% disseminate the information in foreign languages. It is important to note that some Member States have more than one official language.

The information provided is very varied. Goes through by pedagogical material, workshops in the frame of Awareness and capacity building campaigns on flood-related issues for public authorities and communities were hold. Lecturers were from the universities, scientific research institutes, US Copernicus program, civil protection authorities, cartography or understandable colors of traffic lights for danger.

It is important to note that some MSs also provide information in special formats such as Braille.



Figure 22. Example of special formats such as Braille used in UK



Figure 23. Several examples of information (flow levels, historical information, traffic signals) used in communication and flood risk awareness.



What kind of information do you think is helpful in the context of preparedness?

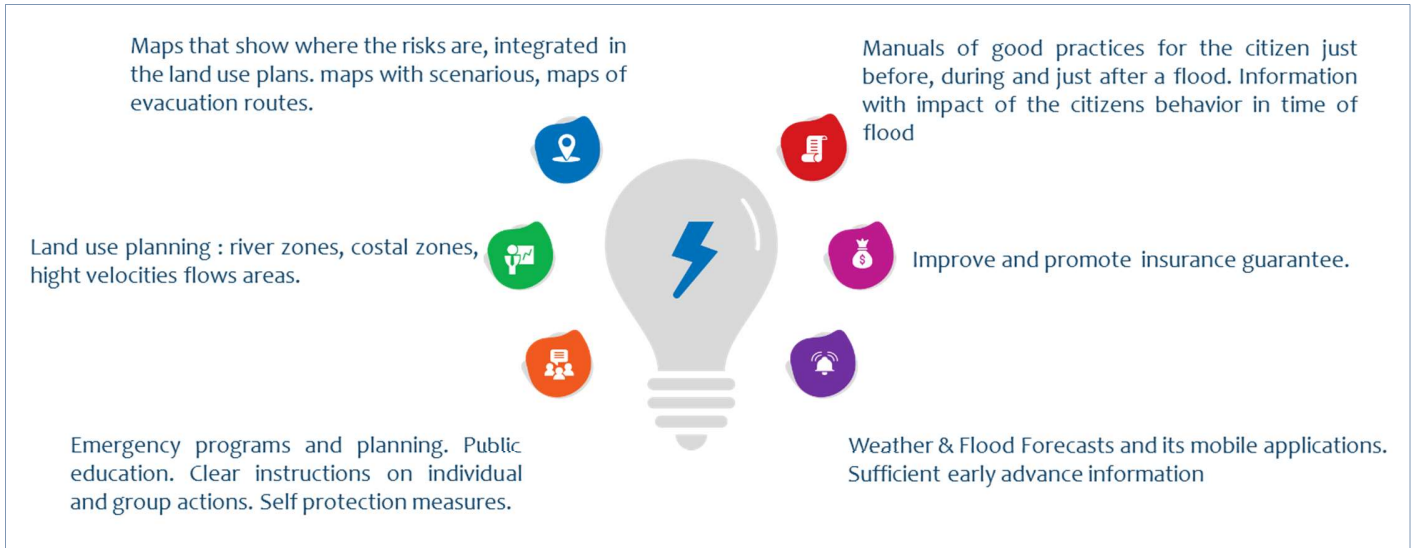


Figure 24. What kind of information do you think is helpful in the context of preparedness?



Classify the following communication topics, which you consider most important in increasing resilience and preparedness with respect to the flood risk of your member state? (from 1st for highest importance till 7th)

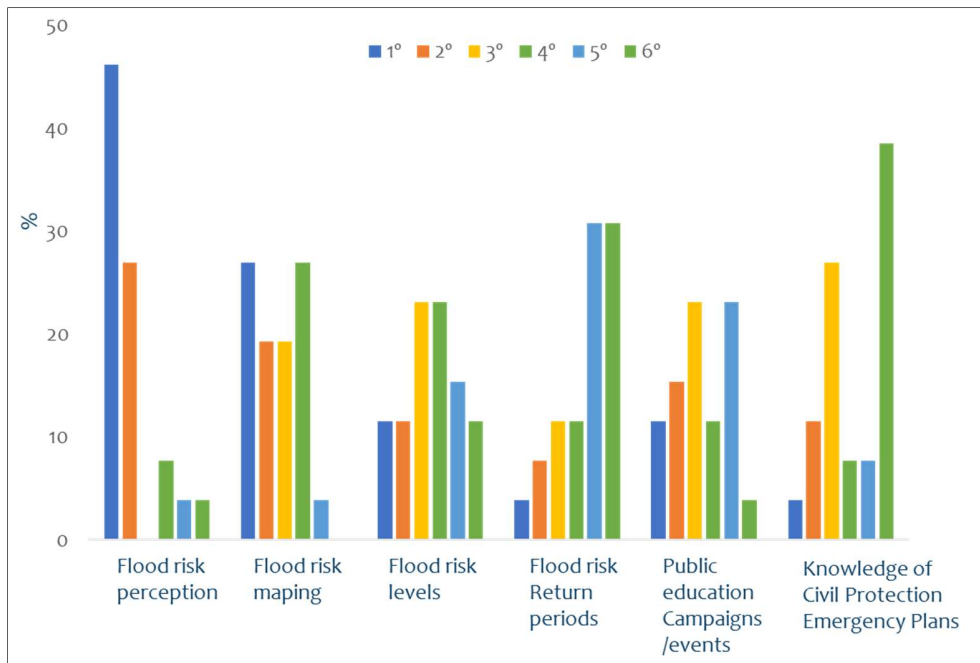


Figure 25. Classify the following communication topics, which you consider most important in increasing resilience and preparedness with respect to the flood risk of your member state?

Flood risk perception and flood risk maps are considered the most important topics. By contrast, the perception of the concept of return period and knowledge of emergency civil protection plans are less important in the suggested topics. Possible depth of flooding and education campaigns is intermediate topics regarding the communication of flood risk.



Figure 26. Example of Public Education Campaign's in Portugal

There are still other topics mentioned, such as: possible depth of flooding; Probability of occurrence; Possibilities to prepare; What to do in the event of flooding, brochures, regional plans.



Do you specifically provide explanations on:

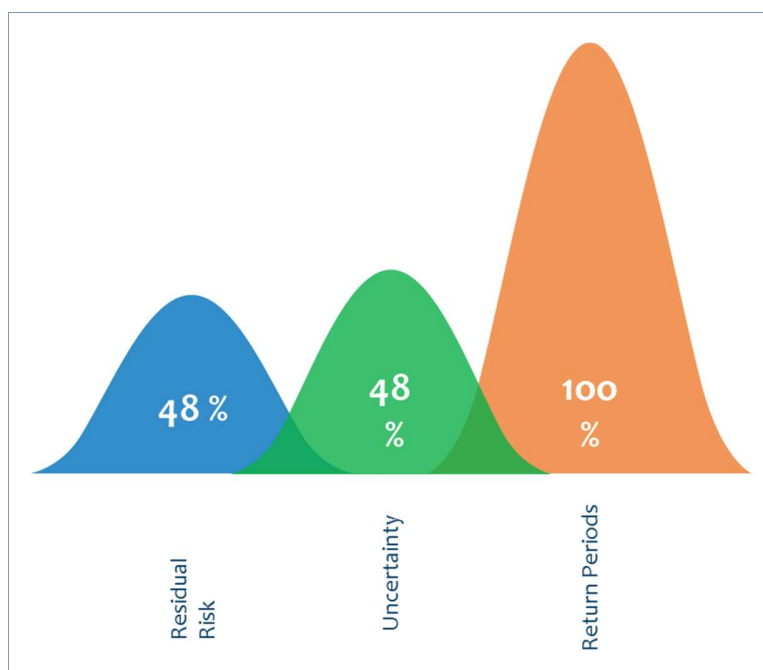


Figure 27. Do you specifically provide explanations on:

When we talk about flood risk communication, some concepts are determinant to increase population perception. These include: residual risk, uncertainty and return periods. The legal frameworks derived from the

European directive use the concept of return period, which is transmitted by all member states. The remaining concepts are approached by almost half the member states, where the uncertainty issue is extremely difficult to communicate.



What kind of information is provided (to the public) flood warning system in your country?



Figure 28. What kind of information is provided (to the public) flood warning system in your country?

