AdriaClim

Climate change information, monitoring and management tools for adaptation strategies in Adriatic coastal areas

Project ID: 10252001

D5.4.8 A dashboard to support the planning of adaptation to climate change for the Veneto project area able to allow self-assessment of the current territory planning and health policy for searching adaptation actions already in place

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Authors	ARPA Veneto: Francesco Rech, Giovanni Massaro, Fabio Zecchini; IUAV: Francesco Musco, Denis Maragno, Filippo Magni, Gianfranco Pozzer, Nicola Romanato.
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2 The abacus of adaptation and mitigation measures

The adaptation process that leads to improving the overall resilience of a territorial system can be recognised in the knowledge-building process that thrives on complex investigations, forms of participation and integrated, multi-level governance. This process, therefore, becomes tangible when the measures that counteract climatic phenomena and the forcing factors put in place within the territorial matrix of reference are made operational; in fact, since adaptation is a process calibrated on the specificities of the territory, it becomes indispensable to equip oneself with plastic, reinterpretable and multifunctional solutions.

Depending on the specific needs of a place and its socio-economic fabric, a policy line may be more effective than a physical measure, just as a grey measure may be more efficient than a green one, and so on: adaptation presents a strong variability and a high rate of specificity. In fact, these solutions are inserted within the existing city, providing an opportunity to review urban planning practices and spatial governance tools that already deal with organising spatial planning at the local scale, but reorganising themselves according to a different angular perspective that updates the paradigms of the traditional discipline and addresses the challenges imposed by climate change.

The abacus was thus conceived as a tool to support stakeholders dealing with urban transformations, the management of natural areas and the maintenance of agricultural areas, as well as to direct municipal administrators and professionals working within the coastal space in general. These, guided by multi-risk analyses, find themselves able to develop both planning hypotheses and policy tools taking into account especially the most at-risk contexts. Characterising the operational pathway by organising it according to a hierarchical system that reorders resources according to intervention priorities makes it possible to rationalise forces over time and to act firmly where adaptation is strictly necessary. Because of this, the consequential reading between multi-hazard and adaptation could then accompany planning towards the construction of an organic, overall urban framework, where the morphological vulnerabilities and functional destinations of the coastal space become the core of the adaptive project.

As a first applicative example, reference is made to Figure 1: in the urban quadrant of Jesolo, once the hot-spots of climatological and very high risk have been characterised, the adaptation measures are inserted into the background scenario thanks to the link with the types of land use; since adaptation is a process that involves different spheres of land governance (e.g. physical,

organisational, economic measures), land use becomes the common denominator to concretise towards the convergence between the abacus of measures and the territory under investigation.

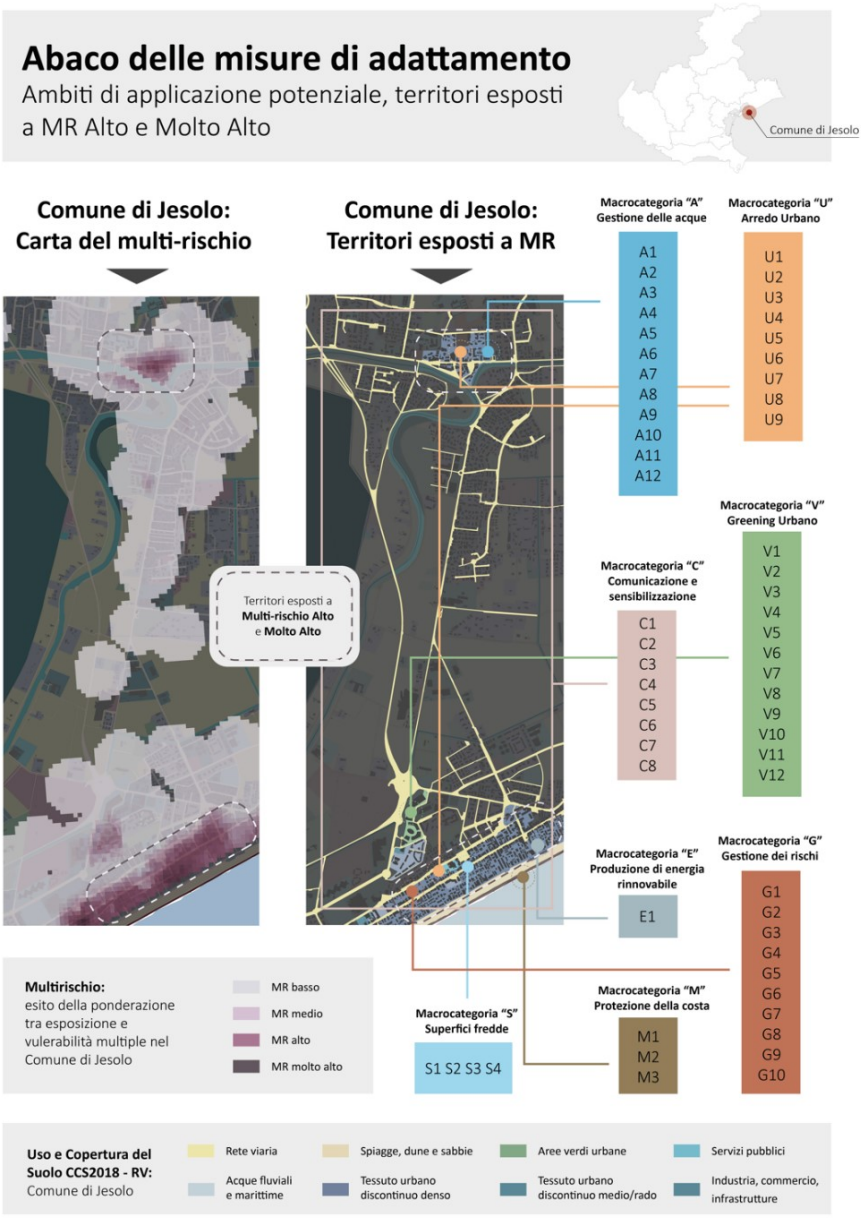

Figure 1: Application of the different adaptive measures in coherence with multi-hazard urban fabrics[1]

