Interreg Co-funded by the European Union
Alpine Space

X-RISK-CC

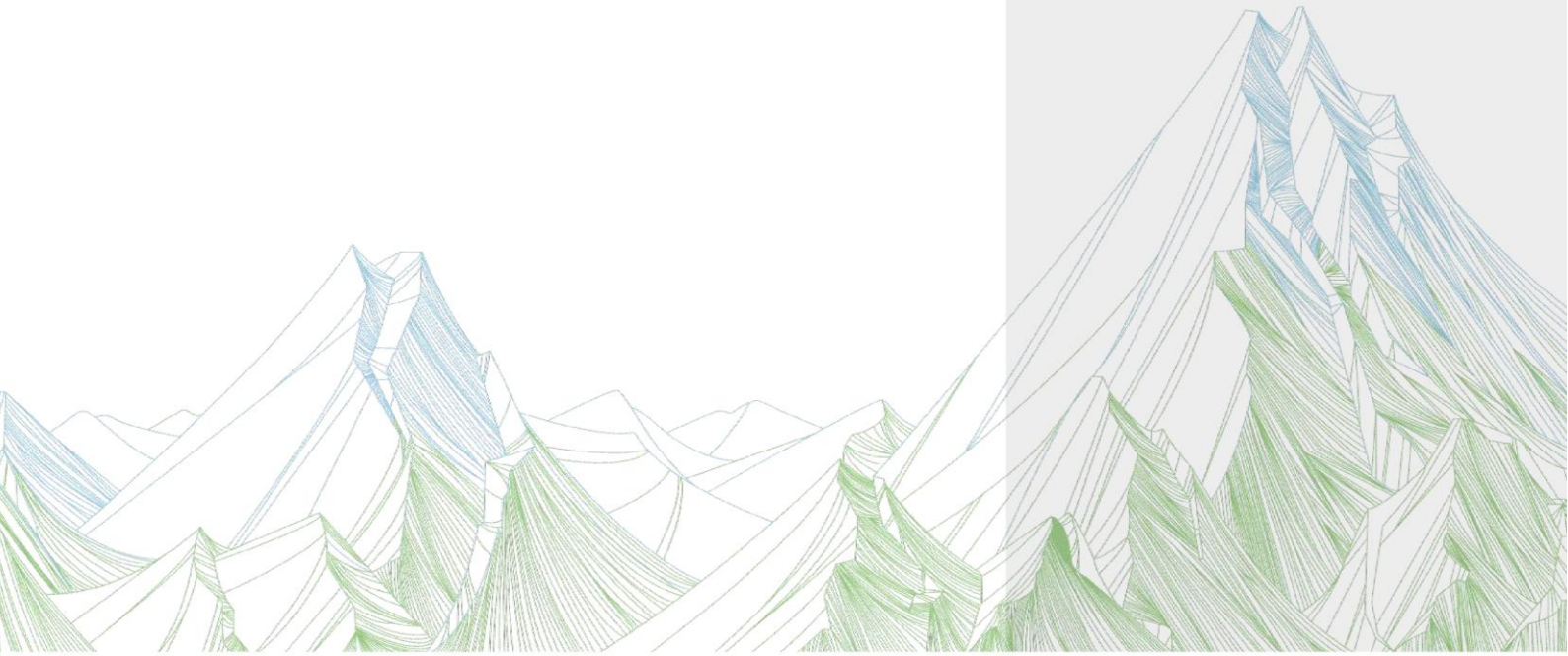
TAILORED ACTION PLAN
FOR RISK MANAGEMENT IMPROVEMENT

Interreg Alpine Space X-RISK-CC project – 2023/2025

PILOT AREA:

Arly Catchment

In Savoie, France



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PROJECT: **X-RISK-CC**

How to adapt to changing weather eXtremes and associated compound RISKs in the context of Climate Change

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X-RISK-CC - Alpine Space Programme

INTRODUCTION TO THE X-RISK-CC PROJECT

Project Background and Objectives

The X-RISK-CC project addresses the increasing challenges posed by climate-related extreme weather events across the Alpine Space. Recent years have demonstrated that compound and cascading extremes—such as storms combined with heavy precipitation, or heatwaves followed by drought and flooding—can challenge current risk management capacities. The unexpected magnitude and intensity of these extremes can cause compound impacts and domino effects that turn into complex, long-lasting, or even irreversible consequences. While scientific evidence links climate change to the increasing intensity and frequency of such events, knowledge and management of their cascading impacts and risks remain insufficient. The X-RISK-CC project aims to improve risk management of such extreme events in the context of climate change. By considering selected pilot areas across the Alpine Space, co-designed, context-specific interventions are elaborated based on a comprehensive assessment of past extreme events, future climate projections, and systematic evaluation of existing risk management capabilities and gaps. This document presents the Tailored Action Plan developed for one of the project pilot areas.

The Pilot Area of Reference

In the French Northern Alps (Haute-Savoie, Savoie and Isère), storm Eleanor in December 2018 triggered a series of rain-on-snow events that led to flooding in small catchments and shallow landslides and mudflows in areas where such hazards were considered rare. In the Arly Catchment, saturated soils gave way, causing substantial damage to chalets, roads, and local infrastructure. A rapid rise in the rain-snow line and additional precipitation associated with storm Carmen in January 2019 further intensified the situation, contributing to widespread avalanches and forest damage. This illustrates how closely spaced storms can produce cascading impacts across mountain regions.

For further details on the pilot area, the natural hazards that occurred and the activities that led to the co-creation of the tailored action plan, refer to the document “PILOT DOSSIER: ARLY CATCHMENT IN SAVOIE, FRANCE” available at the project website under “Outcomes”.

Outcomes:
X-RISK-CC - Alpine Space Programme
https://www.alpine-space.eu/project/x-risk-cc/

X-RISK-CC – Web GIS:
Information on intensity and frequency of weather extremes in the entire Alpine Space
https://cct.eurac.edu/x-risk-cc

THIS DOCUMENT

Based on the results of participatory workshops with local stakeholders, this document presents the Tailored Action Plan (TAP), which outlines the priority actions to strengthen the region's capacity across all phases of the risk management cycle. The TAP addresses key gaps in early warning systems, data integration, coordination mechanisms, infrastructure resilience, legal frameworks, and public awareness. The actions are designed to be implementable, measurable, and aligned with both regional and transnational objectives of the Alpine Space for disaster risk reduction and climate change adaptation.

Purpose and Concept

While this document provides the overall structure and documentation, the TAP itself is conceived as a living set of implementation-oriented actions, forming a dynamic and evolving database of priority measures. The actions can be continuously updated and adapted over time and serve as a practical reference for identifying next steps, tracking ongoing initiatives, and maintaining a clear overview of progress in strengthening regional resilience. This flexible approach acknowledges that effective risk management in the context of climate change requires ongoing learning, adaptation, and coordination among stakeholders.

Methodology

The methodology employed to develop the TAP for each pilot area of the project follows a **Community-Based Approach,** engaging stakeholders across all phases of the risk management cycle (prevention, preparedness, response, recovery). **Participatory workshops with local stakeholders** were conducted **between 2023 and 2025** in each pilot area.

Participants in the workshops of the pilot area Arly Catchment, in Savoie:

- Auvergne-Rhône-Alpes Énergie Environnement (AURA-EE)
- Alpine Centre for Studies and Research on Natural Risk Prevention (PARN)
- Representatives of municipalities and communities of municipalities in the Arly Catchment
- Union of rivers and watershed services of Arly Catchment
- Office for Civil Protection (SDIS)
- Natural Hazard Service of the Savoie Department, Infrastructure Directorate
- Mountain Terrain Restoration Service of the National Forest Office (remote participation)

Prioritization Strategy of Actions

Prioritization was carried out separately for each pilot area in the project and is therefore not uniform across pilots, reflecting different risk contexts, institutional settings, and capacities.

In the Arly Catchment pilot area, participants in the workshop were asked to place eight stickers next to the actions they personally considered as priorities. The nine actions that received the most stickers were labelled as Group A and further detailed through a working group. The remaining actions were classified as Group B. A few additional actions, initially grouped under the heading 'Others' in Groups A and B, are grouped here as Group C for the record. A priority level from 1 (low priority) to 5 (high priority) was also assigned to each action separately.

