Supplementary Materials

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Table S1. Main results of the full-text assessment.

	A. Basic information			B. Socio-economic assessment methods		C. Climate change impact and adaptation context	
ID	**Authors**	**Article title**	**Geographical Scale**	**Assessment method**	**Aim of the assessment**	**Climate hazards addressed**	**Sectoral climate impacts addressed by the adaptation strategies**	**Type of adaptation strategies assessed**
1	[81]	The Costs of Sea-Level Rise: Coastal Adaptation Investments vs Inaction in Iberian Coastal Cities	Urban/peri-urban	CBA	To estimate potential economic damage of no adaptation actions and the investment cost of implementing adaptation strategies.	Flooding	Others - damage to assets exposed to coastal flooding.	Hard (building defences).
2	[65]	Protection by hard defence structures or relocation of assets exposed to coastal risks: Contributions and drawbacks of cost-benefit analysis for long-term adaptation choices to climate change	Urban/peri-urban	CBA	Assess the costs and benefits of a territorial project of urban development.	Flooding	Multi impact (risk to tourism; damage to commercial buildings; damage to residential buildings; damage to civil infrastructure; risk to local economy).	Hybrid (e.g., riprap structures; beach nourishment; purchasing housing and businesses at risk; demolition of infrastructure; renaturing the beach front).
3	[49]	Coastal Management Software to Support the Decision-Makers to Mitigate Coastal Erosion	Regional/provincial	CBA	Assessment of COMASO (coastal management software), a sequence of coastal modelling tools for coastal management and planning.	Coastal erosion.	Multi impact (risk to properties, risk of habitat loss, risk to tourism, risk to local economy).	Hybrid (artificial nourishments, groins, longitudinal revetments, and detached breakwaters).
4	[15]	An economic evaluation of adaptation pathways in coastal mega cities: An illustration for Los Angeles	Regional/provincial	CBA	To provide insights in the individual economic efficiency of the strategies and the timing of investment.	Sea-level rise.	Multi impact (damage to commercial buildings; damage to residential buildings; damage to civil infrastructure).	Hybrid (e.g., beach nourishment; elevation of buildings; highway elevation; breakwater; wet flood proofing).
5	[86]	A micro-scale cost-benefit analysis of building-level flood risk adaptation measures in Los Angeles	Urban/peri-urban	CBA	To offer policymakers insight into economically optimal strategies for adapting to sea-level rise.	Multi hazards (SLR and flooding).	Multi impact (damage to commercial buildings, damage to residential buildings).	Hybrid (elevation of buildings and roads, storm surge barriers, dykes underneath beaches).

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ID	**Authors**	**Article title**	**Geographical Scale**	**Assessment method**	**Aim of the assessment**	**Climate hazards addressed**	**Sectoral climate impacts addressed by the adaptation strategies**	**Type of adaptation strategies assessed**
6	[5]	Hard or soft flood adaptation? Advantages of a hybrid strategy for Shanghai	Urban/peri-urban	CBA	Analyse the costs and benefits of several adaptation strategies to reduce flood risk.	Flooding	Others - damages to land uses and vehicles, excluding indirect impacts.	Hybrid (e.g., storm surge barrier; floodwalls; enhance building codes, wetland restoration).
7	[56]	Economic, equitable, and affordable adaptations to protect coastal settlements against storm surge inundation	Urban/peri-urban	CBA	To calculate measures of economy, equity, and affordability for three types of adaptations.	Flooding	Others - risk to buildings and land values of many properties, civil infrastructure.	Hybrid (sea wall, changed minimum floor height, and retreat).
8	[42]	Economic evaluation of climate risk adaptation strategies: Cost-benefit analysis of flood protection in Tabasco, Mexico	Regional/provincial	CBA	To provide insights for identifying economically efficient adaptation strategies to manage natural disaster risk (riverine and coastal flooding).	Flooding	Multi impact (damage to commercial buildings, damage to residential buildings, damage to civil infrastructure).	Hard (river and coastal dyke infrastructure).
9	[67]	Coastal and river flood risk analyses for guiding economically optimal flood adaptation policies: a country-scale study for Mexico	Regional/provincial	CBA	To assess current and future levels of risk of both coastal and riverine flooding and determine costs and benefits of increasing flood-protection standards.	Flooding	Others - damage to urban environments, agriculture, pasture, and nature.	Hybrid (e.g., dykes, floodplain zoning, beach nourishment or realignment).
10	[53]	Damage of extreme water levels and the adaptation cost of dikes in the Pearl River Delta	Regional/provincial	CBA	To evaluate the efficiency of adaptation strategies for different scenarios and compare projects that provide the greater net benefit.	Sea-level rise.	Risk to local economy.	Hard (dykes).
11	[88]	Economically efficient flood protection standards for the Netherlands	Regional/provincial	CBA	To determine the optimal (economically efficient) flood protection standards for all dike ring areas in the Netherlands.	Flooding	Not specified.	Hard (rise dyke heightening).