The primary approach to flood risk communication is assumed from different perspectives. Most member states adopt meteorological and hydrological warnings. Half of the member states consider this as an objective of civil protection, while 14% report on the associated environmental risks.

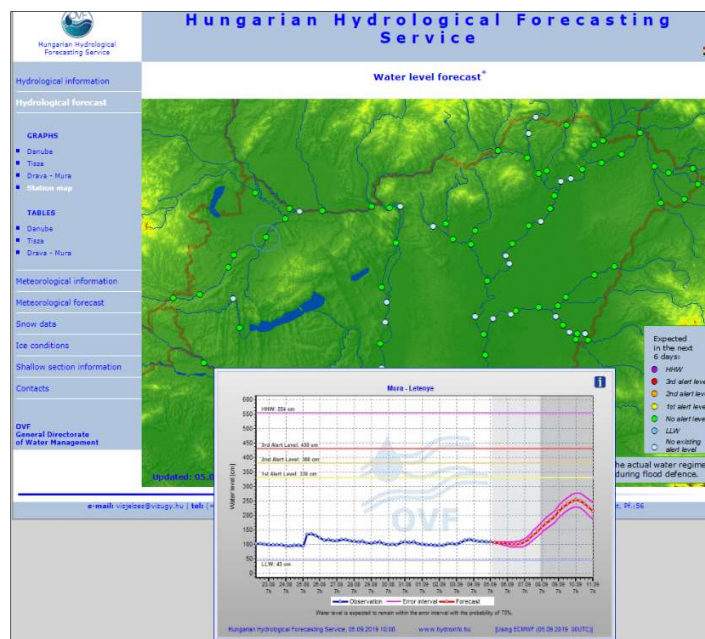


Figure 29. Flood warning system from Hungarian Hydrological Forecasting Service <http://www.hydroinfo.hu>



How is flood alert spread in your member state?

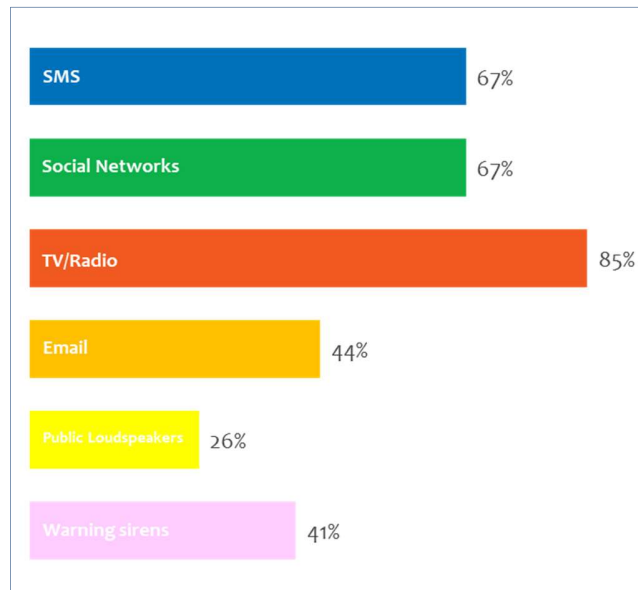


Figure 30. How is flood alert spread in your member state?

The way to disseminate and transmit flood risk information is crucial when assessing the target population. Using a single form is no longer a strategy. Most member states follow the evolution of society and use social networks as the most important way of transmitting information. It is important to emphasize that conventional means such as sirens or loudspeakers, especially in high-risk areas, are still used.

Belgium, for example, uses a pilot project on early warning and alert in case of disasters, executed by a communication-information system called the National Early Warning and Alert System for the bodies of the executive authority and the population. The Early Warning and Alert System for the population is intended to simultaneously provide early warnings and alerts for groups of people residing in particular territories for a disaster or imminent disaster threat and to provide information on the necessary measures and actions through acoustic signals and voice information. Acoustic signals and voice information are transmitted by acoustic devices (sirens);

URBAN EUROPE

FloodCitiSense

FloodCitiSense aims at developing an urban pluvial flood early warning service for, but also by citizens and city authorities. This service will reduce the vulnerability of urban areas and citizens to pluvial floods, which occur when heavy rainfall exceeds the capacity of the urban drainage system.

Due to their fast onset and localized nature, pluvial floods cause significant damage to the urban environment and are challenging to manage. Citizens will be actively involved in the monitoring of rainfall and pluvial flooding, making use of low-cost sensors and web-based technologies. The early warning service will enable 'citizens and cities' to be better prepared and to better respond to urban pluvial floods.

Aim/objective

The FloodCitiSense project aims at integrating crowdsourced hydrological data, collaboratively monitored by local stakeholders, including citizens, making use of low-cost sensors and web-based technologies, into a flood early warning system.

Approaches/methods

A co-creation of this innovative public service in an urban living lab context with all local actors is targeted, building upon the state-of-the-art knowledge, methodologies and smart technologies provided by research units and private companies.

Expected results and impacts

- Operational crowdsourced data collection 'FloodCitiSense' platforms in pilot cities
- Urban pluvial flood early warning systems co-created in living labs
- Summary of lessons learnt of the crowd-sourcing and co-creation of flood early warning service

be alert

Home | Be warned | What is BE-Alert? | How does BE-Alert work? | Register now | What's the correct reaction? | FAQ

Home > Be warned

In case of an emergency situation in your neighbourhood, we would like to **warn you in time**. That is always the first step in **crisis communication**.

In case of emergency, your municipality, province or the Ministry of the Interior will try to give you the **necessary recommendations** as quickly and clearly as possible, as you'll immediately know what to do in order to keep yourself and others safe. Like staying indoors and doors in case of fire. That's why the first message reads:

- Search as many residents as possible
- As quickly as possible
- With an uniform and clear message
- From an official and clearly identified source
- Use different channels that complement each other

Get warned via different channels

How you will be notified depends on the **available channels** in your municipality, province or at national level.

Depending on the emergency situation, the authorities competent for crisis management can use different channels: door-to-door, message via police headquarters, BE-Alert, social media...

You can be notified via:

| Channel | Benefits | Cons |
|-------------------------------|--|---|
| Door-to-door by the police | <ul style="list-style-type: none"> Efficient in extreme need Personalized notice | <ul style="list-style-type: none"> Only possible in a restricted zone Only possible if there is no immediate danger |
| Police (textpage) | <ul style="list-style-type: none"> Efficient in case of evacuation | <ul style="list-style-type: none"> It takes time to notify the areas affected area Impossible to warn the street and hard-to-access (parking) |
| Traditional media (TV, radio) | <ul style="list-style-type: none"> Rapid warning Reaches a very large number of people quickly | <ul style="list-style-type: none"> Not clear targeted group |
| Social media | <ul style="list-style-type: none"> Good reach and distribution Possible to reach specific targeted groups (young people) Prevents dialogue between government and citizens | <ul style="list-style-type: none"> Little impact if social media channel is not known Risk of losing the message in the overload of information |
| BE-Alert | <ul style="list-style-type: none"> Very targeted (specific: street / neighbourhood / zone) No intermediary channel: direct information from the government to the population Efficient to quickly communicate the necessary recommendations | <ul style="list-style-type: none"> Less available in some situations - for example, impact on the whole country or an emergency situation in the middle of the night |

Be ready

The best way to be ready is by being well informed about what to do with each type of alarm and which channels are available. You can:

- Register on BE-Alert!
- Follow the official social media channels of your municipality or province, or the national Crisis Centre

Figure 31. Examples of Earlier warning system and information streaming channels used in Belgium. <https://ipi-urbaneurope.eu/project/floodcitisense/> and <https://ipi-urbaneurope.eu/project/floodcitisense/>



From the following flood information, which do you consider to be most important in your member state, and why?

