The contribution of participatory decision making in the planning of ecosystem-based adaptation

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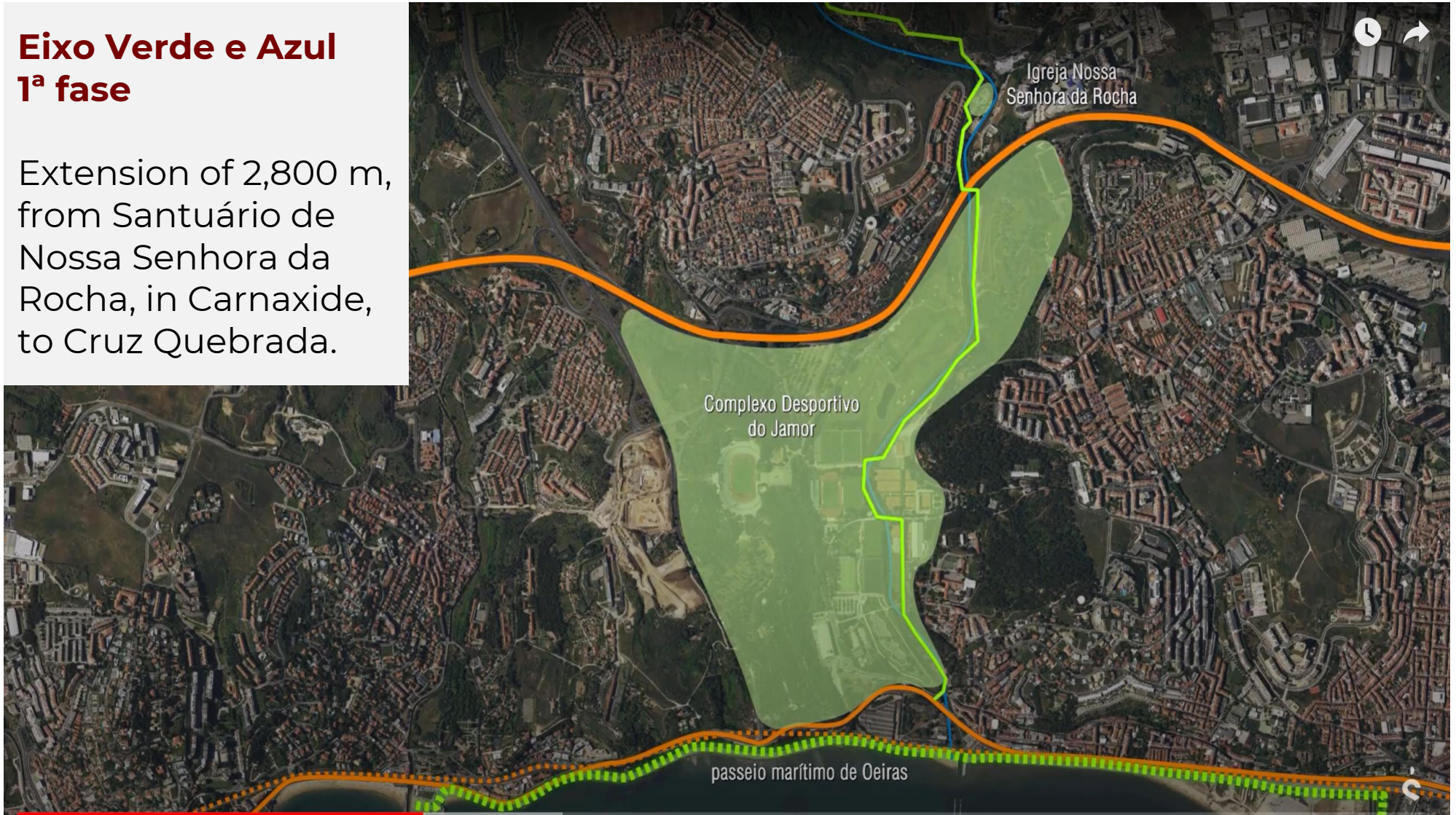
Abstract

1. MCA workshop in Oeiras (Portugal)

Study area

Eixo Verde e Azul
1ª fase

Extension of 2,800 m, from Santuário de Nossa Senhora da Rocha, in Carnaxide, to Cruz Quebrada.