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ID	**Authors**	**Article title**	**Geographical Scale**	**Assessment method**	**Aim of the assessment**	**Climate hazards addressed**	**Sectoral climate impacts addressed by the adaptation strategies**	**Type of adaptation strategies assessed**
12	[63]	Socio-Economic Assessment of Green Infrastructure for Climate Change Adaptation in the Context of Urban Drainage Planning	Urban/peri-urban	CBA	To evaluate the socio-economic viability of selected Green Infrastructure applied to two different case studies.	Multi hazards (flooding, combined sewer overflows).	Multi impact (damage to commercial buildings, damage to residential buildings, risk to local economy).	Hybrid (green roofs, bioretention cells and retention and detention basins, permeable pavements, and infiltration trenches).
13	[89]	Assessment of urban pluvial flood risk and efficiency of adaptation options through simulations – A new generation of urban planning tools	District/neighbourhood/ street	CBA	CBA was implemented to illustrate the applicability of the setup model and compare the investments into flood adaptation against benefits from implementing the strategy.	Flooding	Not specified.	Hybrid (master plans; flood zoning; rainwater harvesting facilities; increase in pipe capacity).
14	[37]	Coastal sustainability depends on how economic and coastline responses to climate change affect each other	Regional/provincial	CBA	Explore the impact of hurricane-generated waves on shoreline evolution along a populated cuspate coastline.	Coastal erosion.	Others - property values along a coastline.	Soft (shoreline nourishment).
15	[7]	Cost-Benefit Analysis of Mixing Gray and Green Infrastructures to Adapt to Sea Level Rise in the Vietnamese Mekong River Delta	Regional/provincial	CBA	To evaluate inundation impacts and the economic damage from sea-level rise and identify the effectiveness of mixing grey and green infrastructures.	Flooding	Multi impact (damage to commercial buildings, damage to residential buildings, agriculture stress, damage to civil infrastructure, risk to local economy).	Hybrid (concrete and earthen dykes, mangrove forest rehabilitation).
16	[43]	Flexible adaptation planning process for urban adaptation in Melbourne, Australia	Urban/peri-urban	CBA	To incorporate and evaluate flexibility into adaptation measures for managing flood risk.	Multi hazards (frequent and intense rainfall events, flooding and sea-level rise).	Multi impact (damage to residential buildings, damage to commercial buildings, damage to civil infrastructure).	Hybrid (e.g., rainwater harvesting tanks, wet proofing houses, drainage retrofitting).