STRUCTURE AND CONTENT OF THE TAILORED ACTION PLAN

Each action in this document includes:

- **IDENTIFICATION:** Unique code, title, and summary
- **GAP ADDRESSED:** Specific weakness or need in current risk management
- **FRAMING:** Position in risk cycle, action type, governance level, ownership, target groups
- **DESCRIPTION:** Detailed explanation of the action, preliminary steps, expected benefits, and potential challenges
- **VALIDATION:** Indicators and parameters for monitoring progress and success
- **FEASIBILITY:** Timeline, funding status, responsibilities, and implementation pathway

Action Plan Fields Explained

ID Number	Unique identifier assigned to each action. This allows for easy reference, tracking of connections between actions, and integration with other planning documents.
Title of the Action	Brief, descriptive name that clearly communicates the core focus of the action.
Gap(s) it refers to	Specific deficiencies, weaknesses, or missing elements in current risk management practice that this action aims to address. Gaps may include missing infrastructure, inadequate procedures, lack of

	coordination, insufficient data, legislative limitations, communication deficiencies, or capacity constraints.
Description of the action	Main objective of the action and proposed solutions to implement
Risk Cycle Position	The phase(s) or interphase(s) of the risk management cycle where this action primarily operates: Prevention, Preparedness, Response, Recovery, or Interphases (e.g., "Preparedness-Response," "Recovery-Prevention").
Type	Classification of the action according to its primary mechanism: • **Data and Knowledge:** Actions focused on improving information, understanding, monitoring, or data systems • **Communication:** Actions aimed at improving information flow, awareness, warnings, or coordination • **Legislation:** Actions requiring changes to laws, regulations, standards, or formal procedures • **Technical Measures:** Actions involving physical infrastructure, technology deployment, or engineering solutions • **Capacity Building:** Actions focused on training, institutional strengthening, or resource development • **Multiple:** Actions related to multiple classes, further details are reported in the Annex
Level	The primary governance or implementation scale: Local (municipal level), Provincial/Regional, National, Cross-border/International, or Multiple levels.
Ownership	The institution(s) or organization(s) with primary responsibility for initiating, implementing, and ensuring completion of the action. Ownership implies decision-making authority and accountability.
Actors	Other institutions, organizations, or groups that play significant roles in implementing the action, providing input, or whose cooperation is essential for success.
Target Groups	The populations, sectors, or constituencies that will directly benefit from or be affected by the action. This may include general population, specific vulnerable groups, professional sectors, municipalities, emergency responders, or infrastructure operators.

Priority	Ranking from 1 (Low Priority) to 5 (High Priority) based on the prioritization methodology described above. Priority reflects urgency, impact potential, feasibility, and stakeholder consensus.
Funding	Current or anticipated funding status
Finalize by (timewise)	Target date or timeframe for completion of the action: Short-term (within 1-2 years), Medium-term (3-5 years), Long-term (5+ years), Ongoing (continuous improvement without fixed endpoint), or Specific dates where applicable.
Progress Status	Current state of implementation
Comments/Details/Observations	Additional context, clarifications, challenges identified, lessons learned, or other relevant information that does not fit in structured fields.
Documentation and Links	References to supporting documents, reports, legal texts, technical studies, websites, or other resources relevant to understanding or implementing the action.

List of acronyms

ORSEC	France's civil protection emergency response system
EPCI	Public Establishment for Inter-Municipal Cooperation
GIRN	Integrated Natural Hazard Risk Management
PAPI	Flood Prevention Action Programmes
PCS	Municipal Safeguard Plan
PICS	Inter-Municipal Safeguard Plan
PIZ	Z-Index Plan (risk-based urban zoning reference plan)
PPR	Risk Prevention Plans
SCoT	Territorial Coherence Scheme
SPC	Flood Forecasting Service

TAILORED ACTION PLAN

Table of actions

Table 1 provides a comprehensive overview of all identified actions. Each action is coded according to the system described in the previous section and can be filtered by its position in the risk cycle, type, priority level, or progress status. **Detailed descriptions of each action are provided in the Annex**, including the rationale, the gap or need addressed, its position within the risk management cycle, institutional ownership and involved actors, intended target groups, and current implementation status. Together, these descriptions contextualize the actions, support prioritization and monitoring, and provide a transparent basis for coordination, decision-making, and future updates of the action plan.