2.1 Keys to reading the abacus

2.1.1 Macrocategories of intervention

The following possible interventions open up eight different categories. This possible additional division is intended to improve the reading of the Abacus according to the need for compensatory actions. The eight macro-categories are:

- **Punctual micro-interventions**: This category contains measures that act directly on the re-design or addition of elements to the urban context, with the aim of aesthetically and functionally upgrading built-up areas and public places. This category includes paving interventions, upgrading of urban infrastructures, planters, public parks, roofing elements (canopies, porches, etc.).
- **Communication and awareness-raising**: promoting a lasting and robust climate transition requires adequate collective technical and operational awareness and preparedness. Approaching the issues also from the point of view of technical and educational awareness-raising of administrators, decision-makers, citizens and establishing communication systems for real-time and post-emergency forecasting is indispensable to involve as many stakeholders as possible and to achieve higher effectiveness and efficiency of interventions. This category contains measures that involve, inform, stimulate and broaden the knowledge and interest of local communities.
- **Risk management**: climate change also leads to an increase - not always predictable either in terms of their characterisation or their intensity - of events that put territorial systems and people at risk. It is therefore necessary to increase the resilience of people, cities and territories to increase their capacity to respond to multiple and unexpected risks. This macro-category, therefore, contains both measures that physically increase resilience capacities and measures that increase technical and emergency preparedness capacities among the population and specialised personnel (civil protection, decision-makers, technicians, volunteers, etc.).
- **Water management**: the management, especially during extreme or prolonged meteorological events, of water whether meteoric, flowing down rivers or coming in from the sea is one of the central issues in territorial security, particularly in urban or heavily man-made, hence sealed, areas. Intervention strategies fall into three possible options: stemming water flows, delaying and slowing their path to the final receptor - be it the sewer, the river, the sea, a ditch, etc. - and reusing the water resource. - and reuse the water resource. This macro-category contains measures that can be implemented to improve water management

[1] The subdivision by macro-categories contextualises each box, while the dashed box shows the portions of territory on which policy instruments and adaptive measures can be grafted.

systems and to prepare territories and cities to reduce the chances of suffering devastating impacts in the event of weather events.

- **Urban greening**: the term greening is related to the instrument implemented to support the agricultural policies of the European Union, which promotes greening initiatives in order to ensure the conservation of agricultural productivity in the long term with ecological practices. In the urban context it is applicable in any intervention that reinforces, protects, increases the green endowment with new trees, parks, SuDS, lawns, in order to increase urban biodiversity, improve the microclimate, increase the capacity to react to phenomena such as flooding, mitigate the effect of heat islands.
- **Renewable energy production**: if, as seen, it is indispensable to strengthen urban systems in order to better prepare them for the impacts of climate change, in parallel it is indispensable to strengthen as much as possible the interventions for mitigation, reduction, retention, compensation of CO2 produced, reduction of pollutants, etc. This category, therefore, includes interventions that contribute to increasing the share of renewable energy produced.
- **Coastal protection**: in the territory considered by this Annex, coastal systems are among those most at risk of suffering continuous and irreparable impacts such as storm surges, tornadoes, extreme weather events. The measures contained in this macro-category therefore indicate some of the options that can be implemented to strengthen and make more resilient, both with engineering and grey interventions and with measures to strengthen the capacity of natural systems, the coastal strip and the first marine strip.
- **Cold surfaces**: this category contains interventions involving a different colouring of materials, either by replacement or by painting existing surfaces. These interventions have the primary purpose of increasing albedo, but they are also very useful for improving the aesthetic quality of public spaces, car parks, shed roofs, etc. Moreover, due to their cost-effectiveness and speed of implementation, they can also be used for tactical urban planning and/or urban redevelopment.

2.1.2 Types of measurement

Different types of measurement can be adopted:

- **Green**: green measures refer to the set of solutions using an ecosystem approach, exploiting plant elements such as trees, lawns, hedges, parks, fields, forests, to achieve their purpose. These measures tend to have benefits on the microclimate, the ability to store water, slow water runoff, mitigate heat islands, but also on increasing biodiversity - including urban biodiversity - and the sense of pleasantness of places.
- **Grey**: Grey measures refer to the complex of engineering, technological and infrastructural solutions that use elements such as buildings, roads and other urban constructions to

achieve their purpose. Included in this category are measures to upgrade, adapt, reinforce infrastructure - roads, electricity, sewage, etc. - and urban systems. - and urban systems.

- **Blue**: blue measures refer to the set of solutions that recognises natural or man-made water systems as a central element for managing hydraulic risks and mitigating extreme weather events by reducing the risks of storm surges and flooding. Understandably, thanks to water's natural vocation for mitigating heat fluctuations, these interventions also contribute to mitigating heat islands. This includes, for example, strengthening the capacity and quality of water elements such as rivers, canals, ponds, wetlands, floodplains, water treatment plants, etc.
- **Policy**: Policy measures refer to the set of solutions that intervene through strategic instruments, economic incentives, public policies, etc. On the one hand, it is fundamental to succeed in converting economic and industrial processes towards more sustainable and circular production and consumption models, both from an economic and environmental point of view; on the other hand, it is now essential to strongly address the mainstreaming process of local, supra-local and regional planning, with a view to climate-proofing, by directing public funding towards the qualitative upgrading of the energy performance of buildings and towards more sustainable modes of transport. To meet these needs, it is therefore essential to approach the issue of climate change and ecological transition also with the necessary policy tools to ensure an overall transformation of production and land management systems.