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ID	**Authors**	**Article title**	**Geographical Scale**	**Assessment method**	**Aim of the assessment**	**Climate hazards addressed**	**Sectoral climate impacts addressed by the adaptation strategies**	**Type of adaptation strategies assessed**
17	[40]	The Comparative Study of Adaptation Measure to Sea Level Rise in Thailand	Regional/provincial	CBA	To compare the adaptation measures to sea-level rise.	Multi hazards (sea-level rise, coastal erosion, storm surge).	Multi impact (risk to tourism, risk to local economy).	Hybrid (beach nourishment, seawall, and setback).
18	[14]	Adaptation to sea level rise: A multidisciplinary analysis for Ho Chi Minh City, Vietnam	Urban/peri-urban	CBA	To quantify the effectiveness of several adaptation measures aimed at reducing flood risk and to evaluate their economic performance and social suitability.	Flooding	Not specified.	Hybrid (e.g., dyke; modify land elevation; land use change).
19	[91]	The economic value of delaying adaptation to sea-level rise: An application to coastal properties in Connecticut	Urban/peri-urban	CBA	To determine the optimal timing of initiating protection that maximizes expected net benefits.	Multi hazards (sea-level rise and coastal storms).	Multi impact (damage to residential buildings, damage to commercial buildings, damage to civil infrastructure, environmental impacts).	Hybrid (seawalls, land elevation, setback lines).
20	[68]	Regional economic analysis of flood defence heights at the German Baltic Sea coast: A multi-method cost-benefit approach for flood prevention	Regional/provincial	CBA	To show that combination of CBA and a multi-method approach can narrow down the range of acceptable and efficient solutions.	Flooding	Multi impact (risk to local economy, damage to residential buildings, damage to commercial buildings, damage to civil infrastructure).	Hybrid (dykes, dunes, floodwalls).
21	[54]	Economic motivation for raising coastal flood defences in Europe	Regional/provincial	CBA	Quantify the rise in coastal flooding damages unless mitigation and adaptation measures are taken.	Multi hazards (sea-level rise and flooding).	Others – socio-economic growth; population.	Hard (dyke construction and rising dyke height).

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ID	**Authors**	**Article title**	**Geographical Scale**	**Assessment method**	**Aim of the assessment**	**Climate hazards addressed**	**Sectoral climate impacts addressed by the adaptation strategies**	**Type of adaptation strategies assessed**
22	[55]	Evaluating adaptation measures for reducing flood risk: A case study in the city of Colombo, Sri Lanka	Urban/peri-urban	CBA	Application of CBA for decision making on public investments for flood risk management.	Flooding	Multi impact (damage to commercial buildings; damage to residential buildings; damage to civil infrastructure; cars and other vehicles).	Hard (e.g., widening of locks; a tunnel to discharge water; a new pumping station, new pump diversions).
23	[92]	Economic assessment of climate adaptation options for urban drainage design in Odense, Denmark	Urban/peri-urban	CBA	To inform decision makers on how best to adapt to urban pluvial flooding due to climate impacts in cities.	Flooding	Multi impact (damage to residential buildings, Rick to local economy, civil infrastructure, loss of wetlands).	Hybrid (e.g., pipe enlargement; infiltration; individual assets protection).
24	[62]	Adaption to extreme rainfall with open urban drainage system: An integrated hydrological cost-benefit analysis	Urban/peri-urban	CBA	Comparative assessment of adaptation schemes to help decision-makers select the appropriate adaptable solution.	Flooding	Damage to residential buildings.	Hybrid (e.g., pipe enlargement; Open Urban Drainage Systems – OUDS; green spaces in the urban landscape).
25	[8]	Multi-criteria approach for selection of green and grey infrastructure to reduce flood risk and increase CO-benefits	Urban/peri-urban	MCA	Help decision-makers in the selection and planning of measures process, considering local preferences.	Flooding	Not specified.	Hybrid (underground pipes, tubes, tunnels, demountable barriers, underground storages, bypasses, dry flood proofing, hollow roads, wet flood proofing).
26	[35]	Exploring trade-offs among the multiple benefits of green-blue-grey infrastructure for urban flood mitigation	Urban/peri-urban	MCA	To compare among green-blue, grey and hybrid strategies for flood mitigation and how it changes if considering co-benefits.	Flooding	Multi impact (damage to commercial buildings; damage to residential buildings; damage to civil infrastructure).	Hybrid (e.g., open detention basis, rainwater barrels, pervious pavements).
27	[66]	Assessment of and Adaptation to Beach Erosion in Islands: An Integrated Approach	District/neighbourhood/street	MCA	To evaluate socio-economic significance of beaches and their vulnerability to sea-level rise and the design of	Coastal erosion.	Others – tourism revenues, coastal asset values and insurance costs.	Soft (beach nourishment).