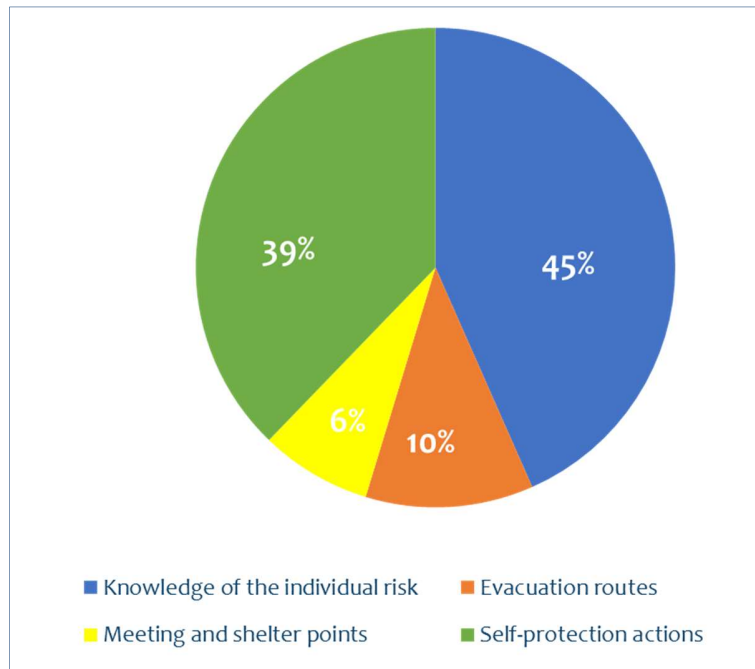


Figure 32. From the following flood information, which do you consider to be most important in your member state, and why?

The type of information transmitted is another important issue in communicating flood risk. For almost half of the member states, knowledge of individual risk and self-protection measures are considered the most important elements. Evacuation routes and meeting points and shelters are less important, although this approach from the point of view of hydrological management can be understood as a task previously adopted by the civil protection authorities.

For some MSs using historical event information is also a great measure that increases risk perception and helps reinforce the concept of individual risk.

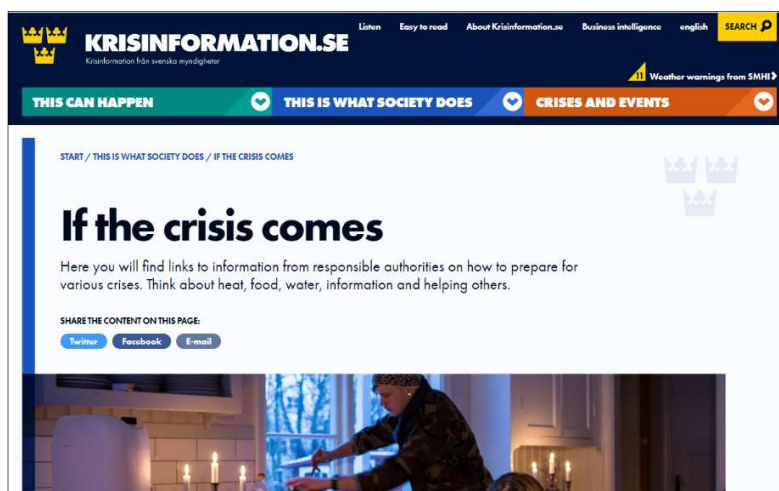


Figure 33. Example of Swedish webpage for raise risk awareness and to take actions to self-protection <https://www.krisinformation.se>



Do you evaluate the effectiveness of applied communication tools after an event occurred?

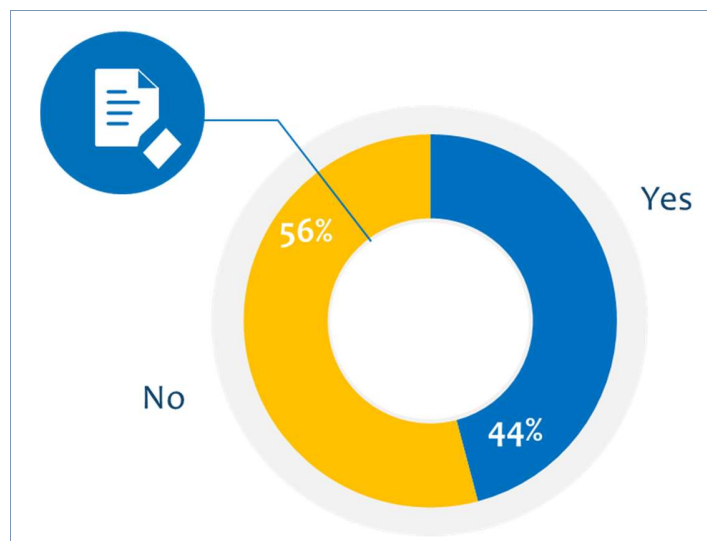


Figure 34. Do you evaluate the effectiveness of applied communication tools after an event occurred?

In general, half the member states evaluate the effectiveness of communication strategies. Although many do not have an exclusive mechanism for assessing communication strategies, in some cases they are assessed as part of the overall flood risk management process.

One of the consensual ways to evaluate the effectiveness of communication and awareness mechanisms is quantification through analysis before and after the event. Check if the communication campaigns had effects on the population and in the post event moment quantify the reduction of exposure, since the population should theoretically be prepared.

This process consists of building evaluation matrices, evaluating not only the efficiency on the target population, but also at the institutional level, adjusting and readjusting the measures and channels in order to optimize the entire communication and awareness strategy.

United Kingdom, for example, after major flood events, there will commonly be a formal de-briefing of those involved in response to flooding. This will include how the civil contingency organisations provided appropriate communications to the public and media. There may be a formal report on the key aspects of the event, what were the major causes and impacts, how the response could have been improved, what aspects were done well; what was done badly. There will normally be recommendations on future approaches, changes to protocols, potential measures to reduce risk;

| Stage | Expected action | Result |
|---|--|---|
| 1 Formal engagement with the Met Office in a 'partnering' approach to better information and the impact assessment of National Severe Weather Warning for heavy rainfall. | A Memorandum of Understanding between the Rivers Agency and the Met Office. | Completed |
| 2 Ensuring adequate 'informing' in relation to flood risk, to enable responders and the public to be effective in dealing with flooding. | Creation of the Regional Community Resilience Group to identify communities, prepare community resilience plans and agree on information to be shared. | Completed and reviewed by the Red Cross |
| 3 Public dissemination of water level information. | Provision of river level warnings, real time flood alert and gauging data on the Rivers Agency website, where these are likely to be beneficial. | Ongoing |
| 4 Review and development. | Consider the need for further refinement, taking into account national advances in this area and feedback from community groups and the wider public. | Ongoing |

Figure 35. Example of assessment matrix to evaluate the effectiveness of applied warning systems in United Kingdom, full report: <https://www.niauditoffice.gov.uk/sites/niao/files/media-files/Flooding%20Report.pdf>



Do you have a funding scheme for flood damages?

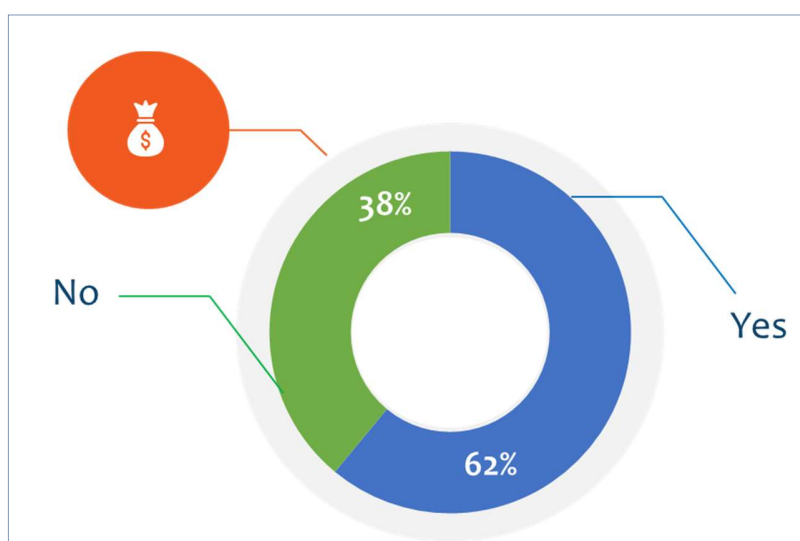


Figure 36. Do you have a funding scheme for flood damages?

In summary, 62% of member states have a funding mechanism for flood damage. Some of this financial aid is based on the European civil protection mechanism which operates after the declaration of the state of calamity. The remaining member states do not have specific mechanisms, although by the European cooperation mechanisms they can access them if necessary.