ID	Title of the action	Gaps it refers to	Description of the action	Risk Cycle position	Type	Level	Ownership	Actors	Target Groups	Priority	Funding	Finalize by (timewise)	Progress Status	Comments/ Details/Observations
A.1	Improvement of the watershed alert system (Form 2)	Capacity of the current warning system: The warning system for the watershed is relatively effective for common events, but is not accurate enough and needs to be supplemented locally. Météo France's department-level alerts are too general and lack precision in mountainous areas, particularly due to the lack of radar coverage with "gaps" in the APIC service (Intense Rainfall Warning at the Municipal Level). Ability to predict impacts: Need to align the various alert systems: o Flood Forecasting Service (SPC): predicts flood peaks on rivers but not on tributaries. o French Electrics (EDF): highly competent on tributaries, but we are unable to "bring them into the loop." o Need for someone to "take the lead": activate a command structure = need for an Operational Command Post (Prefecture) at the valley level, otherwise emergency plans are triggered too late and do not work. o Need to centralize information for municipalities by pooling available data on the basin (roads, EDF, SPC Arc/Isère, municipalities, ski lift services)	1. Objective: Strengthen warning systems in order to shorten the warning chain and improve the system's ability to predict extreme events and their local impacts 2. Proposed measures: • Align the various existing warning systems (weather, floods, etc.) • Pooling of data (EDF, ski lift services) • Testing of public alerts (sirens, text messages), to be implemented locally • Localised alerts and contextual data: communication and information for residents on a zone-by-zone basic	Interphase: Prep - Resp	Data and Knowledge	local	Prefect	EPCIs, government services, local authorities	Elected officials, risk management services, emergency services	5				
A.2	Intermunicipal crisis management organisation (Form 14)	The organisational structure in place is adequate for managing everyday events, but may not have sufficient capacity to manage very large-scale events in the event of a breakdown in communication with a disaster area (e.g. Storm Alex), with the need to mobilise specific experts and responders (natural hazards, technological hazards, emergency works). Need to take a step back at the inter-municipal level. Redundancy and robustness: Theoretically, there is no need for redundancy in the command structure, but actors in the field (who can be mobilised quickly) are sometimes overwhelmed by information when they are already dealing with the problem. Awareness: Some actors are not aware of the protocols in place locally. Training is needed. Adaptability of the response (crisis management): The protocol's ability to adapt and manage unexpected situations arising during the event is unknown. Adaptability depends on the resources available and the size of the intervention area considered in crisis management. On the other hand, repeated management of unexpected situations teaches us how to respond appropriately. 2. Challenges and opportunities: Clear definition of stakeholders' roles; Mapping based on past events; Informing the public is useful for raising awareness and disseminating information on how to respond.	1. Objective: Organise multi-scale management of large-scale events. 2. Proposed measures: • Develop an Inter-Municipal Safety Plan (PICS) for the entire catchment area. • Upstream-downstream management: strengthen communication between municipalities located upstream and downstream. • Crash-test PCS (Municipal Safety Plan) and PICS in the event of an extreme event (work on the sequential chain of intervention between the local level and the activation of the ORSEC plan- Department Safety plan) • Raise awareness: Share the prefectural alert system with businesses (check that they are responsive and have the necessary vehicles and equipment) • Governance: Clarify the roles and responsibilities of local authorities at different administrative levels within the Territorial Coherence Scheme (ScoT), particularly with regard to risk communication • Ensure the responsiveness of partner companies in the event of announced incidents/contracts? • Mobilisation of resources, volunteers, technical equipment, shelters, etc. • More frequent exercises, necessary role-playing • Training for all types of responders • Inventory of reception facilities (shelters) and other resources	Interphase: Prep - Resp	Legislation	provincial/ regional	EPCI**	Municipalities (safety commission) and inter-municipal cooperation (proposal for an inter-municipal safety commission with qualified staff + representatives elected by sector)	On the life basin and not only the EPCI**	4		regulatory deadline November 2026	Steps to be taken: - local consultation - identification of catchment areas and risks of disruption (e.g. roads, etc.) - inventory of resources	Please note: in mountain areas, the perimeter of the life basin is sometimes more relevant/complementary than the perimeter of the EPCI** for inventory and deployment of resources/e.g. La Gieggaz -> Praz, Megève, La Clusaz outside the Arlysère EPCI.
A.3	Adapting financial and insurance instruments for prevention and compensation to meet new challenges (Form 15)	• Financing: Financial resources are not adapted to emerging needs, as it would be necessary to be able to assess and anticipate what is precisely unpredictable (working with insurance companies). • Insurability: Today, the financial challenges arising from reconstruction are increasingly difficult to insure. • Prevention is better than cure: Provide the means for maintenance rather than remedial action (financial reality).	Provide the means to carry out maintenance rather than remedial work (financial reality) Proposed measures: • Identification of local needs • Organise an event with stakeholders (government, insurers, reinsurers, e.g. CCR, Groupama, etc.) to shed light on the issue (proposed tools), put it on the agenda and promote prevention • Formulate recommendations for other levels, particularly the EU (WP4 of the X-RISK-CC project) Develop financial participation in preventive work that could be undertaken by individuals?	unclear/ see description	Data and Knowledge	Multiple			Private stakeholders	5				
A.4	Build better to prevent better (Form 20)	After the disaster in La Léchère in Tarentaise, where a torrent devasted the centre of the village, identical reconstructions were carried out very quickly after the CatNat assessment. How can lessons be learned to ensure that the reconstruction phase contributes to prevention? Challenges and opportunities: • Asking the right questions before restoring a semblance of order • Capitalising on/passing on knowledge • Reporting: mapping and analysing causes to identify corrective actions / organise collective knowledge	1. Objective: Better anticipate the reconstruction and recovery phase after high-impact events. 2. Proposed measures: • Consult former residents. • Give mayors more leeway. • Initiate local discussions and share the results with as many people as possible. • Training...	Interphase: Recov - Prev	Multiple	national	Municipalities, conurbation, departement	All (from the State to local authorities + expert support services)	Municipalities for buildings, and the Department for roads	2				
A.5	GIRN* - Action 3,2: Action to improve crisis management by local authorities in the riverwatershed - provision of outsourced training on crisis management and simulation exercises (Form 5)	Need to better prepare communities for crisis management	This action aims to develop and implement the tools necessary to improve crisis management in the 25 municipalities located in the watershed. Implementation of the following tools: - Crisis management exercises in 23 sectors, - Training for elected officials and technical staff on crisis management, 12 sessions to cover the requests of the local authorities identified.	Interphase: Prep - Resp	Legislation	local	SMBVA	municipalities, EPCI, SMBVA, Fire brigades (CSI)	municipalities / safety commissions / ski areas	4	FEDER Massif des Alpes	AAPC (Public Call for Competition Notice) : Second half of 2025 Service provision: First half of 2026 to the end of the first half of 2028 Acceptance: End of the first half of 2028	Founding requested (GIRN project*)	
A.6	GIRN* - Action 2,1: Design and implementation of a flood monitoring platform - external project management assistance service (Form 1)	Need to better anticipate and manage floods Need to centralize data acquired across the territory to simplify crisis management	This action concerns the development of an innovative flood management platform, enabling the collection of flood monitoring data (existing hydrometeorological data) and field observations, facilitating decision-making and event management (crisis management, post-flood management).	Interphase: Prep - Resp	Data and Knowledge	local	SMBVA	SMBVA (technicians and elected officials), municipalities, EPCI**, and data producers/managers	This platform is intended to be shared between the authorities responsible for managing the event: the union responsible for flood prevention, 25 municipalities, 4 EPCI**, and government departments.	3	FEDER Massif des Alpes	AAPC : 2nd semestre 2025 Assistance service : beginning of 2026 to end of 2027 Reception : beginning of 2028	Founding requested (GIRN project*)	
A.7	Adapt forest management to preserve its protective function (Form 11)	Forest vulnerability (drought, heatwaves, storms, fires, pests)	"1. Objective: Improve consideration and management of the (multifunctional) role of forests, including their protective function 2. Proposed measures: • Study on the protective role and vulnerability of forest stands in the Arly basin (see INRAE's AGIRA project) • Resource inventory (e.g. Mountain Forestry Guide)"	Prevention	Technical measures, implementation proposal	local	Municipalities, private stakeholders			5	municipal budgets, FEDER Massif des Alpesfor project AGIRA ?		action planned in the 2025-2030 PAPI***	
A.8	Improving risk and safety awareness among the population (Form 8)	Communication: There is a lack of information sharing and risk awareness. For example, to ensure that the population behaves appropriately in the event of a preventive evacuation. Better preparation/need for drills: 'We are going to have more and more incidents, and we don't feel comfortable with risk management because we haven't tested the emergency plan in the event of a major incident.'	Develop a risk culture at every level 1. Objective: Educate and better prepare the population for crisis situations, adapt the response and educate users: have even more stringent risk prevention plans. 2. Proposed measures: • Strengthen "risk culture" initiatives among different audiences (schools, businesses, local authorities) to promote appropriate behaviour • Make simulation exercises mandatory to regularly test emergency plans, particularly through multi-stakeholder exercises (e.g. preventive evacuation of campsites)	Interphase: Prev - Prep	Communication	local	Municipalities + Department + SMBVA	Local authorities, local risk managers, government services (Prefecture, ...)	Population	4	For SMBVA founding via Arly'sPAPI*** on the subject of floods			
A.9	Better anticipating the impacts of extreme events (Form 18)	Concrete actions resulting from debriefings to deal with future events: better anticipate impacts! How can the response phase help simplify the recovery phase (Response → Recovery)? Challenges and opportunities: • Promote responsiveness to minimise the impacts of the disaster • Well-targeted intervention at predefined or known sites	1. Develop the knowledge needed to anticipate rather than suffer the impacts of extreme events through proportionate, structured and targeted responses: - by preserving human life as much as possible, it allows the recovery phase to focus on material aspects - by developing 'fuse' dredgings, i.e. sacrificing certain areas to preserve the rest 2. Proposed measures: • Establish risk scenarios • Characterise potentially catastrophic events • Identify sensitive points and monitoring points: initial overflows • Strengthen infrastructure maintenance • Review the resistance of bridges • Define storage areas, flood zones and even structures to be sacrificed • Install sensors and measuring scales on certain structures (to avoid human risk-taking)	Interphase: Prev - Prep	Data and Knowledge					3				
B.1	GIRN* - Action 2,2 : Acquisition of video and photo monitoring equipment (Form 3)	Need to better anticipate and manage floods	Additional equipment for three river monitoring sites (cameras or webcams) and linking to the digital platform.	unclear/ see description	Data and Knowledge	local	SMBVA		Idem	1	FEDER Massif des Alpes	AAPC : 1er semestre 2027 Prestation : 2nd semestre 2027 Réception : fin 2027	Founding requested (GIRN project*)	
B.2	GIRN* - Action 3,1: Action to improve crisis management by local authorities in the river basin - outsourced provision of crisis management documents and risk information, or updating of existing documents (Form 4)	Need for operational documents for crisis management	This action aims to develop and implement the tools necessary to improve crisis management in the 25 municipalities located in the catchment area. Implementation of the following tools: - Information documents on existing risks in 15 sectors, - Documents for the organisation of multi-risk crisis management in 15 sectors, - Crisis management support mapping for the entire watershed, covering 25 municipalities.	Interphase: Prev - Prep	Multiple	local	SMBVA		Elus, services des collectivités	1	FEDER Massif des Alpes	AAPC : 1er semestre 2026 Prestation : 2nd semestre 2026 à la fin du 1er semestre 2028 Réception : fin du 1er semestre 2028	Founding requested (GIRN project*)	
B.3	Graduated Action Plan (Form 6)	• Levels of preparedness: there are too many 'false alarms' (numerous orange alerts), we need to scale our response (ex. Graduated Action Plan for Grenoble-Alpes-Métropole TAGIRN); the real challenge is our ability to identify when we are entering a catastrophic event • Adaptation to large-scale events: Tools and resources are suited to localised events, but less clear beyond that (there is a lack of a culture of response to large-scale events in France).	1. Objective: Define thresholds and procedures to better grade alerts and better qualify the transition to a 'disaster' situation 2. Proposed measures: • Push training to test extreme risk (activation or non-activation of the ORSEC plan = Department Safety plan)	Preparedness	Data and Knowledge	local	SMBVA			1				
B.4	GIRN* - Action 4: Developing a risk culture - video on integrated risk management in the Arly river basin (Form 7)	Need to maintain and develop a culture of risk and resilience	This initiative aims to implement various information and awareness-raising activities designed to develop a culture of risk awareness among the general public in the region. The proposal is to produce a 5-minute video discussing past floods, flood coincidences and other hazards such as landslides, and to provide photomontages of exposed areas to help the public visualise the risks.	Prevention	Communication	local	SMBVA		Grand public	1	FEDER Massif des Alpes	AAPC : 1er semestre 2026 Prestation : 2nd semestre 2027 Réception : fin 2027	Founding requested (GIRN project*)	
B.5	PAPI*** -Creation of river meandering areas (Form 9)	Facing the increasing frequency and intensity of events, existing risk management measures are reaching their limits and must be strengthened to avoid repeated remedial measures in certain sectors.	Protection and adaptation strategies: The work planned under the 2027-2032 PAPI*** will improve structural flood prevention measures.	Prevention	Technical measures, implementation proposal	local	SMBVA				PAPI 2027-2032		a study is currently underway on the Flood Zone Atlas and on the river's functional space as part of the PAPI*** programme	
B.6	PAPI - Local Measures to Reduce Vulnerability in Inhabited Areas and high-exposure sites (sediment management, dredging, bridge capacity checks, driftwood management) (Form 10)	Facing the increasing frequency and intensity of events, existing risk management measures are reaching their limits and must be strengthened to avoid repeated remedial measures in certain sectors.	Protection and adaptation strategies: The work planned under the 2027-2032 PAPI*** will improve structural flood prevention measures.	Prevention	Technical measures, implementation proposal	local	SMBVA				PAPI 2027-2032			
B.7	Update of hazard maps for the entire Arly basin (Form 12)	PPRs (Risk Prevention Plans) are produced at municipal level but not at inter-municipal level (heterogeneous data) and multi-risk maps do not exist.	Objective: Update and standardise hazard maps across the entire Arly basin • We need a comprehensive overview of the entire catchment area, particularly in non-urbanised areas (e.g., in landslide-prone areas such as the Arly gorges, where there is a lack of specific mapping) • The maps must be kept up to date and updated as new events occur	Prevention	Data and Knowledge	provincial/ regional	TDB							
B.8	Development of a multi-risk approach integrating natural and technological risks (Form 13)	NATECH: Take into account the risks of dam failure (working with EDF - French Electricity) and technological risks (Ugitech)	Developing a multi-risk approach that integrates natural and technological risks	Prevention	Data and Knowledge	Multiple	SMBVA in coordination with relevant industrial and public stakeholders		Local authorities, emergency services and communities exposed to natural and technological hazards					
B.9	Limiting urban sprawl and restoring spaces to nature (Form 16)	Key considerations for future recovery plans: Do not exacerbate hazards, vulnerabilities or exposure to issues, but rather reduce them, in the context of increasing hazards.	1) Objective: Limit urban sprawl in high-risk areas and restore natural floodplain functions to reduce exposure and vulnerability. 2) Proposed measures: •Strictly prohibit new constructions in zones classified as high or very high risk (flood zones, landslide-prone areas, etc.) as part of urban planning regulations. •Restore or maintain natural spaces, such as floodplains and riparian zones, to improve water retention, reduce flood peaks, and enhance ecological functions. •Integrate these measures into municipal planning documents and PPRs to ensure long-term compliance and resilience.	Prevention	Technical measures, implementation proposal	local	Municipal authorities in coordination with SMBVA.		Local communities, future residents, and the environment	3				
B.10	Improve feedback on events (Form 17)	Learn from past events: The information gathered during debriefings and from documentation of past events is essential but is not shared nearly enough. Look back too: don't hesitate to revisit what was done several years ago, as this improves personal and collective culture.	1. Objective: Optimise the collection of information on events. Reporting: mapping and analysis of causes to identify corrective actions / organise collective memory. 2. Proposed measures: • Appoint observers and capitalise on the events (transmission of memory). • Document engravings, log jams and clean-ups/dredgings more systematically.	Interphase: Recov - Prev	Multiple	Multiple	SMBVA in coordination with municipal authorities and emergency services		Local authorities, emergency services, and communities	3				
B.11	Better predicting landslides (Form 19)	Potential for large-scale landslides and massive sediment deposits in the watercourses of the catchment area, particularly in the Arly Gorges (see MIROIR project)	1. Objective: better anticipate landslides and their impacts on sediment transport in watercourses 2. Proposed measures: • Implementation of detection and warning systems in the event of landslide, possibly with measurement scales	Prevention	Data and Knowledge	provincial/ regional	SMBVA in coordination with relevant technical and scientific partners		Local authorities, infrastructure managers, and downstream communities	3				
B.12	Better integrating risks into territorial sectoral policies (Form 21)	Each collectivity has its own SECAP, with varying levels of progress. Future challenges: o Water resource issues o Problems related to tourism o Shortage of human and financial resources	1. Objective: Anticipate medium/long-term territorial transformations 2. Proposed measures: • Territorial prospective study?	Prevention	Technical measures, implementation proposal	local	SMBVA in coordination with municipalities and relevant sectoral authorities		Local authorities, planning departments, and communities	3				
C.1	Looking to the future	Future challenges: • Issues related to tourists and limited resources • Updating records • Shortage of human and financial resources? • Accessibility and suitability of the territory...	1. Objective: Anticipate medium/long-term changes in the region 2. Proposed measures: • Regional profile: 'Risk and tourism'? (cf. "Profils de territoire") • Regional prospective study?	Prevention	Data and Knowledge	provincial/ regional	TBD		Local authorities, planning bodies, and communities.	3				
C.2	Improve the coverage and updating of Municipal Safety Plans (PCS)	• Limited scenarios: The emergency plans currently in place are insufficient to deal with future events • Planning at municipal level: Some municipalities are highly exposed to risks but have very few tools at their disposal (Flumet, Crest-Voland, Cohennoz): they have Z-Indexation Plans (PIZ) but no Risk Prevention Plans (PPR). Not all municipalities have a Municipal Safety Plan (PCS) (4 or 6 out of 26 municipalities), but PCSs are becoming mandatory. PCSs are a useful tool, to be completed during a safety committee meeting, for example. However, there is a need to operationalise and test PCSs with crisis management exercises.	Preparation for crisis management: Plan assembly points in case evacuation is necessary and conduct drills to prepare.	Preparedness	Multiple	local	Municipalities, with support from SMBVA and relevant authorities							
C.3	Improving communication in emergency situations	Alert dissemination: Speed of alert dissemination via FR ALERT++ and social media Vulnerability: Communication systems are highly fragile (example of Storm Alex in the Alpes-Maritimes region)	1) Objective: Improve the reliability, speed and resilience of communication during emergency situations. 2) Proposed measures: •Designate a communication contact person for each sector or municipality to ensure coordinated information flow. •Establish clear communication protocols between authorities and emergency services. •Equip municipalities and key stakeholders with radio communication equipment to ensure continuity in case of network failure. •Develop backup communication strategies in the event of digital or telecommunications disruption	Response	Communication	local	Municipalities in coordination with SMBVA and emergency services							