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					effective adaptation measures.			
28	[36]	Assessment of selected climate change adaptation measures for coastal areas	Regional/provincial	MCA	To provide an initial 7ecisions7 of measures to adapt to coastal risks regardless of the study site.	Multi-hazards (coastal flooding, erosion).	Not specified.	Hybrid (e.g., wetland restoration, beach access management, temporary storm surge dams, cliff drainage).
29	[47]	Adaptation analysis for environmental change in coastal communities	District/neighbourhood/street	MCA	To evaluate adaptation decision options and the development of measures for vulnerability and adaptive capacity.	Multi-hazards (flooding, storms, and storm surges).	Multi impact (damage to commercial buildings, damage to residential buildings, damage to civil infrastructure).	Hybrid (e.g. road build up, breakwater).
30	[60]	Applying Analytic Hierarchy Process to Adaptation to Saltwater Intrusion in Vietnam	Regional/provincial	MCA	To rank adaptation options to salt water intrusion for rice farmers, considering sustainability criteria.	Other (saltwater intrusion).	Not specified.	Hybrid (e.g., switch to new plantations/food production).
31	[33]	The Role of Green Infrastructures in Urban Planning for Climate Change Adaptation	Urban/peri-urban	MCA	To classify alternative scenarios based on the preferences of individual groups and certain decision criteria.	Other (air quality, and urban heat island – UHI).	Not specified.	EBA (e.g., creation of green areas such as urban gardens).
32	[9]	Assessing the Co-Benefits of green-blue-grey infrastructure for sustainable urban flood risk management	Regional/provincial	CBA/MCA	Assess how economic viability of different strategies changes when co-benefits are considered.	Flooding	Multi impact (damage to commercial buildings; damage to residential buildings).	Hybrid (green roofs, rainwater barrels, pervious pavements; open detention basins; pipes).
33	[61]	Comparing the cost effectiveness of nature-based and coastal adaptation: A case study	Regional/provincial	CBA/CEA	To quantify cost and effectiveness of green, grey and policy adaptation measures for current and future risks.	Flooding	Multi impact (damage to commercial buildings; damage to residential buildings; agriculture stress;	Hybrid (e.g., local levees; sandbags; dykes; home elevation; wetland restoration; oyster reef restoration).

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		from the Gulf Coast of the United States					damage to civil infrastructure).	
34	[82]	Investing in adaptation: Flood risk and real option application to Bilbao	District/neighbourhood/street	other	Assess investments in adaptation and determine whether it is an optimal decision is to invest now or delay it.	Flooding	Risk to local economy.	Hard (opening the pre-existing Deusto canal in Bilbao).
35	[83]	Evolutionary and holistic assessment of green-grey infrastructure for CSO reduction	Urban/peri-urban	other	Develop a method to help decision-makers evaluate alternative green-grey infrastructure options for urban drainage.	Other – storms.	Not specified.	Hybrid (green roofs, pervious pavements, infiltration trenches, combined with storage tanks).
36	[50]	Enhancing city resilience to climate change by means of ecosystem services improvement: a SWOT analysis for the city of Faro, Portugal	Urban/peri-urban	other	To provide information and tools for local administration to strengthen the green areas and mitigate urban threats.	Multi hazards (heatwaves, flooding, and water scarcity/drought).	Not specified.	EBA (permeable soils; shadow to streets, sidewalks and buildings through trees plantation and green walls; proper planning that considers impacts on waterways).
37	[10]	Assessing Potential Impacts of Sea Level Rise on Public Health and Vulnerable Populations in Southeast Florida and Providing a Framework to Improve Outcomes	Regional/provincial	other	To develop a long-term planning framework to adapt to sea-level rise and protect vulnerable infrastructure.	Multi hazards (sea-level rise, temperature and precipitation).	Damage to civil infrastructure.	Hybrid (e.g., infiltration trenches; stormwater pumping stations; rise roadways; gravity wells; raise sea walls; relocation of locks; redevelopment control ordinances).
38	[45]	Adaptation of a freshwater evaluation framework to a coastal system: The case of Kamari, Santorini	Regional/provincial	other	To assess the viability of the selected protection measures, and their impact on the beach and the society.	Multi hazards (coastal erosion and sea-level rise).	Risk to tourism.	Hybrid (breakwaters and sand replenishment).