Many MSs have support mechanisms that only activate after catastrophic events. It is noteworthy that there are cases where the law prescribes this aid, such as Austria (*The Disaster Relief Fund*), or Netherlands (*Disaster damage compensation Act*).



Do you actively inform the population on potential tools or funding mechanisms in case of flood damage?

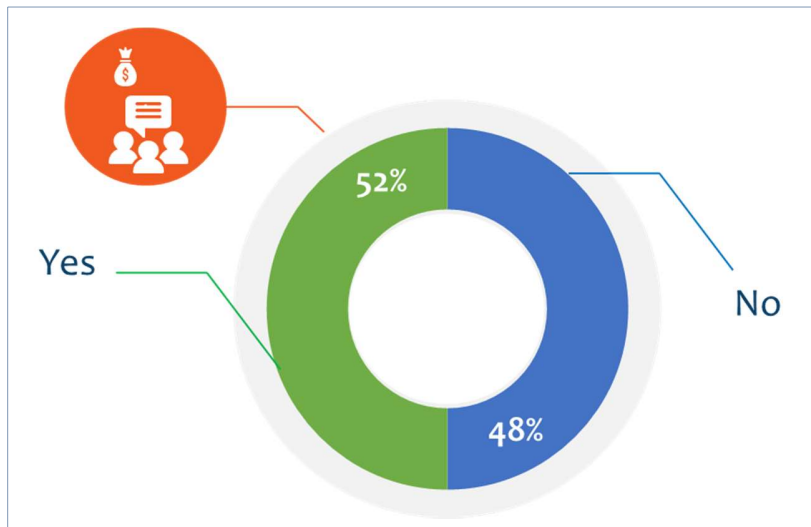


Figure 37. Do you actively inform the population on potential tools or funding mechanisms in case of flood damage?

Most countries have information available on the official pages, however direct communication to population is practically non-existent. Still, only half informs the population of any aid in case of suffering damage to a flood event.

This process is usually managed by local authorities who are able to know and reach the affected populations more easily and help them if needed.



Do you have an insurance system for flood damages?

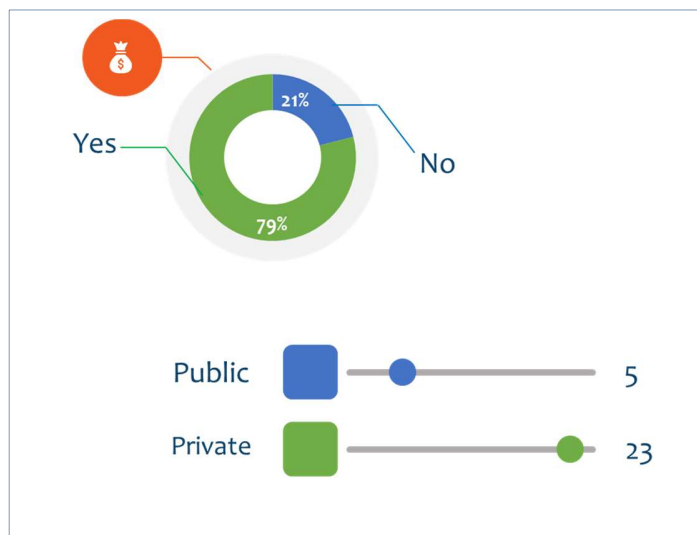


Figure 38. Do you have an insurance system for flood damages?

79% claim to have an insurance system. Only 21% do not have insurance aids or systems. The member states that have insurance system, only five are public others are provided by private companies.

There is a general allusion on the part of MSs that are increasing the number flood of insurances, which may indicates a better perception of risk.

Two examples of different approaches in flood insurance are the followings:

- The Spanish system for covering extraordinary risks (including floods) involves collaboration between the public and private sectors. The *Insurance Compensation Consortium (CCS)*, a public business entity attached to the Ministry of Economy, Industry and Competitiveness, manages the system. Extraordinary risks are mandatorily covered by policies with any insurance company authorised to provide insurance in the areas of damage to property, life, personal accidents and loss of benefits, by means of a clause included in each policy, (the CCS does not issue policies of its own). If damage is caused by the legally defined extraordinary risks (flooding, winds above 120 km/h, earthquake, etc.), the CCS automatically assumes the coverage and directly indemnifies the policy holder according to the insured capital and the conditions established in his or her policy. The system is financed through a mandatory surcharge, which must be paid by policyholders together with their policy premium. The surcharge rate, which is applied to the capital insured in the policy, depends solely on the type of property covered. Private companies collect this surcharge and transfer it each month to the CCS, retaining a small amount as commission.



Figure 39. Spanish Insurance Compensation Consortium system for covering extraordinary risks <https://www.conorsegueros.es>

- The UK system consists on a flood reinsurance scheme called 'Flood Re' operated by the insurance industry that makes flood insurance cover more widely available and affordable as part of home insurance. The scheme is funded through a levy by insurers on home insurance. This levy raises £180m every year to cover the flood risks in home insurance policies. Flood Re helps households at the highest risk of flooding and also provides information about taking action to reduce flood risk. Flood Re will run for the next 25 years, at which point insurers should be offering policies based on actual risk to property;

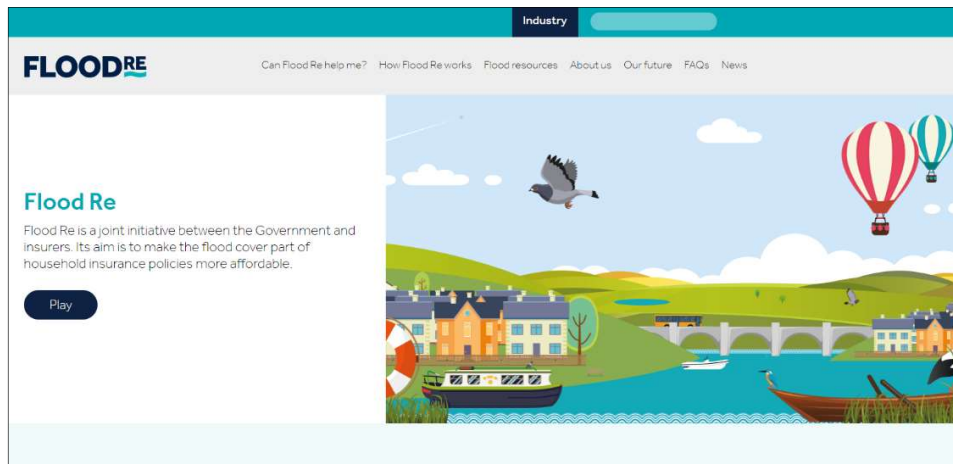


Figure 40. UK public-private flood insurance systems <https://www.floodre.co.uk>

3.2.3 Breakout Sessions Day 2 – Awareness in Flood Risk Management

An introduction was given to the break out session. Awareness in Flood Risk Management for MSs is a very significant point of approach and consideration. The conclusions and challenges are:

Do you monitor or evaluate the effectiveness of applied communication tools after an event occurred?

- Most MS have no process for post-event evaluation of communication tools – this is a recognised challenge for the next FD cycle.

Role of the media, and how to convert them into allies for the dissemination of messages.

- Use of media: There is a clear role during events, although this cannot always be controlled. For awareness, there are examples of documentaries and dramatized programmes about flooding – also within existing popular programmes. It is important to find the right moment, e.g. right after a flood event.

Official mechanisms to improve actions of self-protection.

- Official mechanisms for self-support: typically there is national level information which is disseminated by local authorities. There are different mechanisms for funding self-support. E.g. Austria: no funding for individual-focused measures. In general there are high public expectations on government.
- Dealing with GDPR in flood risk communications: MS all apply it and don't feel this is a major issue. E.g. opt-in vs. opt-out, published information made anonymous.

Achievement in raising awareness and flood risk: memory historical flood levels and different groups.

- Test effectiveness of communications strategies: Not generally in a structured way; some local / research examples, e.g. Spain. MS use *Google analytics* (but there is concern it is black box). UK: there was a specific feedback page as part of beta testing, but very little feedback was received.
- Acceptable level of flood risk: NL has legal standards based on individual risk. Others may have a target rather than a duty. Actual level of protection is best defined locally, with involvement of a local champion. Prevention (spatial planning): guidelines generally exist for new developments. In Belgium has been

developing a game to enable communities to decide how to spend flood risk budget (work in progress) – suggested for a presentation in a future WGF meeting.