TABLE 1: *Complete inventory of the Tailored Action Plan for the Arly Catchment pilot area.*

The table is visible
by zooming in

CONCLUSIONS AND NEXT STEPS

This document represents a living framework for improving risk management in the X-RISK-CC pilot area of the Arly Catchment in response to climate-related extreme events. The actions identified through participatory workshops with local stakeholders address critical gaps across all phases of the risk management cycle.

Key Outcomes:

- 23 tailored actions developed in collaboration with local stakeholders
- Systematic coding system enabling efficient tracking, monitoring and coordination
- Integration of scientific climate projections with local knowledge and practical experience

Implementation Approach

Some actions, annotated with the acronyms of various regulatory or contractual frameworks (e.g., PAPI, GIRN), reinforce the plans currently being negotiated with financial partners (e.g., ERDF Massif des Alpes) and will be implemented within these frameworks. Other actions will be pursued under different frameworks, under the responsibility of the Arly Watershed Joint Association itself or other local authorities and stakeholders.

ANNEX

In the following, each action presented in Table 1 is described individually.

Action A.1 – Improvement of the Watershed Alert System

GAP THE ACTION ADDRESSES

- **Capacity of the current warning system:** The watershed warning system is relatively effective for common events but lacks precision in mountainous areas. Department-level alerts from Météo-France are too general, particularly due to radar coverage gaps in the APIC service (Intense Rainfall Warning at the Municipal Level).
- **Ability to predict impacts:**
  - Align the various alert systems:
    - Flood Forecasting Service (SPC) predicts river peaks but not tributaries.
    - French Electrics (EDF) has strong monitoring on tributaries, but integration with other systems is limited.
  - Assign clear leadership: an Operational Command Post (Prefecture) at the valley level is needed, otherwise, emergency plans may be triggered too late.
  - Centralize information for municipalities by pooling available data on the basin (roads, EDF, SPC Arc/Isère, municipalities, ski lift services).

FRAME OF THE ACTION

- **Phases:** Preparedness (alert system capacity, decision-making tools) and Response (mobilising services during crisis); also the Preparedness-Response interphase.
- **Type of action:** Data and knowledge (watershed data) and Communication (warning system).
- **Level:** Local (municipalities and EPCI) and provincial ("département").
- **Ownership:** Prefect of Savoie.
- **Beneficiaries:** Elected officials, risk management services, emergency services.
- **Priority:** High (5).

DESCRIPTION OF THE ACTION

- **Objective:** Strengthen warning systems to shorten the warning chain and improve prediction of extreme events and their local impacts.
- **Proposed measures:**
  - Align existing warning systems (weather, floods, etc.).
  - Pool data (EDF, ski lift services).
  - Test public alert mechanisms (sirens, text messages), on the local level.
  - Provide localised alerts and contextual information for residents on a zone-by-zone basis.

POSITIVE OUTCOMES

- **Enhanced safety** – Faster, more accurate warnings help prevent injuries and save lives.
- **Reduced damage** – Early alerts allow better protection of property and infrastructure.

- **Efficient resource use** – Accurate forecasts optimize decision-making and reduce costs.
- **Improved coordination** – Strengthened links with existing platforms and resource partners.

POSSIBLE CRITICALITIES/ SIDE EFFECTS

- **False alarms** may cause panic or reduce trust.
- **Missed events** – some storms may develop too quickly to predict.
- **Data dependence** – the system relies on high-quality radar and sensor data.
- **Over-reliance on technology** – automated alerts may overshadow other preparedness measures.
- **Cost and maintenance** – advanced alert systems require ongoing investment.