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ID	**Authors**	**Article title**	**Geographical Scale**	**Assessment method**	**Aim of the assessment**	**Climate hazards addressed**	**Sectoral climate impacts addressed by the adaptation strategies**	**Type of adaptation strategies assessed**
39	[85]	Assessing the effectiveness of non-structural flood management measures in the Thames Estuary under conditions of socio-economic and environmental change	Regional/provincial	other	To assess the benefits of non-structural measures, in terms of reduction to economic flood risk, in the considered timescales.	Flooding	Multi impact (damage to commercial buildings; damage to residential buildings).	Hybrid (e.g., land use planning; insurance, floodproof external doors, pumps, resilient windows and frames, concrete/sealed floors, raised electrics and appliances).
40	[84]	The Economic Value of Climate Information in Adaptation Decisions: Learning in the Sea-level Rise and Coastal Infrastructure Context	Regional/provincial	other	To explore the suitability of ROA method to maintain tractability by allowing the application of alternative decision rules.	Multi hazards (storms and high waves).	Damage to civil infrastructure.	Hard (e.g., improvement and up-grading of the current defences).
41	[48]	A local-scale approach to estuarine flood risk management	Urban/peri-urban	other	Present an integrated approach to support flood risk management in transitional systems considering different climate scenarios and levels of the decision-making.	Flooding	Multi impact (loss of cultural heritage; damage to residential buildings; damage to civil infrastructure).	Hybrid (e.g., implement formal system of road signs providing warning of flooded roadways and sidewalks; protect existing wetlands, beaches, and dune systems; forbid the construction in flood-prone areas).
42	[87]	Assessing climate change impacts, sea level rise and storm surge risk in port cities: a case study on Copenhagen	Urban/peri-urban	Other – Economic impact evaluation.	Assess the economic impacts of sea-level rise and storm surge risk in the city of Copenhagen and the benefits of adaptation.	Multi hazards (sea-level rise and storm surge).	Multi impact (damage to buildings (residential, government buildings), loss of cultural heritage, damage to transport infrastructure).	Hard (dykes, sea walls).
43	[57]	Natural disasters and climate change: An economic perspective (5.4 Case Study: Heavy Precipitations in Mumbai)	Urban/peri-urban	Other – Economic impact evaluation.	To assess the the vulnerability to heavy precipitations of the city of Mumbai and estimate direct and indirect losses.	Multi hazards (heavy precipitations and extreme run-offs).	Multi impact (damage to commercial buildings, damage to residential buildings).	Hybrid (upgrade in the drainage system and an increase in building quality).

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ID	**Authors**	**Article title**	**Geographical Scale**	**Assessment method**	**Aim of the assessment**	**Climate hazards addressed**	**Sectoral climate impacts addressed by the adaptation strategies**	**Type of adaptation strategies assessed**
44	[69]	Benefits of adapting to sea level rise: the importance of ecosystem services in the French Mediterranean sandy coastline	Regional/provincial	other	To estimate the potential benefits of adapting to sea-level rise to help decision makers discussing the possible consequences of the different adaptation options.	Multi hazards (coastal erosion and flooding).	Multi impact (damage to commercial buildings; damage to residential buildings; and marinas).	Hybrid (beach nourishment; road relocation; relocate population, housing and economic activities).
45	[58]	Assessing sea level rise costs and adaptation benefits under uncertainty in Greece	Regional/provincial	other	ROV is used to tackle with uncertainty and flexibility when investment decisions in sea-level rise adaptation strategies are to be taken by decision-makers.	Sea-level rise.	Multi impact (damage to commercial and residential buildings, risk to tourism, agriculture, wetland, forest land uses).	Hybrid (groins, beach nourishment, revetments and geotextiles, bulkheads).
46	[38]	Evaluating the impacts of sea level rise on coastal wetlands in Languedoc-Roussillon, France	Regional/provincial	Other – Economic impact evaluation.	To evaluate the impacts of coastal inundation on ecosystem services production.	Sea-level rise.	Multi impact (risk to local economy, risk to tourism, agriculture stress, loss of wetlands, loss of animal habitat).	Hybrid (adaptation strategies – denial; laissez-faire; and strategic retreat of infrastructure and buildings).
47	[6]	Adaptation Decision Support: An Application of System Dynamics Modeling in Coastal Communities	Urban/peri-urban	other	Evaluate coastal community adaptation strategies to environmental change.	Others – storms.	Not specified.	Hybrid (e.g., seawalls; grading coastal cliffs; planting or maintaining existing vegetation; elevated houses; zoning plans; land swapping).
48	[46]	Simulating flood risk under non-stationary climate and urban development conditions e Experimental setup for multiple hazards and a variety of scenarios	District/neighbourhood/street	other	To reduce the computational effort required for quantifying economic flood damage.	Multi hazards (flooding and pluvial risk).	Multi impact (damage to commercial buildings; damage to residential buildings).	Hybrid (e.g., increase of stormwater pipe capacity; flood proofing of buildings; dyke construction).