2.1.3 Intervention zoning

Zoning represents the meeting point between measures and potential areas of application in the territory. It is one of the parameters that favours, on the one hand, the reading of the local scale and, on the other hand, the incorporation of technologies, the initiation of retrofit practices or the adoption of specific policies within each cluster. Starting from the regional information level updated in 2018, the aggregation into macro-clusters took into account the internal morphological

and functional homogeneity, the reconnection with the solutions contained in the abacus and the effectiveness of use during the decision-making process:

- **Coast:**
  - port areas (fishing, commercial and pleasure port areas);
  - beaches, dunes and sands.

- **Urbanised:**
  - sports and recreational areas (amusement parks, sports areas, campsites, tourist accommodation facilities);
  - dense discontinuous urban fabric (artificial surface between 50% and 80%);
  - discontinuous medium/low residential urban fabric (artificial surface between 10% and 50%, residential complexes including green areas, isolated residential structures, Veneto villas);
  - industry, commerce, infrastructure, (livestock settlements, areas designated for industrial activities and adjoining areas, water infrastructure, areas designated for commercial activities);
  - public services (non-vegetated cemeteries, public utility technology infrastructure, parking areas, places of worship, schools, public, military and private service areas)
  - urban green areas (private green areas, urban parks, green areas associated with roads, uncultivated green areas in urban areas);
  - quarrying areas, landfills or areas under construction (construction sites and spaces under construction, excavations, landfills, quarry deposits, mines, areas undergoing transformation, reworked and artefactual soils, abandoned areas).

- **Natural and agricultural environments:**
  - agricultural land (poplar groves in cultivation, permanent grassland, vineyards, orchards, herbaceous cover crops, wood arboriculture, complex cropping systems and parcels, arable land in non-irrigated areas, arable land in irrigated areas, other permanent crops);
  - river and maritime waters (salt or brackish water aquaculture);
  - wetlands (reed and bulrush beds of riverine wetlands, salt marshes, reclaimed land open to the lagoon or the sea, hygrophilous vegetation, lagoon mudflats, coastal wetlands, fishing valleys);
  - natural or semi-natural areas (broadleaf forest, shrub forest, evolving woodland and shrub vegetation, coastal dune vegetation, willow forests and other riparian

formations).

- **Road infrastructure:**
  - road network.

2.1.4 Measurement Characteristic

Feature:

- **Physical**: this refers to interventions that can be implemented with tangible changes to the building, urban form, areas and spaces.
- **Organisational**: this refers to interventions that implement a change in practices, procedures or behaviour and do not primarily involve changes in space. They include changes to rules, plans, regulations, but also measures for monitoring, information, awareness-raising, education, training, participation.
- **Economic**: this refers to interventions that act also or above all with economic and promotional instruments such as incentives, defiscalisation, volume premiums, etc.

2.1.5 The expected effect of the measure

Expected effect:

- Impact reduction: dedicated impact reduction measures allow fragile elements of the territory to be reinforced.
- Dispersion of the phenomenon: the dispersion of the phenomenon exclusively or promiscuously describes a spatial intervention capable of letting an event vent without it having a serious effect on the continuity of urban life.
- Citizen self-protection: citizen self-protection measures are designed to provide inhabitants, or users of areas at risk, with suggestions and incentives to protect themselves and their material assets.

2.1.6 Climate impacts

Impacts to which it responds:

- **Urban Heat Island (UHI)/Urban Heat Island:** these are linked to the recording of extreme temperatures in terms of both intensity and frequency in conjunction with the co-presence of several critical factors that contribute to the concentration and increase of temperature in urban agglomerations. Among the most obvious factors that can be referred to are urban morphology, land densification, exposed climatic-geographical zone, human activities and

energy metabolism. The UHI phenomenon causes a worse quality of life in cities, in some cases reduces the dispersion of air and water pollution, increases energy costs for cooling buildings, reduces urban biodiversity and acts as an amplification factor of heat waves generated by global warming, and last but not least, increases health risks for the population.

- **Runoff/urban flooding**: this is one of the main issues related to the risk of flooding whose problematic nature stems from the degree of impermeability of the soil. While in natural environments, rainwater is washed and filtered slowly from and through the soil, in the urban environment impermeable surfaces encourage rapid runoff to receptor bodies. The occurrence of extreme weather phenomena attributable to climate change increases the inflow of water to the receptor bodies causing temporary flooding in the urban fabric. Climate change places urban drainage systems in a state of inefficiency during extreme weather events and the problem becomes a priority as extreme rainfall events are expected to intensify.
- **Sea storms**: these are meteo-marine events of great intensity and proportions and therefore produce significant impacts on coastlines such as coastal erosion, but also flooding, damage to infrastructure, etc. Sea storms are characterised by significant wave heights. The nature and intensity of the phenomenon causes different impacts depending on the morphological characteristics of the coast (such as the material, orientation with respect to currents and waves, bathymetry of the seabed) and the proximity and exposure of works, built-up areas,

services, infrastructures its vulnerability, in terms of works, infrastructures, inhabited areas, activities[2].

2.1.7 Integration of measures into existing planning

Proposed integration of measures into the local urban and sectoral planning system:

- Building regulations.
- Green regulation.
- Three-year Public Works Plan - PTOOPP.
- Green Plan.
- Emergency Plan.
- Communication Plan.
- PAESC - Sustainable Energy and Climate Action Plan.
- Water Plan.
- Intervention Plan.