VALIDATION/ INDICATORS – ANALYSIS

- **Human factors:** Consider changes in municipal elected teams and technical staff, ensure traceability.
- **Communication media:**
  - External: population alerts.
  - Internal: risk managers and technical services.

FEASIBILITY AND TIMELINE

- Requests and approvals to be coordinated with the prefecture.

Action A.2 – Intermunicipal Crisis Management Organisation

GAP THE ACTION ADDRESSES

- **Capacity for large-scale events:** The existing organisational structure is adequate for managing everyday events but may not cope with very large-scale events, particularly if communication with the disaster area breaks down. Mobilising specialised experts and responders (natural hazards, technological hazards, emergency works) is challenging, highlighting the need for inter-municipal coordination.
- **Redundancy and robustness**: Although theoretically redundant command structures are unnecessary, field actors can be overwhelmed by information while already managing the crisis.
- **Awareness**: Some actors are not familiar with local protocols, making training essential.
- **Adaptability of response**: The protocol's capacity to adapt to unexpected situations is uncertain and depends on resources available and the scale of the intervention. Repeated exposure to unforeseen events improves future responses.

FRAME OF THE ACTION

- **Phases**: Mainly Preparedness, but also Prevention and Response; includes Prevention-Preparedness and Preparedness-Response interphases.
- **Type of action**: Legislation (PICS - compulsory in France from November 2026), plus Knowledge/Data and Technical Measures.
- **Level**: Local (municipalities and EPCI) and departmental (strong link with Prefecture).
- **Ownership**: EPCI.
- **Beneficiaries**: Municipalities (Safety Commission) and inter-municipal cooperation bodies (proposal for an inter-municipal Safety Commission with qualified staff and elected sector representatives). The catchment may be more relevant than the EPCI perimeter in mountain areas for resource deployment (e.g., La Gieggaz → Praz, Megève, La Clusaz outside the Arlysère EPCI.
- **Priority**: High (4)

DESCRIPTION OF THE ACTION

- **Objective:** Organise multi-scale management of large-scale events.
- **Proposed measures:**
  - Develop an Inter-Municipal Safety Plan (PICS) covering the entire catchment.
  - Strengthen upstream-downstream communication management between municipalities.
  - Test PCS (Municipal Safety Plan) and PICS in simulated extreme events, focusing on the intervention chain to activate the ORSEC plan (Department Safety Plan).
  - Raise awareness: share the prefectural alert system with businesses and check their responsiveness and available equipment.
  - Governance: clarify roles and responsibilities of local authorities within the Territorial Coherence Scheme (ScoT), particularly for risk communication.
  - Ensure responsiveness of partner companies in case of announced incidents.
  - Mobilise resources: volunteers, technical equipment, shelters, etc.
  - Conduct regular exercises and role-playing scenarios.

- Provide training for all types of responders.
- Maintain an inventory of reception facilities (shelters) and other critical resources.

POSITIVE OUTCOMES

- Connection with municipal crisis management plans (PCS).
- Clear definition of stakeholder roles.
- Mapping of past events to inform planning,
- Increased public awareness and dissemination of response

POSSIBLE CRITICALITIES/ SIDE EFFECTS

- Need to formalise knowledge transfer for incoming officials.

VALIDATION/ INDICATORS – ANALYSIS

- Success depends on effective mobilisation of resources at the inter-municipal level.

FEASIBILITY AND TIMELINE

- Regulatory deadline: November 2026.
- Next steps:
  - Conduct local consultations.
  - Identify catchment areas and potential disruption risk (e.g., roads).
  - Inventory available resources.

Action A.3 – Adapting Financial and Insurance Instruments for Prevention and Compensation to Meet New Challenges

GAP THE ACTION ADDRESSES

- **Financing:** Current financial resources are not adapted to emerging needs. Mechanisms would be needed to assess and anticipate risks that are inherently unpredictable, in collaboration with insurance companies.
- **Insurability:** Financial challenges arising from reconstruction are increasingly difficult to insure.

FRAME THE ACTION

- **Phases:** Prevention and Preparedness.
- **Type of action:** Data and knowledge.
- **Level:** European, to ensure effectiveness.
- **Ownership:** Unclear at this stage.
- **Beneficiaries:** Private stakeholders.
- **Priority**: High (5)

DESCRIPTION OF THE ACTION

- **Objective:** Provide financial mechanisms that enable preventive maintenance rather than reactive remedial work.
- **Proposed measures:**
  - Identify local needs.
  - Organise stakeholder events (government, insurers, reinsurers, e.g., CCR, Groupama) to raise awareness, discuss tools and promote prevention.
  - Formulate recommendations for national and European levels
  - Explore financial participation mechanisms for individuals to support preventive measures.

POSITIVE OUTCOMES

- Supports prevention rather than reactive remediation.
- Promotes the development of a risk-aware culture among stakeholders.

VALIDATION/ INDICATORS – ANALYSIS

- This action cannot be implemented effectively on the local level (EPCI) and must be addressed on national or European levels.
- Ideally implemented as part of a broader climate adaptation project.

FEASIBILITY AND TIMELINE

- Requires investment from insurers and private sector actors.
- Dedicated funds may need to be established.

Action A.4 – Build Better to Prevent Better

GAP THE ACTION ADDRESSES

After the disaster in La Léchère in Tarentaise, where a torrent devasted the village centre, identical reconstructions were carried out quickly following the CatNat assessment. How can lessons be learned to ensure that the reconstruction phase contributes to prevention?

Challenges and opportunities:

- Ask the right questions before restoring order.
- Capitalise on and transmit knowledge.
- Report, map and analyse causes to identify corrective actions and organise collective knowledge.

FRAME THE ACTION

- **Phases**: Recovery-Prevention interphase; resilience focus.
- **Type of action**: Technical measures and legislation.
- **Level**: Local, regional level and national.
- **Ownership**: Municipalities, conurbations, departmental authorities.
- **Beneficiaries**: Municipalities (buildings) and Department (roads).
- **Priority**: Medium (2)

DESCRIPTION OF THE ACTION

- **Objective**: Better anticipate reconstruction and recovery after high-impact events.
- **Proposed measures:**
  - Consult former residents.
  - Provide mayors with more flexibility in decision-making.
  - Initiate local discussions and disseminate results widely.
  - Conduct training sessions for relevant stakeholders.

POSITIVE OUTCOMES

- Encourages reflection on risk issues and helps reduce the risk.
- Supports decision-making in land use and urban planning.
- Promotes financial coherence and relevance in reconstruction projects.

POSSIBLE CRITICALITIES/ SIDE EFFECTS

- Return periods of extreme events are often unknown and may exceed infrastructure lifespans.

VALIDATION/ INDICATORS – ANALYSIS

- The action is effective if reconstruction is less constrained by hazard contingencies, either structurally or through preventive measures.

FEASIBILITY AND TIMELINE

- No precise plan established.

Action A.5 – GIRN – Action 3.2: Improving Crisis Management by Local Authorities in the Watershed - Outsourced Training and Simulation Exercises

GAP THE ACTION ADDRESSES
Communities need better preparation for crisis management.

FRAME THE ACTION
- **Phases**: Preparedness-Response interphase.
- **Type of action**: Legislation (response to regulatory obligations).
- **Level**: Local.
- **Ownership**: SMBVA, with support from municipalities, EPCI and fire brigades (CSI).
- **Beneficiaries**: Municipalities, safety commissions and ski areas.
- **Priority**: High (4)

DESCRIPTION OF THE ACTION
- **Objective**: Develop and implement tools to improve crisis management in the 25 municipalities of the watershed.
- **Proposed measures**:
  - Conduct crisis management exercises across 23 sectors.
  - Provide training for elected officials and technical staff (12 sessions) to meet the needs of identified local authorities.

POSSIBLE CRITICALITIES/ SIDE EFFECTS
- The regulatory recommendation of one exercise every five years may not be sufficient to ensure preparedness.

VALIDATION/ INDICATORS – ANALYSIS
- Success depends on participation from all municipalities.
- The action aligns with existing regulatory obligations and serves as a prerequisite for inter-municipal crisis management coordination.

FEASIBILITY AND TIMELINE
- **Funding**: GIRN project, FEDER Massif des Alpes.
- **Schedule**:
  - AAPC (Public Call for Competition Notice): Second half of 2025.
  - Service provision: First half of 2026 - first half of 2028.
  - Acceptance: End of first half of 2028.

Action A.6 – GIRN – Action 2.1: Design and Implementation of a Flood Monitoring Platform - External Project Management Assistance

GAP THE ACTION ADDRESSES

- Improve anticipation and management of floods.
- Break down barriers to existing information and expertise by centralizing data across the territory to simplify crisis management.