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ID	**Authors**	**Article title**	**Geographical Scale**	**Assessment method**	**Aim of the assessment**	**Climate hazards addressed**	**Sectoral climate impacts addressed by the adaptation strategies**	**Type of adaptation strategies assessed**
49	[90]a	Sequencing Infrastructure Investments under Deep Uncertainty Using Real Options Analysis	District/neighbourhood/street	other	To identify a preferred pathway(s) that will be followed under certain climate changes forecast.	Flooding	Not specified.	Hybrid (expansion of drainage canals; implementation of green roofs; and implementation of porous pavements).
50	[32]	Adaptation options for marine industries and coastal communities using community structure and dynamics	Regional/provincial	other	To predict the effects of change and identify potential adaptation strategies.	Others – ocean warming temperatures.	Risk to local economy.	Soft (fisheries management).
51	[41]	Assessing urban heat-related adaptation strategies under multiple futures for a major US city	Urban/peri-urban	other	Assess the effectiveness of adaptation strategies in relation to challenges to implementation.	Others – extreme heat events.	Others – population exposure to heat events, heat-related mortality.	Hybrid (green roofs, trees planting, adaptation strategies related to poverty, social isolation, air conditioning and land use).
52	[31]	Characterization of SDGs towards Coastal Management: Sustainability Performance and Cross-Linking Consequences	Regional/provincial	other	To assess the level of sustainability and transitions to coastal resilience solutions and adaptation to climate change.	Flooding	Not specified.	Hybrid (e.g., sand nourishment, barrier reef and mangrove forests).
53	[64]	Ranking coastal flood protection designs from engineered to nature-based	Regional/provincial	other	Present a method to assess the extent to which a flood protection system is 'nature-based'.	Flooding	Not specified.	Hybrid (beach nourishment, groins, eco-engineered dunes, natural marshes, managed marshes, constructions, and training walls).
54	[44]	Fighting the inevitable: infrastructure investment and coastal community adaptation to sea level rise	Regional/provincial	other	To test vulnerability trajectories associated with investment strategies in coastal infrastructure protection.	Sea-level rise.	Damage to civil infrastructure.	Hybrid (e.g., seawalls; green infrastructure for shoreline stabilization; beach and dune nourishment; elevation; post-disaster relocation).

Table S2. Assessment methods and authors applied in the reviewed studies.

Type of method			Studies
CBA			);; [5,7,14,15,37,40,42,43,49,53-56,62,63,65,67,68,81,86,88-92]
MCA			[8,33,35,36,47,60,66]
Other methods	Adaptive Regional Input-Output (ARIO)		[57]
	Demonstrate Ecosystem Services Enabling Innovations in the Water Sector (DESSIN)		[45]
	Ecosystem-Based Ranking (EBR)		[64]
	Effectiveness assessment with scenario-based approach		[41,85]
	Expected Annual Damages (EAD)		[46]
	Gains and losses in ecosystem services		[38]
	Hydrodynamic and optimization model		[83]
	Input-Output model		[87]
	Real Options Analysis (ROA)		[58,84]
	Strengths-Weaknesses-Opportunities-Threats (SWOT)		[50]
	System Dynamics (SD) modelling		[6,44]
	Integrated approach	Benefit assessment and hazard modelling	[69]
		CBA – cost effectiveness	[61]
		CBA/MCA	[9]
		Framework combining Sustainability Development Goals (SDG) and Sustainability Impact Score (SIS).	[31]
		NPV and ROA	[90]
		Qualitative modelling and Bayesian Belief Networks (BBN)	[32]
		Risk assessment and a decision-making approach	[48]
		Value-at-Risk (VAR) and ROA	[82]
		Vulnerability assessment and evaluation	[10]

Table S3. Main results of the CBA studies.

