

Report of the progress on FRMP updating in Italy

Final Version of March/2023

Deliverable Number 3.3.2.



Project Acronym STREAM
Project ID Number 10249186

Project Title Strategic Development of Flood Management

Priority Axis 2 - Safety and Resilience

Specific objective 2.2 - Increase the safety of the Programme

area from natural and man-made disaster

Work Package Number 3

Work Package Title Creating Flood Knowledge Documents

Activity Number 3.3.

Activity Title Flood Risk Management Plan

Partner in Charge University of Zadar

Partners involved LP, PP1, PP3, PP5, PP6, PP7, PP8, PP9, PP10,

PP11, PP13, PP14, PP15

StatusFinalDistributionPublic



Contents

Intro	ducti	on	4
Repo	ort of	the progress on FRMP updating in Italy	5
1.	Pre	vention measures (M2)	9
	1.1.	Regional scale	9
	1.2.	Venice watershed and lagoon	15
2.	Pro	tection measures (M3)	16
	2.1.	Regional scale	16
	2.2.	Venice watershed and lagoon	18
3.	Pre	paredness measures (M4)	25
	3.1.	Regional scale	26
	3.2.	Venice watershed and lagoon	49
4.	Rec	overy measures (M5)	51
	4.1.	Regional scale	51
5.	Ref	erences	55
•		the progress of a Flood Risk Management and Climate Change Adaptation Municipal xperience in Italy	.56
	Strate	egic Vision and Pillars	58
	Targe	ted Hazards and Risks	60
	Meas	ures: table of contents and reordering matrix	63
1.	Pre	vention (M2)	68
	1.1.	Removal or relocation	68
1.3	1.1.	[M22_a New urban development projects]	68
	1.2.	Reduction (M23)	73
1.2	2.1.	[M23_a Reducing hazards' impacts and effects on exposed elements]	73
1.2	2.2.	[M23_b Business and service continuity]	80
1.2	2.3.	[M23_c NBS reducing adverse consequences, urban + rural]	82
	1.3.	Other prevention (M24)	84
	3.1. Ifores	[M24_a DR assessment and mapping update: evaluating exposed elements, new or een hazards]	84
1.3	3.2.	[M24_b Disaster and climate data collection, analysis, update, and sharing]	92
1.3	3.3.	[M24_b Monitoring sustainability and mainstreaming climate risk]	97
2.	Pro	tection1	.03



2.1.1.	[M31_a Blue and green infrastructures for rainwater harvesting]	103
2.1.2.	[M31_b Environmental restoration of the lagoon and coasts]	111
2.2.	Water flow regulation (M32)	114
2.4.	Surface Water Management (M34)	120
2.4.1.	[M34 SUDS and surface water drainage]	120
3. Pre	eparedness (M4)	124
3.1.	Flood Forecasting and Warning (M41)	124
i. [M	41 Sensors, forecasting, EWS]	124
3.2.	Emergency Event Response Planning / Contingency planning (M42)	132
3.3.	Public Awarness and Preparedness (M43)	136
3.4.	Other preparedness (M44)	141
4. Re	covery (M5)	142
4.1.	Environmental recovery (M52)	142
5. Re	ferences	142
Conclusio	n	143



INTRODUCTION

This report provides an overview of the progress made in updating the Flood Risk Management Plan in Italy. As a country prone to various types of flooding, it is crucial to continually enhance and refine strategies for mitigating the impacts of floods. This report aims to outline the key advancements and initiatives undertaken to strengthen Italy's Flood Risk Management Plan, ensuring a more resilient and adaptive approach to flood risk. Additionally, the report emphasizes the importance of stakeholder engagement and participatory processes in the updating of the Flood Risk Management Plan. Recognizing the diverse interests and responsibilities of various actors, including government agencies, private sector entities, and local communities, the plan aims to foster collaboration and shared ownership in the management of flood risks.



REPORT OF THE PROGRESS ON FRMP UPDATING IN ITALY

The reporting of Flood Risk Management Plan (FRMP) updating for Italy covers the Eastern Alps District Basin Authority (*Distretto Idrografico Alpi Orientali*) experience and presents the measures planned for the 2016-2021 and 2022-2027 periods in application of the 2007 European Flood Directive (2007/60/EC).

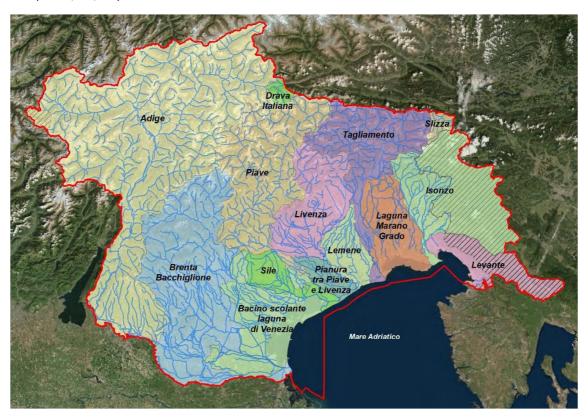


Figure 1. The Eastern Alps District structure in Units of Management (Source Aggiornamento e revisione del Piano di Gestione del Rischio di Alluvioni - Relazione Generale, Autorità di bacino distrettuale delle Alpi Orientali 2021)

The Eastern Alps District Basin Authority is one of the 5 River Basin Districts committed to the application of the Flood Directive in Italy, and is structured in 9 Units of Management corresponding to the different river basins flowing into the Adriatic Sea.

The analysis considered the plan documents and annexes publicly available (https://sigma.distrettoalpiorientali.it/portal/index.php/direttiva-alluvioni/) for both phases and selected those concerning the Venice Lagoon, i.e., those included in the Veneto Region Unity of Management (UoM) that affect the basins draining into the lagoon and the lagoon area itself. This Unity of Management covers interventions at the regional and at the local scale, accordingly this report presents both planning levels separately.

The focus on a local scale Unity of Management almost correspondent to the City of Venice metropolitan area ease a comparison with the Flood Risk Management planning efforts performed



by Croatian Pilot Cities of the Interreg Stream Project, and with other Flood Risk Management and Climate Change Adaptation experiences ongoing in Venice Municipality.

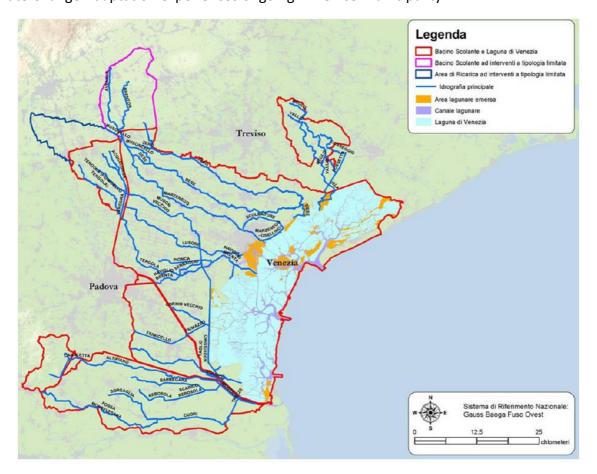


Figure 2. River basins draining into Venice Lagoon: main hydrographic network (Source Bacino Idrografico Scolante nella Laguna di Venezia - Piano stralcio per l'Assetto Idrogeologico (PAI) – RELAZIONE – Regione del Veneto, 2015).



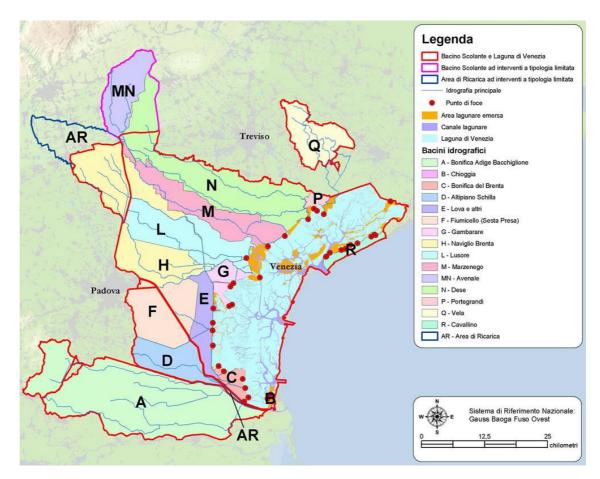


Figure 3. River basins draining into Venice Lagoon: areas of pertainance and inlets (Source: https://www.arpa.veneto.it/temi-ambientali/acqua/acque-interne/bacino-scolante-1)

The key sources of the data collection have been:

- the 2022-2027 FRMP update general document which details measures at the district level;
- the 2022-2027 FRMP update annex III, which resumes the progress of implementation of the previous phase and presents the new proposed interventions;
- the 2016-2021 FRMP annex IV, which present an overview table of all the information foreseen for the plan.

Relevant measures where assembled in a resuming matrix, based on the table already available for the 2016-2021 plan (Annex IV), confronting old to new versions, costs and progresses of implementation, and adding the new planned measures missing. Planned interventions are grouped and presented here according to the Flood Directive's flood risk management measures class and typology, both at Regional and at the local level.

Each measure of the Flood Risk Management Plan is presented within a form (see the table sample below) briefly reporting the following information:

- Measure brief description;
- Measure location;



- Targeted hazard, i.e., heavy rainfalls (R), floods (F), high tides (T), and coastal storm surges (S);
- Expected contribution to flood risk management and climate change adaptation;
 - Understanding and assessing DR,
 - Forecasting and assessing hazards,
 - Reducing DR impacts,
 - Hazard mitigation and dispersion,
 - Protecting exposed elements,
 - DR-informed governance,
 - Awareness and preparedness,
 - Emergency procedures;
- Progress of implementation reported in the 2022-2027 Plan;
- Costs and financial coverage;
- Responsible body;
- Implementation timeframes;

These components are highlighted and reported solely based on measures' descriptions and on the information provided in the plan's tables.



		Т	argeted	d Hazar	d			
Severe rainfalls (R)	Floods (F) High tid		High tides (T)		Coastal storm surges (S)			
	С	ontrib	ution to	FRM a	nd CC	Α	•	
Understanding and assessing DI		ecasting ssing ha	_		Reducing DR impacts		Hazard mitigation and dispersion	
Protecting exposed elemen		R inforn			reness a	ess and edness		Emergency procedures
	ı	Progre	ss of im	plemer	ntation	1		
Proposed	Not Star	ted		_		n Going Onstruction		Completed
Implementation timeframes			Co	st		Resp	oon	sible bodies
2016 – 2021 2022 – 2027								

The FRMP measures for the river basins draining into Venice Lagoon are presented in this deliverable following the four phases of the flood risk management cycle, prevention – protection – preparedness – recovery, covering the two planning phases, 2016-2021, 2022-2027, and the regional and local levels of intervention.

1. Prevention measures (M2)

The planned prevention measures have been 6 at the regional scale for a total of 145 thousand euros, 1 at the Venice watershed and lagoon scale for 600 thousand euros for the first period (2016-2021), with 2 additional measures that will continue in the second phase of the plan (2022-2027) for 120thousand euros.

1.1. Regional scale



Measure class and typology	Measure Name	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
M21_1 – Update of the hydrological system plan (PAI)	Aggiornamento delle norme del PAI o strumenti equivalenti (PGUAP o strumenti derivati) e recepimento negli strumenti urbanistici di pianificazione e gestione del territorio per tener conto dei nuovi scenari di rischio idraulico	1		20.000	R - F
M22_1 – Settlements relocations initiatives	Promuovere iniziative di programmazione e attuazione per la delocalizzazione degli insediamenti dalle aree maggiormente esposte a rischio di esondazione	1		0	R - F
M23_1 – Buildings' vulnerability reduction manual	Predisposizione di un manuale su come operare per ridurre la vulnerabilità degli edifici o gruppi di edifici in aree allagabili e di ristagno idrico	1		3.000	R - F
M24_1 – Rivers embankments' monitoring systems	Primo sviluppo di sistemi di monitoraggio - a basso costo - dei corpi arginali e delle opere di difesa idraulica definendo degli standard minimi di riferimento	1		100.000	R - F
M24_2 – Mapping update and upgrade of exposed cultural and landscape heritage elements	Progressivo aggiornamento delle mappe di rischio in relazione ai dati disponibili dei beni culturali, sia di proprietà pubblica, sia di proprietà privata, e ai beni paesaggistici	1	1	30.000	R - F - T
M24_3 – Mapping update of territories' topography	Programmare (phase Ia-A) ed effettuare (phase Ia-B) l'aggiornamento sistematico della topografia del territorio con particolare riferimento alla rete idrografica principale	1		12.500	R - F
M24_4 – Mapping update of the hydraulic interventions' catalogue	Definizione di un protocollo per lo sviluppo e l'aggiornamento del catalogo georeferenziato delle opere idrauliche a scala regionale / provinciale	1		10.000	R - F
M24_5 – Improvement of the Ministry of Culture cultural heritage "Carta del Rischio" and "Vincoli in Rete" initiatives	Potenziamento e aggiornamento della Carta del Rischio e di Vincoli in Rete del MIBACT, attraverso collegamenti tra mappe e banca dati del patrimonio culturale, con schede di approfondimento sul singolo bene	1	1	90.000	R - F

- M21_1 Update of the hydrological system plan (PAI), mainstreaming flood scenarios for local planning tools.
- M22_1 Settlements relocation initiatives from overly exposed flood risk areas, also including renaturalization and landscape redevelopment interventions of the areas.
- M23_1 Development of a buildings' vulnerability reduction manual for urban planning interventions concerning areas affected by floods in the past.
- M24_1 Rivers embankments' status monitoring, so as to report sections and areas that do not reach minimum standard requirements.
- M24_2 Mapping update and upgrade of cultural and landscape heritage exposed elements.
- M24_3 Mapping update of territories' topography, paying particular attention to the hydrographic network.



- M24_4 Mapping update of hydraulic interventions' catalogue, so as to coordinate their maintenance.
- M24_5 Mapping and database update of cultural heritage assets, reporting on their conservation status, so as to define appropriate protocols of interventions in case of flooding.

This section applies to the whole Veneto region, presenting prevention measures already in place (with ongoing implementations) in the previous version of the plan (2016-2021) targeting flood risk through monitoring, mapping and planning interventions. The proposed initiative of settlement relocations (M22_1), undoubtedly the most ambitious and complex in terms of risk reduction, has been set as "not feasible" after the past planning period. The key addressed exposed elements of these prevention measures are buildings, cultural heritage, riverbanks and hydraulic interventions.

		T	argeted	d Hazaro	i				
<u>Severe</u> rainfalls (R)	Floods (<u>F)</u>	Severe (V		High tides (Τ)	Coastal storm surges (S)	
	C	ontrib	ution to	Measure description					
Understanding and assessing D	_	casting ssing ha			ucing [npacts			azard mitigation and dispersion	M21_1 – Update of the hydrological system plan (PAI).
		inforn overna		Awareness and preparedness				Emergency procedures	Update of the hydrological system plan (PAI), mainstreaming flood risk scenarios to local
	F	rogre	ss of im	plemen	tation	n			urban planning and development tools.
Proposed	Not Start	ted				On Going onstruction		Completed	Measure location
•	Implementation timeframes		Co	Cost		Res	Responsible bodies		Veneto's regional basins
	2016 – 2021 2022 – 2027			.000			lps D	Region, Eastern District Basin uthority	



		-	Targeted	d Hazaro					
<u>Severe</u> rainfalls (R)	Floods ((<u>F)</u>		re winds (W)		gh tides (T)		Coastal storm surges (S)	
Contribution to FRM and CCA									M22 1 – Settlements relocations initiatives.
Understanding and assessing D			ng and Reducing impacts					azard mitigation and dispersion	. 5
Protecting exposed elemen		R infor						Emergency procedures	risk areas, especially in the case of urbanized flood plains. The measure implementation may coordinate and include the possibility of
	ı	Progre	ess of im	plemen	tatio	n			renaturalization and landscape redevelopment of the intervention areas.
Proposed	Not Star	Started Planning Ongoing		0	On Going Constructio		Completed		
Implement timefran			Cost			Res	Responsible bodies		Measure location Veneto's regional basins
<u>2016 – 20</u> 2022 – 20	М	easure st feas		iot		Veneto Region			

		-	Targeted	d Hazard	t				
<u>Severe</u> rainfalls (R)	Floods (F)		High tides (T))	l storm es (S)	Measure description M23_1 – Buildings' vulnerability reduction		
	(Contrib	oution to	FRM a	nd CCA	1	•		<u>manual.</u>
Understanding and assessing D						DR Hazard m		_	Development of a buildings' vulnerabili reduction manual for urban planning interventions concerning areas affected
Protecting exposed elemen	_	DR informed governance		Awareness and preparedness			Emerge	,	stagnation and flood risk. The measure ain exposed buildings vulnerability reductio
	•	Progre	ess of im	plemen	tation				providing local Municipalities with a manual the urban planning tools implementation in
Proposed	Not Sta	Not Started		ning oing			Com	oleted	areas previously affected by floods.
Implementation timeframes			Co	st	st Re		Responsible bodies		Measure location Veneto's regional basins
2016 – 2021 2022 – 2027			€3.	€ 3.000		Eastern Alps District Basin Authority		ct Basin	Veneto's coastal areas

		Targeted Hazard			
<u>Severe</u> rainfalls (R)	Floods (F)	Severe winds (W)	High tides (T)	Coastal storm surges (S)	Measure description M24_1 – Rivers embankments' monitoring systems.
	Contrib	oution to FRM a	systems.		



Understanding and assessing D	R asses	ecastin ssing h	azards	in	ucing npacts	<u>i</u>		exard mitigation and dispersion Emergency	Developmen embankmen setting minin measure is es		
exposed elemen		rogress of implementation						procedures	as possible, ele by embankr		
Proposed	Not Star	ted		ning			Completed		the behavio		
Implement timefram		Cost				Res	spon	sible bodies	should repor that do r requirement		
'	2016 – 2021 2022 – 2027			€ 100.000				Eastern Alps District Basin Authority			

Development of hydraulic defences and rivers embankments' low-cost monitoring systems, setting minimum standard requirements. This measure is essentially aimed at reducing, as far as possible, elements exposed in areas defended by embankments whose characteristics are unknown and for which is not possible to know the behaviour during flooding events. The development of low-cost monitoring techniques should report the status of sections and areas that do not reach minimum standard requirements and need future maintenance.

Measure location

Veneto's regional basins

Targeted Hazard										
Severe rainfalls (R)	Floc	ods (F)	Severe winds (W)		High tides (T		<u>T)</u>	Coastal storm surges (S)		
	Contribution to FRM and CCA									
Understanding and assessing D	Forecastin	0		Reducing DR impacts			azard mitigation and dispersion			
Protecting exposed elemen	DR infor		Awareness and preparedness			Emergency procedures				
		Progre	ess of im	plemen	tatio	n				
Proposed	Not S	Started	Plan Ong	ning oing	On Going Construction			Completed		
Implement timefran			Cost				Responsible bodies			
2016 – 20 2022 – 20			€ 30.000				Ministry of Culture (MIBACT), Eastern Alps District Basin Authority			

Measure description

M24_2 – Mapping update and upgrade of exposed cultural and landscape heritage elements.

Progressive update and upgrade of risk maps focused on exposed cultural and landscape heritage elements, both public and private. This measure aims at improving the data quality and representation of cultural and landscape assets in relation to their number, role and vulnerability during flood events, so to support decision-making and measures implementation regarding these elements.

Measure location

Veneto's regional basins

Targeted Hazard										
<u>Severe</u> rainfalls (R)	Floods (F)	Severe winds (W)	High tides	Coastal storm surges (S)	1					
	Contribution to FRM and CCA									
Understanding Forecastin and assessing DR assessing h		U	ducing DR mpacts	Hazard mitigation and dispersion	1					

Measure description

M24 3 – Mapping update of territories' topography.

Program and perform the systematic mapping update of territories' topography paying particular attention to the hydrographic



Protecting exposed elemen		R informed overnance			Emergency procedures	network. Such topography improvement is needed to model flood risk mapping.
	ı	Progress of im	Measure location			
Proposed	Proposed Not Start		ning oing (On Going Construction	Completed	Veneto's regional basins
•	Implementation timeframes		ost	Res	ponsible bodies	
-	2016 – 2021 2022 – 2027		.500	\	/eneto Region	

			Targeted	l Hazaro	t										
<u>Severe</u> rainfalls (R)	Floods	<u>(F)</u>	Severe (V		High	n tides (1	Γ)	Coastal storm surges (S)							
	С	ontrik	oution to	FRM a	nd CC	Ά			Measure description M24 4 – Mapping update of the hydraulic						
Understanding and assessing D		ecastin ssing h	g and azards		ucing [npacts				interventions' catalogue. Develop and update the hydraulic intervention						
Protecting exposed elemer		R infor			eness aredne			Emergency procedures	GIS mapping catalogue at the regional and county level. This protocol aims at reordering						
	ı	Progre	ess of im	plemen	tation	n			the available data on hydraulic interventions, so to program and coordinate their maintenance.						
Proposed	Not Star	ted	Plan	0		n Going estructio	<u>n</u>	Completed	Measure location						
Implement timefran			Co	st		Res	pon	sible bodies	Veneto's regional basins						
	2016 – 2021 2022 – 2027		€ 10	€ 10.000		Eastern Alps District Basin Authority, Veneto Region		-							

	•	Targeted Ha	Targeted Hazard											
<u>Severe</u> rainfalls (R)	Floods (F)	Severe wind	ds High tides	(T)	Coastal storm surges (S)	M24 5 – Improvement of the Ministry of Culture cultural heritage "Carta del Rischio" and "Vincoli in Rete" mapping initiatives.								
	Contrib	oution to FR	M and CCA			Improvement and update of the Ministry of								
Understanding and assessing D	_	_	Reducing DR impacts	Н	Culture's mapping and database of cultural heritage assets, enhancing their interoperability. This aims at reporting on cultural heritage assets									
Protecting exposed elemen	DR informats governa		Awareness and preparedness		Emergency procedures	conservations status, and to define appropriate interventions protocols for reducing their vulnerability and planning their protection in								
	Progre	ess of impler	mentation			case of a flooding event.								
Proposed	Not Started	Planning Ongoing	On Going Constructi		Completed	Measure location								



Implementation timeframes	Cost	Responsible bodies	Veneto's regional basins
<u>2016 – 2021</u> <u>2022 – 2027</u>	€ 90.000	Ministry of Culture (MIBACT), Eastern Alps District Basin Authority	

1.2. Venice watershed and lagoon

Measure class and typology	Measure Name	Measure Location	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
M24_3 - Mapping update of territories' topography	Manutenzione annuale e gestione integrata dell'ambito costiero. Rilievi ed analisi degli ambiti di foce fluviale - Provincia di Venezia	Bacino scolante laguna Veneta; Provveditorato alle OO.PP. Per il Triveneto; foce fiumi Piave, Sile	1		600000	F - S

Mapping update of territories' topography (M24_3) is ongoing also at the local scale, analyses specifically focus on Venice Lagoon rivers' outlets areas.

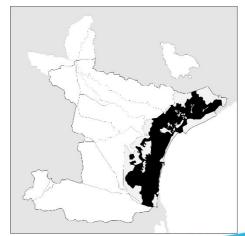
		,	Targete	d Hazaro	ł				
Severe rainfalls (R)	Floods	Floods (F)			e winds V)		(T)	Coastal storm surges (S)	
	C	ontril	ribution to FRM and CCA						
Understanding and assessing D	_	ecastir ssing h	ng and nazards		Reducing DR impacts			azard mitigation and dispersion	
Protecting exposed elemen	Protecting DR info exposed elements gover					eness and paredness		Emergency procedures	
		Progr	ess of im	nplemen	tatio	n			
Proposed	Not Star	ted				n Going		Completed	
Implement timefrar			Cost			Responsible bodies			
2016 – 2 0 2022 – 20		€ 600.000				Public Works Superintendency			

Measure description

M24 3 – Mapping update of territories' topography.

Reliefs and analysis of Venice Lagoon rivers' outlets areas' topography for their periodic maintenance and integrated management.

Measure location





2. Protection measures (M3)

The protection measures foreseen for the first planning period (2016-2021) have been 4 at the regional scale for a total of 3,358 million euros, and 9 at the Venice watershed and lagoon scale for 33,494 million euros. Furthermore, at the local level, 2 additional measures will continue in the second phase of the plan (2022-2027) for 223,5 million euros.

2.1. Regional scale

Measure class and typology	Measure Name	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
M33_1 – Riverbed, floodplain and coastal defence and regulation interventions	Progettazione dei lavori di adeguamento arginale lungo i canali consorziali	1		262.500	R-F
M35_1 – Hydrographic system maintenance programs	Programma di manutenzione della rete idrografica	1		3.000.000	R - F
M35_2 – Watercourses	Linee guida per la manutenzione e la gestione integrata dei corsi d'acqua	1		10.000	R - F
integrated maintenance and management guidelines	Rilievo sezioni di riferimento morfologico sui corsi d'acqua a supporto della redazione delle linee guida di manutenzione fluviale	1		85.000	R-F

Protection measures concerned (2016-2021 planning phase) morphological survey (M35_2), integrated management guidelines (M35_2) and programming (M35_1), riverbanks upgrading works (M33_1) for the whole hydrographic network of the Plan. These measures target directly rivers and rainwaters structural and infrastructural control.



		Т	argeted	l Hazard					
<u>Severe</u> rainfalls (R)	Floods (<u>F)</u>	Severe (W		High	n tides (Τ)	Coastal storm surges (S)	
	Co	ontrib	ution to	FRM a	nd CC	CA.			
Understanding and assessing D		casting ssing ha			ucing (azard mitigation and dispersion	Measure description M33_1 – Riverbed, floodplain and coastal defence and regulation interventions.
Protecting exposed elemen		l inforn overnar			eness aredn			Emergency procedures	Riverbanks structural upgrading works on canals
	P	rogre	ss of im	plemen	tatio	n			of the whole hydrographic network.
Proposed	Not Start	ted	Plani Ongo	0		n Going Istructio		Completed	Measure location Veneto's regional basins
Implement timefran			Co	st		Res	pon	sible bodies	
-	2016 – 2021 2022 – 2027		€ 262.000		Veneto Region		eto Region		

		Targete	d Hazard	i								
<u>Severe</u> rainfalls (R)	Floods (F)		winds V)	High	n tides (T)	Coastal storm surges (S)	Measure description					
	Coi	ntribution to	FRM a	nd CC	Ά		M35 1 – Hydrographic system maintenance					
Understanding and assessing [_	asting and ng hazards		ucing [npacts	_ _	azard mitigation and dispersion	<u>programs.</u> Programming an integrated management of t					
Protecting exposed elemen		nformed ernance		reness and Emergency paredness procedures			whole hydrographic system. To this regard competent authorities should define, and progressively implement, a detailed program					
	Pr	ogress of im	plemen	tation	n		and timeline of interventions, or the existing					
Proposed	Not Starte	d Plan Ong	ning oing		n Going estruction	Completed	planning tool pursuing these tasks.					
Implement timefrar		Co	Cost		Responsible bodies		Measure location Veneto's regional basins					
	2016 – 2021 2022 – 2027		00.000		Veneto Region							

		Targeted Hazard	Measure description		
<u>Severe</u> rainfalls (R)	Floods (F)	Severe winds (W)	High tides (T)	Coastal storm surges (S)	M35 2 – Watercourses integrated maintenance and management guidelines.



	C	ontril	oution to	FRM a	nd CC	CA			
Understanding and assessing D	-	ecastir ssing h	ng and nazards	Reducing I				azard mitigation and dispersion	
Protecting exposed elemen		R infor overna		Awareness preparedn				Emergency procedures	
Progress of implementation									
Proposed	Not Star	ted	ed Plannin Ongoin					Completed	
Implement timefran		Cost			Responsible bodies				
2016 - 20 2022 - 20		€ 10	.000		Eastern Alps District Basin Authority				

Watercourses integrated maintenance and management constitutes a coordination element between flood risk mitigation and rivers status and morphology protection. The definition of guidelines should aim both at river morphological and environmental conservation as well as at the sustainability of defence interventions themselves.