FRAME THE ACTION

- **Phases**: Preparedness (platform design) and Preparedness-Response interphase (implementation).
- **Type of action**: Data and knowledge (design and implementation), technical measure (usage).
- **Level**: Local.
- **Ownership**: SMBVA.
- **Beneficiaries**: Authorities responsible for managing the event: the union responsible for flood prevention, 25 municipalities, 4 EPCI, and relevant government departments.
- **Priority**: Medium (2)

DESCRIPTION OF THE ACTION

- **Objective**: Develop an innovative flood management platform to collect hydrometeorological and field data, facilitating decision-making during crisis and post-flood management.
- **Proposed measures**:
  - Enable the SMBVA team to monitor events more effectively (flood and ebb phase).
  - Organise field interventions by centralising observations.
  - In a second phase, consider sharing the platform with municipalities and EPCIs in the catchment area.

POSITIVE OUTCOMES

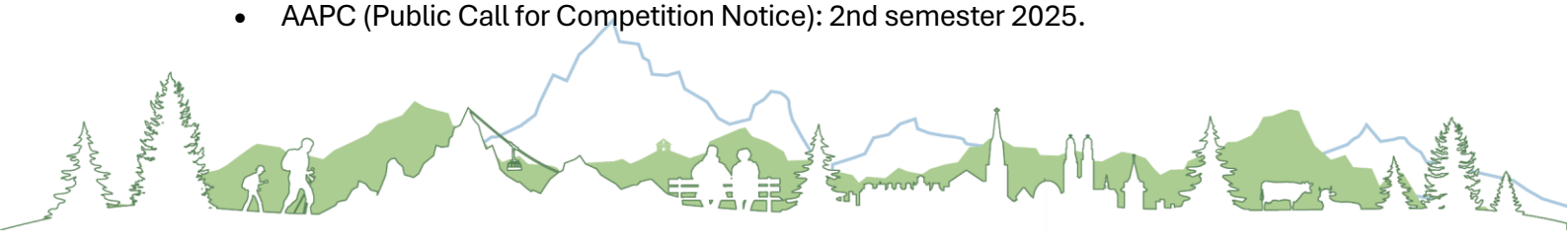
- Streamlined crisis management and more efficient field operations.

VALIDATION/ INDICATORS – ANALYSIS

- Success will be achieved if:
  - The platform is online and actively used by the SMBVA team.
  - The platform is shared with all 25 municipalities and 4 EPCIs in the catchment area.
  - Enables faster data collection, analysis and resource allocation during flood events.

FEASIBILITY AND TIMELINE

- **Funding**: GIRN project, FEDER Massif des Alpes.
- **Timeline**:
  - AAPC (Public Call for Competition Notice): 2nd semester 2025.



- Assistance service: beginning of 2026 - end of 2027.
- Acceptance: beginning of 2028.

Action A.7 – Adapt Forest Management to Preserve its Protective Function

GAP THE ACTION ADDRESSES
Forest vulnerability to climate-related hazards (drought, heatwaves, storms, fires, pests).

FRAME THE ACTION
- **Phase**: Prevention (new structural prevention measures for the future).
- **Type of action**: Implementation.
- **Level**: Local.
- **Beneficiaries**: Municipalities and private stakeholders (forest owners).
- **Priority level**: Highest (5)

DESCRIPTION OF THE ACTION
- **Objective**: Improve consideration and management of the multifunctional role of forests, including their protective function.
- **Proposed measures**:
  - Conduct a study on the protective role and vulnerability of forest stands in the Arly Catchment (see INRAE's AGIRA project).
  - Develop a resource inventory (e.g., Mountain Forestry Guide).

POSITIVE OUTCOMES
- Reduced risk of rockfalls and ground instability.
- Strengthened long-term protective capacity of forests.

VALIDATION/ INDICATORS – ANALYSIS
Success will be achieved if:
- the issue is recognized as a public policy priority.
- the protective role of forests is fully integrated into forest management objectives.

FEASIBILITY AND TIMELINE
- Funding sources: Municipal budgets; FEDER Massif des Alpes (AGIRA project), subject to the launch of a new call for projects in 2026.
- Action included in the 2025-2030 PAPI.

Action A.8 – Improving Risk and Safety Awareness among the Population

GAP THE ACTION ADDRESSES

- Insufficient information sharing and limited risk awareness among the population, including a lack of understanding of appropriate behaviour in the event of a preventive evacuation.
- Limited preparedness due to insufficient testing of emergency plans, resulting in low confidence in risk management during major incidents.

FRAME THE ACTION

- **Phases**: Preparedness (improving the effectiveness of short-term preparedness measures); Prevention-Preparedness interphase.
- **Type of action**: Communication and awareness raising.
- **Level**: Local.
- **Ownership**: Municipalities, Département and SMBVA.
- **Beneficiaries**: General population.
- **Priority level**: High (4)

DESCRIPTION OF THE ACTION

- **Objective:** Strengthen public awareness and preparedness for crisis situations, improve response capacity and enhance risk prevention planning.
- **Proposed measures:**
  - Strengthen risk awareness ("risk culture") initiatives targeting different groups (schools, businesses, local authorities) to promote appropriate behaviour.
  - Organise regular simulation exercises to test emergency plans, including multi-stakeholder exercises (e.g., preventive evacuation of campsites).

POSITIVE OUTCOMES

- Increased risk awareness across all target groups.
- Improved vigilance and appropriate behavioural responses during emergencies.

POSSIBLE CRITICALITIES/ SIDE EFFECTS

- Difficulty in mobilising and sustaining stakeholder engagement.
- Uncertain level of participation from the population.

VALIDATION/ INDICATORS – ANALYSIS

Success will be achieved if the population:

- understands alert procedures.
- adopts appropriate behaviour during emergency situations.

FEASIBILITY AND TIMELINE

Potential funding through SMBVA under the Arly PAPI, particularly for flood-related risk awareness actions.

Action A.9 – Better Anticipating the Impacts of Extreme Events

GAP THE ACTION ADDRESSES

How can actions taken during the response phase facilitate and simplify the recovery phase?

FRAME THE ACTION

- **Phase**: Recovery (key elements to be integrated into future recovery planning); Response-Recovery interphase.
- **Type of action**: Data and knowledge.
- **Priority level**: Medium (3)

DESCRIPTION OF THE ACTION

- **Objective**: Develop the knowledge and tools needed to anticipate, rather than react to, the impacts of extreme events, through proportionate, structured and targeted response strategies:
  - Prioritising the protection of human life, thereby allowing the recovery phase to focus primarily on material and infrastructure damage.
  - Identifying controlled “sacrifice” or buffer areas to protect critical zones and reduce overall damage.
- **Proposed measures**:
  - Develop risk scenarios.
  - Characterise potentially catastrophic events.
  - Identify critical and sensitive points, including monitoring locations (e.g. initial overflow points).
  - Strengthen infrastructure maintenance.
  - Assess and, where necessary, improve the structural resistance of bridges.
  - Define temporary storage areas, flood expansion zones and, where appropriate, areas or structures that could be intentionally sacrificed to protect higher-value assets.
  - Install sensors and water-level gauges on selected structures to improve monitoring and reduce the need for risky field interventions.

POSITIVE OUTCOMES

- Faster and more effective response, reducing overall disaster impacts.
- Targeted interventions at predefined critical locations.
- Improved conditions for a quicker and more efficient recovery phase.

Action B.1 – GIRN – Action 2.2: Acquisition of Video and Photo Monitoring Equipment

GAP THE ACTION ADDRESSES

Need to improve flood anticipation and operational management through enhanced real-time monitoring.

FRAME THE ACTION

- **Phases**: Preparedness (platform design) and Response; Preparedness-Response interphase (implementation).
- **Type of action**: Data and knowledge.
- **Level**: Local.
- **Ownership**: SMBVA.
- **Beneficiaries**: The equipment will be shared among the authorities responsible for flood management, including the flood prevention syndicate, 25 municipalities, 4 EPCIs, and relevant government departments, in coordination with the digital platform.
- **Priority level**: Low (1)

DESCRIPTION OF THE ACTION

Acquisition and installation of additional monitoring equipment (cameras or webcams) at three river monitoring sites, with integration into the digital platform to enable real-time observation and data sharing.

FEASIBILITY AND TIMELINE

- **Funding:** Application submitted under the GIRN project to the FEDER Massif des Alpes programme.
- **Timeline:**
  - AAPC (Public Call for Competition Notice): 1st semester 2027.
  - Procurement and assistance services: 2nd semester 2027.
  - Delivery and installation of equipment: End of 2027.

Action B.2 – GIRN – Action 3.1: Strengthening Crisis Management by Local Authorities through the Development and Updating of Crisis Management and Risk Information Documents

GAP THE ACTION ADDRESSES

Need for operational and up-to-date documents to support effective crisis management at the municipal level.

FRAME THE ACTION

- **Phases**: Prevention-Preparedness interphase.
- **Type of action**: Governance, planning and operational support.
- **Level**: Local.
- **Ownership**: SMBVA.
- **Beneficiaries**: Elected officials and technical services of local authorities (municipalities and inter-municipal bodies).
- **Priority level**: Low (1)

DESCRIPTION OF THE ACTION

- **Objective:** Develop and implement the tools necessary to strengthen crisis management capacity in the 25 municipalities within the catchment area.
- **Proposed measures**:
  - Risk information documents for 15 priority areas.
  - Multi-risk organisation plans for the same 15 areas.
  - Crisis management support mapping for the entire watershed, covering all 25 municipalities.