2.1.8 SDGs - Sustainable Development Goals

The Sustainable Development Goals were issued in September 2015 at the United Nations where, with the aim of contributing to global development without undermining human well-being and environmental protection, the community of states approved the 2030 Agenda for Sustainable Development: 17 development goals accompanied by 169 sub-goals that, spanning all possible fields, commit with concrete, verifiable and assessable actions the whole World in a universal and voluntary way - from individuals, to associations, to Cities, to States, to International Organisations - towards a "sustainable development to tackle climate change and build peaceful societies by the year 2030." The goals, which are plural and numerous, have a central role for local communities and urbanised contexts; they are indeed ambitious and broad, but, by nature, practically applicable to local political agendas. It is precisely this holistic view, which implies unanimous efforts of all categories and entities to achieve a sustainable situation for the Planet, that underlines the resilient

[2] Read more: www.arpae.it/it/temi-ambientali/mare/scopri-di-piu/cose-una-mareggiata

approach that the 17 goals have. That is why this Abacus considers the SDGs and points out which goals can be achieved with which measures.

Table 1: Climate change adaptation measures, divided into macro-categories. Each measure is associated with a unique ID code

Macro-Category 1: Street furniture	
Urban shading through green at altitude	U1
Lightweight fixed elements	U2
Fixed rigid elements	U3
Protection of buildings with architectural elements	U4
Usable fountains	U5
Nebulisation	U6
Drinking water fountains	U7
Water tanks	U8
Water squares	U9
Macro-Category 2: Communication and Awareness-raising	
App development	C1
Early Warning Systems	C2
Loudspeakers in the City	C3
SMS alert	C4
Dissemination of information on social media	C5
Digital Panels	C6
Promoting meetings on sustainable climate	C7
Development of technical skills	C8
Macro-Category 3: Risk Management	
Breakwater	G1
Brushes	G2
Private floodgates	G3
Protection walls	G4
Upgrading existing drains	G5
Power units for hydraulic pumps	G6
Lightning protection	G7
Tidal gates to protect against storm surges	G8

Strengthening the reefs	G9
Nourishment of the emerged and submerged beach	G10
Macro-Category 4: Water Management	
Permeable portions in impermeable parking areas	A1
Draining asphalts	A2
Widening of existing channels/ditches	A3
Rainwater collection in underground siphon	A4
Rainwater collection in external siphon	A5
Leakage or seepage wells	A6
Filter trenches	A7
Infiltration and bioretention basins	A8
Detention basins	A9
SuDS in the road environment	A10
Implementation of buffer strips	A11
Restoration of floodplains	A12
Macro-Category 5: Urban Greening	
Tree-lined avenues	V1
Lowland forests	V2
Urban gardens	V3
Climatic façade	V4
Depavation	V5
Intensive green roofs	V6
Practicable green roofs	V7
Productive green roofs	V8
Extensive green roofs	V9
Green roofs on canopies	V10
Windbreak hedges	V11
Promoting the functional connectivity of ecological networks	V12

Macro-Category 6: Renewable Energy Production	
Installation of solar systems	E1
Macro-Category 7: Coastal Protection	
Vegetating the dunes	M1
Screening the dunes	M2
Establishing marine protected reserves	M3
Macro-Category 8: Cold Surfaces	
Cold roofs by painting	S1
Cold surfaces on the ground	S2
Cold surfaces on the ground in car parks	S3
Increasing the reflectance (albedo) of the road surface	S4

2.2 Abacus of climate change adaptation measures

2.2.1 Macro-Category 1: Punctual Micro-Interventions

Urban shading through green at altitude							**U1**
Shading of urban areas by means of evergreen or deciduous climbing plant elements.							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric				Reg. green	
		Discontinuous sparse urban fabric		dispersion of the phenomenon		Green Plan	
		Industry, trade, infrastructure				PAESC	
		Public Services					

Lightweight fixed elements							**U2**
Shading using light materials such as PVC, synthetic or natural canvas, coloured umbrellas, curtains, which can also be used for the beautification of boulevards or squares.							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					

Fixed rigid elements							U3
Shading through rigid elements such as pompeianes, pergolas							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					

Protection of buildings with architectural elements							U4
Installation of additional elements (wood, metal, etc.) on the façades of buildings, especially on those facing south, east and west, to lower the level of incidence of sunlight							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					

Usable fountains							U5
Level, usable, walkable fountains can also be an engine of urban regeneration, pedestrianisation of areas, a place of play and recreation for children.							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric					

		Discontinuous sparse urban fabric				PAESC	
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
		Sports and recreational areas					

Nebulisation							**U6**
Direct or indirect evaporation in public spaces in city centres							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
		Sports and recreational areas					

Drinking water fountains							**U7**
Fountains with drinking water, both for people and animals, in the most frequented stretches							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					

		Sports and recreational areas					

Water tanks							**U8**
Underground tanks of different sizes in urban environments, equipped with a closed hydraulic circuit of moving water							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric				PTOOPP	
		Discontinuous sparse urban fabric		dispersion of the phenomenon	Run-off	PAESC	
		Industry, trade, infrastructure					
		Public Services					

Water squares							**U9**
Multi-purpose public squares and, in the event of more or less heavy rain, partially floodable							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13
		Medium discontinuous urban fabric				PTOOPP	
		Discontinuous sparse urban fabric		dispersion of the phenomenon	Run-off	PAESC	
		Industry, trade, infrastructure				Water Plan	
		Public Services					