Source: Parques de Sintra (https://www.youtube.com/watch?v=V5V-w7lX6jw)

1. MCA workshop in Oeiras (Portugal)

Scoring of criteria | results

Name of the EbA	Perception of flood risk reduction	Carbon capture and sequestration	Biodiversity conservation and improvement	Water quality improvement	Improve human health	Increase recreational opportunities	Increase job opportunities	Total mean score	Ranking
River regularisation	*4.44*	*1.81*	*3.00*	*3.31*	*2.56*	*3.00*	*2.69*	2.97	*4*
Riverbanks maintenance	*3.60*	*1.69*	*2.44*	*2.81*	*2.38*	*2.88*	*2.44*	2.60	*5*
Riparian reforestation	*3.25*	*3.75*	*4.81*	*3.94*	*3.50*	*2.69*	*2.94*	3.55	*1*
Maintenance of the river network	*4.00*	*2.31*	*3.56*	*3.50*	*3.19*	*3.00*	*3.44*	3.29	*3*
Floodplain enlaregement	*4.19*	*2.56*	*3.00*	*2.44*	*4.25*	*4.50*	*3.00*	3.42	*2*
Permeable pavements	*3.25*	*1.56*	*2.19*	*2.63*	*3.31*	*3.25*	*1.94*	2.59	*6*

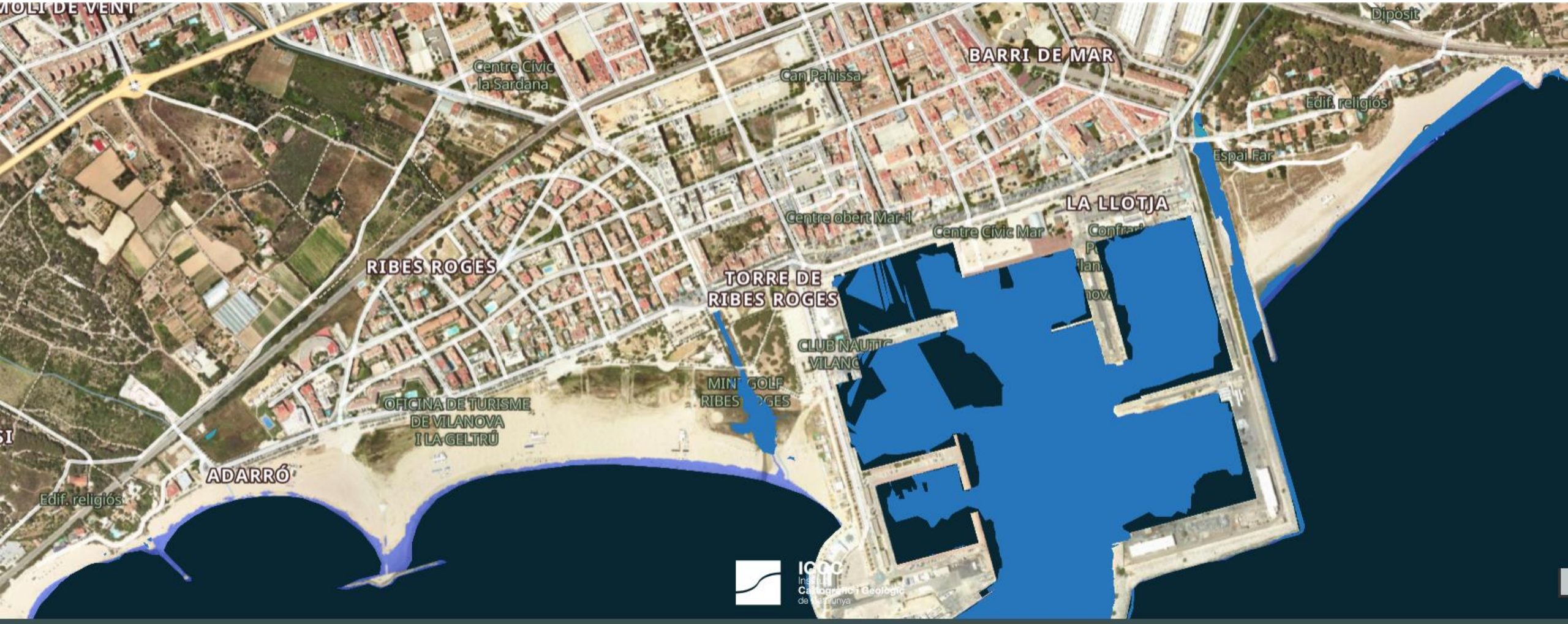
1. MCA workshop in Oeiras (Portugal)