FEASIBILITY AND TIMELINE

- **Funding:** Application submitted under the GIRN project to the FEDER Massif des Alpes programme.
- **Timeline:**
  - AAPC (Public Call for Competition Notice): 1rst semester 2025.
  - Procurement and assistance service: 2nd semester 2026 to mid-2028.
  - Delivery and validation of outputs: End of the 1st semester 2028.

Action B.3 – Graduated Action Plan

GAP THE ACTION ADDRESSES

- **Preparedness levels:** The high number of alerts (e.g., frequent orange-level warnings) reduces their operational effectiveness. A more graduated response system is needed to better align operational measures with the actual level of risk (e.g., the TAGIRN graduated action plan developed by Grenoble-Alpes-Métropole). The key challenge is the ability to detect the transition towards a potentially catastrophic event.
- **Adaptation to large-scale events:** Existing tools and resources are generally suited to localised events, but are less adapted to large-scale or systemic events. There is limited operational experience and response culture for such events in France.

FRAME THE ACTION

- **Phases**: Preparedness (improving the effectiveness of short-term preparedness measures); Response (crisis management - improving organisational flexibility and adapting operational protocols).
- **Type of action**: Data and knowledge (design and implementation); operational/technical measure (application).
- **Level**: Local.
- **Ownership**: SMBVA.
- **Priority level**: Low (1)

DESCRIPTION OF THE ACTION

- **Objective:** Define operational thresholds and procedures to refine alert levels and better identify and manage the transition to a disaster-scale situation.
- **Proposed measures:**
  - Develop and implement a graduated action framework linking risk levels to predefined operational measures.
  - Strengthen training and exercises focused on extreme scenarios, including decision-making on the activation or non-activation of the ORSEC plan (Departmental Emergency Response Plan).

Action B.4 – GIRN – Action 4: Developing a Risk Culture - Video on integrated Risk Management in the Arly River Basin

GAP THE ACTION ADDRESSES

Need to maintain and strengthen a culture of risk awareness and resilience among the population.

FRAME THE ACTION

- **Phase**: Prevention.
- **Type of action**: Communication.
- **Level**: Local.
- **Ownership**: SMBVA.
- **Beneficiaries**: General public.
- **Priority level**: Low (1)

DESCRIPTION OF THE ACTION

- **Objective:** implement information and awareness-raising activities to promote a stronger culture of risk awareness among the general public in the Arly Catchment.
- **Proposed measures:**
  - Producing a 5-minute video addressing past flood events and their impacts and the cumulative or cascading nature of certain hazards (e.g., floods and landslides).
  - Visual simulations (photomontages) of exposed areas to help residents better understand and visualise risk scenarios.

  The visualizations will support integrated risk management by illustrating the interconnected nature of hazards within the basin.

FEASIBILITY AND TIMELINE

- **Funding:** Application submitted under the GIRN project to the FEDER Massif des Alpes programme.
- **Timeline:**
  - AAPC (Public Call for Competition Notice): 1st semester 2026.
  - Procurement and production phase: 2nd semester 2027.
  - Delivery and dissemination: End of 2027.

Action B.5 – PAPI – Creation of River Meandering Areas

GAP THE ACTION ADDRESSES

In the context of increasing frequency and intensity of flood events, existing risk management measures are reaching their limits. Structural solutions need to be strengthened and adopted to avoid repeated emergency or remedial interventions in vulnerable sectors.

FRAME THE ACTION

- **Phase**: Prevention (improving the effectiveness of structural prevention measures).
- **Type of action**: Technical/structural measure.
- **Level**: Local.
- **Ownership**: SMBVA.

DESCRIPTION OF THE ACTION

Restore or create river meandering areas and increase the river's functional space in order to slow down flow velocities, enhance natural flood retention capacity, reduce downstream flood peaks and improve the overall resilience of the river system.
The measure will be implemented as part of the structural flood prevention works planned under the 2027-2032 PAPI.

FEASIBILITY AND TIMELINE

- **Funding:** PAPI 2027-2032.
- **Preparatory work:** Ongoing studies on the Flood Zone Atlas and on the river's functional space within the framework of the PAPI programme.

Action B6 – PAPI – Local Measures to Reduce Vulnerability in Inhabited Areas and high-exposure sites (sediment management, dredging, bridge capacity checks, driftwood management)

GAP THE ACTION ADDRESSES

In the context of increasing frequency and intensity of flood events, existing risk management measures are reaching their limits. Targeted local interventions are required to strengthen protection and reduce vulnerability in high-risk sectors, in order to avoid repeated emergency or remedial actions.

FRAME THE ACTION

- **Phase**: Prevention (improving the effectiveness of structural prevention measures).
- **Type of action**: Technical/structural measure.
- **Level**: Local.
- **Ownership**: SMBVA.
- **Funding**: PAPI 2027-2032.

DESCRIPTION OF THE ACTION

- **Objective:** implement targeted local measures to reduce flood vulnerability in inhabited areas and other high-exposure locations (e.g. areas with significant economic or tourist activity).
- **Proposed measures:**
  - Sediment management and local dredging where necessary to maintain flow capacity,
  - Structural and hydraulic capacity checks of bridges and crossing structures,
  - Driftwood and debris management to prevent blockages and overflow,
  - Localised works to improve hydraulic performance and reduce flood impacts.

  These measures will contribute to strengthening the effectiveness and reliability of structural flood risk prevention under the 2027-2032 PAPI.

FEASIBILITY AND TIMELINE

- Implementation planned within the framework of the PAPI 2027-2032 programme.

Action B.7 – Update of Hazard Maps for the Entire Arly Basin

GAP THE ACTION ADDRESSES

Risk Prevention Plans (PPRs) are currently developed at the municipal level, resulting in heterogeneous data and methodologies across the basin. There is no harmonised inter-municipal or basin-wide mapping, and multi-risk maps are not available.

FRAME THE ACTION

- **Phase**: Prevention.
- **Type of action**: Data and knowledge (mapping and planning support).
- **Level**: Basin-wide (inter-municipal).
- **Ownership**: To be defined (SMBVA in coordination with relevant authorities)

DESCRIPTION OF THE ACTION

- **Objective:** Update, harmonize and standardise hazard maps across the entire Arly Catchment to ensure a consistent and integrated risk assessment framework.
- **Proposed measures:**
  - Develop a comprehensive basin-wide overview, including non-urbanised and less-documented areas (e.g., landslide-prone areas such as the Arly gorges, where detailed mapping is currently lacking).
  - Promote the development of multi-risk maps integrating different hazards (e.g., floods, landslides, erosion).
  - Ensure that mapping products are regularly updated, particularly following significant events or the availability of new data.

Action B.8 – Development of a Multi-Risk Approach Integrating Natural and Technological Risks

GAP THE ACTION ADDRESSES

The basin faces both natural hazards (floods, landslides, etc.) and technological risks, including potential dam failures (in collaboration with EDF- French Electricity) and industrial hazards (e.g., Ugitech). Current risk management largely treats these hazards separately, lacking an integrated multi-risk framework.

FRAME THE ACTION

- **Phase**: Prevention.
- **Type of action**: Data, knowledge and planning support (multi-risk integration).
- **Level**: Local and basin-wide.
- **Ownership**: SMBVA in coordination with relevant industrial and public stakeholders.
- **Beneficiaries**: Local authorities, emergency services and communities exposed to natural and technological hazards

DESCRIPTION OF THE ACTION

- **Objective:** Develop an integrated multi-risk approach that accounts for both natural and technological hazards to improve risk assessment, preparedness and crisis management.
- **Proposed measures:**
  - Mapping of combined natural and technological hazard zones.
  - Assessment of cascading risks (e.g. flood causing dam stress or industrial incidents).
  - Integration of multi-risk scenarios into existing emergency plans and municipal PPRs.
  - Coordination protocols with industrial operators and emergency services for NATECH risk management.

POSITIVE OUTCOMES

- Improved understanding of interdependent hazards.
- Enhanced preparedness and operational response to complex, multi-hazard events.
- Strengthened cooperation between public authorities and industrial operators.

Action B.9 – Limiting Urban Sprawl and Restoring Spaces to Nature

GAP THE ACTION ADDRESSES

To reduce hazards, vulnerabilities and exposure in the context of increasing flood and other natural risks, future urban development must avoid exacerbating risk in sensitive areas. Restoration of natural spaces can contribute to hazard mitigation and ecosystem resilience.

FRAME THE ACTION

- **Phase**: Prevention.
- **Type of action**: Technical and planning measures.
- **Level**: Local.
- **Ownership**: Municipal authorities in coordination with SMBVA.
- **Beneficiaries**: Local communities, future residents, and the environment.
- **Priority level**: Medium (3).