Measure location

Veneto's regional basins

	Targeted Hazard												
<u>Severe</u> rainfalls (R)	<u> </u>	-loods (<u>F)</u>	Severe winds (W)		High tides (T)		(T)	Coastal storm surges (S)				
	Contribution to FRM and CCA												
	Understanding Force and assessing DR assessing DR					ucing npacts			azard mitigation and dispersion				
Protecting exposed elemen	nts		infor		Awareness preparedn				Emergency procedures				
		P	rogre	ess of im	plemen	tatio	n						
Proposed	Z	ot Start	ed				On Going nstruction		Completed				
Implementation timeframes			Cost			Responsible bodies							
2016 - 20 2022 - 20			€ 85.000			Eastern Alps District Basin Authority							

Measure description

M35_2 – Watercourses integrated maintenance and management guidelines.

Morphological survey of watercourses to support the redaction of the integrated management guidelines. This hydromorphological monitoring should evaluate the current impacts of both pressures and of the intervention already in place.

Measure location

Veneto's regional basins

2.2. Venice watershed and lagoon

Measure class and typology	Measure Name	Measure Location	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
M31_1 – Water discharges and	Interventi di ripascimento periodico ogni 10 anni pari al 10% del volume di sabbia	Litorali di Pellestrina, Lido	1		12.500.000	S



Measure class and typology	Measure Name	Measure Location	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
floods natural retention	refluita inizialmente. Lavori di ripascimento di circa Mmc/10 anni nei litorali di Pellestrina e di Lido di Venezia			1	12.500.000	S
M32_1 – Hydraulic discharges retention	Progettazione dei lavori di :Costruzione di casse di espansione e laminazione per la riduzione dei picchi di piena da realizzare lungo l'alto bacino del fiume Marzenego (PG_044 e PG_045)	Noale, Trebaseleghe, Piombino Dese, Loreggia, Resana, Massanzago	1		343.000	F
	Progettazione dei lavori di :Completamento della sistemazione idraulico-ambientale dello scolo Lusore a monte della botte a sifone del Taglio di Mirano - II Stralcio (PG_077), 1° Lotto	Mirano, Santa Maria di Sala, Villanova di Camposampiero, Borgoricco	1		245.000	F
	Progettazione dei lavori di :Interventi di rinaturalizzazione e di riduzione dei picchi di piena nell'alto bacino del Fiume Dese (PG_177)	Scorzè, Trebaseleghe, Piombino Dese, Resana	1		406.000	F
M33_1 – Riverbed,	rbed, della laguna di competenza dello Stato, in Bo		1		221.000.000	Т
floodplain and coastal defence and regulation	attuazione della legge 798/84 - Sistema MOSE	MOSE		1	221.000.000	Т
interventions	Interventi urgente di protezione e ripascimento del litorale di Pellestrina	Litorali di Pellestrina	1		11.000.000	S
	Ripresa di frane estese sia lato fiume che lato campagna, con necessità di diaframmi e	Stra, Fiesso d'Artico,	1		1.000.000	F
	jet-grouting	Dolo, Mira	1		600.000	F
	Interventi di difesa idrogeologica delle arginature del canale Novissimo	Chioggia (VE) e Codevigo (PD), Campagna Lupia (Ve)	1		1.000.000	F
M34_1 – Urban surface water management	Pulizia ed espurgo del bacino di arrivo dell'impianto idrovoro di Tessera in comune di Venezia	Venezia	1		900.000	F
M35_1 – Hydrographic system maintenance programs	Manutenzione delle opere di difesa costiera di Lido di Venezia e Pellestrina e della Laguna retrostante	Litorali di Pellestrina, Lido, laguna	1		18.000.000	S

 M31_1 – Beach nourishment periodic intervention (every 10 years) on the Pellestrina and Lido di Venezia coasts.



- M32_1 Flood retention basin construction works for reducing flood peaks along the Marzenego river upper basin.
- M33_1 Interventions for river basins hydraulic and environmental upgrading, embankments reinforcement, renaturalization and flood peaks reduction of the Dese River, Taglio and Novissimo Canals.
- M33 1 Recovery of extensive landslides along, around and within riverbanks.
- M33_1 MOSE system interventions for Venice and its lagoon protection.
- M34_1 Urban surface water management through Tessera drainage plant's (Venice) cleaning and draining.
- M35_1 Coastal defence works maintenance programs for Lido di Venezia, Pellestrina and behind lagoon.

The planned protection measures target water outflows, rainwaters and floods defence, management and regulation interventions along riverbeds, floodplains as well as coasts of the Venetian area, thus exclusively targeting different hazards from rivers (rainwater and rivers floods) and the sea (high tides and storm surges). The cost of these structural measures outweighs all the others, with around 40 million euros for river and coastal protections and 220 million for the MOSE system alone.

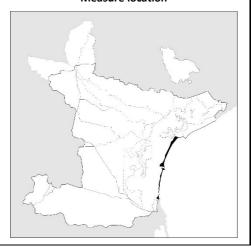


		,	Targeted	l Hazaro	t				
Severe rainfalls (R)	Floods	(F) Severe winds (W) High			h tides (T)		Coastal storm surges (S)		
Contribution to FRM and CCA									
Understandin and assessing [_		ng and nazards		ucing npacts			azard mitigation and dispersion	
Protecting exposed eleme			ormed Awarenes.					Emergency procedures	
	F	Progr	ess of im	plemen	tatio	n			
Proposed	Not Star	ted	Plan Ongo			n Going nstructio		Completed	
Implementation Cost Responsible bod						sible bodies			
2016 – 2021 2022 – 2027			€ 12.50	00.000		S		olic Works rintendency	

 $\underline{\text{M31 1-Water discharges and floods natural}}_{\underline{\text{retention.}}}$

Beach sand nourishment periodic interventions (every 10 years) on the Pellestrina and Lido di Venezia coasts.

Measure location



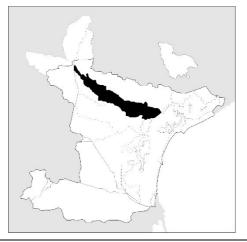
				Tauasta	d 11aaa				
Severe rainfalls (R)	<u>F</u>	Floods (Severe	winds		h tides ((T)	Coastal storm surges (S)
Contribution to FRM and CCA									
Understanding and assessing D				ng and nazards		ucing npacts			azard mitigation and dispersion
Protecting exposed elemen	infor	ormed Awareness preparedn				Emergency procedures			
		P	rogr	ess of im	plemen	tatio	n		
Proposed	N	ot Start	ed		ning		n Going		Completed
Implement timefrar	Cost						Res	spor	nsible bodies
2016 – 2021 2022 – 2027				€ 343	3.000			Ven	eto Region

Measure description

M32 1 – Hydraulic discharges retention.

Construction works of flood retention basins for reducing flood peaks along the Marzenego river upper basin.

Measure location



Targeted Hazard										
Severe rainfalls (R)	Floods (F)	Severe winds (W)	High tides (T)	Coastal storm surges (S)						
Contribution to FRM and CCA										

Measure description

M33 1 – Riverbed, floodplain and coastal defence and regulation interventions.

21



Understanding and assessing D		ecastir ssing h	g and azards	Reducing DR impacts			Hazard mitigation and dispersion	
Protecting exposed elemen		R infor overna						Emergency procedures
	ı	Progre	ess of im	plemen	tatio	n		
Proposed	Not Star	ted		ning oing		n Going Istruction		Completed
Implement timefrar			Cost		Re	spor	sible bodies	
2016 – 2021 2022 – 2027			€ 245	5.000			Vend	eto Region

Intervention for river basins hydraulic and environmental upgrading of the Lusore and Taglio Canals.

Measure location



Targeted Hazard										
Severe rainfalls (R)	<u> </u>	Floods (F)	Severe winds (W) High tides (T)				Coastal storm surges (S)			
Contribution to FRM and CCA										
Understanding and assessing D						_	azard mitigation and dispersion			
Protecting exposed elemen	nts	DR infor		Awar prep		Emergency procedures				
Progress of implementation										
Proposed	N	ot Startod	Plan	ning	On Going	5	Completed			

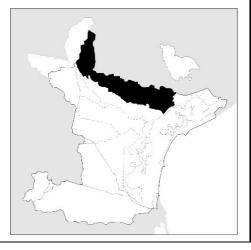
Proposed	Not Start	ed			n Going estruction	Completed
Implement timefran		Cost		Respor	sible bodies	
2016 – 20 2022 – 20			€ 406.000		Vend	eto Region

Measure description

<u>M33 1 – Riverbed, floodplain and coastal</u> <u>defence and regulation interventions.</u>

Interventions for renaturalization and flood peaks reduction on the Dese River upper basin.

Measure location



Targeted Hazard										
Severe rainfalls (R)	Floo	ds (F)	Severe (V		High tides	<u>(T)</u>	Coastal storm surges (S)			
		Contrib	oution to	FRM a	nd CCA					
Understanding and assessing D		orecastin ssessing h	0		ucing DR npacts		azard mitigation and dispersion			

Measure description

<u>M33 1 – Riverbed, floodplain and coastal</u> <u>defence and regulation interventions.</u>

Interventions for Venice and its lagoon protection based on the MOSE system.

Measure location



Protecting exposed elemen	nts	DR info		Awareness and preparedness				Emergency procedures
		Prog	ess of im	plemen	tatio	n		
Proposed	Not	t Started	Planning Ongoing		On Going Construction		-	Completed
Implementation timeframes		1	Cost			Responsible bodies		
<u>2016 – 2021</u> <u>2022 – 2027</u>			€ 221.0	000.000		S		olic Works rintendency



			Targete	d Hazard						
Severe rainfalls (R)	Floods (F)	0010.0	e winds W) High tides			(T)	Coastal storm surges (S)		
	Contribution to FRM and CCA									
Understanding Forecasting and and assessing DR assessing hazards impacts Hazard mitigation and dispersion										
Protecting exposed elemer		med	Awareness and preparedness				Emergency procedures			
	F	rogr	ess of im	plemen	tatio	n				
Proposed	Not Start	ted		ning oing	_	n Going	_	Completed		
Implementation Cost Responsible bodies							sible bodies			
2016 – 2 0 2022 – 20		€ 11.0	00.000		S		olic Works rintendency			

M33 1 – Riverbed, floodplain and coastal defence and regulation interventions.

Protection and beach nourishment urgent intervention on the Pellestrina coast.

Measure location



	Targeted Hazard											
Severe rainfalls (R)	Floods (F)		Severe winds (W) High tides ((⊤)	Coastal storm surges (S)						
Contribution to FRM and CCA												
	Understanding Forecasting and Reducing DR Hazard mitigation and assessing DR assessing hazards impacts and dispersion											
Protecting exposed elemen	Protecting DR informed Awareness and Emergency exposed elements governance preparedness procedures											
	Prog	ress of im	plemen	tation								

Measure description

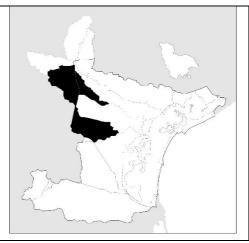
M33 1 – Riverbed, floodplain and coastal defence and regulation interventions.

Recovery of extensive landslides along, around and within riverbanks.

Measure location



Proposed	Not Started				n Going estruction	<u>Completed</u>	
Implementation timeframes			Cost		Responsible bodies		
2016 – 2 0 2022 – 20			€ 1.000.000 € 600.000		Vend	eto Region	



		l										
	Targeted Hazard											
Severe rainfalls (R)	Floods (<u>F)</u>	Severe winds (W)			h tides (Τ)	Coastal storm surges (S)				
Contribution to FRM and CCA												
Understanding and assessing [_		ng and nazards		ucing npacts			azard mitigation and dispersion				
Protecting exposed elemen				rmed Aware				Emergency procedures				
	F	rogre	ess of in	plemen	tatio	n						
Proposed	Not Start	ted	Planning Ongoing			n Going nstructio		Completed				
Implement timefrar			Cost			Responsible bodies						
2016 – 2 0 2022 – 20		€ 1.00	00.000		Veneto Region							

M33 1 – Riverbed, floodplain and coastal defence and regulation interventions.

Interventions for embankments reinforcement along the Novissimo Canal.

Measure location



	Targeted Hazard											
Severe rainfalls (R)	<u>FI</u>	oods (F)		winds V)	High tides (T)		Coastal storm surges (S)					
Contribution to FRM and CCA												
Understanding and assessing D		Forecasting and assessing hazards		Reducing DR impacts		Hazard mitigation and dispersion						
Protecting exposed elemer	nts	DR infor			eness and aredness		Emergency procedures					
	Progress of implementation											

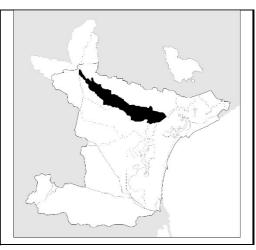
Measure description

M34_1 – Urban surface water management through Tessera (Venice) drainage plant's cleaning and draining.

Measure location



Proposed	Not Started		ted Planning Ongoing		n Going nstruction	Completed	
Implement timefran			Cost		Responsible bodies		
2016 – 2 0 2022 – 20			€ 900.000		Ven	eto Region	

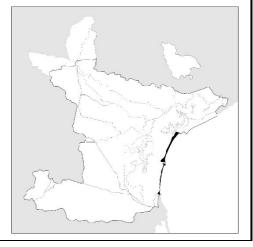


			Targete	d Hazaro	ł							
Severe rainfalls (R)	Floods	(F)	Severe winds (W)			h tides ((T)	Coastal storm surges (S)				
Contribution to FRM and CCA												
Understanding and assessing D			ng and nazards		ucing npacts			azard mitigation and dispersion				
Protecting exposed elemen		R infor		Awareness and preparedness			Emergency procedures					
		Progr	ess of im	nplemen	tatio	n						
Proposed	Not Star	ted	_			n Going Istruction	-	Completed				
Implement timefrar			Co	ost		Responsible bodies						
2016 – 2 0 2022 – 20			€ 18.0	00.000		S		olic Works rintendency				

M35 1 – Hydrographic system maintenance programs.

Coastal defence works maintenance programs for Lido di Venezia, Pellestrina and the lagoon behind.

Measure location



3. Preparedness measures (M4)

The preparedness measures planned for the first period (2016-2021) were 9 at the regional scale for a total of 210 thousand euros, and 2 at the Venice watershed and lagoon scale for 15,25 million euros. The measures continuing in both planning periods (2016-2027) at the regional level are 14 for which are founded 755 thousand euros. The second phase of the plan (2022-2027) funded 15 new measures at the regional level for 1,557 million euros.



3.1. Regional scale

Measure class and typology	Measure Name	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
	Accordo tra ISPRA e Reg Veneto per l'utilizzo dei dati di monitoraggio e previsione meteo marina ai fini dell'allertamento rispetto al rischio di inondazione costiero lagunare e foci fluviali in relazione alle funzioni del CFD della Protezione Civile	1		0	S - T
	Dotare il Servizio Meteorologico Regionale afferente al Centro Funzionale Decentrato, di modellistica meteorologica a scala locale, capace di aggregare le precipitazioni previste nell'intervallo temporale di 1 ora.	1		30.000	R - F
	Installazione di un microradar meteorologico in banda X e sviluppo di un software di segnalazione automatica dell'allarme al verificarsi di precipitazioni intense [sviluppare un software capace di elaborare in automatico e in tempo reale le immagini provenienti dai radar meteorologici regionali al fine di individuare le precipitazioni intense e di allertare via SMS una serie di utenti predefiniti (autorità locali di protezione civile, vigili del fuoco, ecc.) nelle aree interessate dai fenomeni stessi.]	1		30.000	R-F
M41_1 – Flood forecasting and early warning	Omogeneizzazione dei messaggi di allertamento secondo protocolli nazionali	1		10.000	
	Acquisizione di una piattaforma software per la visualizzazione unificata dei modelli idrologici e idraulici presso il CFD della Regione Veneto	1	1	30.000 10.000	R - F
	Campagna di misure di portata e definizione delle scale di deflusso dei principali corsi d'acqua del Veneto		1	900.000	R - F
	Integrazione del Sistema operativo di previsione dei fenomeni di mareggiata in Alto Adriatico nell'ambito delle attività del Centro Funzionale Decentrato.		1	60.000	S - T
	Rafforzamento del numero di operatori dedicati alla Sala Operativa Regionale nell'ordinario e in corso di evento alluvionale		1	166.164	R - F
	Revisione delle procedure inerenti il sistema di allertamento in uso presso il Centro Funzionale Decentrato		1	10.000	R - F
	Revisione delle soglie complesse delle zone di allerta del territorio regionale in uso al Centro Funzionale Decentrato e utilizzate nella valutazione dei livelli di allerta		1	20.000	
	alicita				



Measure class and typology	Measure Name	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
	Sistema di monitoraggio e previsione meteo-marina ai fini dell'allertamento rispetto al rischio di inondazione costiero-lagunare e foci fluiviali	1	1	350.000	S
	Promozione dell'aggiornamento dei Piani comunali di emergenza e adeguamento dei loro contenuti in accordo con le direttive del DNPC ed in relazione alle priorità di intervento, tenendo conto, in particolare, degli scenari alluvionali	1		40.000	
	Acquisizione di una nuova piattaforma informatica di diffusione delle allerte e di gestione delle strutture operative da utilizzarsi presso il Centro Funzionale Decentrato e la Sala Operativa Regionale		1	48.190	
M42_1 – Emergency plans	Adozione di una nuova normativa regionale in materia di protezione civile e sistema di allertamento (in particolare Legge Regionale di Protezione Civile e DGR)		1	50.000	
update	Attivazioni di convenzioni e accordi con le società che gestiscono i vari servizi pubblici essenziali (es. Società Autostrade, Ferrovie dello Stato, ASL) per favorire il ripristino delle condizioni di normalità post evento		1	240.000	
	Redazione dei Piani di emergenza delle grandi dighe (PED)		1	3.900	R - F
	Redazione del Piano di protezione civile regionale per rischio idraulico		1	50.000	R-F
	Redazione di Linee guida regionali inerenti la pianificazione di protezione civile per rischio idraulico a livello locale in linea con la relativa Direttiva del Presidente del Consiglio dei Ministri 30 aprile 2021		1	800	R-F
M42_10 – Information platform on polluting sources.	Predisposizione di una piattaforma informativa ai fini di tutela ambientale condivisa tra tutti i gestori coinvolti nella gestione del'emergenza, con l'inserimento dei dati relativi alle potenziali fonti di inquinamento legati ad eventi alluvionali	1	1	30.000 50.000	
M42_2 – Emergency intervention protocols for cultural heritage	Predisposizione di protocolli di intervento da adottare in caso di emergenza per la salvaguardia del patrimonio culturale	1	1	3.000	
M42_3 – Emergency intervention protocols for environmental heritage	Predisposizione protocolli operativi di intervento da adottare in caso di emergenza per la salvaguardia dell'ambiente	1	1	4.000 20.000	
M42_4 – Emergency protocols guidelines for cultural heritage protection	Elaborazione di linee guida sulle operazioni da effettuare in caso di emergenza per la salvaguardia del patrimonio culturale	1	1	6.000 10.000	
M42_5 – Safe shelters for cultural heritage assets	Coordinamento per l'Individuazione di depositi sicuri che possano diventare ricoveri di beni culturali mobili per affrontare un primo intervento di messa in sicurezza	1		20.000	



Measure class and typology	Measure Name	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
	Individuazione di depositi sicuri che possano diventare ricoveri di beni culturali mobili per affrontare un primo intervento di messa in sicurezza	1	1	65.000	
M42_6 – Rescue teams' preparation for cultural heritage protection	Preparazione e formazione di squadre di soccorso, con specifico riferimento alla salvaguardia del patrimonio culturale, a seconda delle diverse categorie (cose immobili o cose mobili) e tipologie, nonché in base alla proprietà (pubblica o privata)	1	1	10.000 20.000	
Heritage protection	Supporto alla preparazione e formazione di squadre di soccorso per la salvaguardia del patrimonio culturale in caso di eventi calamitosi	1	1	6.000	
	Formazione e preparazione di squadre di soccorso con specifico riferimento alla salvaguardia ambientale, con il coinvolgimento di tutti i soggetti coinvolti nella gestione dell'emergenza e della tutela ambientale	1	1	13.000 30.000	
M42_7 – Rescue teams' preparation for environmental	Corsi di formazione per Sindaci e Tecnici comunali inerenti le linee guida sulla pianificazione di protezione civile		1	1.000	
heritage protection	Corsi di formazione per Sindaci e Tecnici comunali, componenti e strutture operative del sistema regionale di PC inerenti il sistema di allertamento per rischio idraulico		1	6.000	
	Corso QGIS per sindaci/tecnici comunali ai fini della redazione dei piani di protezione civile per rischio idraulico		1	1.000	
M42_8 –Rescue teams (volunteers) preparation and training	Formazione e preparazione di squadre di soccorso, in particolare volontarie, con specifica formazione per le attività di monitoraggio e di gestione del rischio idraulico	1	1	20.000 25.000	
M42_9 – Civil Protection	Assegnazione di codici di relazione dei campi significativi tra le varie piattaforme del MIBACT e la piattaforma informativa condivisibile tra il Dipartimento di protezione civile e varie Amministrazioni pubbliche	1	1	150.000	
Department information platform	Predisposizione di una piattaforma informativa condivisibile tra il Dipartimento di protezione civile e varie Amministrazioni pubbliche, in cui sono inseriti dati utili all'attuazione di azioni e misure di protezione dai rischi legati ad eventi calamitosi	1		75.000	
M43_2 – District level citizens' observatory	Definizione di linee guida per sviluppare l'osservatorio dei cittadini al fine di incrementare le banche dati e i canali di comunicazione durante gli eventi alluvionali anche attraverso l'utilizzo di modelli di resilienza.		1	0	
M43_3 – Technical and citizen education campaigns	Miglioramento della consapevolezza pubblica delle condizioni di rischio del proprio territorio e dei comportamenti da adottare in caso di calamità attraverso specifiche campagne di educazione di tecnici e cittadini	1	1	6.000 5.900	



Measure class and typology	Measure Name	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
M43_4 – "Io non rischio" (I don't take risks) citizen education campaigns	Campagna di educazione ed informazione alla popolazione "io non rischio" finalizzata alla conoscenza dei rischi territoriali e alle misure previste nei piani locali di protezione civile, al fine di sviluppare la capacità di resilienza in caso di emergenza	1		1.000	
M43_5 – Population behaviour flood risk models	Sviluppo di modelli integrati di valutazione del rischio con particolare riferimento al comportamento della popolazione in occasione di eventi alluvionali (esposizione)	1		4.000	R - F
M43_6 – Cultural and landscape heritage flood risk models	Sviluppo di modelli integrati di valutazione del rischio con particolare riferimento: B) al patrimonio culturale (aggiornamento dei parametri di vulnerabilità assegnati al patrimonio culturale (beni culturali e beni paesaggistici) da parte del Distretto)	1	1	10.000	

In the previous phases of the plan (2016 - 2021), preparedness to disaster has been addressed through floods forecasting and early warning initiatives (M41 $_1$) as:

- Marine weather monitoring and forecasting, using national and regional data, to support early warning and alerts in case of coastal flooding of the lagoon and river outlets;
- Local scale meteorological modelling for the Regional Meteorological Service, specifically deemed to the aggregation of expected rainfalls within 1-hour time frame;
- Early warning systems for coastal flooding of the lagoon and river outlets;
- Development of a real-time-automatic software which, in case of heavy rainfalls, alerts responsible authorities (local civil protection authorities, firefighters, etc.) in the affected areas;
- Warning messages homogenization to national protocols;
- Acquisition of a software platform for the unified visualization of hydrological and hydraulic models at the regional level.

To these floods forecasting and early warning measures (M41_1), new ones were planned for the 2022 – 2027 period, concerning particularly Veneto Region's Civil Protection "Decentralized Functional Centres" (CFD):

- Rivers' flow and discharge rates measurements and definition;
- Waterflow of the flow scales of the main watercourses of the Veneto
- Integration of the Upper Adriatic storm forecasting system in the Decentralized Functional Centre's activities;
- Increasing Civil Protection Regional Operations Centre's operators, both in peacetime and during flood emergencies;



- Decentralized Functional Centre's warning system procedures review;
- Review of regional warning zones thresholds and related warning level assessment in use by the Decentralized Functional Centre.

Another substantial preparedness section refers to civil protection's emergency plans update (M42 1), which planned for the 2022 – 2027:

- Adoption of a new civil protection and early warning system regional legislation;
- Drafting of the regional civil protection plan for hydrometeorological hazards;
- Drafting of sectoral emergency plans for large dams;
- Drafting of regional guidelines concerning civil protection planning for hydrometeorological hazards at the local level in line with the relative national Directive;
- Municipal emergency plans update, in line to national directives and to flood risk scenarios;
- IT platform acquisition for disseminating warnings and the management of operational structures, to support the Decentralized Functional Centre and the Regional Operations Centre;
- Conventions and agreements with public services and transportation companies, supporting recoveries back to normal after flood events.

Further civil protection related measures, planned particularly for the 2022 – 2027 period, focus on the preparedness of specific exposed elements: population and its behaviour during floods, but most of all the monitoring, safeguarding and preservation of both the cultural and environmental heritage.

- Development of integrated flood risk assessment models, particularly targeting population behaviour during flood events (M43_5), and cultural and landscape heritage vulnerability parameters update (M43_6);
- Guidelines definition and development of a citizens' observatory to increase databases and communication channels during flood events (M43_2);
- Technical and citizen education campaigns to improve flood risk public awareness, disseminating the local civil protection plans measures (M43_4), and informing on appropriate emergency behaviours (M43_3);
- Definition of emergency intervention protocols for cultural (M42_2) and environmental (M42_3) heritage protection;
- Emergency protocols guidelines for cultural heritage protection (M42_4), identifying also safe deposits location for safely sheltering assets (M42_4);
- Rescue teams preparation and training, with specific reference to hydrometeorological risk monitoring and management (M42_8), and to cultural heritage safeguarding (M42_6), considering the different categories, types, and ownership;



- Rescue team's preparation and training specifically targeting environmental protection (M42_7), with training courses for all the personnel involved, particularly mayors and municipal technicians;
- Adoption of information platforms between the Civil Protection Department and local administrations for coordinating flood risk management interventions (M42_9), cultural heritage assets' codes and identifications (M42_9), pollution sources that might be exposed or relevant in case of flooding events (M42_10).

This set of preparedness measures, often planned for either the whole hydrographic district or Veneto Region, covers floods, tides and storm surges forecasting, early warning systems, emergency plans and protocols, awareness and preparedness campaign. The budget for such wide variety of interventions is set around the 2,5 million euros.



		Tar	rgeted	Hazaro	ł							
<u>Severe</u> rainfalls (R)	Floods (<u>F)</u>		ere winds (W) High tides (T		evere winds (W) High tides (T) Coastal storm surges (S)						
	Co	ontribut	tion to	FRM a	nd CC	Ά			Measure description			
Understanding and assessing D	_	Forecasting and ssessing hazards			- C		J		M41 1 – Flood forecasting and early warning. Marine weather monitoring and forecasting,			
Protecting exposed elemen		informe			eness : aredne			Emergency procedures	based on the agreement between the National Environmental Agency (ISPRA) and the Veneto Region for sharing the needed data, so to			
	P	rogress	of imp	lemen	tation	n			support early warning and alerts in case of coastal flooding of the lagoon and of river			
Proposed	Not Start	ted	Planni Ongoi			On Going Construction		Completed	outlets.			
Implement timefrar		·	Cos	t		Res	pon	sible bodies	Measure location Veneto's coastal areas			
	2016 – 2021 2022 – 2027		/			Envi	ironr PRA)	egion, National mental Agency , Eastern Alps Basin Authority				

		Targe	ted Hazaro	t									
<u>Severe</u> rainfalls (R)	Floods (I	Sev	ere winds (W)	High	h tides (1	tides (T) Coastal storm surges (S)							
	Co	ntribution	to FRM a	nd CC	CA			Measure description					
Understanding and assessing D		casting and sing hazards		ucing (azard mitigation and dispersion	M41 1 – Flood forecasting and early warning.					
Protecting			rmed Awareness				ness and E		Emergency procedures	Equip the Regional Meteorological Service wir local scale meteorological modelling, specifica deemed to the aggregation of expected rainfa			
	Р	rogress of	implemen	tatio	n			within 1-hour time frame.					
Proposed	Not Start	ed	anning ngoing	On Going Construction		Completed		Measure location					
Implement timefran			Cost		Res	pon	sible bodies	Veneto's regional basins					
<u>2016 – 20</u> 2022 – 20		€	30.000		١	√ene	eto Region						

		Targeted Hazaro	Measure description		
<u>Severe</u> <u>rainfalls (R)</u>	Floods (F)	Severe winds (W)	High tides (T)	Coastal storm surges (S)	M41_1 – Flood forecasting and early warning.