Do you actively inform the population on potential tools or funding mechanisms in case of flood damage?

- Ways to actively inform public about tools / funding for incurred flood damages. Plus insurance. Most MS have insurance, usually coupled to household, often multi-hazard; separate system for agriculture. Where damages are higher, there are typically more national measures. Two issues identified about insurance: they use maps that may be different from FRMP maps; and insurance can make the public 'lazy'. Level of understanding of damage funding sources varies.
- Use of historical information to raise awareness – how to focus on target groups. Most MS are working on identifying target groups, but this is work in progress. Historical information has PR value, significant dates (50 years etc), markers of flood levels, personal remembrance, dramatized accounts.

Breakout Sessions - Event photos



4 Workshop Summary and Conclusions

The main conclusions of the workshop can be summarized in the following key points:

Risk Communication in Flood Risk Management

Key point 1

Although most of member states have a strategy in place or under development with respect to flood risk communication, general speaking, there is a need for improving the consistency of these mechanisms in order to achieve the target groups, namely managers, policy makers, local leaders... who act as a conveyors of the messages, especially in populations most exposed at floods. Having a sound strategy also allow prioritise sectors and stakeholders to involve. This strategy should be provided not only with appropriate budget, but with practitioners to carry it out.

It is not enough to create a strategy, it is necessary to maintain and improve it. It can be recommended that the flood risk communicators should not be complacent in assuming that people are aware of issues after they carry out a flood risk awareness raising exercise or community engagement event, and therefore cease consultations or engagement with the communities; it should remain as an ongoing activity

This process should be carried out in stages (Pandit, S. 2014)

- Stage 1: Understand the process of risk communication and the influencing barriers and factors (through participatory communication)
- Stage 2: Assess current knowledge, needs and expectations of the communities at risk of flooding (through participatory communication)
- Stage 3: Assess and if required establish trust with communities at risk of flooding
- Stage 4: Review organisational resources and systems for flood risk communication through internal review
- Stage 5: Identify topics and media for flood risk communication for reaching a shared understanding with the communities
- Stage 6: Carry out flood risk communication (through combination of both top-down or participatory communication as appropriate)
- Stage 7: Evaluate communication efforts and feedback to Stage 1

Key point 2

It is recommended to strengthen collaboration between different agencies of the State such as, environment, agency, water agency, meteorological agency and civil protection. Many countries also consider essential the support of stakeholders and NGOs and the role of media in communicating the flood risk.

It would be interesting to establish protocols between the different organizations in order to promote an improvement in communication channels, establishing the hierarchy, type of information, informative moments, contents and general evaluation of the whole process.

It is important to strengthen partnerships between the responsible entities and the media. One of the ways to reinforce this synergy is to train them in the themes to be communicated, with focus on the concepts, target audience, moments of communication, etc. This will reinforce the impact of risk communication, as it improves the quality of the information transmitted and generates trust in the population. These media sources also

need to be published widely so that people living in flood risk areas know where to look for the information they require.

Key point 3

Communication strategies are mostly based on recent flood events but historical information (flood marks, photos, videos, etc.) should be considered as important part of the strategy.

The flood hazard and risk maps are still considered the best tool to communicate. In this sense, it would be important establishing a mapping standards used in the communication process. With more fluid reading, noticeable, with only the information that is absolutely necessary to let people know whether or not they are at risk.

It is also recommended that flood risk communication strategies clearly publicise the roles and responsibilities of all relevant agencies.

Key point4

It is important to focus attention on assessment of risk communication effectiveness.

Why is it important to evaluate risk communication programs? In response to this question, participants agreed that evaluation is critical to effective risk communication; without evaluation, there is no way to determine whether risk communication activities are achieving or have achieved their objectives.

It is recommended that evaluation can be integral part of the flood risk communication process. When carried out at each stage of program development, evaluation provides information critical to program effectiveness. For example, evaluation provides essential planning information and program direction, and it can help demonstrate program accomplishments. Most fundamentally, evaluation can signal the need for timely modifications.

When viewed in this way, evaluation has much to offer organizations that have risk communication responsibilities. During the planning and preproduction phase, evaluation can provide data critical to effective program design, including information about element at risk, environment, resources, needs and concerns; information about risk management needs and concerns; and information about how to meet those needs and concerns. Through surveys, questionnaires, focus groups, and other research tools, evaluation can be used to (1) identify stakeholders and other relevant audiences, (2) assess audience opinions or reactions, (3) find out what people see as important problems, (4) find out what issues and events people are aware of, and (5) find out how people react to different sources of information. Pretesting and pilot testing can be used to (1) forecast the effectiveness and feasibility of alternative risk communication activities, (2) determine the kinds of information needed by target audiences to understand risk communication material, (3) examine how people process and interpret risk communication information, and (4) obtain feedback on draft materials. Estimates of the effectiveness of alternative risk communication activities can be combined with information about their costs to determine which risk communication strategy will be most cost effective.

Once the risk communication program is operational, evaluation can be used to address questions of accountability and performance. For example, evaluation studies can determine whether the risk communication program is reaching the intended audience, provide feedback on the performance of risk communicators, identify program strengths, suggest ways these strengths can be used to communicate more effectively, and determine whether the program is being implemented appropriately (e.g., what material was produced, how much was produced, how long it took, what it cost, and what audiences received the material).

Once the risk communication program has been implemented, evaluation can provide information on program impact and outcome. For example, evaluation can determine what members of the audience actually received

the information, what they learned, and whether changes occurred in the way they feel, think, or behave. The results can be used to answer the most important question: Did the program achieve its goals?

One major reason for evaluating risk communication activities is the general lack of resources for development of comprehensive risk communication strategies and programs. Few organizations have the resources needed to launch state-of-the-art risk communication programs that address multiple audiences through multiple channels. As a result, managers need to be able to choose messages and channels that use their limited resources most effectively.

A common criticism of many evaluations is that the results are seldom used. Implicit in this criticism is the notion that use means direct and immediate changes in risk communication policies and programs; however, there are several different types of use, and not all of them are immediately apparent. For example, results may be used to confirm that changes in the risk communication program are not needed. In some cases, evaluation may indicate directions for risk communication that are inappropriate or not feasible. Even when there is no immediate discernible use of the information derived from an evaluation, results may accumulate over time and be absorbed slowly, eventually leading to changes in risk communication concepts, perspectives, and programs.

Workshop conclusions and recommendations – Risk Awareness

Key point 1

Drills and early warning systems are a key tool in communicating and preparing for the flood risk. There is a preference to communicate risk in the prevention and protection phase; Flood risk perception is considered the most important topic in increasing resilience;

It would be desirable to frequent performing of drills. It allows checking if the communication between the various actors is operational and if they know all the available tools. Real significant flood events happen very few so emergency drills can keep the knowledge about floods risk alive. Flood emergency drills are a good mechanism to improve cooperation of administrative bodies, improve training of information exchange, check the correctness of procedures, the ability to identify shortcomings, the ability to test your skills in a situation close to the real crisis;

Need for awareness raising through 'communicative action' - Communicative action ensures that the shared meanings and outcomes of stakeholder dialogues on the issues under discussion comply with social norms, values and beliefs and also take into account the knowledge and experience of the individual stakeholders. It is also linked to the 'conveyance' aspect of Media Synchronicity Theory which entails conveyance of messages to generate shared knowledge on issues under discussion (Pandit, S. 2014).

Key point 2

The return period is a difficult concept to explain, even though all countries use it in their cartography, making it difficult to perceive by population; General acceptance of the need to use, in addition, other concepts more easily understood, such as probability of occurrence, flood heights, etc., in the risk communication in order to reduce misunderstandings. It is also important to improve the communication of uncertainties and to create a communications systems based on trust and credibility;

The knowledge of individual risk leads to an increased acceptance of the implementation of either public or private measures and hence, supports flood prevention;

The use of the above concepts, side-by-side/ beyond the return period usually helps to reduce misunderstandings, not only by the general population, but often by technicians and politicians who do not

understand fully the concept of return period. It is advisable use together or adapting, at least in the maps that are used to communicate the risk of flooding. In this way, it not only increases the perception of the population, but also promotes the preparedness and knowledge of individual risk. According the experience, “probability of occurrence” or “water levels” are more straightforward terms to describe flood risk.