Authors	Climate hazards	Adaptation strategies and measures	Benefits definition	Costs definition	Time frame of the analysis	Discount Rate (DR)	Main results *(CBR – Cost/benefit ratio; BCR – Benefit/cost ratio; NPV – Net present value)*
[81]Feu clic o toqueu aquí per escriure text.	Flooding.	Hard (building defences).	Reduction of Expected Annual Damage.	Initial investment costs.	Year 2100	1%, 2%	An analysis of Iberian coastal cities showed that under RCP8.5, Bilbao is the city with the highest accumulated damage costs in case of inaction in the three years considered (€177 million in 2030, €806.4 million in 2050, €4,592.3 million in 2100). In 2100, Valencia is the city with the highest accumulated damage costs (€2,504 million) under 2m and 3m high defence construction.

Authors	Climate hazards	Adaptation strategies and measures	Benefits definition	Costs definition	Time frame of the analysis	Discount Rate (DR)	Main results *(CBR – Cost/benefit ratio; BCR – Benefit/cost ratio; NPV – Net present value)*
[65]	Flooding.	Hybrid (e.g., riprap structures; beach nourishment; purchase houses and businesses at risk; infrastructure demolition; renaturing the beach front).	Avoided damages (classic CBA) plus additional benefits related to the tourist sector and environmental impacts (enhanced CBA).	Investment and maintenance costs, demolition costs, property transfer and leading management, maintaining leased houses, and financial expenses.	20 yrs	2.5%	- *Classic CBA*: NPV for *Protection scenario* (combination of a riprap structure and beach nourishment) of 29.3 million Euros; *Standard relocation scenario* (relocation of individual houses, apartments, shops and restaurants at the beginning of the time horizon) of about -84,3 M€; *Division of ownership relocation scenario* (acquiring bare ownership and leaving usufruct to the former owners until the date agreed upon at the outset of the project) -23,65 M€; and *Leasing relocation scenario* (purchasing the entire property at market prices with no risk estimation and set up a leasing system until a fixed date) -21,48 M€. - *Enhanced CBA*: NPV range from approximately -9.5 to 9.1 M€ in four scenarios.
[49]	Coastal erosion.	Hybrid (artificial nourishments, groins, longitudinal revetments, and detached breakwaters).	Benefits are calculated based on the areas gained/lost over the period of analysis, quantified in land use value.	Construction and maintenance costs, and costs caused by the environmental, cultural, and social impact of the intervention.	10 yrs	3%	The study reveals that artificial nourishment is the most adequate adaptation strategy with a BCR of 1.47 and a NPV of €2,443 million at 3% DR after ten years.
[5]	Flooding.	Hybrid (e.g., storm surge barrier; floodwalls; enhance building codes, wetland restoration).	Reduction in Expected Annual Damage.	Initial investment and maintenance costs.	85 yrs	4%, 6%, 8%	- *DR of 4%*: BCR range from 7 (floodwall; RCP4.5) to 50 (wetland restoration; RCP8.5 high-end); and NPV from 50 (wet-proofing; RCP4.5) to 300 billion USD (storm surge barrier, floodwall and hybrid combination; RCP8.5 high-end). - *DR of 8%*: BCR range from 2 (floodwall; RCP4.5) to 8 (wetland restoration; RCP8.5 high-end); and NPV from 7 (wet-proofing; RCP4.5) to 32 billion USD (hybrid combination; RCP8.5 high-end).
[56]	Flooding.	Hybrid (seawall, changed minimum floor height, and retreat).	Avoided costs due to adaptation.	Inundation costs; devaluation of residential property due to increasing inundation risk.	Years 2010, 2030, 2050	2.08%, 4.08%, 6.08%	Mean benefits range from $1.000 per property for floor height in case study 5 (coastal hamlet directly exposed to the ocean) to $1,155,000 for seawall in case study 1 (relatively flat coastal suburb, with minimum property heights). Adaptation costs range from $1.000 per property for floor height in case study 5 to $209.000 per property for retreat in case study 6 (coastal canal estate protected from direct exposure to the ocean by a dune system). (*Values in Australian dollars*).
[42]	Flooding.	Hard (river and coastal dyke infrastructure).	Reduction of Expected Annual Damage.	Investment and maintenance costs.	100 yrs	4%	- *Current scenario*: highest BCR (8.13) and NPV ($1.24). - *Low sea-level rise scenario*: highest BRC (22.11) and NPV ($32.67). - *High sea-level rise scenario*: highest BCR (21.03) and NPV ($32.98). (*NPV in billion USD, and BCR and NPV indicated for 100 and 1000 years after implementing the measures, respectively*).
[67]	Flooding.	Hybrid (dykes, floodplain zoning, beach nourishment or realignment).	Reduction of Expected Annual Damage.	Investment and maintenance costs.	100 yrs	10%	NPV ranging from $-5 (Chihuahua) to $10 (Sinaloa) in a constant climate scenario; $-7 (Quintana Roo) to $10 (Sinaloa) in RCP2.6; and $-8 (Tabasco) to $10 (Tamaulipas) in RCP8.5. (*NPV in USD billion*).
[53]	Sea-level rise.	Hard (dykes).	Reduction in expected damage due to dyke heightening.	Investment costs of heightening the dyke.	Years 2030, 2050, 2100	5.7%	In 2030, net benefits of heightening the dyke range from $1,737 to $1,818, and costs from $2,569 to $4,092. In 2050, net benefits range from $1,727 to $1,821, and costs from $2,616 to $4,139. In 2100, net benefits range from $1,701 to $1,826 and costs range from $2,734 to $4,257. (*Values in USD million*).