Weighting and prioritization | results

Name of the EbA	Evaluation criteria							Weighted sum scores	Final ranking
	Perception of flood risk reduction	Carbon capture and sequestration	Biodiversity conservation and improvement	Water quality improvement	Improve human health	Increase recreational opportunities	Increase job opportunities		
Mean Weights ⇨	38.0%	9.3%	15.7%	10.7%	16.0%	7.0%	3.3%		
River regularisation	*1.69*	*0.17*	*0.47*	*0.35*	*0.41*	*0.21*	*0.09*	***3.09***	***4***
Riverbanks maintenance	*1.37*	*0.16*	*0.38*	*0.30*	*0.38*	*0.20*	*0.08*	***2.59***	***5***
Riparian reforestation	*1.24*	*0.35*	*0.75*	*0.42*	*0.56*	*0.19*	*0.10*	***3.32***	***1***
Maintenance of the river network	*1.52*	*0.22*	*0.56*	*0.37*	*0.51*	*0.21*	*0.11*	***3.18***	***3***
Floodplain enlaregement	*1.59*	*0.24*	*0.47*	*0.26*	*0.68*	*0.32*	*0.10*	***3.24***	***2***
Permeable pavements	*1.24*	*0.15*	*0.34*	*0.28*	*0.53*	*0.23*	*0.06*	***2.53***	***6***

2. MCA workshop in Vilanova i la Geltrú (Spain)

Flood risk of the study area



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Source: PIMA Adapta costas, ICGC 2022

2. MCA workshop in Vilanova i la Geltrú (Spain)

Feasibility assessment | results

EbA measure	Assessment criteria				Total average
	Stakeholder acceptability	Technical Feasibility	Ease of implementation	Financial feasibility	
River bank heightening	*3.76*	*3.81*	*3.36*	*3.10*	*3.51*
River bank stabilisation and renaturing	*4.00*	*3.90*	*3.41*	*3.14*	*3.61*
River bed deepening	*3.29*	*3.43*	*2.68*	*2.57*	*2.99*
Filter strip	*3.48*	*3.62*	*3.27*	*3.19*	*3.39*

2. MCA workshop in Vilanova i la Geltrú (Spain)

Scoring of criteria | results

Name of the EbA	Assessment criteria						Total mean score	Ranking
	Perception of flood risk reduction	Biodiversity conservation and improvement	Heat stress reduction	Water quality improvement	Landscape aesthetic value	Carbon capture and sequestration		
Combination of measures	4.25	4.06	3.38	3.70	4.05	3.62	3.84	1
River bank stabilisation and renaturing	3.55	3.94	3.62	3.20	4.19	3.48	3.66	2
River bed deepening	3.85	3.39	2.33	2.70	2.67	2.52	2.91	3
River bank heightening	*3.70*	*2.89*	*2.33*	*2.20*	*2.90*	*2.48*	2.75	*4*
Filter strip	2.50	2.67	2.71	2.30	3.05	2.52	2.63	5