2.2.2 Macro-Category 2: Communication and Awareness-raising

<table>
<tr><th colspan="7">App development</th><th>C1</th></tr>
<tr><td colspan="8">Development of mobile applications capable of providing information on extreme events in real time</td></tr>
<tr><th>TYPE</th><th colspan="2">ZONING</th><th>FEATURE</th><th>EXPECTED EFFECT</th><th>IMPACT</th><th>INSTRUMENT</th><th>SDGs</th></tr>
<tr><td rowspan="9">policy</td><td>coast</td><td>Port areas</td><td rowspan="9">organisational</td><td rowspan="9">citizen self-protection</td><td rowspan="6">UHI</td><td>Emergency Plan</td><td rowspan="9">9, 11, 13, 16, 17</td></tr>
<tr><td rowspan="7">urbanised</td><td>Dense discontinuous urban fabric</td><td>Communication Plan</td></tr>
<tr><td>Medium discontinuous urban fabric</td><td rowspan="7">PAESC</td></tr>
<tr><td>Discontinuous sparse urban fabric</td><td rowspan="3">Run-off</td></tr>
<tr><td>Industry, trade, infrastructure</td></tr>
<tr><td>Public Services</td></tr>
<tr><td rowspan="2">Urban green areas</td></tr>
<tr><td rowspan="2">swells</td></tr>
<tr><td>Natural and agricultural areas</td><td>Agricultural land</td></tr>
</table>

Early Warning Systems							C2
Establishment of monitoring, modelling and forecasting systems to warn operators at an early stage of risks related to adverse weather phenomena							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
policy	coast	Port areas	organisational	citizen self-protection	UHI	Emergency Plan	9, 11, 13, 16, 17
	urbanised	Dense discontinuous urban fabric				Communication Plan	
		Medium discontinuous urban fabric				PAESC	
		Discontinuous sparse urban fabric			Run-off		
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
	Natural and agricultural areas	Agricultural land			swells		

Loudspeakers in the City							C3
Loudspeakers to alert the population of a particular event, aware of the significance of certain sounds							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
policy	coast	Port areas	organisational	citizen self-protection	UHI	Emergency Plan	9, 11, 13, 16, 17
	urbanised	Dense discontinuous urban fabric				Communication Plan	
		Medium discontinuous urban fabric				PAESC	

		Discontinuous sparse urban fabric			Run-off		
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
	Natural and agricultural areas	Agricultural land			storm surges		

SMS alert						C4
Dissemination, by the SMS service management, of information to target groups, differentiated by sensitivity, location, or more simply in a generalised manner						
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
policy	coast	Port areas	organisational	citizen self-protection	UHI	Emergency Plan	9, 11, 13, 16, 17
	urbanised	Dense discontinuous urban fabric				Communication Plan	
		Medium discontinuous urban fabric				PAESC	
		Discontinuous sparse urban fabric			Run-off		
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
	Natural and agricultural areas	Agricultural land			storm surges		

Dissemination of information on social media	C5
Dissemination of information on social media with the aim of alerting, providing instructions, managing flows, suggesting precautionary modes of behaviour	

TYPE	ZONING		FEATURE	EXPECTED EFFECT	IMPACT	INSTRUMENT	SDGs
policy	coast	Port areas	organisational	citizen self-protection	UHI	Emergency Plan	9, 11, 13, 16, 17
	urbanised	Dense discontinuous urban fabric				Communication Plan	
		Medium discontinuous urban fabric				PAESC	
		Discontinuous sparse urban fabric			Run-off		
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
					storm surges		
	Natural and agricultural areas	Agricultural land					

Digital Panels	C6
Digital panels placed at strategic points in the city, with the aim of informing about future events (rain, wind, strong heat, event, road closed, traffic restrictions, etc.) and signalling contingent events requiring a change in flow or behaviour	

TYPE	ZONING		FEATURE	EXPECTED EFFECT	IMPACT	INSTRUMENT	SDGs
policy	coast	Port areas	organisational	citizen self-protection	UHI	Emergency Plan	9, 11, 13, 16, 17
	urbanised	Dense discontinuous urban fabric				Communication Plan	
		Medium discontinuous urban fabric				PAESC	

		Discontinuous sparse urban fabric			Run-off		
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
	Natural and agricultural areas	Agricultural land			swells		

Promoting meetings on sustainable climate							**C7**
Organisation of conferences on the subject of climate change, with a particular focus on the extreme events associated with it (storms, droughts, high temperatures, precipitation, etc.).							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
policy	coast	Port areas	organisational	reducing impact	UHI	Communication Plan	3, 4, 11, 13
	urbanised	Dense discontinuous urban fabric					
		Medium discontinuous urban fabric		dispersion of the phenomenon	Run-off		
		Discontinuous sparse urban fabric					
		Industry, trade, infrastructure		citizen self-protection	swells		
		Public Services					
		Urban green areas					
	Natural and agricultural areas	Agricultural land					

Development of technical skills							C8
Increasing information and knowledge on climate change adaptation							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
policy	coast	Port areas	organisational	reducing impact	UHI	Emergency Plan	4, 11, 13
	urbanised	Dense discontinuous urban fabric					
		Medium discontinuous urban fabric		dispersion of the phenomenon	Run-off		
		Discontinuous sparse urban fabric					
		Industry, trade, infrastructure		citizen self-protection	swells	PAESC	
		Public Services					
		Urban green areas					
	Natural and agricultural areas	Agricultural land					

2.2.3 Macro-Category 3: Risk Management

Breakwater							G1
Coastal structures (usually made of quarry boulders thrown into a mound), which extend out to sea and protect boats from wave motion and currents							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	coast	Beaches, dunes and sands	physics	reducing the impact	storm surges	Building Reg.	11, 13, 14, 17
						PTOOP	
				dispersion of the phenomenon		Emergency Plan	
		Port areas				PAESC	
						PI	