These include increasing the relevance of the warnings to people; providing estimates of the severity of likely flooding events and contact details for further information and assistance, and media selection. Further, it was observed that emergency services had valuable information on the potential areas at risk of flooding which could be more effectively shared with other agencies for improved flood risk communication.

Key point 3

Most flood risk communication already uses social networks as the main dissemination tool, so it is recommended to use social networks with caution and adjust risk communication according to the target population and type of social networks used by each one;

It would be very useful to create manuals of good practices for the citizens to apply before, during and after a flood event, and to give information about the impact of the citizen’s behavior in flood context;

All these actions contribute to a society that is involved, interested, reasonable, thoughtful, solution-oriented, and collaborative.

It is essential to study new channels of communication, addressed to the target population, taking into account the location, age, gender, religion, disability, special needs, etc. On the other hand, create policies to promote public participation in order to generate a "risk society", prepared to face the new challenges arising from climate change associated with natural hazards processes.

A communication strategy to inform and warn such diverse target groups should be framed in such a way so that all subgroups are appropriately attended to. Attention should be paid to ensuring that groups of people of different ages, both genders, from different language backgrounds, with or without prior flood experience, those living in their own homes or renting properties, new arrivals or established residents as well as people with limited mobility are included in communication strategies. It is thus recommended that more attention be paid to identifying such groups and information tailoring to ensure that all sections of the population benefit from flood risk communications. (Pandit, S. 2014).

Key point 4

It is vital to increase, promote, facilitate and share information (hydrological systems and earlier warning systems) in all river basins, especially in cross-border river basins (Data, Discharge, Water levels, Forecasting data, Dam information, Joint transnational information and communication);

Improve the system of cooperation in transboundary river basins, not only generically with the exchange of information, but also communication before, during and after crises, influencing behaviours, aiding in decision making, increasing public knowledge.

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Annexes

Annex I – Workshop Agenda

WGF25- Risk awareness and communication in the Flood Risk Management Plans

FINAL AGENDA

Tuesday 26th March

13:00 - 13:30 Registration

Session 1: Setting the Scene: Risk Communication in Flood Risk Management

13:30 - 13:45 Welcome and Introduction: Nuno Lacasta (President of APA)

13:45 - 14:00 Risk awareness and communication in the Floods Directive: Ioannis Kavvadas (EC)

14:00 - 15:30 Presentations on experiences/good practices and lessons learnt in relation to risk communication

Social capacity building for flood risk mitigation. Alba Ballester Ciuró. Universidad Autónoma de Barcelona (UAB) Consultant.

Flood risk warning and intervention in Portugal. Carlos Mendes, National Civil Protection Authority

The flood risk at Lisbon city: how to prevent and prepare. Maria João Telhado. Lisbon Municipality Civil Protection.

Réserve Communale de Sécurité Civile (Municipal Civil Protection Reserve). Rodolphe Pannier. CEPRI.

General Discussion (15 min)

15:30 - 16:00 Coffee Break

16:00 - 16:15 Summary of Questionnaires (Risk communication) (ES/PT)

16:15 - 18:00 Breakout session on Flood Risk Communication

16:15 - 16:20 Introduction to break out session's part I (3)

16:20 - 18:00 Breakout sessions answering questions related to the presentations given (3 groups)

18:00 End of Session 1

Wednesday 27th March

Session 2: Awareness in Flood Risk Management

09:00 - 09:15 Summary Points from Session 1 and Introduction to Session 2

09:15 - 09:30 Summary of Questionnaires (Risk awareness) (ES/PT)

09:30 - 10:30 Awareness of flood risk and successful measures

Enhancing flash flood risk perception and awareness of mitigation actions through risk communication. José María Bodoque del Pozo. Facultad de Ciencias Ambientales y Bioquímica. Universidad de Castilla-La Mancha (UCLM). Spain.

Stakeholder participation in water management and planning: lessons from the WFD implementation. Nuno Videira, Faculty of Sciences and Technology, New University of Lisbon. Portugal.

Information campaign self-protection and individual prevention. Rudolf Hornich, Regional Government of Styria. Austria.

General Discussion (15 min)

10:30 - 11:00 Coffee Break

11:00 - 12:30 Break out session on Flood Risk Awareness

11:00 - 11:05 Introduction to break out sessions part II.

11:05 - 12:00 Break out session: key aspects and recommendations on communication of flood risk

Break out sessions answering questions related to the presentations given (3 groups)

12:00 -12:15 Feedback and Discussion. Conclusions and recommendations for the next steps in the Floods Directive Implementation.

12:15 – 12:45 Workshop wrap up

12:45 End of Workshop

Annex II – List of participants

LIST OF PARTICIPANTS

| NAME | MS OR ORGANISATION |
|-----------------------------------|--|
| Aaron Cutajar | Energy and Water Agency (MT) |
| Agata Wlodarczyk | National Water Management Authority (PL) |
| Agne Aruväli | Ministry of Environment (EE) |
| Alba Ballester | Consultant & Autonomous University of Barcelona (ES) |
| Alexandra Rodrigues | Environmental Agency (PT) |
| Ana Rosária Gonçalves | Environmental Agency (PT) |
| Antti Parjanne | Finnish environment institute SYKE (FI) |
| Athanasia Pardali | Special Secretariat for Water, Ministry of Environment and Energy (EL) |
| Barbro Näslund-Landenmark | Swedish Civil Contingencies Agenc (SE) |
| Carlos Mendes | Autoridade Nacional da Protecção Civil - Portugal |
| Cécile Binchteux | Ministère de la Transition Écologique et Solidaire (FR) |
| Christina Elms | Department for Environment, Food & Rural Affairs (UK) |
| Christine Bastian | Water Agency of Luxembourg (LU) |
| Clemens Neuhold | Federal Ministry of Sustainability and Tourism (AT) |
| Darko Barbalčić | Croatian Waters (HR) |
| David Scott | Scottish Environment Protection Agency |
| Francesco Zaffanella | Autorità di Bacino Distrettuale delle Alpi Orientali (IT) |
| Francisco Espejo | Consorcio de Compensacion de Seguros (ES) |
| Francisco Javier Sánchez Martínéz | Spanish Ministry for the Ecological Transition (ES) |
| Gediminas Dudenas | Environment Protection Agency (LT) |
| Gloria Sara Lazaro | Centre Européen de Prévention du Risque d'Inondation (CEPRI) |
| Hallvard Berg | Water Resources and Energy Directorate (NO) |
| Hans van Os | Jaspers - European Investment Bank |
| Iain Blackwell | European Water Association |
| Ieva Jakovleva | Ministry of Environmental Protection and Regional Development (LV) |
| Ioannis Kavvadas | European Commision |
| Ionel Sorin RÎNDAȘU-BEURAN | National Administration - Romanian Waters (RO) |
| Jaap Flikweert | Royal HaskoningDHV (UK) |
| Janek Dreibrodt | Ministry of Rural Dev., Envir., and Agriculture of the Federal State of Brandenburg (DE) |
| Janez Dodič | Ministry of the Environment and Spatial Planning (SI) |
| Jean-Marie Stam | Ministry Infrastructure and Environment (NL) |
| José Matos | European Water Association |
| José Soares | Environmental Agency (PT) |
| José María Bodoque del Pozo | Universidad de Castilla-La Mancha (ES) |
| Juan Francisco Arrazola | Spanish Ministry for the Ecological Transition (ES) |
| Kaija Jumppanen Andersen | Danish Coastal Authority (DK) |
| Katharina Schwarz | Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (DE) |
| Katrina Lang | Environment Agency (EE) |
| Kostas Aristeidou | Ministry of Agriculture, Natural Resources and Environment (CY) |
| Kremena Simeonova | Ministry of Environment and Water (BG) |
| Laszlo Balatonyi | General Directorate of Water Management (HU) |
| Luciano Martins | Tragsatec (ES) |
| Manuela Saramago | Environmental Agency (PT) |

