RECIPE

REINFORCING CIVIL PROTECTION CAPABILITIES INTO MULTI-HAZARD RISK ASSESSMENT UNDER CLIMATE CHANGE

Guidelines for flood civil protection planning with a participatory approach

With some suggestions for a tool for monitoring and supporting the process

ENGLISH SUMMARY

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1 Introduction

This report is part of the deliverables of the RECIPE Project (Reinforcing Civil Protection capabilities into multi-hazard risk assessment under climate change) and corresponds to the Deliverable 4.2 of Task 4.3.

RECIPE is a two-year Prevention Project (January 2020 – November 2021) founded by the Civil Protection Mechanism of the European Commission (call identifier UCPM-2019-PP-AG), with the participation of 8 institutions from 5 EU countries:

- Forest Science and Technology Centre of Catalonia (CTFC), Spain (Project coordinator).
- Pau Costa Foundation (PCF), Spain.
- Civil Protection General Directorate of Catalonia (DGPC CAT), Spain.
- Forest Research Institute Baden-Württemberg (FVA), Germany.
- CIMA Research Foundation (CIMA), Italy.
- Austrian Research Centre for Forest Natural Hazards and Landscape (BFW), Austria.
- Institute of Cartography and Geology of Catalonia (ICGC), Spain.
- Higher Institute of Agronomy (ISA), Portugal.

The RECIPE Project seeks to develop operational recommendations and tools to reinforce Civil Protection capabilities into emergency management and risk planning of different natural hazards across Europe to address climate change impacts, by using an integrated risk management approach and the exchange of lessons learned and best practices.

By means of putting together multi-hazards' expertise from science and practice on wildfires, floods, storms, avalanches, rockfalls and landslides, main impacts of climate change in risk management will be identified. The potential scenarios of unprecedented multi-risk events will be considered. The interactions between prevention-preparedness-response-recovery actions in projected climate change scenarios will be analysed with an active participation of practitioners and other users. Accordingly, Civil Protection requirements to face new risk management challenges about climate change impacts will be identified.

Based on the above, transferable guidelines will be edited to incorporate the projected multi-risk impacts of climate change into operational decision support systems (DSS) that are used for risk management. Complementary, specific operational tools will be developed at pilot site level for each natural hazard to reinforce Civil Protection capabilities. Participation of public agencies will be promoted from the beginning to achieve an end-user oriented focus. Results will be actively disseminated into Civil Protection systems.

Furthermore, the project's workshops will promote the knowledge exchange in the existing networks to reinforce European landscapes' resilience to natural hazards.

The project is divided in 5 work packages (WP) as follows:

- WP1 Management and coordination of the action.
- WP2 Framing Civil Protection requirements for integrated multi-hazard risk management.
- WP3 Impacts of climate change projections on multi-hazard risk management.
- WP4 Guidelines and decision support tools to integrate climate scenarios into risk assessment and planning.
- WP5 Publicity and project outcomes transference.

Task 4.3 is part of the work package 4. This WP is composed by three tasks. On the one hand, in task 4.1 an analysis of existing decision support systems and the operability to include projected climate change impacts identified in previous WP3, is developed. In the second task (4.2), a description of the risk attributes and data requirements to be included into the DSS to address climate change impacts on multi-hazards risk management is done. Finally, the taks 4.3 includes a set of support tools for civil protection which will serve to address a specific need, taking into account all the work done in the previous WP.

As expected, each support tool will be edited in the local language of the territory of applicability (Italian, Catalan, German and Portuguese), and will be also a summary in english available, which is this document.

2 Guidelines for a civil protection planning with participatory approach and monitoring tool

2.1 Objectives and scope

The following guidelines report a methodology to draft a civil protection plan (with specific reference to flood risk) with a participatory approach between and with institutions, in a fragile territorial context made up of several contiguous municipalities, associated and linked by a common risk characterization and scenarios.

These guidelines are also accompanied by indications, useful for developing an IT tool that allows the development and monitoring of this process, if it is remotely carried out.

These guidelines mainly derive from the realization of a participatory process of civil protection planning (flood risk) - developed and facilitated by CIMA Research Foundation - in the territory of the 5 Terre consisting of three small coastal municipalities of the Liguria Region (Riomaggiore, Vernazza, Monterosso). Due to its socio-environmental value, the territory has been nominated as a UNESCO World Heritage Site and National Park. Moreover, the studied area, crossed by a very high tourist flow due to the exceptional nature of its landscape, is also characterized by a high hydrogeological fragility, due to very small hydraulic basins (prone to flash floods), and by a territorial management not very attentive to hydrogeological risks (terraces abandonment, presence of buried canals, ..).