	Contribution to FRM and CCA											
Understanding and assessing D				g and azards	Reducing Dimpacts				azard mitigation and dispersion			
Protecting exposed elemen	nts		infor		Awareness and preparedness		Emergency procedures					
Progress of implementation												
Proposed	N	ot Start	ed		ning On Going oing Construction			Completed				
Implement timefran	n	Cost			Responsible bodies							
2016 – 2021 2022 – 2027			€ 30.000				Ven	eto Region				

Adoption of a meteorological micro-radar and related development of a real-time-automatic software which, in case of heavy rainfalls, alerts responsible authorities (local civil protection authorities, firefighters, etc.) in the affected areas.

Measure location

Veneto's regional basins

			-	Targeted	Hazaro						
<u>Severe</u> rainfalls (R)	Floods (F)			Severe	winds	High tides ((<u>T)</u>	Coastal storm surges (S)		
Contribution to FRM and CCA											
Understanding and assessing D			orecasting and ssessing hazards		Reducing DR impacts			Hazard mitigation and dispersion			
Protecting exposed elemer	nts		nfori erna		Awareness and preparedness				Emergency procedures		
	•	Pr	ogre	ess of im	plemen	tatio	n				
Proposed	N	ot Starte	d	Plan Ong	_	_		Completed			
Implementation timeframes			Cost				Res	spor	sible bodies		
2016 – 2021 2022 – 2027			€ 10.000					Ven	eto Region		

Measure description

M41_1 – Flood forecasting and early warning.

Warning messages homogenization to national protocols.

Measure location

Veneto's regional basins

Targeted Hazard									
<u>Severe</u> rainfalls (R)	Floods (F)		e winds W) High tides ((T)	Coastal storm surges (S)			
Contribution to FRM and CCA									
Understanding and assessing D	•	Forecasting and assessing hazards		Reducing DR impacts		Hazard mitigation and dispersion			
Protecting exposed elemen		DR informed governance		Awareness and preparedness		Emergency procedures			

Measure description

M41_1 – Flood forecasting and early warning.

Acquisition of a software platform for the unified visualization of hydrological and hydraulic models at the regional level.

Measure location

Veneto's regional basins



	Progress of implementation									
Proposed	oposed <u>Not Started</u>		Planning Ongoing	On Going Construction		Completed				
Implementation timeframes			Cost		Responsible bodies					
2016 – 2021 2022 – 2027			€ 30.000 (P1) € 10.000 (P2)		Ven	eto Region				

		1	Targeted	d Hazaro	ł				
<u>Severe</u> rainfalls (R)	Floods (<u>F)</u>	Severe (V	High tides		ligh tides (T)		Coastal storm surges (S)	
	C	ontrib	ution to	Manager de cartate					
Understanding and assessing D			ting and Reducing I impacts				azard mitigation and dispersion	Measure description M41 1 – Flood forecasting and early warning.	
Protecting exposed elemer					eness and aredness		Emergency procedures	Initiative for rivers' flow and discharge rates measurements and definition of Veneto main watercourses.	
	F	Progre	ss of im	plemen	tatio	n			
Proposed	Not Star	ted_		0		On Going Construction		Completed	Measure location Veneto's regional basins
Implementation timeframes			Cost			Responsible bodies		sible bodies	
2016 – 2021 2022 – 2027			€ 900.000		Veneto Region		eto Region		

		Targeted Ha				
Severe rainfalls (R)	Floods (F)	Severe wind	ds <u>Hig</u>	th tides (T)	Coastal storm surges (S)	
	Contri	oution to FR	Measure description			
Understandin and assessing I			Reducing DR impacts		azard mitigation and dispersion	M41_1 – Flood forecasting and early warning. Integration of the Upper Adriatic storm forecasting system in the Decentralized
Protecting exposed eleme	DR infor				Emergency procedures	Functional Centre's activities.
	Progr	ess of impler	mentatio	n		Measure location
Proposed	Not Started	Planning Ongoing	O .		Completed	Veneto's regional basins
Implemen timefrai		Cost	Cost		nsible bodies	



2016 – 2021	£ 60 000	Vanata Ragion	
<u> 2022 – 2027</u>	€ 60.000	Veneto Region	

		-	Targeted	l Hazaro	I				
<u>Severe</u> rainfalls (R)	<u>Floods</u>	(<u>F)</u>		e winds W)		High tides (T)		Coastal storm surges (S)	
Contribution to FRM and CCA									
Understanding and assessing D		ecasting and Reducing Decay impacts			Ü		Measure description M41 1 – Flood forecasting and early warning.		
Protecting exposed elemer					Awareness and preparedness			Emergency procedures	Increase the number of Civil Protection Regional Operations Centre's operators, both in peacetime and during flood emergencies.
	ı	Progre	ess of im	plemen	tatio	n			, , , , , , , , , , , , , , , , , , ,
Proposed	Not Star	<u>ted</u>	ed l		On Going onstruction		Completed	Measure location Veneto's regional basins	
Implementation timeframes			Cost			Responsible bodies		sible bodies	
2016 – 2021 2022 – 2027			€ 166	5.164		Veneto Region		eto Region	

		Ta	argeted H					
<u>Severe</u> rainfalls (R)	Floods (I	<u>F)</u>	Severe w (W)	-	High tides (T)		Coastal storm surges (S)	
	Co	ontribu	ıtion to F					
Understanding and assessing D		casting sing ha				azard mitigation and dispersion	Measure description M41 1 – Flood forecasting and early warning.	
Protecting exposed elemen		R informed Awareness overnance prepared				Emergency procedures	Review of the Decentralized Functional Centre's warning system procedures.	
	Р	rogres	s of impl	lementat	ion			
Proposed	Not Start	ed	- U		On Going Construction		Completed	Measure location Veneto's regional basins
Implementation timeframes			Cost		Res	Responsible bodies		
2016 – 2021 2022 – 2027			€ 10.000			Veneto Region		

Targeted Hazard	Measure description
-----------------	---------------------



<u>Severe</u> rainfalls (R)	<u>Floods (</u>	<u>F)</u>	Severe winds (W)		tides (T)	Coastal storm surges (S)	M41_1 - Flood forecasting and early warning. Review of regional warning zones thresholds
	C	ontribu	tion to FRM a	and related warning level assessment in use by the Decentralized Functional Centre.			
Understanding and assessing E		ecasting and Reduction Results imp				lazard mitigation and dispersion	Measure location
Protecting exposed elemen		informe overnanc	<u> </u>			Emergency procedures	Veneto's regional basins
	F	rogress	s of implemer	ntation	1		
Proposed	Not Start	<u>ted</u>	Planning Ongoing	On Going Construction		Completed	
Implement timefrar			Cost		Responsible bodies		
2016 – 20 2022 – 20		€ 20.000			Veneto Region		

		Targete	d Hazard				
Severe rainfalls (R)	Floods (F)	Severe winds (W)			Coastal storm surges (S)	
	Co	ontribution t	o FRM an	d CCA			
Understanding and assessing E		casting and sing hazards		cing DR pacts		azard mitigation and dispersion	Measure description M41 1 – Flood forecasting and early warning.
Protecting exposed elemen		informed vernance	ness and redness		Emergency procedures	Meteorological and marine monitoring and forecasting system for early warnings in case of	
	Р	rogress of ir	nplement	ation			storm surges and riverine floods.
Proposed	Not Start	ed	Planning On Going Construction Completed				Measure location
	Implementation Cost		ost	Re	Responsible bodies		Veneto's coastal areas
-	2016 – 2021 2022 – 2027		0.000	Age	ncy (I	Environmental ISPRA), Eastern District Basin uthority	

		Targeted Hazard	Measure description		
<u>Severe</u> rainfalls (R)	Floods (F)	Severe winds (W)	High tides (T)	Coastal storm surges (S)	M42_1 – Emergency plans update. Promotion of municipal emergency plans
	Contril	bution to FRM a	contents update in compliance with national		



Understanding and assessing E		ecasting and essing hazards		ucing DR ipacts		azard mitigation and dispersion	directives and prioritization, in line with flood risk scenarios.
Protecting exposed elemen		R informed governance		eness and aredness		Emergency procedures	Measure location
		Progress of i	mplemen	tation			Veneto's regional basins
Proposed	Not Sta	rted	nning going	On Go Constru		Completed	
Implement timefrar			Cost		Responsible bodies		
<u>2016 – 20</u> 2022 – 20		€ 40.000			Ven	eto Region	

			Targeted	l Hazaro	i				
<u>Severe</u> rainfalls (R)	Floods	(<u>F)</u>	Severe winds (W) High tides (T) Coastal storm surges (S)						
	C	ontrik	oution to	FRM a	nd CC	Α			Measure description
Understanding and assessing D		ecastin ssing h	ig and azards		ucing [npacts			azard mitigation and dispersion	M42 1 – Emergency plans update. Acquisition of an IT platform for disseminating
Protecting exposed elemer									alerts and warnings and for the management of operational structures, so as to support the Decentralized Functional Centre and the
	i	Progre	ess of im	plemen	tation	ation			Regional Operations Centre.
Proposed	Not Star	<u>ted</u>	Plan Ong	0	On Going Construction Completed			Completed	Measure location
•	Implementation Cost timeframes					Res	pon	sible bodies	Veneto's regional basins
	2016 – 2021 2022 – 2027 € 48.190					Vene	eto Region		

			Targete	d Hazaro	t			
	<u>Severe</u> <u>rainfalls (R)</u>	Floods (F)		winds V)	High tides (<u>(T)</u>	Coastal storm surges (S)	Measure description M42 1 – Emergency plans update.
		Contri	bution t	o FRM a	nd CCA			Adoption of a new regional legislation for civil
	Understanding and assessing Di		0		ucing DR npacts		azard mitigation and dispersion	protection and early warning system matters.
ŀ	Protecting exposed elemen	DR infor		-	eness and paredness		Emergency procedures	Measure location Veneto's regional basins
		Progr	ess of in	plemen	itation			



Proposed	Not Start	<u>ted</u>	Planning Ongoing		n Going estruction	Completed
Implemen timefrar			Cost		Respor	sible bodies
2016 - 20 2022 - 20	€ 50.000		Ven	eto Region		

		7	Targeted	d Hazaro					
<u>Severe</u> rainfalls (R)	Floods ((<u>F)</u>	Severe winds (M) High tides (T) Coastal storm surges (S)						
	С	ontrib	oution to	FRM a	nd CC	:A			Measure description
Understanding and assessing D	_	ecastin ssing h	g and azards		ucing (pacts			azard mitigation and dispersion	M42_1 – Emergency plans update. Conventions and agreements with public
Protecting exposed elemen		R informed Awarenes governance prepared						Emergency procedures	services and transportation companies, to support recoveries back to normal after flood
	ı	Progre	ess of im	plemen	tatio	n			events.
Proposed	Not Star	<u>ted</u>	Plan Ong	0		n Going Istruction	_	Completed	Measure location Veneto's regional basins
Implement timefran	Cost			Res	spor	sible bodies	venero s regional basins		
	2016 – 2021 2022 – 2027 € 240.000					Ven	eto Region		

		,	Targete	d Hazaro	ł				
<u>Severe</u> rainfalls (R)	Floods (<u>F)</u>		e winds V)	High tides (T)			Coastal storm surges (S)	
	C	ontril	bution to	o FRM a	nd CO	CA C			
Understanding and assessing D			ng and nazards		ucing npacts			azard mitigation and dispersion	
Protecting exposed elemen		infor overna		-	eness aredn			Emergency procedures	
	F	Progr	ess of in	nplemen	tatio	n			
Proposed	Not Start	<u>ted</u>		ining joing		n Going Istructio		Completed	
Implement timefran			Co	ost		Res	por	sible bodies	
2016 – 20)21		€3.	.900		,	Ven	eto Region	

M42 1 – Emergency plans update.

Drafting of sectoral emergency plans for large dams.

Measure location

Veneto's regional basins



2022 2027		
2022 - 2027		

		7	Targeted	l Hazaro	d				
<u>Severe</u> rainfalls (R)	Floods	<u>(F)</u>	High tides (T)				Τ)	Coastal storm surges (S)	
	C	ontrib	ution to	FRM a	nd CC	:A	,		
Understanding		ecastin	_		ucing			azard mitigation	Measure description
and assessing D	ok asse	ssing h	azards	ır	npacts	,	ĉ	and dispersion	M42 1 – Emergency plans update.
Protecting exposed elemen							Emergency procedures	Drafting of the regional civil protection plan fo hydrometeorological hazards.	
		Progre	ss of im	plemen	tatio	n			
			Plan	ning	0	n Going			Measure location
Proposed	Not Star	ted_	Ong	0		Construction Completed			Veneto's regional basins
•	Implementation Cost				Responsible bodies		sible bodies		
2016 – 2021 2022 – 2027 € 50		.000			Vene	eto Region			

			Targeted	d Hazaro	I				
<u>Severe</u> rainfalls (R)	Floods	(<u>F)</u>	Severe winds (W) High tides (T) Coastal storm surges (S)						
	C	ontrib	oution to	FRM a	nd CC	CA			Measure description
Understanding and assessing D		ecastin ssing h	g and azards		ucing (npacts			azard mitigation and dispersion	M42_1 – Emergency plans update. Drafting of regional guidelines concerning civil
Protecting exposed elemen			informed Awareness vernance preparedne					Emergency procedures	protection planning for hydrometeorological hazards at the local level, in line with the relative
	j	Progre	ess of im	plemen	tatio	n			national Directive.
Proposed	Not Star	Not Started Planning On Going Ongoing Construction					_	Completed	Measure location Veneto's regional basins
Implement timefran		Cost			Responsible bodies		nsible bodies	veneto s regional basins	
	2016 – 2021 2022 – 2027 € 800					Ven	eto Region		

Targeted Hazard	Measure description
-----------------	---------------------



<u>Severe</u> rainfalls (R)	Floods (<u>F)</u>	Severe winds (W)	<u>High</u>	n tides (T)	Coastal storm surges (S)	M42_2 – Emergency intervention protocols for cultural heritage.		
	Co	ontribu	tion to FRM a	Definition of intervention protocols to adopt in case of an emergency for the protection of					
Understanding and assessing D		_	ting and Reducing DR impacts			azard mitigation and dispersion	cultural heritage assets. This should also support the test of emergency plans' general		
Protecting exposed elemen		A informed Awareness preparedr				Emergency procedures	procedures' effective efficiency. Measure location		
	P	rogress	s of implemer	ntation	1		Veneto's regional basins		
Proposed	onosed Not Started			n Going struction	Completed				
	Implementation Cost timeframes		Cost		Responsible bodies				
	2016 – 2021 2022 – 2027		€ 3.000		ſ	MIBACT			

	Targeted Hazard										
(T) Coastal storm surges (S)		h tides (T)	Hig	Severe (W	Floods (F)	<u>Severe</u> rainfalls (R)					
Measure description	Contribution to FRM and CCA										
Hazard mitigation and dispersion M42 3 – Emergency intervention protoco environmental heritage. Definition of intervention protocols to add	_		Reducing impacts	_	Forecasti assessing	Understanding and assessing DR					
Emergency case of an emergency for the protection environmental heritage; protocols to be de	<u> </u>		otecting DR informed Awareness ed elements governance preparedn								
involving all environmental protection rele institutions and bodies.		n	lementatio	ress of im	Progr						
Completed	Completed	n Going nstruction	0	Plani	Not Started	Proposed					
sponsible bodies Veneto's regional basins	sible bodies	Respor	t	Co		Implementation timeframes 2016 – 2021 2022 – 2027					
Veneto Region	eto Region	Ven	` '	€ 4.00 € 20.00	_						

Measure description	Targeted Hazard								
M42 4 – Emergency protocols guidelines fo cultural heritage protection.	Coastal storm surges (S)	High tides (T)	Severe winds (W)	Floods (F)	Severe rainfalls (R)				
This measure aims at establishing, for the various types of cultural heritage assets, the	Contribution to FRM and CCA								
guidelines, based on specific protocols, for the protection in case of flooding events.	azard mitigation and dispersion	0		Forecasting assessing ha	Understanding and assessing DR				



Protecting exposed elemen	Protecting DR informed Awareness governance preparedr					Emergency procedures	Measure location
	1	Progress of im	plementa	tion			Veneto's regional basins
Proposed	Not Star	ted I	ning oing	On Going Construction		Completed	
Implementation timeframes			st Responsible b			sible bodies	
	2016 – 2021 € 6.000 (P1) 2022 – 2027 € 10.000 (P2)					ry of Culture (IIBACT)	

		-	Fargete:	d Hazard	ł						
<u>Severe</u> rainfalls (R)	<u>Floods</u>	(<u>F)</u>	Severe (V		High	High tides (T)		n tides (T)		Coastal storm surges (S)	
	С	ontrik	oution to	Measure description							
Understanding and assessing D		Forecastin assessing h						azard mitigation and dispersion	M42 5 – Safe shelters for cultural heritage assets.		
Protecting exposed elemer		R infori overna			wareness and reparedness			Emergency procedures	Coordination for the identification of safe deposits location for sheltering movable assets		
	ı	Progre	ess of im	plemen	tatio	n			in case of an emergency.		
Proposed	Not Star	<u>ted</u>	Plan Ong	0		n Going		Completed	Measure location		
Implementation timeframes		Co	st	Resp			sible bodies	Veneto's regional basins			
2016 – 2021 2022 – 2027			€ 20	€ 20.000				ry of Culture , Veneto Region			

	Targeted Hazard											
<u>Severe</u> <u>rainfalls (R)</u>	<u>!</u>	Floods (F)		winds V)	High tides (<u>(T)</u>	Coastal storm surges (S)					
Contribution to FRM and CCA												
Understanding and assessing D		Forecastin assessing h	0		ucing DR npacts		Hazard mitigation and dispersion					
Protecting exposed elemen	nts	DR information			eness and aredness		Emergency procedures					
	Progress of implementation											
Proposed	N	ot Started	Planning Ongoing		On Going Construction		Completed					

M42 5 – Safe shelters for cultural heritage assets.

Identification of safe deposits location for initially sheltering movable assets after an emergency.

Measure location

Veneto's regional basins



Implementation timeframes	Cost	Responsible bodies
2016 – 2021 2022 – 2027	€ 65.000	Ministry of Culture (MIBACT), Veneto Region

		Target	ed Hazaro					
<u>Severe</u> rainfalls (R)	Floods (F) Seve	re winds (W)	High tides (T)) C	Coastal storm surges (S)	
	C	ontribution	Measure description					
Understanding and assessing D		ecasting and ssing hazards		ducing DR Hazard mitigation mpacts and dispersion			_	M42 6 – Rescue teams' preparation for cultural heritage protection.
Protecting exposed elemen	Protecting DR informed governance prepared prepared					mergency ocedures	Rescue teams' preparation and training, with specific reference to cultural heritage safeguarding, considering the assets' different	
	F	rogress of	mplemen	tation	1			categories, types, and ownership.
Proposed	Proposed Not Started Planning On Goil Ongoing Construc		n Going struction	1	Completed	Measure location		
Implementation timeframes		(Cost € 10.000 (P1) € 20.000 (P2)			onsik	ole bodies	Veneto's regional basins
2016 – 20 2022 – 20		Veneto Region						

		7	Targeted	d Hazaro	ł												
<u>Severe</u> rainfalls (R)	Floods (<u>F)</u>	Severe (V		<u>High</u>	High tides (T)		<u>ı tides (T)</u>		tides (T)		tides (T)		n tides (T)		Coastal storm surges (S)	
	Co	ontrib	ution to	Measure description													
Understanding and assessing D		ecasting and ssing hazards				Reducing DR Hazard mitigation impacts and dispersion		_	M42_6 – Rescue teams' preparation for cultural heritage protection.								
Protecting exposed elemen	Protecting DR informed Awarene governance prepared					Emergency procedures	Support to rescue teams' preparation and training, with specific reference to cultural										
	Р	rogre	ess of im	plemen	tation	า			heritage safeguarding in case of disasters.								
Proposed	Proposed Not Started		On Going Completed		Completed	Measure location											
•			Co	st	Res	pon	sible bodies	Veneto's regional basins									
· ·	2016 – 2021 2022 – 2027 € 6.000				N	ЛІВАСТ											



			d	d Hazar	Targete									
	Coastal storm surges (S)	High tides (T)		tides (T)		winds N)		Floods (F)	<u>Severe</u> <u>rainfalls (R)</u>					
Measure	Contribution to FRM and CCA													
M42 7 – Rescue t environmental Rescue team's pro	azard mitigation and dispersion		ucing (asting and ng hazards		Understanding and assessing DR							
specifically targeting of with training cours	Emergency procedures	_	reness paredno		nformed ernance		Protecting exposed elements							
involved both on the prote			ntatio	nplemer	ogress of im	Pro								
Measu	Completed	Going ruction		nning	d I	Proposed <u>N</u>								
Veneto's	nsible bodies	Responsible bodies			Co	Implementation timeframes								
	eto Region		00 (P1) 00 (P2)											

M42 7 – Rescue teams' preparation for environmental heritage protection.

Rescue team's preparation and training specifically targeting environmental protection, with training courses for all the personnel involved both on the environmental and civil protection side.

Measure location

Veneto's regional basins

Targeted Hazard											
<u>Severe</u> rainfalls (R)	Floods	(<u>F)</u>		winds V) High		h tides (T)		Coastal storm surges (S)			
Contribution to FRM and CCA											
`	Understanding Fore			Reducing DR impacts			Hazard mitigation and dispersion				
Protecting exposed elemer		R infor		Awareness and preparedness			Emergency procedures				
	ı	Progre	ess of im	plemen	tatio	n					
Proposed	Not Star	<u>ted</u>		ning	_			Completed			
Implement timefran			Cost				Responsible bodies				
2016 – 20 2022 – 20		€ 1.000				Veneto Region					

Measure description

M42 7 – Rescue teams' preparation for environmental heritage protection.

Training courses for mayors and municipal technicians regarding civil protection planning guidelines.

Measure location

Veneto's regional basins

		Targeted Hazard	i							
<u>Severe</u> rainfalls (R)	Floods (F)	Severe winds (W)	High tides (T)	Coastal storm surges (S)						
Contribution to FRM and CCA										

Measure description

M42_7 – Rescue teams' preparation for environmental heritage protection.



Understanding and assessing D		recasting essing ha			cing D pacts		Hazard mitigation and dispersion	Training courses for mayors and municipal technicians regarding Civil Protection's warning systems in case of flooding events.
Protecting exposed elemen		R inform governar		Aware prepa	ness a		Emergency procedures	,
		Progre	ss of im	nlement	ation	1		Measure location
	ı	Progress of implementat						Veneto's regional basins
Proposed	Not Sta	<u>rted</u>	Plani Ongo	0		n Going struction	Completed	
Implement timefran			Co	st		Resp	onsible bodies	
2016 – 20 2022 – 20		€ 6.000		Ve	eneto Region			

			Targeted	d Hazard					
<u>Severe</u> rainfalls (R)	Floods	<u>(F)</u>	Severe (V		High	tides (<u>T)</u>	Coastal storm surges (S)	
	C	ontrib	oution to	FRM a	nd CCA	4			Measure description
Understanding and assessing D		ecastin ssing h			ucing Di pacts	R		zard mitigation nd dispersion	M42 7 – Rescue teams' preparation for environmental heritage protection.
Protecting exposed elemen		R infori overna			eness a arednes			Emergency procedures	GIS training courses for mayors and municipal technicians for the redaction of flood risk civil
	İ	Progre	ess of im	plemen	tation				protection plans.
Proposed	Not Star	<u>ted</u>	Plan Ong	_		Going structio		Completed	Measure location Veneto's regional basins
Implement timefran			Co	st		Res	pon	sible bodies	veneto s regional basins
2016 – 20 2022 – 20			€ 1.	000	Veneto Region				

		Targeted	l Hazaro	t			Measure description
<u>Severe</u> <u>rainfalls (R)</u>	Floods (F)	Severe (V		High tides	<u>(T)</u>	Coastal storm surges (S)	M42 8 –Rescue teams (volunteers) preparation and training
	Contri	bution to	FRM a	nd CCA			Preparation and training of the volunteers taking part to rescue teams with specific reference to
Understanding and assessing D		0		ucing DR npacts		azard mitigation and dispersion	hydrometeorological risk monitoring and management and the related Civil Protection
Protecting exposed elemer	DR infor			eness and paredness		Emergency procedures	protocols.
	Progr	ess of im	Measure location				



Proposed	Not Starte	ed	nning going	n Going struction	On Going Maintenance	Vene	o's regional b	asins
Implement timefrar		C	ost	Respon	sible bodies			
<u>2016 – 20</u> <u>2022 – 20</u>	,		000 (P1) 000 (P2)	Vene	eto Region			

									ı .					
		7	Targeted	d Hazard	I									
<u>Severe</u> rainfalls (R)	Floods (<u>(F)</u>	Severe (V	_	<u>High</u>	tides (<u>T)</u>	Coastal storm surges (S)						
	С	ontrib	oution to	FRM a	nd CCA	4			Measure description					
Understanding and assessing D	_		o o					azard mitigation and dispersion	M42_9 – Civil Protection Department information platform					
Protecting exposed elemer		R inform						Emergency procedures	Definition and coordination of cultural heritage assets' codes and identifications bridging the gaps between the National Cultural Heritage					
	ŗ	Progre	ess of im	plemen	tation				platform and the Civil Protection one, to the					
Proposed	Not Star	ted	Plan Ong	0		Going		Completed	Measure location					
Implement timefran			Co	st		Res	pon	sible bodies	Veneto's regional basins					
<u>2016 – 20</u> 2022 – 20	<u></u>		€ 150	0.000		(MIBA	CT),	ry of Culture Civil Protection Il Department						

		•	Targeted	d Hazaro	t							
<u>Severe</u> rainfalls (R)	Floods ((F) Severe winds (M) High tides (T) Coastal store surges (S										
Contribution to FRM and CCA												
Understanding and assessing D			g and azards		ucing npacts			nzard mitigation and dispersion				
Protecting exposed elemen		infori verna						Emergency procedures				
	Р	rogre	ess of im	plemen	tatio	n						
Proposed Not Started Planning On Going Completed Completed												
Implement timefran			Co	ost		Res	pon	sible bodies				

Measure description M42 9 – Civil Protection Department information platform

Preparation and adoption of an information platform to be shared between the Civil Protection Department and local administrations, providing data (and optimizing local unshared knowledge) useful for implementing and coordinating flood risk management interventions.