| | |
|------------------------|---|
| Maria Gkini | Special Secretariat for Water, Ministry of Environment and Energy (EL) |
| Maria Quadrado | Environmental Agency (PT) |
| Maria Tourné Whyte | Tragsatec (ES) |
| Mario CERUTTI | Ministry of Infrastructure and Water Management (NL) |
| Mark Adamson | Office of Public Works (IR) |
| Martina Bussetini | Italian National Institute for Environmental Protection and Research (IT) |
| Maša Jamnik | Ministry of Environment and Spatial Planning (SI) |
| Michael Schembri | Energy and Water Agency (MT) |
| Mirel Bogdan Ion | National Institute of Hydrology and Water Management (RO) |
| Mónica Aparicio Martín | Spanish Ministry for the Ecological Transition (ES) |
| Mustafa Demirel | Ministry of Agriculture and Forest (TR) |
| Nathalie Asselman | Deltares (NL) |
| Neel Devroede | Flanders Environment Agency (BE) |
| Nuno Simoes | University of Coimbra (PT) |
| Nuno Videira | Fundação para a Ciência e a Tecnologia (PT) |
| Onofre Gabaldó | Confederación Hidrográfica del Júcar (ES) |
| Paula Machado | Environmental Agency (PT) |
| Paulo Diogo | Environmental Agency (PT) |
| Peter Cadek | Water Management Company (SK) |
| Petr Brezina | Povodí Ohre (CZ) |
| Rodolphe Pannier | Centre Européen de Prévention du Risque d'Inondation (CEPRI) |
| Rudolf Hornich | Office of the Styrian Government (AT) |
| Rui Andrade | Environmental Agency (PT) |
| Sandra Sokolic | Ministry of Environment and Energy (HR) |
| Sofia Teinha | Environmental Agency (PT) |
| Stanislav Kelčík | Water Research Institute (SK) |
| Stephen Dawson | Department for Infrastructure (UK - Northern Ireland) |
| Susana Sá | Environmental Agency (PT) |
| Suzana Stražar | Ministry of the Environment and Spatial Planning (SI) |
| Tanya Silveira | Environmental Agency (PT) |
| Tatjana Kolcova | Environment, Geology and Meteorology Centre (LV) |
| Teresa Alvares | Environmental Agency (PT) |
| Thorsten Piontkowitz | Danish Coastal Authority (DK) |
| Victoria Cherrier-Snow | Wood PLC (UK) |
| Ville Keskisarja | Ministry of Agriculture and Forest (FI) |

Annex III – Questionnaire

WGF25WORKSHOP

Risk awareness and communication in the context of Flood Risk Management Plans

Lisbon, 26st /27nd March 2019

PREPARATORY QUESTIONNAIRE

In preparation of the Workshop on Risk awareness and communication in the context of Flood Risk Management Plans, this questionnaire is intended to capture experiences, lessons learnt, good practice but also bad practice from the implementation of the Floods Directive and from previous workshops related to these topics. The questions that you will find below aim at collecting information and evaluating the outcomes, improvements and challenges for the future.

Your input in completing this questionnaire would be greatly valued, and the **responses will be used to shape the discussions at the workshop**. In responding, it would be very useful if you could provide web-links to any relevant material or examples.

Respondent Details

| | |
|--|--|
| Name: | |
| Email: | |
| Country: | |
| Organisation: | |
| Type of Organisation: (e.g., Central Govt., Local Govt., Research Institute, NGO, etc.) | |

Please return completed questionnaires , to **Mónica Aparicio Martín** at maparicio@miteco.es, Juan Francisco Arrazola at jfarrazola@miteco.es, **Paulo Alexandre Diogo** at paulo.diogo@apambiente.pt, and **Manuela Saramago** at maria.saramago@apambiente.pt **not later than 15 March**.

RISK AWARENESS is the acknowledgment of risks and the active process of reducing or eliminating those risks. Is composed by the set of mechanisms through which people increase their perception and will learn how to prevent and prepare for risks. May also be defined as a capability of the organization to recognize risks before they threaten, mitigate them when they arise, and recover from the damages they may cause. (Sendai Framework for Disaster Risk Reduction 2015 – 2030, United Nations, 2015)

RISK COMMUNICATION is any purposeful exchange of information about health or environmental risks between interested parties (individuals, groups, or organizations). Risk communication covers a wide range of activities, such as stimulating interest in environmental health issues, increasing public knowledge, influencing attitudes and behaviour of people, acting in situations of emergency or crises, aiding in decision making, and assisting in conflict resolution. Risk communication should aim for a bidirectional exchange of information, emphasizing from a pedagogical

approach to deliberation, dialogue, and public participation. (White paper on Risk Governance – Towards an integrative approach, IRGC, 2006)

According to the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the Assessment and Management of Flood Risks integrates flood risk communication into flood risk management plans, considering three perspectives: prevention, protection and preparedness¹.

¹ DIRECTIVE 2007/60/EC (chap. IV, art. 7° - 3 [...] *Flood risk management plans shall address all aspects of flood risk management focusing on prevention, protection, preparedness, including flood forecasts and early warning systems and taking into account the characteristics of the particular river basin or sub-basin [...]*), and (Annex A, II – 2 [...] *a summary of the public information and consultation measures/actions taken*).

1. RISK COMMUNICATION

- Status of Communication in Flood Risk Management Plans

1. Situation of Communication in Flood Risk Management Plans

1.1 – Does your member state have a communication strategy in place? Is it prior to the floods directive?

- Yes
- No
- Under development

1.2 - Who is responsible to develop communication strategies?

- National Regional Municipal River Basin Transboundary River Basin Other

Please, explain briefly

1.3 - Which stakeholders are the relevant ones to ensure a sound communication strategy?

select the four most important:

- Meteorological Agency
- Hydrographic Agency
- Environmental Agency
- Police
- Military
- Civil Protection Authority
- Schools
- NGOs
- Private companies
- Other

1.4 - How often should be flood risk communication strategies planned in your member state?

- Each six years (in accordance with the updates provided in the DIRECTIVE 2007/60/EU)
- Annual
- Semi-annual After flood episode
- Other _____

2. RISK AWARENESS

- Levels of Communication in Flood Risk Management Plans

2.1 - Rate the importance that should be given to communication in each phase of the Flood Risk Management in your member state? (1, 2, 3, 4)

- Prevention Protection Preparedness Recovery

2.2 - What kind of information exists regarding flood risk communication in your member state?

- Flood risk maps* Topic related brochures Evidences of historic flood events (Road/ River margins signs/ historical evidences) Public campaigns/events FAQs from technical experts Flood risk issues in educational systems Social media campaigns
- Other _____

* designed with concepts ad-hoc understandable by population

2.3 - Are there mechanisms in place to evaluate and assess the effectiveness of the information provided?

- Yes No

Please, explain briefly:

2.4 - Do you consider that the information contained in flood risk communication meets the standards of :

- Quality check Useful content Understandability Languages spoken by foreigners
- Other _____

Please, explain briefly:

2.5 - What kind of information do you think is helpful in the context of preparedness

2.6 - Classify the following communication topics, which you consider most important in increasing resilience and preparedness with respect to the flood risk of your member state? (from 1st for highest importance till 7th)

Flood risk perception ___ Flood risk mapping ___ Flood risk levels ___ Flood risk recurrences ___
Public education campaigns/events ___ Knowledge of Civil Protection Plans (Floods) ___
Other _____

2.7 - Do you specifically provide explanations on:

Residual risk Uncertainty Return periods Other: _____

2.8- What kind of information is provided (to the public) flood warning system in your country?

Meteorological Hydrological Civil protection Environmental impacts Other

2.9 - How is flood alert spread in your member state?

SMS Social networks TV/Radio Email Public Loudspeakers Warning sirens
 Other _____

2.10 - From the following flood information, which do you consider to be most important in your member state, and why?

Knowledge of the individual risk Evacuation routes Meeting and Shelter points Self-protection actions Other- water alert level

Please, explain briefly:

2.11 - Do you evaluate the effectiveness of applied communication tools after an event occurred?

Yes No

If yes, explain briefly:

2.12 - Do you have a funding scheme for flood damages?

Yes No

If yes, explain briefly:

By law

2.13 - Do you actively inform the population on potential tools or funding mechanisms in case of flood damage?