						Regulations governing bathing activities	

Brushes							G2
Coastal protection structures, built perpendicular to the coastline (or river), from the emerged beach to the submerged beach							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	Coast	Beaches, dunes and sands	physics	reducing impact	Run-off	Building Reg.	11, 13, 14, 17
						PTOOPP	
				dispersion of the phenomenon		Emergency Plan	
		Port areas			Tidal waves	PAESC	
						PI	
						Regulations governing bathing activities	

Private floodgates							G3
Barriers placed on the ground floor of homes, businesses and garages, blocking the ingress of water caused by heavy rain/flooding							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	Run-off	Building Reg.	11
		Medium discontinuous urban fabric				Emergency Plan	
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					

		Dense discontinuous urban fabric				Water Plan	

Protection walls							**G4**
Fixed works for the protection of built-up areas and infrastructure							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	Coast	Dense discontinuous urban fabric	physics	Impact reduction	Run-off	Building Reg.	11
		Medium discontinuous urban fabric			Tidal waves	PTOOPP	
		Discontinuous sparse urban fabric		Dispersion of the phenomenon		Emergency Plan	
		Industry, trade, infrastructure					
		Dense discontinuous urban fabric				PAESC	

Upgrading existing drains							**G5**
Upgrading of pumps to absorb and remove large masses of water, especially used for reclamation works or in cases of flooding							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	natural and agricultural areas	Waters	organisational	reducing impact	Run-off	Building Reg.	11, 17
		Natural or semi-natural areas				Emergency Plan	
		Wetlands		dispersion of the phenomenon	storm surges	PAESC	
						Water Plan	
						PI	

Power packs for hydraulic pumps	G6
Modification to ensure an effective level of resilience to stressful situations caused by high tides and flooding by securing in elevated positions the electrical power units supplying the water evacuation pumps outside the buildings.	

TYPE	ZONING		FEATURE	EXPECTED EFFECT	IMPACT	INSTRUMENT	SDGs
grey	natural and agricultural areas	Waters	organisational	reducing impact	Run-off	Building Reg.	11, 17
		Natural or semi-natural areas				Emergency Plan	
				dispersion of the phenomenon	storm surges	PAESC	
		Wetlands				Water Plan	
						PI	

Lightning protection	G7
Device designed to attract and disperse atmospheric electrical discharges	

TYPE	ZONING		FEATURE	EXPECTED EFFECT	IMPACT	INSTRUMENT	SDGs
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	swells	Building Reg.	9, 11
		Medium discontinuous urban fabric				Emergency Plan	
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Dense discontinuous urban fabric					

Tidal gates to protect against storm surges	G8
Fixed structures allowing the passage of running water under normal flow conditions, but equipped with bulkheads that can be closed to prevent flooding in the event of storm surges or tides	

TYPE	ZONING		FEATURE	EXPECTED EFFECT	IMPACT	INSTRUMENT	SDGs
grey	coast	Beaches, dunes and sands	physics	dispersion of the phenomenon	storm surges	Emergency Plan Water Plan	11, 13

Strengthening the reefs	G9
Strengthening of cliffs and improvement of slope strength and stability to minimise bearing pressures and possible phenomena such as landslides, collapses and falling rock blocks	

TYPE	ZONING		FEATURE	EXPECTED EFFECT	IMPACT	INSTRUMENT	SDGs
grey	coast	Waters Natural or semi-natural areas Beaches, dunes and sands	physics	reducing impact	swells	PTOOPP	11, 13

Nourishment of the emerged and submerged beach	G10
Artificial placement of sand on the eroded shoreline in order to maintain the amount of sand present on the coastal seabed	

TYPE	ZONING		FEATURE	EXPECTED EFFECT	IMPACT	INSTRUMENT	SDGs
green	coast	River and maritime waters Natural or semi-natural areas Beaches, dunes and sands	physics	reducing impact	storm surges	PTOOPP PI	11, 13

2.2.4 Macro-Category 4: Water Management

Permeable portions in impermeable parking areas							A1
Conversion of portions of impermeable parking areas into permeable areas, designed to allow the infiltration of water into the subsoil and the related recharge of the water table							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Dense discontinuous urban fabric	physics	reducing impact	Run-off	Building Reg.	11, 13
		Medium discontinuous urban fabric		dispersion of the phenomenon		PAESC	
		Discontinuous sparse urban fabric					
		Industry, trade, infrastructure					
		Public Services					
		Dense discontinuous urban fabric					

Draining asphalts						A2
Type of asphalt that significantly reduces water run-off on the road surface						
TYPE	**ZONING**	**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	Road Network	physics	reducing impact	Run-off	Building Reg.	11, 13
	Public Services		dispersion of the phenomenon		PAESC	

Widening of existing channels/ditches							A3
Works to widen existing canals and ditches, aimed at increasing reservoir volumes							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	natural and agricultural areas	Natural or semi-natural areas	physics	reducing impact	Run-off	PTOOPP	3, 11, 13
		Agricultural land				PAESC	

Rainwater collection in underground siphon							A4
Provision of underground siphons to collect rainwater drained from the roof, which can then be used for garden maintenance, toilet flushing, etc.							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	Run-off	Building Reg.	6, 11, 13
		Medium discontinuous urban fabric				PAESC	
		Discontinuous sparse urban fabric				Water Plan	
		Public Services					

Rainwater collection in external siphon							A5
Provision of small external siphons for collecting rainwater, which can also serve as planters or as a base for garden boxes							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	Run-off	Building Reg.	6, 11, 13
		Medium discontinuous urban fabric				PAESC	
		Discontinuous sparse urban fabric				Water Plan	