DESCRIPTION OF THE ACTION

- **Objective:** Limit urban sprawl in high-risk areas and restore natural floodplain functions to reduce exposure and vulnerability.
- **Proposed measures:**
  - Strictly prohibit new constructions in zones classified as high or very high risk (flood zones, landslide-prone areas, etc.) as part of urban planning regulations.
  - Restore or maintain natural spaces, such as floodplains and riparian zones, to improve water retention, reduce flood peaks, and enhance ecological functions.
  - Integrate these measures into municipal planning documents and PPRs to ensure long-term compliance and resilience.

POSITIVE OUTCOMES

- Reduced risk to life and property from floods and other natural hazards.
- Increased natural retention capacity and ecological quality of the basin.
- Improved long-term sustainability of urban development.

Action B.10 – Improve feedback on events

GAP THE ACTION ADDRESSES

- **Learning from past events is currently limited:** information gathered during debriefings and from documentation of past events is insufficiently shared.
- **Long-term reflection is needed:** revisiting actions taken in past years strengthens both individual and collective risk management culture and preparedness.

FRAME THE ACTION

- **Phases**: Recovery (optimising the usefulness of reports and documentation from past emergencies); Recovery-Prevention interphase.
- **Type of action**: Knowledge management and operational improvement.
- **Level**: Local and basin-wide.
- **Ownership**: SMBVA in coordination with municipal authorities and emergency services.
- **Beneficiaries**: Local authorities, emergency services, and communities.
- **Priority level**: Medium (3).

DESCRIPTION OF THE ACTION

- **Objective:** Optimise the collection, analysis and dissemination of information on past events to improve preparedness and inform future interventions.
- **Proposed measures:**
  - Appoint observers to systematically capitalise on events and transmit lessons learned to relevant stakeholders.
  - Document and analyse flood-related phenomena, including sediment deposits, log jams, dredging and clean-up operations, to support the collective memory of the watershed.
  - Map causes and effects of past events to identify corrective actions and inform future risk management strategies.

POSITIVE OUTCOMES

- Enhanced learning from past events, leading to more effective preparedness and response.
- Improved institutional memory and operational coordination.
- Reduced recurrence of avoidable errors in flood and emergency management.

Action B.11 – Better Predicting Landslides

GAP THE ACTION ADDRESSES

There is a risk of large-scale landslides and significant sediment deposits into watercourses within the catchment area, particularly in the Arly Gorges (see MIROIR project). These phenomena may have major impacts on river dynamics, infrastructure and flood risk.

FRAME THE ACTION

- **Phase**: Prevention.
- **Type of action**: Data and knowledge; monitoring and early warning.
- **Level**: Basin-wide (priority areas).
- **Ownership**: SMBVA in coordination with relevant technical and scientific partners.
- **Beneficiaries**: Local authorities, infrastructure managers, and downstream communities.
- **Priority level**: Medium (3).

DESCRIPTION OF THE ACTION

- **Objective**: Improve the anticipation of landslides and their impacts on sediment transport and watercourse dynamics.
- **Proposed measures**:
  - Implement monitoring, detection and early warning systems in high-risk areas.
  - Install appropriate instrumentation (e.g., sensors, gauges, or observation systems) to detect ground movements and sediment mobilisation.
  - Integrate monitoring data into risk management and early warning procedures.

POSITIVE OUTCOMES

- Earlier detection of potentially critical slope movements.
- Improved preparedness and risk management for sediment-related hazards.
- Reduced impacts on infrastructure and downstream flood risk.

Action B.12 – Better Integrating Risks Into Territorial Sectoral Policies

GAP THE ACTION ADDRESSES

Each local authority has its own SECAP (Sustainable Energy and Climate Action Plan), but progress and integration of risk considerations vary widely. Future challenges for territorial planning include:

- Water resource management and protection.
- Risks and impacts related to tourism development.
- Limited human and financial resources for integrated risk management.

FRAME THE ACTION

- **Phase:** Prevention / Long-term planning.
- **Type of action:** Policy integration and planning support.
- **Level:** Local and inter-municipal.
- **Ownership:** SMBVA in coordination with municipalities and relevant sectoral authorities.
- **Beneficiaries:** Local authorities, planning departments, and communities.
- **Priority level:** Medium (3).

DESCRIPTION OF THE ACTION

- **Objective:** Integrate risk considerations systematically into territorial and sectoral policies to anticipate medium- and long-term territorial transformations and ensure resilient development.
- **Proposed measures:**
  - Conduct a territorial prospective study to identify potential future changes and their interaction with natural and technological risks.
  - Develop recommendations for integrating risk management into SECAPs and sectoral policies (e.g., tourism, water management, urban planning).
  - Support inter-municipal coordination to harmonise risk integration across the basin.

Action C.1 – Looking to the future

GAP THE ACTION ADDRESSES

The territory faces several long-term challenges that are not yet sufficiently anticipated, including:

- Increasing pressure related to tourism and limited local resources.
- The need to regularly update territorial data and risk information.
- Limited human and financial resources for long-term planning and risk management.
- Issues related to accessibility and suitability of the territory in the context of evolving risks and climate change.

FRAME THE ACTION

- **Phase:** Prevention.
- **Type of action:** Knowledge, foresight, and strategic planning.
- **Level:** Territorial (basin or inter-municipal).
- **Ownership:** To be defined (SMBVA in coordination with local authorities).
- **Beneficiaries:** Local authorities, planning bodies, and communities.
- **Priority level:** Medium (3).

DESCRIPTION OF THE ACTION

- **Objective:** Anticipate medium- and long-term regional changes in order to support resilient development and informed decision-making.
- **Proposed measures:**
  - Develop a regional profile focusing on the interactions between risks, climate change and tourism (building on existing approaches, e.g.,"Profils de territoire").
  - Conduct a prospective regional study to identify future trends, vulnerabilities and adaptation needs.
  - Provide strategic recommendations to support planning, resource allocation and risk management policies.

POSITIVE OUTCOMES

- Improved anticipation of future risks and pressures.
- Better-informed strategic and planning decisions.
- Strengthened long-term territorial resilience.

Action C.2 – Improve the Coverage and Updating of Municipal Safety Plans (PCS)

GAP THE ACTION ADDRESSES

- **Limited scenarios:** Existing emergency plans are not sufficiently adapted to future or more extreme events.
- **Uneven planning at the municipal level:** Some municipalities are highly exposed to risks but have limited risk management tools (e.g., Flumet, Crest-Voland, Cohennoz). While Zoning Plans for Natural Hazards (PIZ) are available, Risk Prevention Plans (PPR) are not always in place.
- **Incomplete coverage:** Not all municipalities currently have a Municipal Safety Plan (PCS), although these plans are becoming mandatory.
- **Operational limitations:** Existing PCSs are not always sufficiently operational and need to be regularly updated, coordinated and tested through crisis management exercises.

FRAME THE ACTION

- **Phases**: Preparedness (improving the adequacy of civil protection plans) and Prevention-Preparedness interphase.
- **Type of action**: Governance, planning, and operational preparedness.
- **Level**: Municipal.
- **Ownership**: Municipalities, with support from SMBVA and relevant authorities.

DESCRIPTION OF THE ACTION

- **Objective:** Strengthen municipal crisis preparedness
- **Proposed measures:**
  - Ensure full PCS coverage across all municipalities and supporting their regular updating.
  - Expand scenarios to include extreme and future risk conditions.
  - Identify and plan evacuation assembly and operational procedures.
  - Organise regular training and simulation exercises to test and operationalise PCSs.
  - Strengthen coordination through local safety or civil protection committees.

Action C.3 – Improving Communication in Emergency Situations

GAP THE ACTION ADDRESSES

- **Alert dissemination:** The speed and reliability of alert dissemination (e.g., via FR-ALERT) and social media need to be improved to ensure timely information reaches the population.
- **System vulnerability:** Communication systems can be highly fragile during extreme events, highlighting the need for more resilient and redundant communication channels.

FRAME THE ACTION

- **Phase**: Response (improve communication during the emergency situations).
- **Type of action**: Operational preparedness and communication resilience.
- **Level**: Local and inter-municipal.
- **Ownership**: Municipalities in coordination with SMBVA and emergency services.

DESCRIPTION OF THE ACTION

- **Objective**: Improve the reliability, speed and resilience of communication during emergency situations.
- **Proposed measures**:
  - Designate a communication contact person for each sector or municipality to ensure coordinated information flow.
  - Establish clear communication protocols between authorities and emergency services.
  - Equip municipalities and key stakeholders with radio communication equipment to ensure continuity in case of network failure.
  - Develop backup communication strategies in the event of digital or telecommunications disruption

POSITIVE OUTCOMES

- Faster and more reliable dissemination of alerts.
- Improved coordination between authorities during crises.
- Greater resilience of communication systems during extreme events.

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