Yes No

If yes, explain briefly:

2.14 - Do you have an insurance system for flood damages?

Yes No

If yes,

Public Private

Are there any signs that this system has induced any change regarding the attitudes of the population at risk? (E.g. induced measures taken by the population, at home or local level)

Please, explain briefly:

3 - Global Approach to Flood Risk Communication

3.1 - Do you consider flood emergency drills as a good mechanism to improve flood risk perception?

Yes No

If yes, explain briefly:

3.2 - Do you think that the communication of the flood risk in return periods can be misinterpreted and thus reduce the real perception of it? (For example 100 years of return period)

Yes No

If yes, briefly suggest alternatives:

3.3 - Which improvements do you consider important relating cross-border warnings and data exchanges on flood events?

3.4 - Is there a particular question, issue or topic you would like to be discussed at the workshop?

Yes No

If yes, please provide a brief description:

4. Best practices that you want to share with other countries.

Note: If you have online information, you can introduce the links.

Thank you very much for your assistance.

The results from the questionnaire will be included in the workshop report.

Annex IV – USEFUL LINKS

Useful links

Note: The information contained in this section is only information provided by each member state during the consultation process through the questionnaires.

(AT) - AUSTRIA

Climate change adaptation in Austria web site

https://www.klimawandelanpassung.at/ms/klimawandelanpassung/de/kwa_news/kwa_salzach/

(BE) - BELGIUM

Flood City Sense project

<https://jpi-urbaneurope.eu/project/floodcitisense/>

National for national communication systems

<https://be-alert.be/>

Portail Inondations

http://environnement.wallonie.be/inondations/inondations_liens.htm

Réseau de mesure limnimétrique de la Direction des Cours d'Eau non navigables

<http://aqualim.environnement.wallonie.be/login.do?time=1567709302241>

Info Crue

<http://voies-hydrauliques.wallonie.be/opencms/opencms/fr/hydro/Actuelle/crue/index.html>

(DE) - GERMANY

After the large flood events in the Elbe river basin in 2002 and 2013 there were external evaluations of – among other things - the communication tools applied during a flood event*. After larger flood events and from time to time in between there are internal evaluations of the communication tools by the responsible federal state authorities.

<https://publikationen.sachsen.de/bdb/artikel/10825>

<https://publikationen.sachsen.de/bdb/artikel/20534>

Regional flood conferences: present products of the Floods Directive and planned flood protection measures in the region to the public

<https://lfu.brandenburg.de/cms/detail.php/bb1.c.422305.dE>

(ES) - SPAIN

Guías de adaptación al riesgo de inundación

<https://www.miteco.gob.es/es/agua/temas/gestion-de-los-riesgos-de-inundacion/usuarios-del-suelo-en-zonas-inundables/>

Proyecto Educen

<http://www.educenproject.eu>

Proyecto Horizon 2020 del que forma parte la CH de Segura

<https://www.chsegura.es/chs/cuenca/proyectoeducen/>

Capflo Project funded by the European Commission's Humanitarian Aid and Civil Protection department (ECHO). Its general objective is to promote participatory capacity building processes for flood risk mitigation.

<http://capflo.net/>

Adoption of integrated management schemes and land use planning in flood areas.

<http://drainage.cedex.es/>

(HU) - HUNGARY

The public the preliminary flood risk assessment, the flood hazard maps, the flood risk maps and the flood risk management plans. <http://www.vizugy.hu/index.php?module=content&programelemid=1&id=826>

<http://www.vizugy.hu/index.php?module=content&programelemid=62>

Meteorological data

http://www.hydroinfo.hu/Html/metelo/precip_elo_1_6.html

Hydrological data

http://www.hydroinfo.hu/Html/hidelo/hidelo_graf_duna.html

(HR) - CROATIA

Establishment of a joint Flood Forecasting and Warning System in the Sava River Basin (Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro).

https://www.savacommission.org/project_detail/24/1

(I) - IRELAND

An information site on flood preparation, resilience and recovery. A website providing flood mapping and information on existing / proposed flood risk management measures

<https://www.flooding.ie/>

Municipal: Local Authorities lead on the implementation of flood relief schemes, and will promote engagement events locally and maintain project websites

<https://www.lowerleefrs.ie/>

Website providing real-time water level data around the country

<https://waterlevel.ie/>

Flood relief scheme project website

<https://www.lowerleefrs.ie>

(IT) - ITALY

Regarding the national level main communication strategies items are related to the early warning systems and risk awareness communication campaign, namely "Io non rischio"

www.iononrischio.it

Earlier warning system
t-alert.it

(LU) - LUXEMBOURG

Flood warning web site
www.inondations.lu

Brochure on how to build in flood prone areas

https://eau.public.lu/actualites/2018/06---Juin/Leitfaden_Ueberschwemmung/Leitfaden-fuer-Bauvorhaben-innerhalb-von-Ueberschwemmungsgebieten_AGE_2018_.pdf

(NL) - NETHERLANDS

Water communication tool
<https://www.onswater.nl/>

(PL) - POLAND

FRMP development
www.powodz.gov.pl

Institutions responsible for flood risk monitoring publish information, warnings and forecasts on public websites

<http://www.wody.gov.pl/sytuacja-hydrologiczno-nawigacyjna>

<http://www.pogodynka.pl>

<https://rcb.gov.pl/aktualnosci/>

Funding mechanisms

<https://rcb.gov.pl/wp-content/uploads/RCB-KPZK-część-B.pdf>

Polish Financial Supervision Authority (KNF) developed the guidelines on flood risk management in the insurance sector

https://www.knf.gov.pl/knf/pl/komponenty/img/knf_136428_KNF_Guidelines_on_flood_risk_management_in_the_insurance_sector_41872.pdf

(PT) - PORTUGAL

Sistema Nacional de Informação do Ambiente - Inundações (Diretiva 2007/60CE) - Portugal Continental

<https://sniamb.apambiente.pt/content/inunda%C3%A7%C3%B5es-diretiva-200760ce-portugal-continental?language=pt-pt>

Sistema Nacional de Informação de Recursos Hídricos

<http://snirh.apambiente.pt>

(SE) - SWEDEN

Din säkerhet - Your security in English) that provides the public with a lot of information on how to prepare yourself and which measures that can be taken in general and for different kind of events.

www.dinsakerhet.se

Raise risk awareness and to take actions to protect yourself

www.Krisinformation.se

<https://www.dinsakerhet.se/>

Brochure “*if the crisis or the war comes*”

<https://www.msb.se/sv/Forebyggande/Krisberedskap/MSBs-krisberedskapsvecka/Fakta-om-broschyren-Om-krisen-eller-kriget-kommer-/>

“*Krisberedskapsveckan*” at national and local level,

<https://www.msb.se/sv/Forebyggande/Krisberedskap/MSBs-krisberedskapsvecka/>

Din säkerhet

<https://www.dinsakerhet.se/>

Prevention pages at MSB

<https://www.msb.se/en/Prevention/> English

<https://www.msb.se/sv/Forebyggande/> Swedish

Emergency, *Brandvarnardagen*

<https://www.msb.se/sv/Om-MSB/Nyheter-och-press/Nyheter/Nyheter---Statistik/Brandvarnardagen-1-december---Lat-inte-din-bostad-drabbas-av-brand/>

(UK) - UNITED KINGDOM

Find out if you're at risk of flooding in England

<https://www.gov.uk/check-flood-risk>

Flood warning system

<https://flood-warning-information.service.gov.uk/warnings>

National Flood Risk Assessment Communication Animation

<https://youtu.be/D1f2Nntfmow>

National Flood Risk Assessment Data Explorer

<https://www.sepa.org.uk/data-visualisation/nfra2018/>

Floodline portal

<https://floodline.sepa.org.uk/floodupdates/>

Live river levels online

<http://apps.sepa.org.uk/waterlevels/>

RCRG Regional Community Resilience Group

<https://www.infrastructure-ni.gov.uk/publications/getting-weather-ready-regional-community-resilience-group-newsletter>

Sample publication from *RCRG* via the link

<https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/rcrg-newsletter-winter-2018.pdf>

Flood reinsurance scheme called '*Flood Re*' is operated by the insurance industry

<https://www.floodre.co.uk/>