		Public Services					
		Urban green areas					

Leakage or seepage wells							A6
Wells suitable for low-permeable soils, useful for small-scale operations in built-up areas, with limited available surface area (less than 1% of the drained area). Only poorly polluted rainwater may be pumped into the wells after pre-treatment, which must include at least effective sedimentation							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	Run-off	Building Reg.	6, 11, 13, 16
						PTOOPP	
		Medium discontinuous urban fabric				Reg. green	
				dispersion of the phenomenon		Green Plan	
		Discontinuous sparse urban fabric				PAESC	
		Public Services					
		Urban green areas					

Filter trenches							A7
Excavations backfilled with gravel, sand and stones or with prefabricated elements made of plastic materials, created to facilitate infiltration into the trench and the subsequent filtration of rainwater into the subsoil through the sides and bottom of the trench							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Dense discontinuous urban fabric	physics	reducing impact	Run-off	Building Reg.	6, 11, 13, 16
						PTOOPP	
		Medium discontinuous urban fabric				Reg. green	
				dispersion of the phenomenon		Green Plan	
		Discontinuous sparse urban fabric				PAESC	
		Public Services					
		Urban green areas					

Infiltration and bioretention basins							A8
Areas modelled to create reservoirs between 0.3 and 0.6 m deep, aimed at temporarily storing water and disposing of runoff produced by an impermeable surface through infiltration. These basins can provide for water to remain in them over the long term, as long as the problem of insect and mosquito proliferation is managed. Infiltration basins must be built on soils with high permeability (at least 13 mm h-1) and the most suitable soils are sandy soils with the presence of coarse gravel, as they facilitate drainage and prevent the formation of water stagnation.							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
blue	urbanised	Dense discontinuous urban fabric	physics	reducing impact	Run-off	Building Reg.	6, 11, 13, 16
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric				PTOOPP	
		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
	natural and agricultural areas	Agricultural land				Reg. green	
				dispersion of the phenomenon		Green Plan	
						PAESC	

Detention basins							A9
Large basins (20,000-970,000 m^3) with low permeability, designed to temporarily store part of the excess flow of a large watercourse							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
blue	urbanised	Dense discontinuous urban fabric	physics	reducing impact	Run-off	Building Reg.	6, 11, 13, 16
		Medium discontinuous urban fabric				PTOOPP	
		Discontinuous sparse urban fabric					

		Industry, trade, infrastructure					
		Public Services					
		Urban green areas					
	natural and agricultural areas	Agricultural land				Reg. green	
				dispersion of the phenomenon		Green Plan	
						PAESC	

SuDS in the road environment						A10
Permeable pavements for sustainable urban drainage (SuDS) along road infrastructures that diversify the urban image and, at the same time, make a positive contribution to the challenge of climate change						
TYPE	**ZONING**	**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	Road Network	physics	reducing impact	UHI	Building Reg.	6, 11, 13, 16
				Run-off	PTOOPP	
			dispersion of the phenomenon	storm surges	PAESC	
					Water Plan	

Implementation of buffer strips						A11
buffer zones in which certain activities or actions that may cause pollution of nearby water resources are prohibited						
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	coast	Natural or semi-natural areas	physics	reducing impact	UHI	PTOOPP	6, 11, 13
		Beaches, dunes and sands				Water Plan	
	urbanised	Dense discontinuous urban fabric					
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric			Run-off		
		Industry, trade, infrastructure.					
		Public Services					

		Urban green areas					
	natural and agricultural areas	Agricultural land					

Restoration of floodplains							**A12**
Rehabilitation of floodplains and river wetlands, aimed at fostering seasonal aquatic habitats, creating ecological corridors through the presence of native riparian forests and shaded riverine and terrestrial habitats							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green, blue	coast	Natural or semi-natural areas	physics	reducing impact	UHI	Water Plan	3, 11, 13, 14
		Beaches, dunes and sands				Intervention Plan	
		Wetlands					
	natural and agricultural areas	River and maritime areas			Run-off	Three-Year Public Works Plan	
		Agricultural land			storm surges		

2.2.5 Macro-Category 5: Urban Greening

Tree-lined avenues							**V1**
Avenues that, thanks to the presence of trees, protect the road surface from the sun, decreasing its surface temperature							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Medium discontinuous urban fabric	physics	reducing impact	UHI	Reg. green	3, 11, 13, 15
					Run-off	PTOOPP	
		Discontinuous sparse urban fabric				Green Plan	
		Industry, trade, infrastructure				PAESC	
		Public Services					
		Urban green areas					

Lowland forests							V2
Extensive wooded areas, especially in peri-urban areas, to protect and promote biodiversity and mitigate heat waves							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Industry, trade, infrastructure	physics	reducing impact	UHI	Reg. green	3, 11, 13
		Public Services					
		Urban green areas			Run-off	PTOOPP	
	natural and agricultural areas	Natural or semi-natural areas				Green Plan	
		Wetlands					
		Agricultural land				PAESC	
						PI	

Urban gardens							V3
Urban areas designated for gardens and gardening activities, rich in vegetation, crops and permeable soils that contribute to climate change adaptation.							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Discontinuous sparse urban fabric	physics	reducing impact	UHI	Building Reg.	1, 2, 3, 11, 13
		Industry, trade, infrastructure				Reg. green	
		Public Services			Run-off	Green Plan	
		Industry, trade, infrastructure, public services				PAESC	

Climatic façade							V4
Bioclimatic façades that help to substantially increase the energy efficiency of buildings, reducing greenhouse gas emissions and consumption, and improving the quality of interior spaces.							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	3, 11, 13, 15
		Industry, trade, infrastructure					
		Public Services		dispersion of the phenomenon		PAESC	