In this context, the objective of this process was to build civil protection procedures capable of mitigating the flood risk, addressing the best tourist flows management in the context of a hydrometeorological alert (flood risk) or in the case of a flood.

This process started in February 2020 but had to be stopped due to the Covid-19 crisis immediately after, to resume in March 2021 and it end in August 2021.

According to EEA (2017), pluvial floods and flash floods, which are triggered by intense local precipitation events, are likely to become more frequent throughout Europe. In this context, therefore, climate change would lead the studied area to be subject to increasingly frequent climatic weather events, which would greatly increase the actual risk, also derived from the actual conditions of vulnerability, exposure and capacity that characterize it since from now. This implies the need, on the one hand of the civil protection system at all territorial levels to be prepared to face such events and, on the other hand, the need for an integrated approach that is not aimed only at preparedness and response.

The process that is described below can also help in building a participatory civil protection planning that has an integrated approach, that is capable of inheriting and enhancing and "exchanging" risk information deriving from other types of planning (territorial planning), as well as favoring interinstitutional cooperation and the exchange of information between entities.

Moreover, a participatory process like the one carried out in the 5 Terre area, if intersected with a participatory process involving citizens or specific stakeholders, can become a place for identification and definition of in-depth policies, targeted and accepted by the community, defined as constituted by the administration and citizenship.

2.2 Description of the tool

The development of a participatory civil protection planning process with an integrated approach is characterized by two main phases: its design and its implementation. Each phase is realized through the development of different steps (see Figure 1).

1. DESIGN:
    - Institutional stakeholders mapping.
    - Preliminary investigation and analysis of the context - and of the local civil protection system - and identification of weaknesses or critical elements (semi-structured interviews and literature analysis).
    - Definition of the general objective of the path (consultation and / or co-design with institutional actors) and updating of the mapping of institutional stakeholders.
2. IMPLEMENTATION:
    - Establishment of the interinstitutional working group and its formalization.
    - Training.
    - Participatory SWOT analysis on the general objective identified in the previous phase.
    - Co-design / Identification of solutions to the problem identified within the interinstitutional working group.

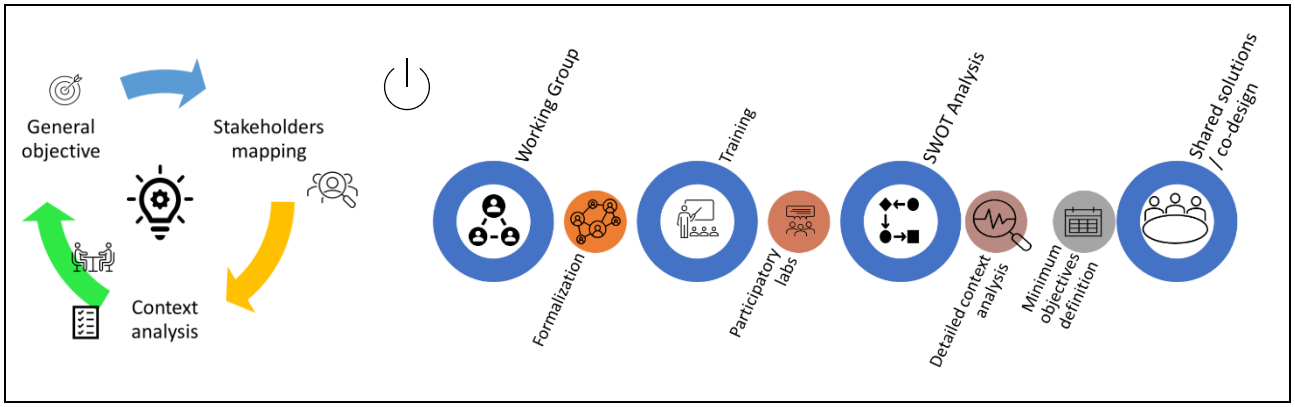

Figure 1 Outline of the steps for the process development.

In order to ensure the development and implementation of the participatory process, in a pandemic period, the support of some IT tools that allow interactions between stakeholders even remotely is essential.