2. MCA workshop in Vilanova i la Geltrú (Spain)

Weighting and prioritization | results

Name of the EbA	Evaluation criteria						Weighted sum scores	Final ranking
	Perception of flood risk reduction	Biodiversity conservation and improvement	Heat stress reduction	Water quality improvement	Landscape aesthetic value	Carbon capture and sequestration		
Mean Weights ⇨	45.5%	18.3%	8.1%	8.0%	13.1%	7.0%		
Combination of measures *	1.91	0.73	0.27	0.30	0.53	0.25	**3.99**	**1**
Renaturing along river stream banks	1.60	0.71	0.29	0.26	0.54	0.24	**3.64**	**2**
Restitution of river stream-bed depth and renaturing	1.73	0.61	0.19	0.22	0.35	0.28	**3.27**	**3**
Heightening the river stream bank	1.67	0.52	0.19	0.18	0.38	0.17	**3.10**	**4**
Implementing a filter strip	1.13	0.48	0.22	0.18	0.40	0.18	**2.58**	**5**

3. MCA workshop in Benidorm (Spain)

Flood risk of the study area

3. MCA workshop in Benidorm (Spain)

Feasibility assessment | results

EbA measure	Assessment criteria				Total average
	Stakeholder acceptability	Technical Feasibility	Ease of implementation	Financial feasibility	
Urban dune	*4.50*	*4.63*	*4.38*	*4.13*	*4.41*
Sand dike	*4.38*	*4.63*	*4.25*	*4.00*	*4.31*
Floodable Park	*4.63*	*3.63*	*3.75*	*2.50*	*3.63*
Permeable pavements	*4.00*	*3.63*	*4.25*	*3.25*	*3.78*
Riparian reforestation	*4.25*	*4.75*	*3.63*	*3.63*	*4.06*
Tree plantation	*4.63*	*4.75*	*4.88*	*4.00*	*4.56*

3. MCA workshop in Benidorm (Spain)

Scoring of criteria | results

Name of the EbA	Perception of flood risk reduction	Biodiversity conservation and improvement	Water quality improvement	Carbon capture and sequestration	Increase recreational opportunities	Landscape aesthetic value	Total mean score	Ranking
Urban dune	*4.07*	*3.21*	*2.54*	*2.54*	*2.54*	*3.77*	3.1	*5*
Sand dike	*3.71*	*3.00*	*2.38*	*2.15*	*2.23*	*3.54*	2.8	*6*
Floodable Park	*4.21*	*4.21*	*4.08*	*3.77*	*4.77*	*4.62*	4.3	*1*
Permeable pavements	*3.50*	*2.93*	*3.69*	*2.85*	*2.62*	*3.54*	3.2	*4*
Riparian reforestation	*3.29*	*4.57*	*3.54*	*4.31*	*3.46*	*4.31*	3.9	*3*
Tree plantation	*2.64*	*4.57*	*3.54*	*4.54*	*3.92*	*4.77*	4.0	*2*

3. MCA workshop in Benidorm (Spain)

Weighting and prioritization | results

Name of the EbA	Evaluation criteria						Weighted sum scores	Final ranking
	Perception of flood risk reduction	Biodiversity conservation and improvement	Water quality improvement	Carbon capture and sequestration	Increase recreational opportunities	Landscape aesthetic value		
Mean Weights ⇨	41.0%	15.0%	14.0%	13.0%	9.0%	8.0%		
Urban dune	*1.67*	*0.48*	*0.36*	*0.33*	*0.23*	*0.30*	***3.07***	***4***
Sand dike	*1.52*	*0.45*	*0.33*	*0.28*	*0.20*	*0.28*	***2.79***	***6***
Floodable Park	*1.73*	*0.63*	*0.57*	*0.49*	*0.43*	*0.37*	***3.85***	***1***
Permeable pavements	*1.44*	*0.44*	*0.52*	*0.37*	*0.24*	*0.28*	***3.00***	***5***
Riparian reforestation	*1.35*	*0.69*	*0.50*	*0.56*	*0.31*	*0.34*	***3.40***	***2***
Tree plantation	*1.08*	*0.69*	*0.50*	*0.59*	*0.35*	*0.38*	***3.21***	***3***