Depavation							V5
Interventions to depave residual public grey areas and the encouragement of similar interventions in private properties.							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	PTOOPP	11, 13
		Medium discontinuous urban fabric			Run-off	PAESC	
		Industry, trade, infrastructure					
		Public Services					

Intensive green roofs							V6
Type of roofs with a greater load on their structure, requiring continuous and significant maintenance, including irrigation, feeding and pruning							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Medium discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	11, 13, 15
		Discontinuous sparse urban fabric					
		Industry, trade, infrastructure			Run-off		

		Public Services				Green Plan PAESC	

Practicable green roofs							**V7**
Type of multifunctional roofs, with a part used for recreation, or for the exclusive use of the building's inhabitants, or open to the city							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	11, 13, 15
		Medium discontinuous urban fabric					
		Public Services			Run-off	Green Plan PAESC	

Productive green roofs							**V8**
Type of roofs with self-grown or city-grown vegetables and fruits							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Medium discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	1, 2, 3, 11, 13, 15
		Discontinuous sparse urban fabric			Run-off		
		Public Services				Green Plan PAESC	

Extensive green roofs							**V8**
Type of roofs characterised by low-growing, self-sufficient and low-maintenance vegetation consisting of drought-resistant plants, succulents, mosses or grasses							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Medium discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	11, 13, 15
		Discontinuous sparse urban fabric					

		Industry, trade, infrastructure, public services				Reg. green	
					Run-off	Green Plan	
						PAESC	

Green roofs on canopies							V10
Covering bus shelters with plants and vegetation to increase biodiversity, clean the air of fine dust, cool the city in the summer months and slow down water runoff							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	11, 13, 15
		Medium discontinuous urban fabric				Reg. green	
		Discontinuous sparse urban fabric			Run-off	Green Plan	
		Public Services				PAESC	

Windbreak hedges							V11
Vegetation elements that improve landscape and spatial interconnection and link otherwise isolated environments							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	urbanised	Urban green areas	physics	reducing impact	UHI	Reg. green	11, 13
	natural and agricultural areas	Natural or semi-natural areas		dispersion of the phenomenon		Green Plan	
		Agricultural land					

Promoting the functional connectivity of ecological networks							V12
Fostering dynamic ecosystem adaptation processes to counter biodiversity loss and safeguard ecosystem services, particularly in view of climate variability							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	coast	Beaches, dunes and sands	physics	reducing impact	UHI	Reg. green	3, 11, 13
		Wetlands			Run-off		
	urbanised	Urban green areas				Green Plan	

	natural and agricultural areas	Agricultural land Natural or semi-natural areas			storm surges	Water Plan	

2.2.6 Macro-Category 6: Renewable Energy Production

Installation of solar systems							**E1**
Cope with the expected higher demand for cooling buildings in summer to prevent the use of fossil fuel-based air conditioning systems							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric Medium discontinuous urban fabric Discontinuous sparse urban fabric Industry, trade, infrastructure Public Services	physics	reducing impact	UHI	PAESC	7, 11, 12, 13

2.2.7 Macro-Category 7: Coastal Protection

Vegetating the dunes							C1
Increasing vegetation on the front and back side of the dunes to reduce wind speed on the surface and promote sand accumulation							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	coast	Beaches, dunes and sands	physics	reducing impact	storm surges	Reg. green	11, 13, 15
						PTOOPP	
		Wetlands		dispersion of the phenomenon		Green Plan	
						PAESC	
						Regulation of the Regulation of Bathing Activities	

Covering the dunes							C2
Covering the back side of the dunes with plant debris and branches, aimed at stabilising the dunes, promoting the accumulation of sand and protecting the vegetation							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	coast	Beaches, dunes and sands	physics	reducing impact	storm surges	Reg. green	11, 13, 15
						PTOOPP	
		Wetlands		dispersion of the phenomenon		Green Plan	
						PAESC	
						Regulation of the Regulation of Bathing Activities (coordinated text)	

Screening the dunes							C3
Construction of barriers along the front side of the dune to reduce wind velocity and encourage the deposition of sediments that make up the first row of dunes, close to the high tide line (foredune)							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
green	coast	Beaches, dunes and sands	physics	reducing impact	swells	Reg. green	11, 13, 15
						PTOOPP	
		Wetlands		dispersion of the phenomenon		Green Plan	
						PAESC	
						Regulation of the Regulation of Bathing Activities (coordinated text)	

2.2.8 Macro-Category 8: Cold Surfaces

Cold roofs by painting							S1
Painting roofs in a light colour to increase albedo and make the surface absorb less heat							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	11, 13
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					

Cold surfaces on the ground							S2
Colouring the ground surface to increase its albedo and reflective power							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	11, 13
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					

Cold surfaces on the ground in car parks							S3
Colouring of the ground surface intended for parking, aimed at increasing its albedo and reflective power							
TYPE	**ZONING**		**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	urbanised	Dense discontinuous urban fabric	physics	reducing impact	UHI	Building Reg.	11, 13
		Medium discontinuous urban fabric					
		Discontinuous sparse urban fabric		dispersion of the phenomenon		PAESC	
		Industry, trade, infrastructure					
		Public Services					

Increasing the reflectance (albedo) of the road surface						S4
Integration of road infrastructure with clear, coloured elements or reflective coatings on road surfaces						
TYPE	**ZONING**	**FEATURE**	**EXPECTED EFFECT**	**IMPACT**	**INSTRUMENT**	**SDGs**
grey	Road Network	physics	reducing impact	UHI	PTOOPP	11, 13
			dispersion of the phenomenon		PI	

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