Measure location

Veneto's regional basins



|--|

			Targeted	d Hazaro	ı				Measure description				
<u>Severe</u> rainfalls (R)	Floods	<u>(F)</u>	<u>Severe</u> (V		Higl	h tides (<u>T)</u>	Coastal storm surges (S)	M42_10 – Information platform on polluting sources.				
	C	ontril	oution to	FRM a	nd CC	A			Adoption of an information platform and related				
Understanding and assessing D	-	ecastir ssing h	ng and nazards		ucing I			azard mitigation and dispersion	database aimed at environmental protection shared between all the institutions involved in the emergency management, regarding				
Protecting exposed elemen		R infor overna		- Interpensy					polluting sources that might be exposed or relevant in case of flooding events. The				
	ı	Progre	ess of im	plemen	tatio	n			coordination of this information requires bette analysis targeting the potentially polluting				
Proposed	Not Star	<u>ted</u>	Plan Ong	0		n Going Istructio		Completed	locations so as to plan their delocalization or other tailored interventions to prevent cascading disasters.				
Implement timefran			Co	st		Res	pon	sible bodies	Measure location				
2016 - 20 2022 - 20			€ 30.00	` '	Veneto Region				Veneto's regional basins				

			d	d Hazaro	Targete							
	Coastal storm surges (S)	ides (T)	High	winds V)		Floods (F)	<u>F</u>	<u>Severe</u> rainfalls (R)				
M	l		nd CC	o FRM a	bution t	Contril						
M43 2 – Dist Guidelines de district-level c	azard mitigation and dispersion		ucing I			Forecasting h		Understanding and assessing [
databases and flood events, di	Emergency procedures						nts	Protecting exposed elemen				
citizens and loca floo			ntatio	plemen	ess of im	Progr						
ı	Completed	Going ruction		ning		lot Started	N	Proposed				
Ven	sible bodies	Responsible bo			Co	on		Implemen timefrar				
	lps District Basin , Veneto Region			0	€	2016 – 2021 2022 – 2027						

M43 2 – District-level citizens' observatory.

Guidelines definition and development of a district-level citizens' observatory to increase databases and communication channels during flood events, directly involving and coordinating citizens and local organizations in environmental flood-related monitoring.

Measure location

Veneto's regional basins



			Targete	d Hazaro	i						
<u>Severe</u> rainfalls (R)	Floods (<u>F)</u>		e winds W) High tides (T)				Coastal storm surges (S)			
Contribution to FRM and CCA											
Understanding Forecasting and Reducing DR Hazard mitigation and assessing DR assessing hazards impacts and dispersion											
Protecting exposed elemer		l infor overna			eness aredn			Emergency procedures			
	F	rogress of implementati				n					
Proposed	Not Star	ted		Planning Co				On Going Maintenance			
Implement timefran			Co	ost		Responsible bodies		sible bodies			
2016 - 20 2022 - 20				00 (P1) 00 (P2)			Ven	eto Region			

M43 3 – Technical and citizen education campaigns.

Specific education campaigns informing and improving technicians' and citizens' public awareness of the territory's risk conditions and their preparedness in case of flooding. The periodic and systematic update of technicians allows to maintain and increase their competences and preparation, that of citizens shall raise awareness of the possible hazardous situations to which they are exposed.

Measure location

Veneto's regional basins

								ı				
Targeted Hazard												
<u>Severe</u> rainfalls (R)	Floods (Floods (F) Severe winds (W) High tides (T) Coastal store surges (S)										
Contribution to FRM and CCA												
Understanding and assessing D			ng and nazards		ucing npacts			azard mitigation and dispersion				
Protecting exposed elemen		infor overna			eness aredn			Emergency procedures				
	F	Progress of implementa				n						
Proposed	Not Star	ted		ning		n Going nstructio		On Going Maintenance				
Implement timefrar			Co	ost		Responsible bodies						
<u>2016 – 20</u> 2022 – 20			€ 1.	000			otec	Region, Civil tion National partment				

Measure description

M43 4 – "Io non rischio" (I don't take risks) citizen education campaigns.

Educational and awareness campaign for the population to improve and enhance their resilience to flood risk emergencies through local Civil Protection offices.

Measure location

Veneto's regional basins

	Targeted Hazard									
<u>Severe</u> rainfalls (R)	Floods (F)	Severe winds (W)	High tides (T)	Coastal storm surges (S)						
Contribution to FRM and CCA										

Measure description

M43 5 – Population behaviour flood risk models.



Understanding and assessing DF Protecting exposed element	asses	ecasting and ssing hazards tinformed overnance	im	ucing [ipacts eness aredno	and	azard mitigation and dispersion Emergency procedures	Development of integrated flood risk assessment models, particularly targeting population behaviour and exposure during flood events. This measure aims at improving population behaviour and patterns during flood
Proposed	Not Start	red	nplement	01	n Going	Completed	emergencies so to limit their exposure, both transferring best practices and formalizing relevant procedures already in place.
•	Implementation timeframes		ost Re		Respor	nsible bodies	Measure location Veneto's regional basins
	2016 – 2021 2022 – 2027		€ 4.000			eto Region	

		1	Targeted	l Hazard					
<u>Severe</u> rainfalls (R)	<u>Floods</u>	(F)	Severe (V		High tides (T)		_)	Coastal storm surges (S)	
	Contribution to FRM and CCA								Measure description
Understanding and assessing D	-	ecastin ssing h	g and azards		ucing [npacts			nzard mitigation and dispersion	M43_6 – Cultural and landscape heritage flood risk models.
Protecting exposed elemer		R inform			eness a			Emergency procedures	Development of integrated flood risk assessment models, particularly targeting and updating cultural and landscape heritage's
	ı	Progre	ess of im	plemen	tatior	1			vulnerability parameters, in coordination with hazard maps update.
Proposed	Not Star	ted	Plan Ong	0		n Going struction	<u>n</u>	Completed	Measure location
Implement timefran			Co	st	Respon		Responsible		Veneto's regional basins
<u>2016 – 20</u> <u>2022 – 20</u>	<u>-</u>		€ 10	.000		Eastern Alps District Basin Authority, Ministry of Culture (MIBACT)			



3.2. Venice watershed and lagoon

Measure class and typology	Measure Name	Measure Location	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
M41_1 – Flood forecasting and early warning	Creazione di una piattaforma di supporto alle decisioni basata su un modello numerico per la simulazione in tempo reale della risposta idrologica e idraulica agli eventi meteorici nel bacino del Fiume Marzenego	Mestre, Martellago, Salzano, Noale, Trebaseleghe, Piombino Dese, Loreggia, Resana, Massanzago	1		250.000	R-F
	Monitoraggio e previsione del Sistema MOSE	Bocche di porto, sistema MOSE	1		15.000.000	Т
				1	0	Т

Preparedness at the local level has been addressed through floods and tides forecasting platforms and early warning systems (M41_1) for the Marzanego River and for the lagoon MOSE System. MOSE System's monitoring and forecasting platform costs 15 million euros alone.

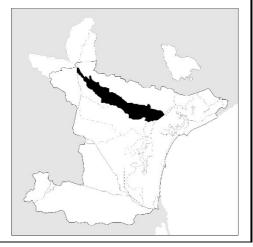


			Targete	d Hazaro	d			
<u>Severe</u> rainfalls (R)	Floods (<u>(F)</u>	Severe winds (W)			h tides	(T)	Coastal storm surges (S)
	C	ontril	oution to	o FRM a	nd CO	CA		
Understanding and assessing D			ng and nazards		ucing npacts			azard mitigation and dispersion
Protecting exposed elemen	Protecting DF exposed elements go			Awareness and preparedness			Emergency procedures	
	F	Progre	ess of in	plemen	tatio	n		
Proposed	Not Star	ted				On Going nstruction		Completed
Implement timefrar		Cost			Responsible bodies			
2016 – 2 0 2022 – 20			€ 250	0.000			Ven	eto Region

M41 1 – Floods and tides forecasting and warning.

Decision support system based on the real time simulation of responses to hydrometeorological hazards in the Marzenego basin.

Measure location





		T	argeted Ha	zard			Measure description		
Severe rainfalls (R)	Floods (F)	Severe win	High tides (T		Coastal storm surges (S)	M41 1 – Floods and tides forecasting and warning.		
	Contribution to FRM and CCA Monitoring and forecasting for the M systems.								
Understanding and assessing D			Forecasting and assessing hazards impacts			Hazard mitigation and dispersion	Measure location		
Protecting exposed elemen			_	Awareness preparedn		Emergency procedures			
	F	rogres	ss of imple	mentatio	n		he for the same of		
Proposed	Not Start	ted	Planning Ongoing	_	n Going	Completed			
Implement timefran			Cost		Resp	onsible bodies			
	2016 – 2021 2022 – 2027		€ 15.000.0	00	Ī -	ublic Works perintendency			

4. Recovery measures (M5)

The planned recovery measures amount to 5 in total at the sole regional level: 1 of 30 thousand euros for the first period (2016-2021), 1 that will continue in the second phase of the plan (2022-2027) for 129,6 thousand euros, 3 new ones for 585 thousand euros.

4.1. Regional scale

Measure class and typology	Measure Name	1st phase - (2016 - 2021)	2nd phase (2022 - 2027)	Cost (€)	Hazard targeted
M53_1 – Insurance policies	Studio per l'adozione di politiche assicurative	1		30.000	
M53_2 – Flooding events cadastre	Catalogo degli eventi alluvionali significativi	1	1	129.600	F



	Implementazione di un sistema rapido di raccolta dati di danno post-evento alluvionale a supporto della richiesta dello stato di emergenza	1	102.480	F
M53_3 – Other recovery measures	Redazione Piano degli interventi urgenti di cui alle OPCM di Protezione Civile in seguito a dichiarazione dello stato di emergenza	1	480.000	
	Sistematizzazione dell'attività istruttoria relativa alla richiesta dello stato di emergenza in caso di eventi alluvionali rilevanti	1	2.400	R - F

The last section of the planned measures covers recovery measures and needs, impacts and damages evaluations after flood events. The interventions planned for the 2022 – 2027 period foresee to continue the redaction of a flood cadastre database (M53_2), collecting data and information from past flood events so to support and feed in the FRMP update.

Furthermore, in case of flood event the following measures (M53_3) are planned to support the emergency status declaration:

- Post-event rapid damage data collection system;
- Civil Protection Emergency Intervention Plan drafting;
- Systematization of preliminary activities.

The study and adoption of appropriate insurance policies (M53_1) addressing vulnerabilities to flood events remains yet to be implemented from the previous phases of the plan.

		-	Targeted	d Hazaro	i							
<u>Severe</u> rainfalls (R)	Floods (<u>(F)</u>	Severe (V		Hig	High tides (T)		Coastal storm surges (S)				
	С	ontrik	oution to	FRM a	nd CC	CA C			Measure description			
Understanding and assessing D		Forecastin assessing h		,		0		azard mitigation and dispersion	M53 1 – Insurance policies. The study and adoption of appropriate insurance policies in case of flooding events,			
Protecting exposed elemen			· · · · · · · · · · · · · · · · · · ·			eness and aredness		Emergency procedures	line with EU requests and standards.			
	F	Progre	ess of im	plemen	tatio	n			Measure location			
Proposed	Not Star	ted_	Plan Ong	0		n Going nstructior	n	Completed	Veneto's regional basins			
Implementation timeframes			Co	Cost		Responsible bodies		sible bodies				



2016 – 2021	€ 30.000	Eastern Alps District Basin	
<u> 2022 – 2027</u>	€ 30.000	Authority	

			d Hazard	Targete		
n	Coastal storm surges (S)	h tides (T)	Hie	Severe	Floods (F)	Severe rainfalls (R)
Measure description M53 2 – Flooding events cadastre.		CA	FRM and Co	ribution to	Contr	<u>l</u>
	azard mitigation and dispersion		Reducing impact:		Forecast assessing	Understanding and assessing DR
information regarding past flooding eve (time, locations, consequences) on t	Emergency procedures		Awareness preparedr		rotecting DR information of the protecting DR information of the protection of the p	
FloodCAT online platform. This catalogue support also the update and redaction o		n	gress of im	Prog		
FRMP itself.	Ongoing Maintenance	n Going nstruction	0		Not Started	Proposed
Measure location Veneto's regional basins	sible bodies	Respo	ost	Co		Implementat timeframe
	tion National	Veneto Region, Civil € 129.600 Protection National Department				2016 – 2021 2022 – 2027

			1	Targeted	l Hazaro	ı			
Severe rainfalls (R)	<u> </u>	Floods (F)	Severe winds (W)			High tides (T)		(T)	Coastal storm surges (S)
		Con	ntrib	ution to	FRM a	nd CC	CA C		
				g and azards		Reducing DR impacts			azard mitigation and dispersion
Protecting exposed elemen	nts		R informed overnance		Awareness and preparedness				
		Pro	ogre	ss of im	plemen	tatio	n		
Proposed	<u>N</u>	ot Started	ed Planning Ongoing			On Going Construction			Completed
Implement timefran	n	Cost				Responsible bodies			
2016 - 20 2022 - 20		€ 102.480			Veneto Region				

M53 3 – Other recovery measures.

Adoption of a post-event rapid damage data collection system supporting the definition of the Emergency Status for most critical affected areas.

Measure location

Veneto's regional basins



		7	Targeted	d Hazard	i		
<u>Severe</u> rainfalls (R)	Floor	ds (F)	Severe (V	winds V)	High tides	s (T)	Coastal storm surges (S)
		Contrib	oution to	FRM a	nd CCA		
Understanding and assessing D		orecastin sessing h	_				
Protecting exposed elemer	nts	DR information			Awareness and preparedness		Emergency procedures
	•	Progre	ess of im	plemen	tation		
Proposed	Not S	tarted_	Plan Ong	0	On Goir Construct	_	Completed
Implement timefran			Co	st	Respons		nsible bodies
2016 – 20 2022 – 20			€ 480.000 Ve		Ven	eto Region	

			Targete	d Hazaro	i				
<u>Severe</u> rainfalls (R)	Floods	<u>(F)</u>		winds V)	Hig	h tides ((T)	Coastal storm surges (S)	
	C	ontrik	oution to	o FRM a	nd CO	ĊΑ			
Understanding and assessing D	_	ecastin ssing h	g and azards		ucing npacts			azard mitigation and dispersion	<u>M53</u>
Protecting exposed elemer		R infor			eness aredn			Emergency procedures	System require declaratio
	Į	Progre	ess of im	plemen	tatio	n			
Proposed	Not Star	<u>ted</u>		ning		n Going Istruction		Completed	
Implement timefran			Co	ost		Res	spor	sible bodies	
2016 – 20 2022 – 20			€ 2.	400			Ven	eto Region	

M53 3 – Other recovery measures.

Systematization of preliminary activities required in case of an Emergency Status declaration following a severe flooding event.

Measure location

Veneto's regional basins



5. References

- Distretto Idrografico delle Alpi Orientali (2016). "Piano di Gestione del Rischio di Alluvioni. Relazione di piano e allegati I, II, III e V"
- Distretto Idrografico delle Alpi Orientali (2016). "Piano di Gestione del Rischio di Alluvioni. Allegato IV Schede interventi";
- Autorità di bacino distrettuale delle Alpi Orientali (2021). "Aggiornamento e revisione del Piano di Gestione del Rischio di Alluvioni. Relazione Generale";
- Autorità di bacino distrettuale delle Alpi Orientali (2021). "Aggiornamento e revisione del Piano di Gestione del Rischio di Alluvioni. ALLEGATO II Schema delle Schede interventi (reporting)";
- Autorità di bacino distrettuale delle Alpi Orientali (2021). "Aggiornamento e revisione del Piano di Gestione del Rischio di Alluvioni. ALLEGATO III Tabellone interventi";
- Autorità di bacino distrettuale delle Alpi Orientali (2021). "Aggiornamento e revisione del Piano di Gestione del Rischio di Alluvioni. ALLEGATO V Norme tecniche di attuazione".



REPORT ON THE PROGRESS OF A FLOOD RISK MANAGEMENT AND CLIMATE CHANGE ADAPTATION MUNICIPAL PLANNING EXPERIENCE IN ITALY

This report presents Venice Municipality's Climate Adaptation Plan (CCAP), an endeavour of IUAV University of Venice in collaboration with CORILA Consortium that thrives to address present and future challenges related to the changing climate in the field of urban planning, disaster risk management and civil protection.

The planning process relied on a convergence of research projects and funding projects at the local, municipal, regional and international levels: the Rockefeller Foundation 100 Resilient Cities, the EU Covenant of Mayors SECAP initiative, Venezia2021 program, Life VenetoAdapt, DG-ECHO Savemedcosts-2, and Interreg Stream research projects.

Within this thriving research context, the plan has been developed in a multi and transdisciplinary perspective, responding to various evaluation panels and to different stakeholder groups, involving a plurality of Municipal services and regulatory bodies.

The Plan's climatic risk assessment phase presents an articulated understanding of the Venetian territory, considering climate-related hazards and risks for Venice's inland, islands, and coastal zones while bearing in mind interrelated coastal and lagoon's natural and anthropogenic peculiarities, e.g., seabed heights, currents directions, mitigation works already in place such as the MOSE system.

The strategic planning phase took into high consideration the many projects and initiatives already in progress in the area, short and long-term sectoral objectives, as well as the different interests at stake.



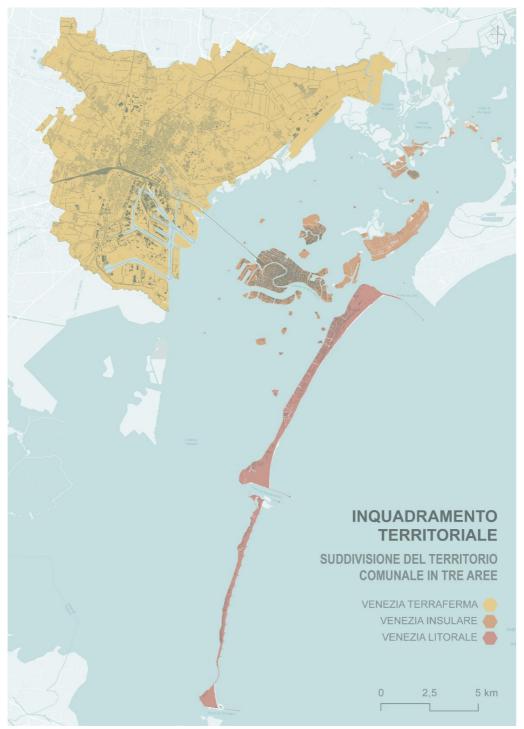


Figure 4. Venice Municipality's peculiar territory: inland, islands, and coastal zones.

As a first implementation of the Climate Adaptation Plan, a strategic policy document has been developed by IUAV University of Venice specifically targeting the Municipal Civil Protection Plan. These Climate-informed Civil Protection Municipal Guidelines (CiCPMG) mainstream the broader CCAP focus, knowledge, and understanding of climate risks, to emergency management and civil protection matters, aiming for acclimate-proofing of the adopted plan. Such a survey aimed at



identifying coping tools that may already be in place, understanding the underlying planning strategy and culture, and harmonizing the planned measures.

Once completed the CCAP, the assessed climate risks were transferred from the adaptation to the Civil Protection plan. The risk analyses were aimed at understanding the needed coping capacities (new and already existing) and rapid intervention procedures, particularly during the implementation of adaptation measures and in the event of their failures.

This led to a second evaluation of the adopted Civil Protection Plan, considering foreseen scenarios and actions through the lens of the new Disaster Risk Assessment information, thus considering hazards, exposures and vulnerabilities already assessed in the past, those exacerbated by climate change effects, as well as some that were acknowledged just in part or not expected.

Once this investigation process was completed, the group met with the Venice Municipality's Civil Protection sector delegates for a broad and detailed discussion on the adaptation planning foreseen outcomes. The discussion covered different matters, hazards, scenarios, actions, communication tools, procedures, emergency locations, etc. This discussion led to the definition of a strategic approach which then guided the research group in drafting the CiCPMG. Regardless of the Venice Civil Protection sector involvement, these guidelines constitute a strategic document supporting local emergency planning but are not to be considered a product nor a strategy of the Venice Municipality.

The main goal of the present deliverable has been to reorder and evaluate the measures highlighted by these two planning experiences, so as to present them following the Flood Directive's structure and measure types. The measures taken into consideration address urgent and complex matters related to both the Flood Risk Management and Climate Change Adaptation realms in a paradigmatic territory driven by land-lagoon-sea interactions.

Strategic Vision and Pillars

Climate Adaptation Plan

The CCAP guiding principles focus on connecting green and blue corridors in the Venetian territory as a strategic opportunity to promote sustainability on three levels: ecological, social, and economic. These reconnections require a profound understanding of the lagoon ecosystem, of the significant works that transformed it during the past centuries (river diversion, canals excavation, artificial islands, etc.), and of processes and events that affect it in the present and the future.

The plan envisions three cross-cutting objectives:

• To reduce disaster risk, considering climate change as a pejorative driver of existing hazards and threats;



- To develop a territory with a high ecosystemic value, shifting from the anthropocentric vision;
- To increase urban safety perception, making these corridors an opportunity for a new social balance.

The planned actions are grouped into three pillars:

- Pillar 1 New low-impact economies. The plan aims at closing short-range economic cycles and at releasing high-added value intangible products connecting a wider territorial context. This implies avoiding economies and interventions with great environmental impacts by bringing Venice back to production models with a high technological and cultural value.
- Pillar 2 Green and blue inclusion. The plan aims at transforming the urban perception of beauty, well-being, and safety in the ecological corridors' reconnection, an opportunity to rethink spatial relationships and uses and to overcome the cumulated and neglected social marginalities and degradation.
- Pillar 3 Ecological Venice. Rethinking Venice's ecosystem relationships by overcoming the man-nature dichotomy, guaranteeing its quality, and promoting biodiversity growth.

Starting from the plan's extensive risk analysis, the adaptation strategy vision and pillars were directed into 14 action lines and 56 implementation measures. These strategic lines of action are dedicated to

- climate-informed direct interventions on the structural and infrastructural heritage (existing building stock and new urban transformations);
- hydraulic defences, active, i.e., addressing the hydraulic hazard, and passive, i.e., intervening on exposed and vulnerable elements;
- climatic requalification of the agricultural and environmental system;
- the management of climate-related data, knowledge, perceptions, and awareness;
- territorial planning and governance.

Climate-informed Civil Protection Guidelines

The key areas of intervention recognized for the climate-informed review of the Civil Protection Plan are five, all of which target the assessed risks of the Venetian territory: scenarios and analyses; information and communication; intersectoral coordination; maintenance; first emergency interventions.

These strategic areas of intervention might support the Civil Protection Plan update in all its dimensions and phases:

 Scenarios and analysis (10 actions) – revision of risk understanding, assessment, and scenarios in the territory, so as to update and redefine Civil Protection's needs of personnel, tools, vehicles, and secure locations in the event of an emergency.



- Information and communication (7 actions) citizenship involvement in disaster risk understanding and assessment as well as in the preparation for hazardous events, thus raising awareness, enhancing their training, self-protection behaviours, and understanding of information and alerts.
- Intersectoral coordination (5 actions) coordination and support between the Civil Protection, the other Municipal sectors and governmental authorities before, during and after emergencies in terms of common data, tools, interventions, and practices.
- Maintenance (2 actions) territory maintenance operations needed to support more effective emergency management.
- Emergency intervention (5 actions) reorienting first emergency operational aspects and phases not sufficiently updated in relation to the extreme events expected increase.

Targeted Hazards and Risks

The hazards targeted in Venice Municipal area for the Climate Adaptation Plan, and consequently also valid for the Civil Protection Plan, have been: intense rainfall, severe wind, heat waves and waves, wildfires, droughts, floods and storm surges, coastal erosion, chemical-physical variation of the sea, of lightning activity, wind and of tidal regimes.

Out of all the hazards, this deliverable focuses only on hydrometeorological ones:

- Severe and heavy rainfalls (R), which will increase runoff in urban areas, flooding of public and private infrastructures, flooding of underpasses and private underground floors;
- Severe winds (W), increase that may cause infrastructural damages, walls collapse, public and private superfetation, high waves even in the lagoon, tree materials collapse, services and navigability interruption.
- High tides (T), coastal storm surges (S), and floods (F) increases resulting from the compounding of the previous components with sea level rises and water networks' unstable flows.

These hazards have been cross-referenced with the exposed and vulnerable assets of the territory, in terms of anthropogenic land uses (residential, cultural, agriculture and fishing, industrial, trade and crafts, tourism, arts and professions, health) and environmental ones (water, air, soil, biodiversity status and quality).

The CCAP produced a substantial detailed cartographic apparatus for identifying and mapping the risks resulting from each hazard, vulnerability, and exposed elements, linking the resulting climatic risk conditions to each of the planned actions.

For each hazard, The Civil Protection Plan requires analogue risk mapping, scenarios and interventions reorganization.



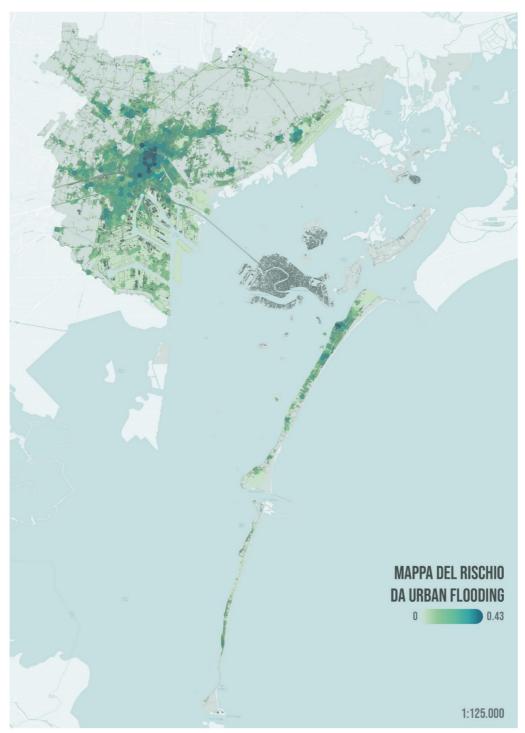


Figure 5. Urban flood risk map for Venice Municipality



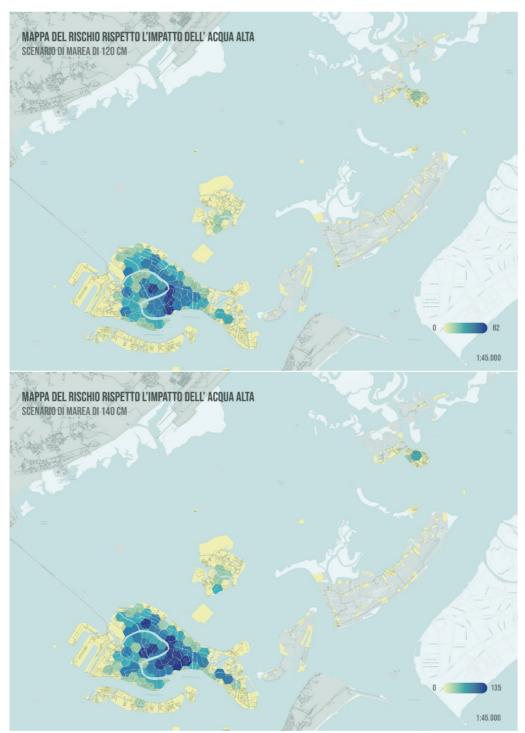


Figure 6. Sea level rise risk maps (120 and 140 cm) for Venice Municipality



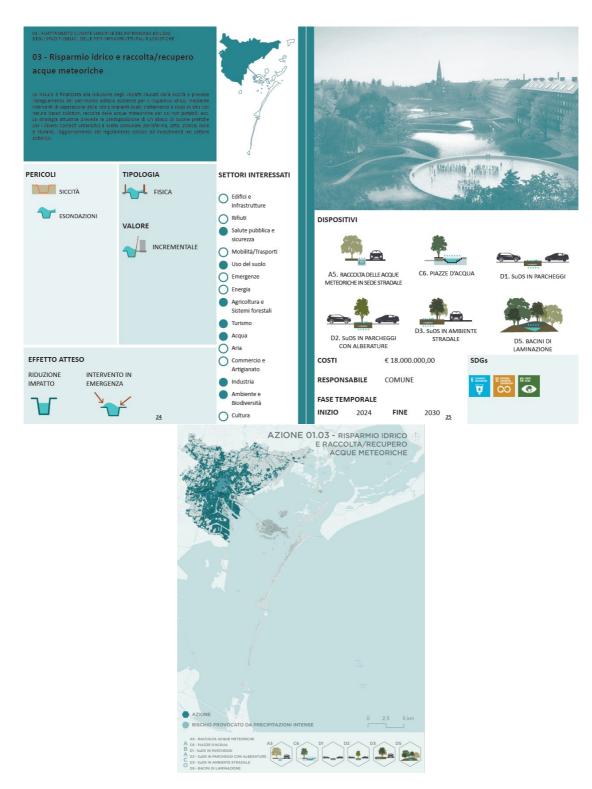
Measures: table of contents and reordering matrix

Each implementation measure of the CCAP is presented in a form reporting the following information:

- brief description;
- addressed hazard;
- type of action, understood as physical, governance, or economic macro-typologies;
- measure's value, which can be
 - reactive emergency response strategies;
 - incremental adaptation measures planned for controlling the phenomenon, developed to maintain or recover a pre-existing safety level;
 - transformative systemic transformation interventions of the territory to adapt the landscape to future events;
- contribution to the adaptation strategy, i.e., expected effect in addressing climate risks,
 - impacts reduction;
 - citizen self-protection;
 - monitoring and mapping;
 - mitigation and dispersion of the phenomenon;
 - emergency intervention;
- tools and devices needed for the implementation;
- municipal sectors concerned;
- costs and financial coverage;
- responsible bodies,
- implementation timeframes;
- needed tools for the implementation;
- measure location.