Based on the extensive literature related to digital Living Labs, it is possible to state that tools that recall their logic are the most suitable tools to encourage participation even remotely. In fact, digital living labs allow to create innovative, easy-to-use interaction and consultation environments, to open participation even to those who cannot directly participate and to create mixed sessions online and in person. Through the logic of living labs, it is also possible to maintain long-term relationships with stakeholders who can

verify and monitor the application of the results of the participatory process (Følstad, A. & Karahasanovic, A.,[1] and Leminen, S.[2]).

This tool should consist of an IT environment with differentiated functions (Rooms) and with targeted access but open to all users for consultation of the results. Therefore, it should perform the tasks of encouraging co-planning and proposal, but also observation and consultation.

This IT environment will be constituted by 4 sections: Participation rooms, Training rooms, Documents repository rooms and Rooms for proposals and external contributions.

2.2.1 DESIGN

2.2.1.1 Institutional stakeholders mapping

In order to design an effective participatory process, it is essential to correctly map the stakeholders at different territorial levels, paying attention to include those who have a specific competence and those who have a more general competence, but which can affect or influence the choices covered by the path.

For this reason, in the context of civil protection planning with an integrated approach, it is necessary to identify

- ➔ institutional actors with specific Civil Protection competence;
- ➔ other institutional actors with territorial planning competence.

WHEN	DESIGN
OBJECTIVE	Identification of the potential institutional stakeholders of the process
TOOLS/METHODOLOGY	Analysis of documents and interviews
OUTPUTS	Actors database with contact details
ACTIONS THAT CAN BE SUPPORTED BY THE IT TOOL	
ELEMENTS THAT CAN BE UPLOADED TO THE IT TOOL	List of participating institutions

In the case study, this mapping was carried out through the remote analysis of territorial planning documents and civil protection plans.

The identified stakeholders were (see Figure 2):

- ➔ institutional actors with specific civil protection competence (Region - civil protection Sector, Prefecture and Municipalities - civil protection sector)
- ➔ other institutional actors with territorial planning competences (5 Terre National Park, Municipalities - technical and environmental sector).

[1] Følstad, Asbjørn & Karahasanovic, Amela. (2012). Online applications for user involvement in Living Lab innovation processes: An initial framework, Proceedings of the IADIS International Conference e-Society 2012 with a link to IADIS, (pp. 257-264). Copyright: IADIS, http://www.iadis.or.

[2] Leminen, Seppo. (2013). Coordination and Participation in Living Lab Network. Technology Innovation Management Review. 3. 5-14. 10.22215/timreview/740.

Figure 2 Identification of institutional stakeholders in the case study of 5 Terre

2.2.1.2 Preliminary investigation and context analysis in terms of the local civil protection system and identification of weaknesses or critical issues (semi-structured interviews and literature analysis)

This step is accomplished through:

- ➔ a preliminary analysis conducted by experts;
- ➔ the realization of individual or group interviews - in the form of focus groups – with the aim of analyzing the weaknesses of the local civil protection system and identifying the challenges that the system will have to face in the context of climate change.

Both activities are useful for tracing the roles of institutional actors in the different risk management phases and identifying synergies that could be developed in an integrated civil protection planning, addressing an overall vision of the problems that have emerged and approaching to integrated and shared solutions.

WHEN	DESIGN
OBJECTIVE	Participatory analysis of the process context in terms of risk management (including civil protection system)
TOOLS/METHODOLOGY	Document analysis and interviews and focus group
OUTPUTS	Map of roles and responsibilities in the different phases of flood risk management cycle
ACTIONS THAT CAN BE SUPPORTED BY THE IT TOOL	Focus group and interviews
ELEMENTS THAT CAN BE UPLOADED TO THE IT TOOL	Map of actual roles and responsibilities and collection of existing plans and procedures

In particular, with respect to the case study, on the basis of the documents analysis, focus groups were structured to understand the elements of the local Civil Protection system deemed not completely consistent with local needs.
The institutional stakeholders involved in the focus groups were: Liguria Region - Civil Protection, Liguria Region - Environment, the mayors and technicians with territorial planning and civil protection competences of the 5 Terre Municipalities and the 5 Terre National Park.

2.2.1.3 Definition of the general objective of the process and method of implementation (consultation and/ or co-design with institutional actors) and stakeholders mapping updating

Before starting to implement a participatory process in general - and related to civil protection in particular - it is necessary to define the objectives and the type / level of participation[3].

The general objective of the process must be defined together with the institutional stakeholders, based on the context elements (results of the preliminary investigation process and context analysis) and on its feasibility, assessed by the stakeholders. It must be a clear and shared objective and this will favor the institutional actors to take charge of the process implementation. In the absence of such taking charge, the participatory process could be ineffective.

WHEN	DESIGN
OBJECTIVE	Definition of the general objective and acceptation
TOOLS/METHODOLOGY	Analysis of documents and interviews and focus groups
OUTPUTS	Description of the general objective of the process and its approval by institutional stakeholders
ACTIONS THAT CAN BE SUPPORTED BY THE IT TOOL	Discussion and co-planning between institutions and technicians/ experts
ELEMENTS THAT CAN BE UPLOADED TO THE IT TOOL	Systematization of Focus groups Description of the general objective of the process and definition of a methodology

In the case study, the general objective of the process - defined together with the Liguria Region, the Municipalities of the 5 Terre and the Prefecture of La Spezia - was to improve the local civil protection capacity and therefore the flood risk mitigation also through a coordinated management of tourist flows in the case of a hydro-meteorological alert and during a flood event.
Following the definition of the general objective, the mapping of stakeholders to be involved in the process was improved. It was decided to involve in the process:

- The tourism sector of Liguria Region,
- ARPAL, the regional environmental protection agency and forecasting and monitoring civil protection center of Liguria Region,
- Ferrovie delle Stato, the entity responsible for transport in the area.

[3] According to the classification of Arnestein (1969), levels of participation start from a first level of non-participation, which in its degrees of manipulation and therapy, indicates those processes centered on the "care" of disadvantaged subjects by the institutions, and therefore not aimed at any way to include citizens in the policy-making cycle; we then move on to the level of tokenism, which indicates that set of actions taken in order to listen and give a voice to citizens through the three degrees of informing, consultation and placation, which can be translated into the known information, consultation and conciliation procedures, which, in a more or less strong way, they allow citizens to acquire awareness and expose their visions, while lacking the guarantee that they are implemented by the political-institutional level. The last level of the scale is occupied by citizens power, which involves the effective influence of citizens in policy making through the three degrees of partnership, delegated power and, finally, citizens control.

2.2.2 IMPLEMENTATION

2.2.2.1 Establishment of the institutional working group

The formal constitution of the interinstitutional working group is a very important step for the effectiveness of a participatory process and consists in identifying the individuals who undertake to follow the participatory process, ensuring its development.
The formalization in fact initiates a process of greater empowerment of individuals who thus officially become part of the path.

WHEN	IMPLEMENTATION
OBJECTIVE	Taking charge of the process and activation
TOOLS/METHODOLOGY	Internal consultations
OUTPUTS	Commitment document
ACTIONS THAT CAN BE SUPPORTED BY THE IT TOOL	Presentation of the commitment document and commitment document
ELEMENTS THAT CAN BE UPLOADED TO THE IT TOOL	Commitment document

In particular, in the case study, a commitment act was firstly constructed with the Liguria Region, in which the actors and their roles in the process, the objectives and the collaboration commitments were identified.

2.2.2.2 Training

Another key element for the effectiveness of the process is the construction of a common and appropriate language on risk and its management by the interinstitutional working group. For this reason, once the working group has been formalized, it is important to deliver training sessions on the theme of risk management and civil protection.

WHEN	IMPLEMENTATION
OBJECTIVE	Creation of a common language, local risk mapping Online lessons and in-depth material
TOOLS/METHODOLOGY	Online lessons, face-to-face lessons, workshops
OUTPUTS	Training plan, in-depth materials, recorded lessons
ACTIONS THAT CAN BE SUPPORTED BY THE IT TOOL	Online lessons, workshops, and in-depth material
ELEMENTS THAT CAN BE UPLOADED TO THE IT TOOL	Online lessons and in-depth material

The training was carried out online with active training techniques. Participatory workshops on specific topics were also held to test and better deepen the knowledge acquired in frontal mode.

In particular, the workshops had focused on:

- the analysis of the tourist flows on the territory of 5 Terre, read and analyzed through the grid of some risk components (exposure, vulnerability and capacity);
- the mapping of civil protection actions;
- the mapping of the monitoring and surveillance instrumentations in the area and the related alert procedures;
- the construction of the participatory process with the population.

Through this training, it was also possible to learn more about the local civil protection system and, with the new knowledge acquired, to map new elements of weaknesses and strengths of the civil protection system, also with an intermunicipal perspective.