Below is a sample extract of CCAP's measures table of contents as presented and described in the plan.





As for the CiCPMG, the briefer form presenting the proposed measures covers the targeted hazards, the typology, and expected effects, the description,n and the implementation phase, as pictured in the extract below



Ricaduta: Coordinamento con altri settori Cartografia unificata per l'emergenza

Tipologia: Studio/scenario monitoraggio/mappatura

Pericoli:















Descrizione:

I sistemi GIS consentono visione unificata delle cartografie e rapido confronto tra i progetti e i piani. È necessario sviluppare una cartografia unificata, multiscalare e modulare per rischio, comprensiva del valore peggiorativo del rischio per il cambiamento climatico. Tutti i settori devono rendere interoperative le carte e i dati per permettere un'interrogazione orientata agli obiettivi territoriali e non ai settori, riducendo la perdita di informazione in emergenza.

Avanzamento: da realizzare

All CCAP and CiCPMG relevant measures have been reordered and presented in this deliverable following the Flood Directive structure and definitions of Flood Risk Management measures (see the table below for definitions).

	No Action
M11	No Action, No measure is proposed to reduce the flood risk in the APSFR or other defined area,
	Prevention
M21	Prevention, Avoidance, Measure to prevent the location of new or additional receptors in flood prone areas, such as land use planning policies or regulation
M22	Prevention, Removal or relocation, Measure to remove receptors from flood prone areas, or to relocate receptors to areas of lower probability of flooding and/or of lower hazard



Prevention, Reduction, Measure to adapt receptors to reduce the adverse consequences in the event of a flood actions on buildings, public networks, etc
Prevention, Other prevention, Other measure to enhance flood risk prevention (may include, flood risk modelling and assessment, flood vulnerability assessment, maintenance programmes or policies etc)
Protection
Protection Natural flood management / runoff and catchment management, Measures to reduce the flow into natural or artificial drainage systems, such as overland flow interceptors and / or storage, enhancement of infiltration, etc and including in-channel, floodplain works and the reforestation of banks, that restore natural systems to help slow flow and store water.
Protection, Water flow regulation, Measures involving physical interventions to regulate flows, such as the construction, modification or removal of water retaining structures (e.g., dams or other on-line storage areas or development of existing flow regulation rules), and which have a significant impact on the hydrological regime.
Protection, Channel, Coastal and Floodplain Works, Measures involving physical interventions in freshwater channels, mountain streams, estuaries, coastal waters and flood-prone areas of land, such as the construction, modification or removal of structures or the alteration of channels, sediment dynamics management, dykes, etc.
Protection, Surface Water Management, Measures involving physical interventions to reduce surface water flooding, typically, but not exclusively, in an urban environment, such as enhancing artificial drainage capacities or though sustainable drainage systems (SuDS).
Protection, Other Protection, Other measure to enhance protection against flooding, which may include flood defence asset maintenance programmes or policies
Preparedness
Preparedness, Flood Forecasting and Warning, Measure to establish or enhance a flood forecasting or warning system
Preparedness, Emergency Event Response Planning / Contingency planning, Measure to establish or enhance flood event institutional emergency response planning
Preparedness, Public Awareness and Preparedness, Measure to establish or enhance the public awareness or preparedness for flood events
Preparedness, Other preparedness, Other measure to establish or enhance preparedness for flood events to reduce adverse consequences
Recovery & Review
Recovery and Review (Planning for the recovery and review phase is in principle part of preparedness), Individual and societal recovery, Clean-up and restoration activities (buildings, infrastructure, etc), Health and mental health supporting actions, incl. managing stress Disaster financial assistance (grants, tax), incl. disaster legal assistance, disaster unemployment assistance, Temporary or permanent relocation, Other
Recovery and Review, Environmental recovery, Clean-up and restoration activities (with several sub-topics as mould protection, well-water safety and securing hazardous materials containers)
Recovery and Review, Other, Other recovery and review Lessons learnt from flood events Insurance policies
Other
Other

The Flood Directive structure and definitions constituted the analytical filter for assessing each CCAP and CiCPMG measure, defining their pertinence to one or more of the Flood Directive measure types (with primary and secondary effects). Furthermore, this content analysis of both strategic documents highlighted the targeted hazard and the strategic contribution to Flood Risk Management (FRM) and Climate Change Adaptation.



The underlying goal of this analytical and reordering process has been to reach an overall strategic assessment entailing:

- measures multiple values addressing different FRM life cycle phases;
- measures different scales of intervention, from the metropolitan to the building level, in a field (FRM) that in Italy mainly focuses on Regional scale strategies;
- measures addressing different hazards;
- measures' approach in addressing disaster and climate risk complexity, targeting hazard mitigation, rather than exposed elements' protection or preparedness;
- most and less beaten phases and areas of intervention;
- urban and regional development projects' positive outcomes and contributions in terms of FRM and CCA.

In order to better appreciate all these components, each measure is presented here with a brief profile (see the sample table below). Measures were reordered following their primary value in the Flood Directive structure and nomenclature, and clustered according to their typology.



Below, is a sample table describing each measure.

			Targete	ed Haza	rd				
Severe rainfalls (R)	Floo	ods (F)		re winds (W)	Hig	High tides (al storm es (S)
		Contri	ibution	to FRM	and C	CA			
Understandii and assessing		Forecasti assessing			ducing			•	
Protecting exposed eleme	ents	DR info govern						Emerge proced	-
		Progr	ess of i	mpleme	entatio	n			
Proposed	Not S	Started		nning going		On Going nstructio	n	Com	pleted
Implemer timefra			c	Cost		Res	Responsible bodies		
			FRM	P value					
M2	-Preventi	tion				M3-Prote	ctior	า	
M21 M2	2 M	/l23	M24	M31	M32	M33	3	M34	M35
M4	-Preparat	tion			M	5-Reconst	tructi	ion	
M41 M4	2 M	<i>1</i> 43	M44	M51		M52	!	ı	M53

1. Prevention (M2)

1.1. Removal or relocation

1.1.1. [M22_a New urban development projects]

CCAP - 01.10 Fusina Integrated Project completion - R - W - F

The measure provides for the Fusina Integrated Project completion and related testing, a strategic technological asset devoted to the Porto Marghera industrial area drainage water, wastewater, and rainwater run-off treatment.



				1	Target	ted Hazaı	rd				
Seve rainfall		Flo	oods (F)	Seve	ere winds (W)	Hi	gh tides	(T)		al storm es (S)
			Co	ntrib	ution	to FRM	and C	CA			
Unders	standing essing D	_	Forec		_		ducing			zard mit nd dispe	
<u>Prot</u> exposed	ecting elemer	<u>nts</u>		inforr verna			renes pared			Emerge proced	,
			Pr	ogre	ss of	impleme	ntati	on			
Propo	sed	No	t Starte	ed		anning ngoing		On Going Onstructi		Com	pleted
•	lement mefran		1			Cost		Re	spon	sible b	odies
2	022 - 20)26		;	€ 194.	000.000,0	0		SIF	A ScPA	
					FRIV	1P value					
	M2-	Prever	ntion					M3-Pro	tectio	n	
M21	<u>M22</u>	<u>-</u>	M23	N	124	<u>M31</u>	M32	. M3	33	M34	M35
	M4-F	repar	ation				М	5-Recon	struct	ion	
M41	M42		M43	N	144	M51		M5	52	1	M53





CCAP - 01.11 Construction of the new, climate-proof, Mestre railway station - R

The Mestre train station, one of Italy's largest in terms of traffic and importance, divides today's Mestre from the neighbouring Marghera, with pedestrian and service incommunicability. The new station, built in a raised and covered plate, following climate change adaptation building criteria, will allow an improvement in users' comfort with atmospheric agents, and will have an endowment of greenery and trees capable of reducing warmth impacts and offering well-being.

			Targ	eted Haza	ırd				Measure Location			
Sever rainfalls		Floods (I	=) Se	vere winds (W)	(W) High tides (High tides (T)			stal storm rges (S)	Ba .
		Co	ntributi	n to FRM	and CO	CA			F			
	standing essing DR		casting an sing hazar	l l	Reducing DR Hazard m and dis							
Prote exposed	ecting elements		informed vernance					gency edures	5			
		Р	rogress	f implem	entatio	n						
Propos	sed	Not Start	ed	Planning Ongoing		n Going nstruction	Со	mpleted				
-	ementa neframe			Cost		Respo	onsible	bodies				
20	022 - 202	5	€ 5	€ 50.000.000,00 Fs Sistemi E Territorio								
			FI	MP value								
	M2-Prevention M3-					//3-Protect		<i>\{</i>				
M21	<u>M22</u>	M23	M24	M31	M32	M33	<u>M34</u>	M35				
	M4-Pre	eparation			M5	-Reconstru	ıction		8			
M41	M42	M43	M44	M5	1	M52		M53	۵			



CCAP - 02.02 Construction of a new residential area following Climate Sensitive criteria - R

The Favaro area, the terminus of the Venice tram line, is becoming a place of great attraction for young professionals, students, and families with a focus on living in the green. The vision for this and other new residential areas, is that of climate-sensitive districts, in terms of urban planning and building criteria, benefitting green and sustainable mobility, favouring local food productions and circular economies.

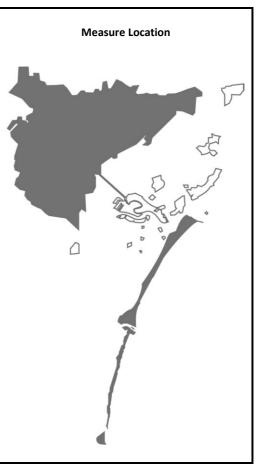
		Ta	argeted	Hazar	d						
<u>Severe</u> rainfalls (R)	Floods	(F)	Severe v (W)		Higl	n tides (T)		astal storm urges (S)			
	C	ontribu	ibution to FRM and CCA								
Understanding and assessing D		ecasting ssing ha			ducing mpacts	_		mitigation spersion			
Protecting exposed elemen		R inform overnan			reness paredn			ergency edures			
		Progres	s of imp	olemei	ntatio	n					
Proposed	Not Star	ted				n Going estruction	Co	ompleted			
Implement timefran			Cos	t		Resp	onsible	bodies			
2023 - 20)26		€ 3.000.0	.000.000,00 Istituto Della Pietà, Ames Spa							
		ı	FRMP v	/alue							
M2-	Prevention		M3-Protection								
M21 <u>M22</u>	M23	M2	24 M	131	M32	M33	<u>M34</u>	<u>1</u> M35			
M4-F	reparation				M5	-Reconstr	uction				
M41 M42	M43	MZ	14	M51		M52		M53			



CCAP - 02.01 Mapping urban planning equalization's potentials aiming for a "zero land consumption" - **R**

The measure aims to reduce anthropic elements' exposure to climate change effects, providing a diagnostic tool to the Venice Municipality capable of mapping areas and defining appropriate equalization solutions for new urban transformations, so as to reduce significantly land consumption. The mapping tool will allow to associate each urban transformation with an appropriate redevelopment intervention for disused or no longer functional spaces, so as to improve the city's physiognomic and functional quality without aggravating the impacts of climate change.

				Targe	ted Haza	rd				
Sever rainfalls		Floods (F)	Sevi	ere winds (W)	Hig	gh tides (T)		al storm es (S)
		Co	ontril	oution	to FRM	and C	CA			
Unders and asse	tanding essing DF			ng and nazards		ducing impact			zard mit nd dispe	tigation ersion
Prote exposed	ecting element		infor			areness eparedi			Emerge proced	
		P	rogr	ess of	impleme	entatio	n			
Propos	sed	Not Start	ed	_	lanning ngoing		On Going nstructior	1	Com	pleted
-	ementa nefram				Cost		Resp	ons	sible b	odies
20	023 - 202	24		€5	0.000,00		Venice		nicipalit Spa	y, Venis
				FRN	/IP value					
_	M2-P	revention					M3-Prote	tion	1	
M21	<u>M22</u>	M23	<u>N</u>	<u>/124</u>	M31	M32	M33		M34	M35
	M4-Pr	eparation				M	-Reconst	ructi	on	
M41	M42	M43	N	//44	M51		M52		1	M53





1.2. Reduction (M23)

1.2.1. [M23_a Reducing hazards' impacts and effects on exposed elements]

CCAP - 01.01 Lightning strikes' impacts reduction - R

The measure builds on the application of the new European standard (CEI EN 62305 - CEI 81-10) for lightning strikes protection in the construction sector, updating public building regulations and implementing specific interventions on public assets. Public and private interventions are encouraged, among these: revision and adaptation of electrical systems, construction of lightning and fire protection systems, updating of emergency and evacuation plans, and specific preparedness trainings.

		Target	ed Hazar	d				
Severe rainfalls (R)	Floods (F)		re winds (W)	High	n tides (T	.)		al storm es (S)
	Contr	ibution	to FRM a	and CC	Ά			
Understanding and assessing DR	Forecast assessing	_		ducing I			zard mit nd dispe	
Protecting exposed elements	DR info			reness paredn			Emerge	,
	Prog	ress of i	impleme	ntatio	n			
Proposed <u>N</u> e	ot Started		anning ngoing		n Going struction	ì	Com	pleted
Implementation timeframes	n	•	Cost	•	Resp	oon	sible b	odies
2024 - 2030		€ 2.00	00.000,00		Ven	ice	Municip	ality
	,	FRM	IP value	<u> </u>				
M2-Preve	ention			N	13-Prote	ctio	n	
<u>M21</u> M22	<u>M23</u>	M24	M31	M32	M33		M34	M35
M4-Prepa	ration			M5-	-Reconst	ruct	ion	
M41 M42	M43	M44	M51		M52		1	M53



CCAP - 01.02 Severe wind' impacts reduction - R - W

In compliance with 2018 building technical standards, constructions of unusual type or shape (e.g., in terms of height or length, slenderness and lightness, flexibility and dissipative capacity, ...) require more restrictive assessment methodologies and related interventions for severe wind, considering present and future climate dynamics and trends.

The measure foresees buildings retrofitting and adaptation according to anemometric forcing characteristics.

			Targe	ted Haza	rd				
Severe rainfalls (R)	F	Floods (F)	Sev	ere winds (W)	Hig	h tides (T	Γ)		al storm es (S)
		Cor	ntribution	to FRM	and CO	CA			
Understanding and assessing D	_		asting and ng hazards		ducing impacts			zard mit	tigation ersion
Protecting exposed elemen	nts_		nformed ernance		areness eparedn			Emerge	,
		Pro	ogress of	impleme	entatio	n			
Proposed	N	ot Starte	d l	lanning		n Going	n	Com	pleted
Implement timefrar		n	·	Cost	•	Resp	pons	sible b	odies
2024 - 20	030		€ 12.	600.000,0	0	Ver	nice I	Municip	ality
			FRI	/IP value					
M2-	Preve	ention			N	//3-Prote	ctior	า	
<u>M21</u> M22)	<u>M23</u>	M24	M31	M32	M33		M34	M35
M4-F	repa	ration			M5	-Reconst	ruct	ion	
M41 M42)	M43	M44	M51		M52		- 1	M53





CiCPMG - 4.1. Coordination with the Green Public Sector for tree falls and collapses R - W

The management of tree falls and related material collapses should be coordinated with the Public Soil and Green Protection Municipal Service in a permanent and standardized way. It is therefore advisable to set intervention objectives, mapping tasks, and risk communication tools between the two sectors.

			Targe	ted Haza	rd					
<u>Severe</u> rainfalls (R)	F	Floods (F) Sev	ere winds (W)	Hig	h tides (Τ)		al storm es (S)	ı.
		Coi	ntributior	to FRM	and C	CA				
Understandin and assessing [_		asting and ing hazards		educing impact			zard mit	_	1
Protecting exposed eleme	nts		informed rernance		areness eparedr			Emerge		
		Pr	ogress of	impleme	entatio	n				
<u>Proposed</u>	N	ot Starte	· Cl	lanning Ingoing		n Going		Com	pleted	
Implemen timefrar		n	1	Cost	•	Res	pon	sible b	odies	
/				/				/		
			FRI	/IP value						
M2-	Preve	ention			ı	M3-Prote	ectio	n		
M21 M22	2	<u>M23</u>	<u>M24</u>	M31	M32	M33	3	M34	<u>M35</u>	
M4-	Prepa	ration			M5	-Recons	truct	ion		
M41 M42	2	M43	M44	M51	L	M52	2	Γ	V153	





CCAP - 04.01 Hydraulic insulation from high tides below 130 cm level - T

Elevations of pedestrian areas most subject to high tides' flooding, with construction techniques capable of counteracting the loss of shores' fine materials due to tidal washout phenomena. The measure includes sewer adaptation to regulations' requirements.

			Targe	ted Haza	rd				
Sever rainfalls		Floods (F	Sev	vere winds (W)	Hig	h tides (T)		tal storm rges (S)	Measure Location
		Co	ntributio	n to FRM	and CC	CA			The M
	standing essing DR		casting and sing hazard		educing impacts			nitigation persion	
Prote exposed	ecting element		informed vernance		areness eparedn			gency dures	
		Pi	rogress o	impleme	entatio	n			
Propos	sed	Not Starte	-d	Planning Ongoing		n Going nstruction	Cor	mpleted	
-	ementa nefram		·	Cost		Respo	nsible	bodies	
20	022 - 202	24	€ 190	0.000.000,0	00	Emer Comm	e Munici gency D issioner Superint	eputy	
			FR	MP value					/
	M2-Pr	revention			Ν	//3-Protect	ion		
M21	M22	<u>M23</u>	M24	M31	M32	<u>M33</u>	M34	M35	\
	M4-Pr	eparation			M5	-Reconstru	ction		ď
M41	M42	M43	M44	M51	1	M52		M53	



CCAP - 04.02 Hydraulic insulation from high tides below 130 cm level for the Castello Insula - T

Due to its position with respect to the Lido harbour entrance's inlets and its conformation, the Castello Insula hydraulic insulation requires an in-depth study and innovative design. The intervention will be an opportunity for researching protection techniques from extraordinary high tides, so as to capitalize on this pilot for similar areas of intervention.

			Targe	ted Haza	rd				
Severe rainfalls (R	₹)	Floods (F	Sev	ere winds (W)	Hig	h tides (T)		tal storm rges (S)	Measure Location
		Coi	ntribution	to FRM	and CC	CA			The M
Understar and assess			asting and ing hazards		ducing		lazard m	nitigation persion	
Protect exposed ele			nformed ernance		areness eparedn		Emerg proce		
		Pr	ogress of	impleme	ntatio	n			
Proposed	d	Not Starte		anning ngoing		n Going nstruction	Cor	npleted	
Implen time	nentati eframes		·	Cost		Respo	nsible l	bodies	
2022	2 - 2024		Part of	CCAP - 04	.01	Emer Comm	e Munici gency D issioner, Superinte	eputy	
			FRI	/IP value					<i>#</i>
	M2-Pre	vention			N	//3-Protect	ion		
M21	M22	<u>M23</u>	M24	M31	M32	<u>M33</u>	M34	M35	
	M4-Prep	paration			M5	-Reconstru	ction		ď
M41	M42	M43	M44	M51		M52		M53	



CCAP - 04.03 Hydraulic insulation and regeneration of the St. Marco's Basilica area - T

St. Marco's Basilica in recent decades has been subject to increasing and more severe tides. The measure consists of a large intervention, already ongoing, involving the Basilica's safety from medium and high tides on one side, and to minor tidal levels on the Piazza St. Marco side. Additional protection is foreseen with the construction of transparent barriers along the perimeter of the Basilica's facade towards the square. The square's defence is planned to remain dry up to a tidal level of +110 cm, beyond which the intervention of the MOSE system is expected.

			Targe	ted Haza	rd				
Severe rainfalls		Floods (F)	Sev	ere winds (W)	Hig	h tides (T)		tal storm rges (S)	Measure Location
		Coi	ntribution	to FRM	and Co	CA			
Underst and asses	0		asting and ing hazard		educing impact:		lazard m	nitigation persion	
Protec exposed e			nformed ernance		areness eparedr		Emerg proce		
		Pr	ogress of	implem	entatio	n			3 1 0 00
Propose	ed	Not Starte	d	lanning Ingoing		n Going	Cor	npleted	
-	ementat neframe			Cost		Respo	nsible l	bodies	
202	22 - 2024	ı	€ 30.	000.000,0	0	Emer Comm	e Munici gency D lissioner, Superinte	eputy	
			FRI	/IP value					{
	M2-Pre	evention			١	M3-Protect	ion		
M21	M22	<u>M23</u>	M24	M31	M32	<u>M33</u>	M34	M35	\
	M4-Pre	paration			M5	-Reconstru	ction		ď
M41	M42	M43	M44	M5:	L	M52		M53	



CCAP - 04.04 Hydraulic insulation of private dwellings - T

To give redundancy to the high tide defence systems, and also to guarantee safety directly to private individuals, the Municipality has favoured the construction of private defence works on a building scale. These works ensure continuity of usability to homes and businesses in the event of high tide levels lower than the opening of the Mose system.

		Targeted Hazard										
Severe rainfalls (R)	Floods (loods (F) Severe winds (W) High tides (T) Surges (
	Co	ontributio	n to FRM	and Co	CA							
Understanding and assessing D		casting and		educing impacts		lazard mitigation and dispersion						
Protecting exposed elemen		informed vernance		rareness eparedr		Emers proce						
	P	rogress o	f implem	entatio	n							
Proposed	Not Start	ed	Planning Ongoing		n Going	Cor	npleted					
Implement timefran		·	Cost	•	Respo	nsible l	bodies					
2022 - 20	30	€ 10	.000.000,0	00	Priva	te house	eholds					
		FR	MP value	1								
M2-F	Prevention			ľ	M3-Protecti	on						
M21 M22	<u>M23</u>	M24	M31	M32	<u>M33</u>	<u>M34</u>	M35					
M4-P	reparation	paration M5-Reconstruction										
M41 M42	M43	M44	M5	1	M52		M53					



1.2.2. [M23_b Business and service continuity]

CCAP - 01.05 Completion of the historic city optical fibre - T

Given the frequency increase of extraordinary high tides and heat waves, with the consequent interruption of urban mobility, the capillary extension of the optical fiber network will support citizens and economic activities distributed within the historic city to limit work interruptions.

	Targeted Hazard										
Severe rainfalls (R)	Floods (Se	Severe winds (W) High tides (T) Coastal surges								
	Co	ntributio	n to FRM	and Co	CA						
Understanding and assessing D		casting an		educing impacts			mitigation ispersion				
Protecting exposed elemen		informed vernance		rareness eparedr			ergency				
	Р	rogress o	f implem	entatio	n						
Proposed	Not Start	ed	Planning Ongoing		n Going	Сс	ompleted				
Implement timefran		•	Cost	•	Resp	onsible	bodies				
2022 - 20	24	€ 4	0.000.000,0	00	FLASI	H FIBER S	SRL, TIM				
		FF	MP value)							
M2-F	Prevention			ľ	/13-Protec	tion					
M21 M22	<u>M23</u>	M24	M31	M32	M33	M34	4 M35				
M4-P	reparation	aration M5-Reconstruction									
M41 <u>M42</u>	M43	M44	M5	1	M52		M53				



CCAP - 04.05 Electric power units' relocations for water pumps - T - F

The relocation to higher positions of hydraulic pumps' electric power systems is foreseen and encouraged to ensure an effective lifting of flood waters outside buildings during and after high tides and flooding. Currently, these power systems are often located on ground floors in locations potentially vulnerable to flooding, risking long periods of decommissioning and greater exposures to goods and properties.

		Targ	eted Haza	ırd			
Severe rainfalls (R)	Floods (F) Se	vere winds (W)	Hig	gh tides (T)		stal storm urges (S)
	C	ontributio	n to FRM	and C	CA		
Understanding and assessing D		casting and		educing impact			mitigation spersion
Protecting exposed elemen		informed		areness eparedr			rgency edures
	F	rogress o	f implem	entatio	n		
Proposed	Not Star	-eu	Planning Ongoing		On Going nstruction	Со	mpleted
Implement timefran			Cost		Respo	nsible	bodies
2022 - 20)25	€1	600.000,00)		e Munio te hous	
		FR	MP value				
M2-I	Prevention			1	M3-Protect	ion	
M21 M22	<u>M23</u>	M24	M31	M32	M33	M34	M35
M4-F	reparation			M	5-Reconstru	ıction	
M41 M42	M43	<u>M44</u>	<u>M5</u> :	<u>1</u>	M52		M53



1.2.3. [M23_c NBS reducing adverse consequences, urban + rural]

CCAP - 01.07 Establishment of a green and fresh roads network - R - W - F

For an effective and complete transformation of the city into a system resilient to climate change, the punctual elements and interventions will be connected through green and blue infrastructures (trees, open canals, green canopies, and roofs). The Municipality has organized a vision and a strategy for this transformation in the 2020 Urban Reforestation Document.

		Targeted Hazard										
<u>Severe</u> rainfalls (R)	Flood	ls (F)	Severe winds (W) High tides (T) Coastal stores (S									
		Contri	bution	to FRM	and Co	CA						
Understanding and assessing D		orecasti sessing l	_		ducing				igation ersion			
Protecting exposed elemen		DR info			areness eparedr			merge oced				
	·	Progr	ess of	impleme	ntatio	n						
Proposed	Not St	arted		anning ngoing		n Going	n	Com	pleted			
Implement timefran				Cost	·	Resp	onsik	ole b	odies			
2023 - 20)26		€ 7.0	00.000,00)		e Muni estione		ty, Soc. Verde			
			FRIV	1P value								
M2-	Preventio	n			ľ	M3-Prote	ction					
M21 M22	<u>M2</u>	3	V124	M31	M32	M33	M	<u>134</u>	M35			
M4-F	Preparatio	n			M5	-Reconst	ruction	n				
M41 M42	M4	3 1	V144	M51		M52			M53			



CCAP - 01.08 Establishment of a green roofs and walls - R - W

Building regulations have been updated in relation to the need to create "green roofs and walls", to be designed according to the particular climatic vulnerability, building context, and uses, so as to increase green spaces, favour sustainable water management and microclimatic mitigation, as well as energy efficiency, carbon absorption, and fine dust capture.

				Tar	rgete	d Haza	rd						
Seve rainfall:		F	loods (F	:) 5		e winds W)	Hig	h tides (T)			al storm ses (S)		
			Co	ntribut	ion t	o FRM	and CC	CA					
Unders	standing essing D			casting a			ducing			zard mit nd dispe	tigation ersion		
Prote	ecting elemen	ts		informe vernance			areness eparedn			Emerge			
			Pi	rogress	of in	npleme	entatio	n					
Propos	sed	No	ot Starte	ed		nning going		n Going nstruction		Com	pleted		
-	lement mefram		n	·	C	ost	•	Resp	ons	sible b	odies		
2	022 - 20	30		1	1.350	.000,00		Priv	ate	househ	olds		
				F	FRMI	o value							
	M2-F	reve	ention				N	//3-Protec	tior	1			
M21	M22		<u>M23</u>	M24	1	M31	M32	M33		M34	M35		
	M4-P	repa	ration		M5-Reconstruction								
M41	M42		M43	M44	1	M51		M52			M53		



CCAP - 08.01 Irrigation systems efficiency - F

Awareness-raising, information and training initiatives for agricultural workers on irrigation and precision agriculture techniques and technologies aimed at optimizing and saving water, also identifying opportunities for investments' financial support, and consequent infrastructural interventions for irrigation efficiency.

			Targe	eted I	Hazar	d				
<u>Severe</u> rainfalls (R)	<u> </u>	Floods (F) Se	vere w		High	n tides (T)		al storm ges (S)
		Coi	ntributio	n to l	FRM a	nd CC	Ά			
Understanding and assessing D	_		asting and			ducing (zard mit nd dispe	tigation ersion
Protecting exposed elemer	nts		nformed ernance			reness paredn			Emerge	,
		Pr	ogress o	f imp	lemer	ntatio	n			
Proposed	<u>N</u>	lot Starte	h l	Planni Ongoi	_		n Going Istruction	1	Com	pleted
Implement timefrar		on	•	Cost	t		Resp	on	sible b	odies
2024 - 20)27		€1.	500.0	00,00				io Di Bo e Risorg	
		•	FR	MP v	alue					
M2-	Prev	ention				N	13-Protec	ctio	n	
M21 <u>M22</u>	2	<u>M23</u>	<u>M24</u>	M	131	M32	M33		M34	M35
M4-I	Prepa	aration				M5-	-Reconstr	ruct	ion	
M41 M42)	<u>M43</u>	M44		M51		M52		-	M53

1.3. Other prevention (M24)

1.3.1. [M24_a DR assessment and mapping update: evaluating exposed elements, new or unforeseen hazards]

CiCPMG - 2.2. Evaluation of tourist and commuter transportation flows - T - R - W

Commuter and tourist mobility in Venice is complex for several reasons: the daily amount of users, the network's fragility, and the multiplicity of involved transport operators. From the point of view of users' quantity, a flow forecasting model is needed to develop exposure studies concerning the communication of an expected impact. From the point of view of the networks, there are several aspects to consider: transit difficulties for water lines in the event of severe wind, heavy rainfall or



storm surges; the presence of a single railway-road connection system between Venice historic city and Mestre; the airport's vulnerability to severe winds and storm surges. Several actors are responsible for managing these transportation flows and, therefore, challenged by these threats, which requires a plural concertation of tasks and communications.

WITICIT	- 1									
			Ta	argete	d Hazar	d				
<u>Sever</u> rainfalls	_	Floods (F)		winds V)	<u>Higl</u>	h tides (T)		Coastal storm surges (S)	Measure Location
		Co	ontribu	ution to	o FRM a	nd CC	CA.			> ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
	standing essing DR		casting sing ha			lucing mpacts			rd mitigation I dispersion	
	ecting elements		inform vernan			reness paredn			mergency rocedures	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
		Р	rogres	ss of im	nplemer	ntatio	n			
Propos	<u>sed</u>	Not Start	ed		ning		n Going struction		Completed	
-	lementa meframe			Co	ost		Resp	onsil	ble bodies	
	/			,	/				/	
				FRMP	value					
	M2-Pr	evention				N	//3-Protec	tion		
M21	M22	M23	<u>M</u> 2	24	M31	M32	M33	N	M35 M35	(
	M4-Pre	eparation				M5	-Reconstr	uctio	n	
M41	M42	<u>M43</u>	M	44	M51		M52		M53	J

CiCPMG - 2.1. Acqua Alta system failure criticality assessment

The Civil Protection system needs to develop an ad hoc scenario and identify the related procedures in the event of a Mose System failure. It is necessary to understand the Mose gates collapse' effects in terms of hydraulic flows generated and debris transport. Even though the event is set as unlikely, it is still necessary to have the relevant documentation given its potentially disruptive effects. It is also necessary to assess the induced cascading effects on the surrounding gates and define appropriate emergency tools for high tide management in the event of a system failure.

		Targeted H	Hazard		
Severe rainfalls (R)	Floods (F)	Severe w	High tides (Coastal storm surges (S)	Mea
	Contri	bution to F	FRM and CCA		
Understanding and assessing D		_	Reducing DR impacts	Hazard mitigation and dispersion	



	ecting elements		nformed		areness eparedn		Emergency procedures	
		Pr	ogress of	implem	entatio	n		Ex.
Propos	<u>sed</u>	Not Starte	n	lanning		n Going estruction	Completed	1
-	lementat meframe			Cost		Respo	nsible bodies	
	/			/			/	
			FRN	/IP value				• . /
	M2-Pre	evention			N	//3-Protecti	on	
M21	M22	M23	<u>M24</u>	M31	M32	M33	M34 M35	
	M4-Pre	paration			M5	-Reconstru	ction	Ť
M41	<u>M42</u>	M43	M44	M5:	1	M52	M53	



CiCPMG - 2.3. Evaluation of severe wind-related collapses increase - S - T - R - W - F

Severe wind can cause artifacts (roof terraces / gutters / historic walls / chimney pots / plasters, etc.) and tree material collapses, with direct damaging effects on people and things, increasing the risk of road network blockage and service networks disruptions and failures. A targeted and detailed assessment is needed for areas exposed to greater risk, developing tools for closing down unsafe routes where possible (e.g., parks or beaches) and deciding where and how to introduce risk communication systems. It is also necessary to evaluate routes' potential impracticability in the event of collapses, so as to produce alternative road maps.

			Targe	ted Haza			Meas	s			
<u>Severe</u> rainfalls (R))	Floods (F)	Seve	ere winds (W)	Hig	h tides (T)		tal storm ges (S)	lla.		
		Con	tribution	to FRM	and CC	CA					
Understan and assessi			asting and ng hazards		educing impacts		Hazard m	itigation persion	4		
Protection exposed ele	_		nformed ernance		areness eparedn		Emers proce				
		Pro	ogress of	implem	entatio	n			7		
Proposed	N	lot Started		lanning		n Going estruction	Cor	npleted			
Implem timef	nentation frames			Cost		Respo	onsible l	oodies			
	/			/			/				
			FRN	/IP value							
ľ	M2-Prev	rention			N	//3-Protect	ion				
<u>M21</u>	M22	M23	<u>M24</u>	M31	M32	M33	M34	M35			
N	√4-Prep	aration			M5	-Reconstru	ıction				1
M41 N	M42	<u>M43</u>	M44	M5:	1	M52		M53			



CiCPMG - 2.4. Assessment of unmanned vessels shipwreck increased risk - S - R - T

Wave movement intensification, due to storm surges, heavy rainfall, or severe wind, can cause an increase in unmanned vessel shipwrecks-related risks. By sinking, these vessels can pose various risks and complications. The first is the occlusion of channel networks, which can slowdowns ordinary and emergency road systems. The second risk is that of damage to other boats. The third refers to the lagoon basin pollution increase. An in-depth analysis of these three risks is needed, so to develop ad hoc mapping practices and intervention protocols.

	Targeted Hazard																
<u>Severe</u> <u>rainfalls (R)</u>	Floods	(F)		(W) High tides (T)					al storm es (S)								
	(Contrik	oution to FRM and CCA														
Understandin and assessing [recastin essing h										9					
Protecting exposed element		R information			areness eparedi			merge									
	·	Progre	ess of i	mpleme	entatio	n											
<u>Proposed</u>	Not Sta	rted		nning going		n Going	n	Com	pleted								
Implemen timefrar			(Cost		Resp	ponsi	ible b	odies								
/				/				/									
			FRM	P value													
M2-	Prevention	l			1	M3-Prote	ction										
M21 M22	M23	<u>N</u>	124	M31 M32 M33 M34													
M4-	Preparation	า	M5-Reconstruction														
M41 <u>M42</u>	<u>2</u> M43	N	144	M51		M52			M53								



CiCPMG - 2.5. Severe storm risk assessment on Lido and Pellestrina islands - S - T

The risk of a severe storm on Venice's islands of Lido and Pellestrina is quite low. The submerged dam offers an effective defence tool in this regard, and the sloping seabed allows a mitigation of the phenomenon. For these reasons, a substantial impact growth is not expected. Nevertheless, given the 1966 exceptional high tides, storm surges, and floods, and the presence of exposed elements with few tools for rapid intervention, it would be appropriate to develop specific scenarios and risk assessments for these coastal areas.

	Targeted Hazard											
Severe rainfalls (R)	Floods	<u>s (F)</u>		e winds W)	Hig	h tides (T	<u>C</u>		l storm es (S)			
	(Contrib	ontribution to FRM and CCA									
Understanding and assessing D		recastin essing h			educing impact			d mit	igation rsion			
Protecting exposed elemen		R inforr governa			areness eparedr			nerge ocedu				
		Progre	ess of i	mpleme	entatio	n						
<u>Proposed</u>	Not Sta	rted		nning going		n Going	n	Comp	leted			
Implement timefran			C	ost		Resp	ponsib	le bo	dies			
/				/			/	,				
			FRM	P value								
M2-	Prevention	l			1	M3-Prote	ction					
M21 M22	M23	<u>N</u>	124	M31	M32	M33	M	34	M35			
M4-F	reparation	า		M5-Reconstruction								
M41 M42	M43	N	144	M51	L	M52		Ν	153			



CiCPMG - 2.6. Assessing and regulating high and extreme waves coastal impacts - S - W

As a result of storm surges and severe winds, particularly high and extreme waves can arise along Venice's coast. A thorough risk assessment is needed to alert and protect citizens and tourists. These evaluations should define intervention areas for prevention, protection, and preparedness measures.

			Targe	ted Haza	rd				Measure Location
Sever rainfalls		Floods (F)	Sev	ere winds (W)	Hig	h tides (T)	· · ·	stal storm rges (S)	<u> </u>
		Cor	ntribution	to FRM	and Co	CA			Charles P
	tanding essing DR		asting and ng hazards		ducing			nitigation persion	
	ecting elements		nformed ernance		areness eparedr			gency edures	
		Pro	ogress of	impleme	ntatio	n			
<u>Propos</u>	sed_	Not Starte	d	anning ngoing		n Going	Со	mpleted	
	ementat neframe			Cost		Resp	onsible	bodies	
	/			/			/		
		·	FRN	/IP value					Ť
	M2-Pre	evention			ſ	M3-Protec	tion		1
M21	M22	M23	<u>M24</u>	M31	M32	M33	M34	M35	/
	M4-Pre	paration			M5	-Reconstr	uction		1
M41	M42	<u>M43</u>	M44	M51		M52		M53	



CiCPMG - 2.8. Lightning strike risk scenarios for Seveso Directive companies - R

Lightning strike risk is potentially significant for the area. Temperature rises lead to an increase of available energy in the atmosphere, with consequent strong increases in lightning risk. It is therefore needed to carry out an in-depth recognition of exposed industries regulated by the Seveso Directive for major accidents hazards, so as to orient a detailed revision of their company and emergency plans. Furthermore, it would be of great support to develop lightning strikes' induced risk scenarios for those companies that are more vulnerable or more characterized by the presence of pollutants or fuels.

	Targeted Hazard																					
<u>Severe</u> rainfalls (R)	F	loods (F)	Seve	ere winds (W)	High tides (T)																	
		Cont	ribution	bution to FRM and CCA																		
Understanding and assessing D																						
Protecting exposed elemer	nts		ormed nance		areness eparedr		_	Emerg proced														
		Prog	ress of	impleme	entatio	n																
<u>Proposed</u>	No	ot Started		anning ngoing		n Going	1	Com	pleted													
Implement timefran		n	·	Cost		Resp	ons	ible b	odies													
/				/				/														
			FRM	1P value																		
M2-	Preve	ntion			- 1	M3-Proteo	ction															
M21 M22	2	M23	<u>M24</u>	M31	M32	M33	1	M34	M35													
M4-F	Prepai	ration	M5-Reconstruction																			
M41 M42	2	M43	M44	M51		M52			M53													



1.3.2. [M24_b Disaster and climate data collection, analysis, update, and sharing]

CCAP - 11.01 Climate Change Adaptation Research Centre - S - T - R - W - F

Venice's peculiar lagoon-coastal-land systems and related climate change challenges is well-suited for hosting a global reference research centre on climate change adaptation in coastal cities.

			Targe	ted Haza	rd						Measure Lo	ocation
Sever rainfalls		Floods (F) Sev	ere winds (W)	Hig	th tides (T			l storm es (S)	Ba.		
		Co	ontributio	n to FRM	and Co	CA				4		
Unders and asse	tanding essing DR		casting and	·	ducing			ard mit	igation ersion	4		
Prote	ecting element		informed overnance		areness eparedr			Emerge	,			*
		P	rogress of	impleme	ntatio	on					2	
Propos	sed	Not Start	ed =	lanning Ongoing		n Going	n	Com	oleted			
-	ementa nefram		·	Cost		Res	pons	ible bo	odies			
20	022 - 202	24	€ 6	00.000,00		Ital	ian G	overnn	nent			
			FRI	MP value							7	
	M2-Pi	revention			ı	M3-Prote	ction				1	
M21	M22	M23	<u>M24</u>	M31	M32	M33		M34	M35			
	M4-Pr	eparation	•		M5	-Reconst	ructio	on	•		1	
<u>M41</u>	M42	<u>M43</u>	M44	M51		M52		ľ	/I53		4	



CCAP - 11.02 Venice Climate Cadastre and Library - S - T - R - W - F

Venice will host a digital and physical database (data, evidences, studies, and chronicles related to climate events and dynamics), accessible to scholars from all over the world, for the study of Venice's climate and its effects.

			Targeted Hazard									
<u>Sever</u> rainfalls		Floods (F	Sev	evere winds (W) High tides (T))		al storm ges (S)				
		Co	ntributio	tion to FRM and CCA								
	standing essing DR		casting and sing hazard									
	ecting elements		informed vernance		areness eparedr		Emergency procedures					
		Pi	rogress of	implem	entatio	on						
Propos	sed	Not Starte	ed l	lanning Ongoing		n Going	1	Com	pleted			
•	ementat neframe			Cost		Resp	ons	ible b	odies			
202	24 onward	ds	€ 6	60.000,00				Studi Ir enti Cli	it. Su matici			
			FRI	MP value								
	M2-Pre	evention			١	M3-Protec	ction	ı				
M21	M22	M23	<u>M24</u>	M31	M32	M33	1	M34	M35			
	M4-Pre	paration		M5-Reconstruction								
<u>M41</u>	M42	<u>M43</u>	M44	M5:	1	M52			M53			



CCAP - 11.03 Climate risk analyses update and integration - S - T - R - W - F

Periodic review of the Plan, updating and integrating climate risk analyses (hazards, vulnerabilities, exposed elements, impacts, etc.) with the available data over time, surveying and monitoring on local climate change effects and on implemented adaptation actions effectiveness.

	Targeted Hazard											
Sever rainfalls		Floods (F) Sev	vere winds (W) High tides (T)				al storm ges (S)				
	Contribution to FRM and CCA											
	standing essing DR											
	ecting l elements		informed rernance		areness eparedr			merg roced				
		Pr	ogress of	impleme	ntatio	n						
Propos	sed	Not Starte	2C	lanning Ongoing		n Going		Com	pleted			
	lementa meframe			Cost		Resp	onsik	ole b	odies			
20	022 - 202	5	€1	20.000,00		Veni	ce Mı	unici	ality			
			FRI	/IP value								
	M2-Pr	evention			1	M3-Protect	tion					
M21	M22	M23	<u>M24</u>	M31	M31 M32 M33 M34 M							
	M4-Preparation M5-Reconstruction											
<u>M41</u>	M42	<u>M43</u>	M44	M51		M52			M53			



CiCPMG - 4.3. Cartography update- S - T - R - W - F

The continuously increasing spatial data and information load needed for an accurate disaster risk assessment and reduction became unsustainable for a central management. A standardized and periodic involvement of data authors is therefore necessary, with precise periodic goals and with ciphered collection systems, with particular attention to exposed sensitive buildings.

				Target	ted Hazar	d									
Seve rainfall	_	Floods (<u>F)</u>	Seve	ere winds (W)	Hig	tides (<u>T)</u>	Coastal storm surges (S)						
		Co	ontrib	oution	ition to FRM and CCA										
Unders	standing essing D			ig and azards		ducing			izard mit	_					
Prote	ecting elemen		infor			renes: pared			Emerge						
		P	rogre	ess of	impleme	ntatio	n								
Propos	<u>sed</u>	Not Start	ed		anning ngoing		On Going		Completed						
-	lement mefran				Cost		Res	pon	sible b	odies					
	/				/ /										
				FRN	FRMP value										
	M2-F	Prevention					M3-Prote	ectio	n						
M21	M22	M23	<u>N</u>	<u> 124</u>	M31	M32	M33 M34 M35			M35					
	M4-P	reparation				M!	5-Recons	truct	tion						
M41	M42	M43	Ν	//44	M51		M52	2	1	M53					





CiCPMG - 4.4. Cooperation with the Fire Brigades' portal - S - T - R - W - F

It is necessary to develop a cartographic collaboration with the Fire Brigade portal to support joint interventions cooperation and to receive information related to most frequently affected locations.

			Target	ed Haza	rd					
<u>Severe</u> <u>rainfalls (R)</u>	<u>Flo</u>	ods (F)	Seve	ere winds (W)	<u>Hig</u>	th tides (T	1		es (S)	
		Con	tribution	to FRM and CCA						
Understanding and assessing D	_		sting and ng hazards	l l	ducing		Hazard mitigation and dispersion			
Protecting exposed elemer	nts		oformed ernance			eness and aredness		merge		
	•	Pro	gress of	impleme	ementation		L			
Proposed	ed Not Started Planning On Going Ongoing Construction		Completed							
Implement timefrar				Cost	Responsible bodies					
1				/		/				
			FRN	1P value	P value					
M2-	Prevent	tion		M3-Protection						
M21 M22		V123	<u>M24</u>	M31	M31 M32 M33			M34	M35	
M4-F	Prepara	ition			M5	S-Reconsti	ructio	on		
M41 M42		V143	M44	M51		M52	M52 M53			



1.3.3. [M24_b Monitoring sustainability and mainstreaming climate risk]

CCAP - 09.02 "Insula" project interventions monitoring - T

Update and monitor the "Insula" project implementation's state of the art, verifying, through satellite imageries, the relationship between redeveloped/raised areas and the simulated/measured high tides' impacts. Thanks to this type of comparison it will be possible to update the work timeline and interventions' prioritization in the medium to long term, also considering climate change trends and the needed adaptation.

		т	argete	d Hazaı	rd					Measure Location
Severe rainfalls (R)	Floods	(F)		e winds N)	High tides (T)		1	Coastal st surges (Γ
	C	Contrib	ution t	o FRM	and CO	CA				< more
Understandin and assessing		ecasting			_		Hazard mitigati			
Protecting exposed eleme	_	R inforn overnar		Awareness and preparedness				mergency		\{\bar{\bar{\bar{\bar{\bar{\bar{\ba
		Progre	ss of in	implementation		n				
Proposed	Not Sta	<u>rted</u>		U		n Going	ı	Complet	ed	
Implemen timefra			Co	ost		Resp	Responsible bodies			
2024 onv	vards		€ 50.0	000,00			Veritas S			4
			FRMP	value						
M2	-Prevention			M3-P		//3-Prote	I3-Protection			/
M21 M23	2 M23	M	124	M31	M32	<u>M33</u> M34 M3		/135	/	
M4-	Preparation	1		M5-Reconstruction				on		
M41 M43	2 M43	M	144	M51		M52 M53			3	٥



CCAP - 09.03 Monitoring of MOSE system environmental effects - S - T

The Mose project building implicates significant systemic and environmental transformations for both the lagoon and the city. A monitoring program is underway to continuously assess this work's sustainability. This monitoring program will support future decisions regarding its use also in terms of climate change responses.

			7	argete	argeted Hazard										
Seve rainfall		Floods (I	=)		e winds	His	gh tides	<u>(T)</u>	Coastal storm surges (S)						
		Co	ntrib	ution 1	ution to FRM and CCA										
	standing essing Df		casting sing h	g and azards		ducing			azard mit	_					
	ecting element		inforr verna			arenes: epared			Emerge						
		Р	rogre	ss of ir	mpleme	ntatio	on								
Propo	sed	Not Start	ed		nning going		On Going		Com	pleted					
-	lementa mefram			c	ost		Re	Responsible bodies							
2	022 - 202	24		€ 2.00	0.000,00)		Corila							
				FRMP value											
	M2-P	revention					M3-Prot	ectio	n						
M21	M22	M23	<u>N</u>	124	M31	M32	M33 M34 M3								
	M4-Pr	reparation				M	5-Recon	onstruction							
<u>M41</u>	<u>M42</u>	M43	N	144	M51		M5	2	M53						





CCAP - 13.02 Climate informed management objectives definition for Natura 2000 Sites - S - R - W

Venice's NATURA 2000 sites are sensitive areas to climate change effects, whose biodiversity is exposed and vulnerable to various current and upcoming hazards and stresses. Considering these climate threats, the Municipality of Venice and the Veneto Region will identify general and specific management objectives, and develop appropriate adaptation measures aimed at preserving affected habitats and species.

	Targeted Hazard										
<u>Severe</u> rainfalls (R)	Floo	ods (F)		e winds W)	Hig	h tides (T	Γ)		al storm ges (S)		
		Contri	bution	on to FRM and CCA							
Understanding and assessing D	-	Forecasting l	_		educing			zard mi nd disp	tigation ersion		
Protecting exposed elemen	nts	DR infor				ness and redness		Emergency procedures			
		Progr	ess of i	npleme	plementation			ementation			
Proposed	Not S	Started				On Going Construction Completed					
Implement timefran			c	ost Responsible boo				odies			
2022				/		Venice Municipalit		ality			
			FRM	P value	value						
M2-	Preventi	on			ľ	M3-Protection					
M21 M22	. M	23 [<u>M24</u>	M31	M32 M33			M34	M35		
M4-F	reparati	ion		M5-Reconstruction							
M41 M42	M	143	V144	M51		M52	M52 M53				



CCAP - 13.03 Climate informed update of Municipal urban planning tools - S - R - W

Mainstreaming available climate risk analysis in Municipal planning tools in the occasion of their update, particularly the "Piano di Assetto del Territorio" (Territorial Development Plan) and the "Piano degli interventi" (Interventions Plan).

		Targeted Hazard									
<u>Severe</u> <u>rainfalls (R)</u>	Flo	ods (F)		re winds (W)	Hig	h tides (T	-)		al storm ges (S)		
		Contr	ibution	to FRM	and Co	CA					
Understanding and assessing D	_	Forecasti assessing			educing		Hazard mitigation and dispersion				
Protecting exposed elemer	nts	DR info				vareness and reparedness			Emergency procedures		
		Prog	ess of i	of implementation		mplementation					
Proposed	Not	Started				Completed			pleted		
Implement timefran			(Cost Responsible bo			odies				
2023 - 20)24			/		Ven	nice N	Munici	ality		
			FRM	1P value							
M2-	Prevent	tion	on		M3-Protection				1		
M21 M22		И23	M24	M31	M32	M33		M34	M35		
M4-F	Prepara	ition			M5	-Reconst	ructi	on			
M41 M42		V143	M44	M51	L	M52		M52 M53			



CCAP - 13.04 Climate-informed and nature-based upgrade of the Water Management Plan - S - R - F

Venice's Water Management Plan detailed vulnerable and endangered areas for surface and underground waters, and planned measures and regulations for overcoming these conditions of risk. According to the climatic data and scenarios gradually available over time, this plan should be periodically updated.

			Targete	d Haza	rd							
<u>Severe</u> rainfalls (R)	Flood	ls (F)		e winds W)	Hig	h tides (T	Γ)		al storm ges (S)			
		Contrib	bution t	o FRM	and Co	CA						
Understanding and assessing D	- 1	orecastin sessing h			ducing				tigation ersion			
Protecting exposed elemen		DR infor		Awareness and preparedness			- 0 /					
		Progre	ess of in	of implementation		n						
Proposed	Not St	arted		_		,			pleted			
Implement timefran			C	ost	Resp			Responsible bodies				
2023 - 20)24			/		Ver	nice M	1unici	oality			
			FRMF	value								
M2-	Preventio	n			M3-Protection							
M21 M22	M2	.3 <u>N</u>	<u>//24</u>	M31 M32 N		M33	<u>N</u>	<u> M34</u>	M35			
M4-F	reparatio	on		M5-Reconstruction			M5-Reconstruction					
M41 M42	M4	3 1	Л44	M51	M52				M53			



CCAP - 14.01 Adaptation strategies coordination with public and private subjects - T - R - W - F

Venice's Climate Change Adaptation Plan's effectiveness is closely interconnected with related strategies developed and implemented by other local authorities. Through appropriate, inclusive, and integrated, governance, co-planning, and co-programming processes, the Municipality of Venice intends to coordinate its adaptation initiatives with analogue ones of public and private subjects.

		1	Target	ed Haza	rd						
<u>Severe</u> rainfalls (R)	Floods	<u>s (F)</u>		re winds (W)	Hig	th tides (1	<u>r)</u>		al storm ges (S)		
	(Contrib	ution	to FRM	and C	CA					
Understanding and assessing D		recasting essing h	_	Re	educing impact				itigation ersion		
Protecting exposed elemen	_	OR inforr governa	prepared			Awareness and Emergency preparedness procedures					
	Progress				entatio	n					
Proposed	Proposed Not Started					On Going Completed					
Implement timefran			(Cost		Responsible bodies					
2022 - onw	vards			/ All competent entities							
			FRM	P value							
M2-I	M2-Prevention M3-Protection										
M21 M22	M23	<u>N</u>	124	M31 M32 M33 M34 M					M35		
M4-P	reparatio	n			M	5-Reconst	ructi	ion			
M41 M42	M43	B	144	M5:	L	M52 M53					



2. Protection

2.1. Natural flood management / runoff and catchment management (M31)

2.1.1. [M31_a Blue and green infrastructures for rainwater harvesting]

CCAP - 01.03 Water saving and rainwater collection and reuse - R - F

The measure aims at reducing drought impacts and provides for existing building stock adaptation in terms of water saving, through sewage networks separation and dual systems, in situ treatment and reuse, rainwater collection for non-potable uses, etc.

			Target	ed Haza	rd			
<u>Severe</u> <u>rainfalls (R)</u>	Flo	ods (F)		re winds (W)	Hig	gh tides (T)		stal storm rges (S)
		Contri	bution	to FRM	and C	CA		
Understanding and assessing D		Forecasting h	_	l l	ducing impact			nitigation persion
Protecting exposed elemen	nts	DR infor			Awareness and preparedness			
		Progr	ess of implementation		on			
Proposed	Not	Started				On Going Construction Completed		
Implement timefran			C	Cost		Resp	onsible	bodies
2024 - 20)30		€ 18.00	00.000,0)	Veni	ipality	
			FRM	P value				
M2-I	Prevent	tion		M3-Protection				
M21 M22		/123	V124	<u>M31</u>	M31 M32 M33 M3			M35
M4-P	repara	tion			M5	5-Reconstr	uction	
M41 M42		/143 N	V144	M51	M52 M53			



CCAP - 05.01 Minor channels and water systems hydraulic and environmental upgrading - R - F

Widespread implementation of Natural Water Retention Measures (NWRM) for minor channels and water systems (of paramount importance for rainwaters and flood surface waters drainage) such as: small streams resection with naturalistic criteria, micro varices and wet areas creation, and aquatic vegetation maintenance (foreseen in the 2020 approved Water Management Plan).