2.2.2.3 Participatory SWOT analysis on the identified general objective identified

The SWOT analysis is usually used in strategic planning to evaluate the strengths, weaknesses, opportunities and threats of a project and to carry out a systematic assessment of the status quo regarding the possible implementation of the project.
In the context of the participatory process for civil protection planning, this analysis has among its main objectives:

- to understand and contextualize which may be the critical issues for achieving the objective of the process;
- to map in a shared way the elements that can feed the process;
- share the opportunities that would exist in the area with the realization of the process.

Through this analysis, it becomes possible to plan the participatory process and its specific objectives in more detail.
In order to support the working group in completing the SWOT analysis, it is advisable that facilitators and experts take into account and address the results of the preliminary investigation and context analysis (see Paragraph 2.2.1.2).

WHEN	IMPLEMENTATION
OBJECTIVE	Identification of specific objectives and of potential conflicts
TOOLS/METHODOLOGY	Focus group
OUTPUTS	Compiled SWOT analysis matrix
ACTIONS THAT CAN BE SUPPORTED BY THE IT TOOL	Focus group on SWOT analysis
ELEMENTS THAT CAN BE UPLOADED TO THE IT TOOL	Systematization of the analysis results

Specifically in the case study, this analysis was conducted within the interinstitutional working group, after sharing the objectives of the participatory process, also underlining some weaknesses that emerged from the context analysis and resulting from the dialogue with the technicians.

2.2.2.4 Co-design / Identification of solutions to the problem identified within the  interinstitutional working group design

This is the step of the participatory process implementation in which the different information, exchanges and insights are systematized to identify the civil protection actions useful for achieving the specific objectives and therefore the general objective.

In particular, this phase is carried out through interinstitutional discussion tables around the realization of the specific objectives.

These tables must be managed and animated by a facilitator.

Due to the complexity of the subject, given that civil protection actions always have an impact on the local civil protection capacity, but can also be effective in reducing vulnerability and exposure, the possible solutions identified can be clustered in macro- groups that have as a reference the risk component on which they mainly impact.

WHEN	IMPLEMENTATION - Codesign
OBJECTIVE	Mapping of potential actions, conflicts resolutions
TOOLS/METHODOLOGY	Interistitutional discussion table
OUTPUTS	List of civil protection actions and commitments
ACTIONS THAT CAN BE SUPPORTED BY THE IT TOOL	Discussion tables
ELEMENTS THAT CAN BE UPLOADED TO THE IT TOOL	Final discussion table + Final decisions

In particular, in the process carried out, the discussion table for the co-design of policies and measures focused on procedures to reduce the risk deriving from the presence of tourist flows on the territory, dividing them into procedures that increase the civil protection capacity, in procedures that decrease the vulnerability and increase civil protection capacity and in procedures that decrease exposure and increase civil protection capacity.

This allows to identify possible sets of solutions for which aspects linked to the limitation of freedoms and the specific responsibilities deriving from them have been highlighted. This restitution and discussion highlighted the need to invite Ferrovie dello Stato to the discussion table, which had not yet been invited to participate in the discussion, and to socialize the solutions identified with citizens and local economic stakeholders, essential for establishing sustainability and acceptability of some solutions.

3 Conclusions

These guidelines address one of the needs that emerged during the analysis of the civil protection system in the context of climate change. In particular, in the face of the climate change scenario and therefore of probable more frequent extreme meteo-hydrogeological events, it emerges the need for a civil protection planning capable of increasing and / or enhancing the linkages between the prevention phase and the preparedness and response phases, starting from the current conditions of civil protection capacity and involving the stakeholders who can contribute to the realization of the measures to these needs. A civil protection planning and therefore a civil protection system that has a WIDER and OVERALL vision.

In this sense, the process carried out in the pilot case wanted to activate and involve all the institutional stakeholders who have the competence of intervening in the territory and on risk mitigation in order to better understand the different components of the risk (hazard, vulnerability, exposure and capacity), their relationships, and in order to identify actions and policies that take all of them into consideration. In perspective, the presence of those involved in prevention in the participatory process can also be useful for enhance communication between sectors, better organizing the territory for the purpose of risk mitigation and coordinating efforts.

4 Recommendations for the EU scalability of the support tool

The above described guidelines can be adapted to prepare for other scenarios involving actors from multiple organizations or sectors, e.g. wildfire, and regional contexts. The process described is most suitable to be implemented at a local level.