			Target	ted Haza	rd				
<u>Severe</u> <u>rainfalls (R)</u>	Flo	ods (F)	Seve	ere winds (W)	Hig	h tides (T)		stal storm urges (S)	
		Con	tribution	to FRM	and Co	CA			
Understanding and assessing D			sting and ng hazards		educing impacts			mitigation spersion	
Protecting exposed elemen	nts		formed		areness eparedr			rgency edures	
	•	Pro	gress of	impleme	mplementation				
Proposed	Not	Started		anning ngoing			On Going Construction		
Implement timefran				Cost		Responsible bodies			
2022 - 20)30		€ 20.0	000.000,0	0			cipality, onsorzi Di ra	
			FRM	/IP value					
M2-I	Prevent	tion		M3-Protection					
M21 M22		V123	M24	<u>M31</u>	<u>1</u> M32 M33			M35	
M4-P	Prepara	ition			M5-Reconstruction				
M41 M42		V143	M44	M51	L	M52 M			



CCAP - 05.02 Osellino Canal hydraulic and environmental upgrading - R - F

The project will lead to an ecological and ecosystem improvement of the Osellino Canal's surrounding areas. A typological and morphological analysis of the canal sections was carried out, assessing environmental, hydraulic, and landscape criticalities related to flooding, high tide, and urban water management phenomena. An upgrade of the Canal as a whole is underway to reduce these criticalities with coherent tools (intervention foreseen in the 2020 approved Water Management Plan).

			Target	ed Haza	rd					
<u>Severe</u> rainfalls (R)	Floods	s (F)		re winds (W)	Hig	h tides (T	-)		al storm ges (S)	
		Contri	bution	to FRM	and Co	CA				
Understanding and assessing D		recasting h	ng and nazards		educing impacts				tigation ersion	
Protecting exposed elemen		OR infor			areness eparedn	0 - 7				
		Progr	ess of i	mpleme	lementation					
Proposed	Not Sta	arted		nning ngoing		On Going Completed		pleted		
Implement timefran			(Cost	•	Resp	onsil	ble b	odies	
2022 - 20)25		€ 24.0	00.000,0	0	Con	ısorzi [Di Boı	nifica	
			FRM	P value	ie					
M2-	Prevention	า			N	M3-Protection				
M21 M22	M23	3 1	M24	<u>M31</u>	M32	M33 M34 M35				
M4-F	Preparatio	n			M5	M5-Reconstruction				
M41 M42	M43	3 1	V144	M51	L	M52 M53				



CCAP - 05.03 Creation of the Marzenego River Park - R - W - F

The creation of this river park will lead to the environmental requalification of a large area of Mestre along the Marzenego river. The intervention will redesign the river course and its surroundings according to environmental requalification criteria. The transformation, of great magnitude and impact, will reduce the flooding risks, improve fauna's quality and quantity guaranteeing biodiversity, redefine the city-river relationship, and redevelop large areas currently critical (intervention foreseen in the 2020 approved Water Management Plan).

			Targe	ted Haza	rd				Measure Location
<u>Severe</u> rainfalls (R)		Floods (F)	Sev	ere winds (W)	High	tides (T)		tal storm ges (S)	Ba
		Cor	ntribution	to FRM	and CC	A			The state of the s
Understand and assessing			asting and ng hazards		ducing [impacts	-	Hazard mitigation and dispersion		
Protecting exposed elem			nformed ernance		areness :				5 3
	Progress of implementation					1			200
Proposed	Proposed Not Started				anning On Goi ngoing Construc			npleted	
Impleme timefr				Cost		Respo	nsible l	oodies	
2022 -	2025		€ 20.	000.000,00)	Consc	orzi Di Bo	onifica	4
	FRMP value							J.	
М	M2-Prevention M3-Protection								/
M21 M	22	<u>M23</u>	M24	<u>M31</u>	M32	M33	<u>M34</u>	M35	
M	1-Prep	aration			M5-	Reconstru	ction		
M41 M	42	M43	M44	M51		M52		M53	4



CCAP - 05.04 Creation of the Dese River Park - R - W - F

The Dese River Park will be built following the Marzenego Park pilot, adopting analogue principles and techniques. This second intervention will enhance river flooding reduction in the Mestre area and constitute another blue and green corridor accessing the city (intervention foreseen in the 2020 approved Water Management Plan).

Targeted Hazard										
Sever rainfalls		Floods (F)		Severe winds (W)		Higl	High tides (T)		Coastal storm surges (S)	
Contribution to FRM and CCA										
Understanding and assessing DR			Forecasting assessing ha		_		cing DR <u>H</u> pacts		Hazard mitigation and dispersion	
Protecting exposed elements			DR information		Awareness a preparedne			Emergency procedures		
Progress of implementation										
Proposed		Not Started		_	Planning Ongoing		On Going Construction		Completed	
Implementation timeframes				Cost		·	Resp		onsible bodies	
2022 - 2025		25	€ 30.0		000.000,00		Consorzi Di Bonifica			
FRMP value										
	n				M3-Protection					
M21	M22	<u>M2</u>	<u>3</u>	Л24	<u>M31</u>	M32	M33		<u>M34</u>	M35
M4-Preparation M5-Reconstruction										
M41 M42 M4		3	//44	M51		M52		M53		



CCAP - 05.05 Creation of the Lusore River Park - R - W - F

The "interventions on the Lusore basin's hydraulic network" project foresees low water disposal system rationalization in the Malcontenta basin through the construction of a high transmissivity network that reduces localized and continuous losses along the project canals. The system, consisting of various Nature-Based interventions, will allow rainwater discharge during lower intensity events directly to the pertaining drainage system, guaranteeing hydraulic safety even during flood events with a 100 years return period, thanks to controlled flooding of retention basins (intervention foreseen in the 2020 approved Water Management Plan).

			Target	ed Haza	rd				
<u>Severe</u> rainfalls (R)	Floods	(F)		re winds (W)	Hig	tides (T)		ll storm es (S)
	(Contrik	oution	to FRM	and C	CA			
Understanding and assessing D	_	recastin essing h	_		educing impact			rd mit	igation ersion
Protecting exposed elemen		R information			areness eparedr			merge roced	
	•	Progre	ess of i	mpleme	entatio	on			
Proposed	Not Sta	rted		nning ngoing		On Going	1	Com	oleted
Implement timefran			(Cost		Resp	onsik	ble b	odies
2022 – 20	024		€ 70	.000,00		Con	sorzi [Di Bor	ifica
			FRM	P value					
M2-I	Prevention				ı	M3-Proteo	ction		
M21 M22	<u>M23</u>	N	Л24	<u>M31</u>	M32	M33	<u>N</u>	<u>//34</u>	M35
M4-P	reparation	1			M5	5-Reconstr	ruction	n	
M41 M42	M43	N	/44	M51		M52			V153



CCAP - 07.01 San Giuliano Park expansion - R - W

The recovery of Bissuola Park's degraded green areas, combined with the planned improvement of green connections throughout the Osellino woods towards the lagoon waterfront, will expand significantly the current San Giuliano Park area. This new large green area candidates to become an important multifunctional ecological axis connecting the Venice lagoon to mainland municipal areas.

			Target	ed Haza	rd				
<u>Severe</u> rainfalls (R)	Floor	ds (F)		re winds (W)	Hig	h tides (T	-)		al storm ges (S)
		Contri	bution	to FRM	and Co	CA			
Understanding and assessing D	_	Forecasting h	_		educing impacts				tigation ersion
Protecting exposed elemen	nts	DR infor			areness eparedn			_	ency Iures
		Progr	ess of i	mpleme	entatio	n			
Proposed	Not S	tarted		nning ngoing		n Going nstruction	n	Com	pleted
Implement timefran			(Cost		Resp	oonsik	ole b	odies
2022 - 20	024		€ 20.0	00.000,0	0	Ven	nice Mu	unici	oality
			FRM	P value					
M2-	Preventio	on			N	//3-Prote	ction		
M21 M22	<u>M2</u>	23	M24	<u>M31</u>	M32	M33	N	134	M35
M4-F	Preparati	on			M5	-Reconst	ruction	n	
M41 M42	2 M4	43	V144	M51		M52			M53



CCAP - 07.02 Completion of Mestre's woods green belt - R - W - F

The measure foresees the completion of the current forest, with the expansion of 1,258 hectares and the planting of approximately 629,000 new plants. In addition, it is planned the construction of a green areas and wetlands system structuring a green belt surrounding Mestre. This will provide great ecosystem benefits against heat waves and intense rainfall effects.

			Targe	ted Haza	rd				
<u>Severe</u> <u>rainfalls (R)</u>	Flo	oods (F)	Seve	ere winds (W)	Hig	h tides (T	(Coastal surge	
		Con	tribution	to FRM	and Co	CA			
Understandin	_		sting and		ducing			ırd miti d dispe	
Protecting exposed eleme	nts		formed rnance		areness paredn			merge rocedu	
		Pro	gress of	impleme	ntatio	n			
Proposed	Not	t Started		anning ngoing		n Going	1	Comp	leted
Implemen timefra				Cost		Resp	onsil	ble bo	dies
2022 - 2	023		€ 3.0	00.000,00	ı	Ven	ice M	unicipa	lity
			FRN	/IP value					
M2-	Preven	ition			N	//3-Protec	ction		
M21 M22	2 <u>N</u>	M23	M24	<u>M31</u>	M32	M33	N	Л34	M35
M4-	Prepara	ation			M5	-Reconstr	ructio	n	
M41 M42	2 1	M43	M44	M51		M52		N	153



2.1.2. [M31_b Environmental restoration of the lagoon and coasts]

CCAP - 06.01 Lagoon's sandbars and seabed morphological regeneration and revegetation - S - T

Lagoon's sandbars and salt marshes have a great naturalistic value essential for the ecosystem's survival, but also constitute a natural infrastructure reducing strong tidal waves' impacts generated in extraordinary high tides. The environmental recovery and regeneration of these infrastructures is foreseen to decrease tidal waves.

			Targe	ted Hazaı	^r d			
Severe rainfalls (Floods (F	Seve	ere winds (W)	Hig	h tides (T)	Co	oastal storr surges (S)
		Co	ntribution	to FRM	and Co	CA		
Understa and assess	_		asting and ing hazards		ducing	- II '-		d mitigation
Protec exposed el	_		nformed ernance		ireness paredr			nergency ocedures
		Pr	ogress of	impleme	ntatio	n		
Propose	ed	Not Starte	-C	anning ngoing		n Going		Completed
-	mentati eframes			Cost		Respo	onsib	le bodies
202	22 - 2025		€ 3.0	00.000,00				Works endency
			FRN	/IP value				
	M2-Pre	vention			ľ	M3-Protect	tion	
M21	M22	<u>M23</u>	M24	<u>M31</u>	M32	M33	M	34 M35
	M4-Prep	paration			M5	-Reconstru	uction	l
M41	M42	M43	M44	M51		M52		M53



CCAP - 06.02 Lagoon's reclaimed lands environmental restoration - T

Lagoon's "artificial islands" resulted from reclaimed lands that compromised the quantity and quality of external-internal lagoon water exchanges. At the same time, these artificial islands became protected naturalistic areas, habitats for flora and fauna's considerable interest. The environmental restoration in these reclaimed lands will aim both at activating the lagoon's ecological processes, including the interaction with tidal fluctuations, but also at safeguarding their ecological heritage.

		Targ	eted Haza	ard				
Severe rainfalls (R)	Floods (Se	vere winds (W)	<u>Hi</u>	gh tides (T))		al storm ges (S)
	C	ontributio	n to FRM	and C	CA			
Understanding and assessing D		ecasting an		educing impact				tigation ersion
Protecting exposed elemen		R informed overnance		arenes: epared			merg roced	
	F	rogress o	f implem	entatio	on			
Proposed	Not Star	<u>ted</u>	Planning Ongoing		On Going Instruction	1	Com	pleted
Implement timefram			Cost		Resp	onsi	ble b	odies
2024 - 20	27	€ 6	.000.000,0	0		Public perint		
		FF	MP value					
M2-F	Prevention				M3-Protec	ction		
M21 M22	<u>M23</u>	M24	<u>M31</u>	<u>M32</u>	M33	Λ	Л34	M35
M4-P	reparation			M:	5-Reconstr	ructio	n	
M41 M42	M43	M44	M5	1	M52			M53



CCAP - 07.06 Coastal dune systems environmental restoration - S - R - W - F

The plan foresees compensation, conservation, and environmental redevelopment measures for coastal Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Specific improvements concern coastal dune systems through new coastal habitats establishment, SACs expansion and SPAs designation, and coastal environmental redevelopment.

			Targe	ted Haza	rd				
Sever rainfalls		Floods (F)	Seve	ere winds (W)	Hig	h tides (T)) (l storm es (S)
		Cor	ntribution	to FRM	and Co	CA			
	standing essing DR		asting and ng hazards		ducing			ırd mit d dispe	igation rsion
	ecting elements		nformed ernance		areness paredn			merge roced	,
		Pro	ogress of	impleme	ntatio	n			
Propos	sed	Not Starte	d I	anning ngoing		n Going		Com	oleted
-	lementat meframe		•	Cost		Resp	onsil	ble b	odies
20	023 - 2026	i	€ 23.0	00.000,00)			: Work tende	
			FRN	1P value					
	M2-Pre	vention			N	M3-Protec	tion		
M21	M22	M23	M24	<u>M31</u>	M32	<u>M33</u>	N	Л34	<u>M35</u>
	M4-Pre	paration			M5	-Reconstr	uctio	n	
M41	M42	M43	M44	M51		M52		ľ	/153

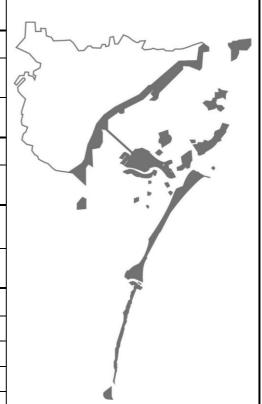


2.2. Water flow regulation (M32)

CCAP - 03.01 MOSE system completion and operational management - S - T

The Mose - Electromechanical Experimental Module - is a mobile dams system formed by four barriers placed at the three inlets of the Venice Lagoon. The objective of the Mose is to control high tide access into the lagoon to preserve Venice's cultural and residential heritage. Experimentally operative since the summer of 2020, expected to be completed and fully operational soon for tidal events exceeding 110-130 cm.

Meas				d	ed Hazar	Target						
П	ıl storm es (S)		tides (T)	High	ere winds (W)	Seve	Floods (F		Sever rainfalls			
7			1	and CC	to FRM a	ntribution	Co					
and the same of th		azard mit		ducing D		asting and ng hazards		standing essing DR				
}		Emerge procedu		reness a		nformed ernance		ecting elements				
				ntation	impleme	ogress of	Pr					
	oleted	Comp	Going truction		anning ngoing	1	Not Starte	sed I	Propos			
•	odies	sible bo	Respor		Cost			lementati meframes				
	-	olic Work endency			8.000.000	€ 53		022 - 2024	20			
					1P value	FRN						
		n	3-Protectio	М			vention	M2-Prev				
	M35	M34	M33	<u>M32</u>	M31	M24	<u>M23</u>	M22	M21			
		tion	Reconstruc	M5-			M4-Preparation					
•	V153	N	M52		M51	M44	M43	M42	M41			



Location



CCAP - 03.02 Hydraulic defence interventions for river courses' flood risk - R - F

Completion and management of the foreseen protection interventions regarding rivers and canals flowing into the lagoon or concerning Venice mainland, i.e., controlled flooding areas, defence structures (e.g., embankments), mechanical defence works (e.g., water pumps).

			Targe	ted Hazaı	ď				
<u>Severe</u> <u>rainfalls (R)</u>	ļ	Floods (F	Sev	ere winds (W)	Hig	h tides (T)			al storm ges (S)
		Co	ntributior	to FRM	and CO	CA			
Understanding and assessing D			asting and ing hazards		ducing mpacts				tigation ersion
Protecting exposed elemer	nts		nformed ernance		reness paredn			merge	
		Pr	ogress of	impleme	ntatio	n			
Proposed	N	lot Starte	d =	lanning Ingoing		n Going nstruction		Com	pleted
Implement timefran		on		Cost		Resp	onsi	ble b	odies
2022 - 20)24		€ 80.	000.000,00)			cque R as Spa	Risogive,
			FRN	/IP value					
M2-	Prev	ention			N	M3-Protec	tion		
M21 M22		M23	M24	M31	<u>M32</u>	<u>M33</u>	1	VI34	M35
M4-F	repa	aration			M5	-Reconstr	uctic	n	
M41 M42		M43	M44	M51		M52		ı	M53



2.3. Channel, Coastal and Floodplain Works (M33)

CiCPMG - 5.1. Hydraulic mitigation interventions S - T - R - F

Hydraulic interventions planned in Venice Municipality should strongly reduce risks related to intense rainfall, floods and storm surges. These defensive projects are expected to mitigate hazards worsening and increase in frequency and will require continuous maintenance and restoration work to avoid further impacts and damages increase.

		7	Targete	ed Haza	rd				
<u>Severe</u> rainfalls (R)	Floods	<u>(F)</u>		re winds (W)	Hig	gh tides (1	<u>T)</u>		el storm es (S)
	(Contrib	oution	to FRM	and C	CA			
Understanding and assessing D		ecastin essing h	ig and lazards		ducing impact			zard mi ind disp	tigation ersion
Protecting exposed elemen	_	R infori			areness eparedi			Emergo	
		Progre	ess of i	mpleme	entatio	on			
Proposed	Not Sta	rted		nning going		On Going Instructio		Com	pleted
Implement timefran			C	Cost		Res	pon	sible b	odies
/				/				/	
			FRM	P value					
M2-I	Prevention					M3-Prote	ectio	n	
M21 M22	M23	N	/124	M31	M32	<u>M33</u>	3	M34	M35
M4-P	reparation	l			M	5-Reconst	truct	tion	
M41 M42	M43	N	144	M51	L	M52	2		V153



CCAP - 03.03 High tide and waves surge hydraulic defences - S - T

Venice Lagoon's main islands constitute the most exposed elements to high tide impacts, particularly extraordinary ones. Main impacts are due to tidal floods ascent and waves, reason why protective masonry systems are required to contain and lower these stresses. This measure plans the implementation of incremental defence works to face this criticality in most sensitive areas.

			Target	ed Haza	rd				
Severe rainfalls (R)	Floods	s (F)		re winds (W)	His	gh tides (1	<u>r)</u>		l storm es (S)
		Contrib	oution	to FRM	and C	CCA			
Understanding and assessing D	_	orecastin sessing h	_		ducing			ard mit	igation ersion
Protecting exposed elemen		DR infori governa			arenes:			Emerge	
	•	Progre	ess of i	mpleme	entatio	on			
Proposed	Not Sta	arted		anning ngoing		On Going onstructio	n	Com	oleted
Implement timefran			(Cost		Res	ponsi	ible b	odies
2022 - 20)26		€ 25.0	00.000,0	0	Em Com	nerger nmissi	lunicip ncy De oner, I erinter	outy
			FRM	P value					
M2-	Prevention	n				M3-Prote	ction		
M21 M22	<u>M23</u>	<u>3</u>	Л24	M31	<u>M32</u>	<u>M33</u>	1	M34	<u>M35</u>
M4-F	Preparatio	n			M	5-Reconst	tructio	on	
M41 M42	M43	3 N	/44	M51	-	M52		ı	Л53



CCAP - 03.04 Storm surge hydraulic defences - S - T

Past coastal defences from storm surges have been protecting the lagoon and its inhabited areas and restoring its natural defences, creating new beaches, recovering and expanding dune systems. The completion of these coastal "protected nourishment", the creation of new beaches protected with stone dams, recalls, albeit artificially, beaches' natural characteristics of flexibility and adaptation to waves.

			Targe	ted Haza	rd				
Severe rainfalls (R)		Floods (F)	Seve	ere winds (W)	Hig	th tides (T) [l storm es (S)
		Cor	ntribution	to FRM	and C	CA			
Understand and assessing			asting and ing hazards		educing impact			rd mit	igation ersion
Protecting exposed elem	_		nformed ernance		areness eparedr			merge roced	,
		Pro	ogress of	implem	entatio	n			
Proposed	N	lot Starte	d	anning ngoing		n Going	n	Com	oleted
Impleme timefr		on		Cost		Resp	onsil	ble b	odies
2022 -	2027		€ 45.0	000.000,0	0	•	Public perint		-
			FRN	/IP value					
М	2-Prev	ention			ı	M3-Proteo	ction		
M21 M	22	M23	M24	<u>M31</u>	M32	<u>M33</u>	N	/134	M35
M	4-Prepa	aration			MS	S-Reconsti	ructio	n	
M41 M	42	M43	M44	M5:	1	M52		ſ	/I53



CCAP - 04.06 Rivers excavation - T

The implementation of the "RII" (rivers in Italian) integrated project foresees canals hygienic, building and static arrangement, sedimented mud dredging, subsoil rearrangement, bank rehabilitation, pavements elevation, sewage drains upgrading, and bridges restoration. These maintenance interventions planned by the Municipality will allow a better connection and use of the historic city even in high tide situations.

		Tar	geted Haza	ırd					Measur	ra I a
Severe rainfalls (R)	Floods	(F) S	evere winds (W)	Hig	h tides (T)		tal storm rges (S)	Пъ	ivicasui	C LO
	C	ontributi	on to FRM	and CO	CA			7-1	VV	7
Understanding and assessing D		ecasting ar		educing impacts	-	lazard m and disp	nitigation persion	End of the second		
Protecting exposed elemen		R informed overnance		areness eparedn		Emerg		}	<	
		Progress	of impleme	entatio	n			1		
Proposed	Not Star	ted	Planning Ongoing		n Going nstruction	Con	mpleted		$\sqrt{}$	
Implement timefran			Cost		Respo	nsible l	bodies		Ц	•
2022 - 20	30	€ 1	10.000.000,0	00		e Munici eritas Sp				A RE
		F	RMP value							1
M2-I	Prevention			N	И3-Protecti	on				1
M21 M22	M23	M24	M31	<u>M32</u>	<u>M33</u>	M34	M35		#	
M4-P	reparation			M5	-Reconstru	ction			1	
M41 M42	M43	M44	M5:	1	M52		M53		Q	



2.4. Surface Water Management (M34)

2.4.1. [M34 SUDS and surface water drainage]

CCAP - 04.07 Sewage systems improvement - R - F

The infrastructural extension and improvement for the integrated water system and lagoon decontamination will allow greater effectiveness in surface water drainage and disposal, helping to reduce potential surface urban flooding. These works will be sided by SUDS (sustainable urban drainage systems) interventions in order to combine territory hydraulic management with environmental protection.

			Targe	ted Haza	rd				
<u>Severe</u> rainfalls (R)	<u>F</u>	loods (F)	Sevi	ere winds (W)	Hi	gh tides (T)	coastal storm surges (S)		
		Con	tributior	to FRM	and C	CA			
Understandin and assessing [Reducing DR impacts			Hazard mitigation and dispersion	
Protecting exposed eleme	nts		formed rnance		arenes: epared			rgency edures	
		Pro	gress of	impleme	entatio	on			
Proposed	No	ot Started		anning ngoing		On Going onstruction	Со	mpleted	
Implemen timefrar		n	·	Cost		Resp	onsible	bodies	
2022 - 20)27		€ 146.	0,000.000	00		ce Munio Veritas S		
		•	FRN	/IP value					
M2-	M2-Prevention M3-Protection								
M21 M22)	<u>M23</u>	M24	M31	M32	<u>M33</u>	<u>M34</u>	M35	
M4-	Prepai	ration			M	5-Reconstr	uction		
M41 M42	2	M43	M44	M51	L	M52	52 M53		



CCAP - 07.03 Strengthening the green ecological network - R

Widespread implementation of interventions completing the green ecological rural-to-urban network, strengthening and connecting among themselves green corridors such as hedges, tree rows and groves, small wetlands, etc.

	Targeted Hazard												
Severe rainfalls (-	Floods (F) Sev	ere winds (W)	Hig	gh tides (T)	Coastal storm surges (S)						
		Co	ntributio	n to FRM	and C	CA							
					Hazard m and disp								
Protec exposed e	_		nformed		arenes: epared	0 - 1							
		Pr	ogress of	implem	entatio	on							
Propose	ed	Not Starte	d	lanning Ongoing		On Going enstruction	Con	npleted					
•	mental		•	Cost		Respo	onsible b	oodies					
202	22 - 202	7	€ 5	00.000,00		_	coltural Fa orzi Di Bo	-					
			FRI	MP value									
	M2-Prevention M3-Protection												
M21	M22 M23 M24 M31 M32 M33 M34 M35					M35							
	M4-Pre	paration			M	5-Reconstru	uction						
M41	M42	M43	M44	M5:	L	M52	M52 M53						



CCAP - 07.04 Creation of urban green spaces - R

The increase in urban greenery (new tree planting) aims at contributing to urban carbon footprint reduction, increasing the pollutants and micro-particulates capture and CO2 absorption, so as to mitigate urban overheating effects and increase rainwater run-off absorption and disposal. These systemic benefits also structurally contribute to the city's better landscape and ecological performance.

			Target	ed Haza	rd					
<u>Severe</u> rainfalls (R)	Floods	(F)		re winds (W)	Hig	h tides (T)	1	oastal surge		
	•	Contrib	bution	to FRM	and Co	CA	•			
Understanding and assessing D					ducing	_		Hazard mitigation and dispersion		
Protecting exposed elemen		R infor			areness eparedn		Emergency procedures			
	<u> </u>	Progre	ess of i	mpleme	ntatio	n				
Proposed	Not Sta	rted		anning ngoing		n Going nstruction		Comp	eted	
Implement timefran				Cost	•	Responsible bodies				
2022 - 20)25		€ 25.0	00.000,00)	Veni	ice Mu	ınicipa	lity	
			FRIV	IP value						
M2-I	Prevention				N	//3-Protec	Protection			
M21 M22	<u>M23</u>	N	Л24	M31	M32	M33	33 <u>M34</u> M35			
M4-F	Preparation	1			M5	-Reconstr	uction	1		
M41 M42	M43	N	//44	M51		M52	M53			



CCAP - 07.05 Making room for the green in marginalized urban areas - R

A profound transformation work is underway for Venice's inland urbanized areas, concerning especially various large abandoned buildings that the Municipality decided to remove, instead of renovating, and substitute with parks serving the Mestre and Marghera neighbourhoods. These green and blue spaces may favour ecosystem services necessary for reducing climate change associated risks as well as mitigating climate-altering emissions.

					Me	easure l	Loc						
<u>Severe</u> rainfalls (R)	Floor	ds (F)		re winds (W)	Hig	h tides (T)	\		al storm ges (S)	II.			
		Contril	bution	to FRM	and CO	CA						4	6
	Understanding Forecasting ar assessing DR assessing hazar		_	Reducing I			Hazard mitigation and dispersion		* **				
Protecting exposed elemen	nts	DR infor			areness eparedn			nerge oced					
	Progress o				entatio	n				2	5		
Proposed	Not St	tarted		nning ngoing		On Going Completed			pleted			40)) " " "
Implemen timefrar			(Cost		Resp	Responsible bodies						1
2022 - 20)24		€ 1.50	0.000,00)	Veni	ice Mu	ınicip	ality			6	1
			FRM	P value								Z	S
M2-	M2-Prevention M3-Protection									1			
M21 M22	<u>M2</u>	M23 M24 M31 M32 M33 M34 M35			M35			/					
M4-I	Preparation	on			M5	-Reconstr	ruction	1				8	
M41 M42	2 M4	13 N	//4 4	M51	L	M52	M52 M53					0	



CCAP - 08.02 Widespread system of micro rainwater harvesting - R

Creation of small and medium-sized multifunctional wetlands, scattered throughout Venice territory, aimed at guaranteeing the runoff rainwater retention, to be carried out according to Natural Water Retention Measures principles. These solutions, in addition to providing an irrigation relief water source, allow biodiversity and landscape improvement and constitute an added value for rural residential and tourism.

	Targeted Hazard												
<u>Severe</u> rainfalls (R)	Floods (F)		e winds	Hig	h tides (T	-)	Coastal storm surges (S)					
	Co	ontribu	ution 1	to FRM	and Co	CA							
Understanding and assessing D		casting sing ha			educing			Hazard mitigation and dispersion					
Protecting exposed elemen		inform			areness eparedr								
	P	rogres	ss of ir	mpleme	entatio	n							
Proposed	Not Start	<u>ed</u>		nning going		n Going	('omnleted						
Implement timefran		•	c	ost	•	Responsible bodies							
2024 - 20	27		€ 1.60	0.000,00)			o Di Bo Risorg					
			FRM	P value		I							
M2-I	M2-Prevention M3-Protection												
M21 <u>M22</u>	M23	M	24	M31	M31 M32 M33 <u>M34</u> M35								
M4-P	reparation				M5	5-Reconst	ructi	on					
M41 M42	M43	M	44	M51	L	M52	M52 M53						

3. Preparedness (M4)

3.1. Flood Forecasting and Warning (M41)

i. [M41 Sensors, forecasting, EWS]

CCAP - 01.04 Transport and logistic floating platforms - T



The strengthening of water transport logistical connections and interchange points foresees the provision of specific sensors at each water transport's docking point, allowing service status, functionality, and accessibility real-time monitoring, particularly relevant during high tide events.

	Targeted Hazard												
Severe rainfalls (R)	F	Floods (F)	Sev	ere winds (W)	Hig	tides (T	<u>r)</u>		al storm ges (S)				
		Cor	ntributio	n to FRIV	and C	CA							
	Understanding Forecasting ar nd assessing DR assessing hazar		_				Hazard mitigation and dispersion		_				
Protecting exposed eleme	ents		nformed ernance		areness eparedr								
	Progress of implemen				entatio	n							
Proposed	N	ot Starte	d	lanning Ongoing		On Going	n	Com	pleted				
Implemen timefra		on		Cost		Responsible bodies							
2022 - 2	.025		€ 2.	0,000.000	0	Ver	nice N	∕lunici	oality				
	FRMP value												
M2	M2-Prevention M3-Protection												
M21 M2	1 M22 M23 M24 M31 M32 M33 M34 M35		M35										
M4-	Prepa	aration			M	5-Reconst	tructio	on					
<u>M41</u> M4	2	M43	M44	M5	1	M52	M53						

CCAP - 09.01 Smart Control Room for environmental and climatic data management and strategic planning - T - R - W - F

The amount of environmental, socio-economic and climatic data the Venice Municipality has to manage is very large and, up to now, fragmented between different sectors and third bodies. The Smart Control Room allows a single processing data management centre, reordering and aggregating them into macro-indicators to better support CCA decisions.

		Targeted	l Hazard	i			
<u>Severe</u> rainfalls (R)	Floods (F)	Severe (M	_	High tides (<u>T)</u>	Coastal storm surges (S)	Measure Location
	Contril	bution to	FRM a	nd CCA			
Understanding and assessing D	•			ucing DR npacts		azard mitigation and dispersion	



Protecting exposed eleme	ents		informed vernance		wareness preparedr		Emerg		
		P	rogress o	f implen	nentatio	n			
Proposed	<u> </u>	Not Start	he he	_		n Going	Completed		
	Implementation timeframes		•	Cost	•	Respo	onsible l	oodies	
2023 - 2	2023 - 2029 € 5			0.000.000	,00	Veni	Venice Municipality		
			FR	MP valu	е				
M2-	-Prev	ention			1	M3-Protect	ion		
M21 M22	2	M23	<u>M24</u>	M31	M32	M33	M34	M35	
M4-	Prep	aration			M5	-Reconstru	uction		
M41 M42	2	M43	M44	M	51	M52		M53	



CiCPMG - 2.10. Enhancing the efficiency of the Smart Control Room T - R - W - F

The Control Room is an essential tool for managing the complexity of Venice in its relations with disaster risks. The climatic and environmental data collection and comparison, and its use in emergency situations will constitute a fundamental contribution for understanding and managing future events and their evolution. After the needed reinforcement of institutions' cooperation, the Control Room shall support local impact assessments and build predictive models.

			Targete	d Haza	rd					N	Measure Locat	ion
<u>Severe</u> rainfalls (R)	Floods	s (F)		e winds W)	Hig	h tides (T)		al storm ges (S)	Ba.		
		Contrib	oution 1	o FRM	and CO	CA				4		М
	Understanding Forecasting and assessing DR assessing haza				_		Hazard mitigation and dispersion		*	رغر		
Protecting exposed elemen		OR infor governa			areness eparedn			Emerg proced				5
		Progre	ess of ir	npleme	entatio	n					2	
Proposed	Not Sta	arted		nning going		n Going nstruction	<u>n</u>	Com	pleted			1
Implement timefran			c	ost		Responsible bodies						
/				/				/				
			FRM	P value							7	
M2-	M2-Prevention M3-Protection						1					
M21 M22	M23	3 \	M24 M31 M32 M33 M34 M35			1						
M4-F	M4-Preparation M5-Reconstruction					1						
M41 M42	M43	3 N	//44	M51		M52			M53		4	



CCAP - 10.01/02 High tides and tornados nowcasting, alert, and communication centre - S - T

Creation of Italy's first, Venice-based, national civil protection centre for coastal and marine forecasting, and the related Municipal department. Once operational, the Centre will manage data and alerts in real-time, communicating it to affected communities.

			Targe	ted Hazaı	rd				
<u>Severe</u> rainfalls (R)		Floods (F) Sev	ere winds (W)	Hig	h tides (T)		al storm ges (S)
		Coi	ntributio	n to FRM	and CC	CA			
Understandir and assessing	_		asting and ing hazard		ducing				tigation ersion
Protecting exposed eleme	nts		nformed		reness paredn		_	merge	
		Pr	ogress of	impleme	ntatio	n			
Proposed	<u>N</u>	lot Starte	hd l	lanning Ongoing		n Going nstruction	1	Com	pleted
Implemen timefra		on		Cost		Resp	onsi	ble b	odies
2023 - 2	025		€ 2.0	000.000,00				icipalit	ty, CNR- AV
			FRI	MP value					
M2	-Prev	ention		M3-Protection					
M21 M2	2	M23	M24	M31	M32	M33	ľ	V134	M35
M4-	Prep	aration			M5	-Reconstr	ructic	n	
M41 M4	M42 M43 M44 M51 M52 M53								



CiCPMG - 3.1. Emergency communication broadcast via public warning system - S - T - W

The measure is aimed at reducing disasters' major impacts through early warning systems in case of violent and rapid extreme events. This measure is particularly deemed to tourists and people not attending Venice regularly, thus without access to the Municipality's alert communication channels. It is, therefore, necessary to introduce a public address system in locations of greater tourist attendance, e.g., along the Riva degli Schiavoni, loudspeakers alerting the public and informing on the most appropriate behaviours.

			Targe	ted Hazaı	rd				Measure Location
Sever rainfalls		Floods (F) Seve	ere winds (W)	Hig	h tides (T)		stal storm Irges (S)	Γ_{γ}
		Co	ntribution	to FRM	and CO	CA			Command &
	Understanding Forecasting and assessing DR assessing hazard		_	Reducing D impacts			Hazard mitigation and dispersion		E A
	ecting element		informed vernance		reness paredn			rgency edures	
	Progress o				ntatio	n			
Propos	sed	Not Starte	o Cl	anning ngoing	n Going	Со	mpleted		
-	lementa mefram			Cost		Resp	onsible	bodies	
	/			/			/		
			FRN	1P value					
	M2-Prevention				N	И3-Protec	tion		<i>\{</i>
M21	M21 M22 M23 M24			M31 M32		M33	M34	M35	
	M4-Preparation				M5	-Reconstr	ruction		§
<u>M41</u>	<u>1</u> M42 <u>M43</u> M44 M51 M52 M53		4						



CiCPMG - 3.5. Alarm and sign warning systems for storm surges

It is necessary to have a permanent warning system, i.e., information plaques with loudspeakers, to be activated in the event of storm surges, alerting the population and moving them away from the coast. The alarm warning system should be immediately recognizable to alert all those at risk, regardless of their language.

			Targe	Measure Location					
Severe rainfalls		Floods (F)	Sev	ere winds (W)	Hig	h tides (T)	1 -	oastal stori surges (S)	
		Coi	ntributio	to FRM	2 months				
	Understanding Forecasting ar and assessing DR assessing hazar			Reducing I impacts			Hazard mitigation and dispersion		
	tecting DR informed Awareness and Emergency d elements governance preparedness procedures								
		Pr	ogress of	implem	entatio	n			
Propose	<u>ed</u>	Not Starte	d	lanning Ingoing	0			Completed	
	ementa neframe			Cost		Resp	onsibl	le bodies	
	/			/			/		
	FRMP value				7				
	M2-Prevention M3-Protection								
M21	1 M22 M23 M24 M31 M32 M33 M34 M35								
	M4-Pr	eparation			M	-Reconstr	uction		1
<u>M41</u>	M42	<u>M43</u>	M44	M5:	L	M52	2 M53		•



CiCPMG - 3.6. Storm surges public forecast and warning

To date, the coastal flooding and storm surge risks are not integrated into the Municipal public warning systems. Introducing forecast and warning systems of this risk within municipal bulletins would be of great use to inform and alert residents and workers.

			Targe	ted Haza	rd				Measure Location
Sever		Floods (F) Sev	ere winds (W)	Hig	h tides (T)	1	stal storm urges (S)	The P
		Со	ntribution	to FRM	and Co	CA			2
	standing essing DR		asting and ing hazards		educing		Hazard mitigation and dispersion		The state of the s
	ecting elements		informed vernance		areness eparedr				
		Pı	ogress of	impleme	entatio	n			
Propos	<u>sed</u>	Not Starte	o Cl	lanning		n Going	Co	ompleted	
-	lementat meframe			Cost		Resp	onsible	bodies	
	/			/			/		7
			FRM	/IP value					f
	M2-Pro	evention			ſ	M3-Protec	ction		/
M21	M21 M22 M23 M24 M31 M32				M33 M34 M35			9	
	M4-Preparation M						ruction		₫
<u>M41</u>	M42	<u>M43</u>	M44	M51	L	M52		M53	



3.2. Emergency Event Response Planning / Contingency planning (M42)

CCAP - 13.01 Civil protection emergency plan climate informed update - T - R - W - F

Provide civil protection with an updated emergency plan with new information on present and future climate risks, optimizing techniques and procedures for managing emergencies. This will incentivize experimental adaptation interventions, promote maintenance programs for most sensitive infrastructures, and set up an intersectoral and multi-stakeholder table for the definition of common criteria and intervention priorities.

			Target	ed Haza	rd						
<u>Severe</u> rainfalls (R)	Floor	ds (F)		re winds (W)	Hig	h tides (T)		l storm es (S)		
		Contr	ibution	to FRM	and Co	CA					
Understanding and assessing [_				_				igation ersion		
Protecting exposed elemen	nts		rogress of implementation					nerge oced			
	Progress of implementation Planning On Going										
Proposed	Not St	tarted		_	_		<u>1</u>	Com	oleted		
Implemen timefrar				Cost		Resp	onsib	ole b	odies		
2022 - 20	023			/		On Going Completed					
			FRIV	P value							
M2-	Preventio	on			1	M3-Proteo	ction				
M21 M22	2 M2	23	<u>M24</u>	M31	M32	M33	33 M34 M35				
M4-I	Preparation	on			M5						
M41 <u>M42</u>	<u>2</u> M4	43	M44	M51	L	M52		ľ	Л53		



CiCPMG - 4.2. Unified cartography for emergency management - S - T - R - W - F

GIS systems allow a unified view of spatial information and quick comparisons between projects and plans. It is needed to develop a unified, multiscale and modular risk mapping, including climate change worsening effects on disaster risk. All sectors should contribute with interoperable data, so to allow queries oriented to territorial objectives and to reduce information losses during emergencies.

			Targete	d Haza	rd					
<u>Severe</u> rainfalls (R)	Floor	ds (F)		e winds W)	Hig	h tides (T)		oastal surge	storm s (S)	
		Contrib	oution t	o FRM	and CC	CA.				
Understanding and assessing D		orecasting h			ducing			azard mitigation and dispersion		
Protecting exposed elemen	ng <u>DR informed</u> Awareness and					nergei ocedu	,			
		Progre	ess of ir	npleme	ntatio	on				
<u>Proposed</u>	Not S	started		_				Comp	leted	
Implement timefran			С	ost		Resp	onsibl	le bo	dies	
/		Started Planning On Going Completed Cost Responsible bodi / FRMP value								
			FRMI	o value						
M2-Prevention M3-Protection										
M21 M22	M2	23 <u>N</u>	<u>//24</u>	M31	M32	M33	M33 M34 M35			
M4-P	reparati	ion			M5	-Reconstr	uction			
M41 <u>M42</u>	M	43 N	/144	M51		M52		N	leted	



CiCPMG - 6.1. Delocalized first aid operational centres T - R - W

Extreme events in the future may most likely prevent navigation in the lagoon, which is particularly relevant for complex emergency transport such as first aid. It is therefore advisable, looking at frosts, cold waves and severe winds, to activate first aid operational centres on each highly inhabited island.

			Targe	ted Haza	ırd					
<u>Severe</u> rainfalls (F	<u>R)</u>	Floods (F)	Sev	ere winds (W)	Hig	th tides (T))		al storm ges (S)	
		Cor	ntributio	n to FRM	and C	CA				
			_		_				tigation ersion	
	Protecting DR informed Awareness and						_			
		Pro	ogress of	implem	entatio	on				
Proposed	<u>d</u>	Not Starte	C	_		redness <u>procedures</u>				
-	Progress of implementation Proposed Not Started Planning On Go Construct Implementation timeframes Cost / / FRMP value M2-Prevention M3-Pi						Responsible bodies			
	/			/				/		
			FRI	MP value	!					
M2-Prevention M3-Protection										
M21	M22	M23	M24	4 M31 M32 M33 M34 M35						
	M4-Prep	paration	ı		M	5-Reconstr	ructio	on		
M41	<u>M42</u>	M43	M44	M5	1	M52			M53	



CiCPMG - 6.3. Definition of last mile procedures - S - T - R - W - F

Alongside the revision of the Civil Protection Plan, it is essential to develop the last-mile implementation procedures, thus addressing all those aspects and details that cannot be left to last-minute choices. This means defining well in advance locations, procedures, duties, routes and vectors to be carried out during an emergency response.

<u>Severe</u> rainfalls (R)	Flo	oods (F)	Seve	re winds (W)	Hig	h tides (T)		astal storm urges (S)				
		Cont	ribution	to FRM	and CC	CA						
	_				ducing			mitigation ispersion				
Protecting exposed eleme	Contribution Inderstanding dassessing DR assessing hazar Protecting posed elements Progress of the proposed				reness paredn			ergency edures				
		Pro	ntatio	n								
<u>Proposed</u>	Not	: Started		_		n Going nstruction	Co	ompleted				
-				Cost		Resp	onsible	bodies				
/	Protecting posed elements DR informed governance Progress of implement Proposed Not Started Planning Ongoing Implementation timeframes / / FRMP value M2-Prevention Massessing hazards implement Aware proposed Aware preparation Cost Planning Ongoing FRMP value M2-Prevention Planning Ongoing FRMP value M2-Prevention Planning Ongoing FRMP value M3-Prevention Planning Ongoing FRMP value M3-Prevention Planning Ongoing FRMP value Planning Ongoing FRMP v						/					
			FRM	IP value								
M2-	-Preven	N	//3-Protec	tion								
M21 M22	2 1	M23	M24	M31	M32	M33	M34	1 M35				
M4-	Prepara	ation			M5	-Reconstr	3 M34 N					
M41 <u>M42</u>	2	V143	M44	M51		M52		M53				



3.3. Public Awarness and Preparedness (M43)

CCAP - 12.01 CCA permanent awareness and education campaign for local citizens - S - T - R - W - F

Environmental awareness and education activities organization and ad hoc informative tools regarding climate change effects on a global and local scale, and the related call for actions in terms of widespread adaptation.

	Contribution to FRM and CCA Contribution to FRM and CCA										
	_	Floods (F)	Sev		Hig	th tides (T)	<u>C</u>		al storm ges (S)		
		Cor	ntributio	n to FRM	and C	CA					
	_		_		_				_		
	essing DR assessing hazards impacts ecting DR informed governance Progress of implementation Seed Not Started Planning On Go										
	Protecting xposed elements DR informed governance Progress of implementation Proposed Not Started Planning On Going Construction Implementation Cost Responsible										
Propos	ed	Not Starte	n l			_		Com	pleted		
-	ementati neframes			Cost		Respo	onsib	ole b	odies		
202	22 onward	S	€1	00.000,00		Veni	ponsible bodies				
			FRI	MP value							
	M2-Prevention M3-Protection										
M21	M22	M23	M24	M31	M32	M33 M34 M35					
	M4-Prep	paration	M23 M24 M31 M32 M33 M34 M ration M5-Reconstruction								
M41	M42	<u>M43</u>	M44	M5:	L	M52			M53		



CCAP - 12.02 CCA permanent training of public and private sector technicians and personnel - **S - T** - **R - W - F**

The action plans to train local technicians, operating in the public and private sectors, building capacities and specific skills in the climate change adaptation field. The training initiatives will be divided into courses co-organized with pertaining professional orders and post-graduate university courses.

			Targe	ted Haz	ard					
<u>Severe</u> rainfalls (R)		Floods (F) Sev	vere winds (W)	Hi	gh tides (T	<u>r)</u>		al storm ges (S)	
		Coi	ntributio	n to FRIV	and C	CA				
	_		_		-				_	
	Protecting <u>DR informed</u> <u>Awarence</u> posed elements <u>governance</u> <u>prepare</u>								-	
		Pr	ogress o	implem	entatio	on				
Proposed	B DR informed governance DR impacts and dispersion procedure Progress of implementation Not Started Planning On Going Construction Possible books are as a procedure procedure procedure. Planning On Going Construction Cost Responsible books are as a procedure procedure.					pleted				
	Protecting proposed elements Proposed Not Started Planning Ongoing Implementation timeframes 2023 onwards € 100.000,00 Protecting DR informed governance Proposed Planning Ongoing Planning Planning Ongoing Planning Planning Planning Ongoing Planning Planning Ongoing Planning Planning Ongoing Planning Planning Ongoing Planning Planning Ongoing Planning Ongoing Planning Ongoing						pons	sible b	odies	
2023 or	nwards	S	€ 1	00.000,00	١	Ver	nice I	Munici	ality	
			FR	MP value	•					
M2-Prevention M3-Protection										
M21 M	122	M23	M24	M31	M32	M32 M33 M34 M35				
M	4-Prep	aration			М	5-Reconst	ructi	ion		
M41 M	142	<u>M43</u>	M44	M5	1	M52			M53	



CiCPMG - 3.2. Citizenship involvement to codevelop resilience - S - T - R - W - F

Citizenship is legally a participant in the Civil Protection system and shall therefore be involved in the emergency planning and management process. Given the expected increases in extreme events, it is appropriate to develop participatory training courses aimed at population awareness, preparedness and self-protection.

	Contribution to FRM and CCA Understanding ad assessing DR assessing hazards impacts and dispersion of the contribution of the contribution to FRM and CCA Address and assessing DR assessing hazards impacts and dispersion of the contribution to FRM and CCA Address and assessing DR assessing hazards impacts and dispersion of the contribution to FRM and CCA Address and assessing DR assessing hazards impacts and assessing DR assessing hazards impacts and dispersion to FRM and CCA Address and the contribution to											
<u>Severe</u> rainfalls (R))	Floods (F	<u>S</u>			Hig	h tides (T	1		al storm ges (S)		
		Coi	ntributi	ion to	FRM a	and CO	CA					
	_											
	essing DR assessing hazards impact ordering DR informed governance prepared Progress of implementation Not Started Planning G											
	proposed elements governance preparedness procedures Progress of implementation Proposed Not Started Planning On Going Complete											
Proposed		Not Starte	ed	Awareness and preparedness Awareness and procedure					pleted			
Implem timef	nentati frames			Co	st		Resp	ons	ible b	odies		
	/			/		ng Construction Completed						
			F	RMP	value							
M2-Prevention M3-Protection												
M21 N	V122	M23	M24	N	M31	M32	M33 M34 M35					
N	И4-Prep	aration				M31 M32 M33 M34 M35 M5-Reconstruction						
M41 N	V142	<u>M43</u>	M44		M51		M52			M53		



CiCPMG - 3.3. Integration of the "io non rischio a casa mia" program - S - T - R - W - F

The "lo non rischio a casa mia" (I don't take risk) National Civil Protection Program constitute an opportunity for integrating and disseminating civil protection best practices regarding climatic and disaster risks. The Local Civil Protection Department might benefit from these dissemination public events to share local preparedness knowledge and appropriate emergency conducts.

			d								
<u>Severe</u> rainfalls (R)		Floods (F)	<u>Se</u>	vere winds (W)	Hig	h tides (T)			l storm es (S)		
		Cor	ntributio	n to FRM	and Co	CA					
Understanding and assessing	_				ducing mpacts		Hazard and d				
Protecting exposed eleme		Contribution to FRM and assessing hazards DR informed governance Progress of implementa Not Started Planning Ongoing Cost FRMP value evention M23 M24 M31 M			reness paredn			ierge ocedu			
		Pr	ogress o	f impleme	ntatio	n					
Proposed		lot Starte	d	_		on Going		Comp	leted		
Impleme timefra		on		Cost		Resp	onsibl	le bo	dies		
/				/	/						
			FR	MP value							
M2	M2-Prevention										
M21 M2	22	M23	M24	M31	M32	M32 M33 M34					
M4	-Prepa	aration			/ / / //P value M3-Protection						
M41 M4	12	<u>M43</u>	M44	M51		M52		N	153		



CiCPMG - 3.4. Information points at parks' entrances - R - W

The frequency increase of rainfall, heat waves and wind severe events will contribute to more frequent falling trees and branches. This compounded risk is particularly relevant for parks and public green areas. For these exposed locations it is advisable to install information points and signs to inform and warn citizens and users.

Measure Lo					ard	ted Haza	Targe							
Ba .		ds High tides (T) Coastal storm surges (S)					Sev	Floods (F	_	Seve rainfall:				
				CCA	1 an	to FRM	ntribution	Coi						
4	_	Hazard mitigation and dispersion			Reduc imp		_		0					
	-	Emergency procedures		ess and edness				assessing DR assessing hazer assessing DR information governance assessing DR assessing DR assessing DR information governance assessing DR assessing DR information governance governance assessing DR information governance governa						
				tion	ent	implem	ogress of	progres						
	pleted	('omnleted		On Going Construction		lanning Ingoing	d	Not Starte	sed N	Propos				
	odies	nsible bo	espor	R		Cost		Protecting posed elements Progre Proposed Not Started Implementation timeframes / M2-Prevention						
4		/				/			/					
7				•	е	VIP value	FRI	Fi						
1		n	tectio	M3-Pro				M2-Prevention						
/	M35	M34	33	32 N	Ν	M31	M24	M21 M22 M23 M24						
1		tion	nstruc	M5-Reco				aration	M4-Prep					
•	M53	N	52	N	51	M5	M44	<u>M43</u>	M42	M41				





3.4. Other preparedness (M44)

CiCPMG - 5.2. Drinking water redundancy - S - T - R - F

The risks related to drinking water, i.e., pollution, shortages, mitigation and dispersion, etc., will increase significantly. It is necessary to perform maintenance and protection works to ensure supply redundancy and service continuity, especially in case of extreme events.

			Targete	ed Haza	rd					
<u>Severe</u> rainfalls (R)	Flood	ds (F)		e winds W)	Hig	gh tides (T)	1 -	oastal sto surges (S		
		Contrib	oution	to FRM	and C	CA				
Understanding and assessing [orecastin sessing h			ducing		Hazard mitigation and dispersion			
Protecting exposed elemen		DR information				ess and Emergency procedures				
		Progre	ess of i	mpleme	entatio	on				
<u>Proposed</u>	Not St	tarted		nning going	Co		Complete	d		
Implement timefrar			C	ost		Resp	onsib	le bodie:	s	
/				/			/			
			FRM	P value						
M2-Prevention M3-							tion			
M21 M22	M21 M22 M23 <u>M24</u>				M32	M33	M3	34 M	35	
M4-F	M4-Preparation						M5-Reconstruction			
M41 M42	· · · · · · · · · · · · · · · · · · ·			M51		M52	M52 M53			



4. Recovery (M5)

4.1. Environmental recovery (M52)

CiCPMG - 6.5. Regulating and cleansing pollution in the lagoon - S - T - R - W - F

As for post-event procedures, it is advisable to have already in place agreements, contracts and rapid activation contacts for Venice Lagoon clean-up and environmental management companies. The timely and effective containment of polluting materials spills, particularly in a regulated lagoon regime, is crucial for the maintenance of its vital ecosystem state.

			Target	ed Haza	rd						Measu	r
<u>Severe</u> <u>rainfalls (R)</u>	Flood	s (F)		re winds (W)	Hig	th tides (<u>T)</u>		el storm (es (S)	Γ_{-1}		_
		Contri	bution	to FRM	and C	CA				< >	~~~	
Understanding and assessing E		recasti essing l	ng and nazards	Re	educing impact			zard mi nd disp	tigation ersion	Ex.		
Protecting exposed elemen		OR infor			areness eparedr		ency ures	{		P		
		Progr	ess of i	implem	entatio	n				1		3
<u>Proposed</u>	Not St	irted		anning ngoing		On Going Completed			pleted			4
Implement timefrar			(Cost		Res	pon	sible b	odies			
/				/				/				4
		•	FRM	IP value								
M2-	Preventio	1			ı	M3-Prot	ection	n				1
M21 M22	M2	V124	M31	M32	МЗ	3	M34	M35		- 1		
M4-F	Preparatio	n			MS	5-Reconstruction					1	
M41 M42	<u>M4</u>	3 1	V144	M5:	1	<u>M5</u>	<u>52</u> M53				•	



5. References

- Autorità di bacino distrettuale delle Alpi Orientali (2021). "Aggiornamento e revisione del Piano di Gestione del Rischio di Alluvioni. Relazione Generale";
- Distretto Idrografico delle Alpi Orientali (2016). "Piano di Gestione del Rischio di Alluvioni. Relazione di piano e allegati I, II, III e V";
- Università IUAV di Venezia (2021). "PIANO DI ADATTAMENTO CLIMATICO, Comune di Venezia, Allegato 1: Linee di azione e misure attuative";



- Università IUAV di Venezia (2021). "PIANO DI ADATTAMENTO CLIMATICO, Comune di Venezia, Allegato 2: Analisi di rischio climatico"
- Università IUAV di Venezia (2022). "Definizione di un sistema di gestione dell'emergenza e della ricostruzione. Documento di indirizzo per la pianificazione emergenziale e della ricostruzione post-disastro in regime di Cambiamento Climatico nella Laguna di Venezia".

CONCLUSION

The reports highlight the proactive and collaborative efforts undertaken by various stakeholders, including government agencies, research institutions, and local communities, to update the Flood Risk Management Plan and integrate climate change adaptation strategies at the municipal level. The progress made in both areas showcases Italy's commitment to enhancing resilience, reducing vulnerability, and protecting its communities and infrastructure from flood-related hazards.

The adoption of advanced technologies, such as remote sensing, data analytics, and modeling techniques, has played a significant role in improving early warning systems, flood forecasting capabilities, and decision-making processes. These advancements empower Italy to respond proactively to flood events, minimizing the potential damages and safeguarding the well-being of its citizens.