Authors	Climate hazards	Adaptation strategies and measures	Benefits definition	Costs definition	Time frame of the analysis	Discount Rate (DR)	Main results *(CBR – Cost/benefit ratio; BCR – Benefit/cost ratio; NPV – Net present value)*
[88]	Flooding.	Hard (dyke heightening).	Decrease in expected flood damages (financial, economic, and intangible losses).	Investments costs.	100 yrs	5.5%	The analysis predicted that for a unitary increase in the ratio – *total flood damage to investment costs (for a 10-fold reduction in flood probability)* – the economically efficient flood protection standard for a dyke ring (associated with the probability of a flood event occurring in any year) increases 38 times.
[63]	Multi hazards (flooding, combined sewer overflows).	Hybrid (green roofs, bioretention cells and retention and detention basins, permeable pavements, and infiltration trenches).	Flood damage reduction, water quality improvements, and additional benefits (e.g., increased aesthetic value, air quality improvement, habitat provision).	Capital, and operation and maintenance expenditures.	80 yrs	1.23%, 4%	Results for the combination of green infrastructure projects: - *Barcelona (Spain)*: with DRs of 1.23% and 4%, NPV becomes positive after 10 and 11 years of implementing the measures, respectively. - *Badalona (Spain)*: with a DR of 1.23%, NPV becomes positive after 75 years. With a DR of 4.0%, NPV always stays negative.
[89]	Flooding.	Hybrid (master plans; flood zoning; rainwater harvesting facilities; increase in pipe capacity).	Reduction of Expected Annual Damage.	Investment costs.	50 yrs	1.4%	- *Business as usual (BAU) scenario*: maximum NPV of $101.5 with flood-zoning, pipe increase, and rainwater harvesting tank implemented at a 5% rate per year. - *Water Sensitive City scenario*: maximum NPV of $93.9 for the previous measures implemented at a 3% rate per year. (*NPV in Australian Dollar million*).
[37]	Coastal erosion.	Soft (shoreline nourishment).	Economic value of nourishment based on beach width increase and property values of the studied areas.	Costs of nourishment, including fixed and variable costs conditioned on the availability of sand resources.	200 yrs	Not included.	The economic viability of nourishment depends on the interaction between regional property values and coastal erosion rates. Towns with higher property values might capture more sand resources in a context of depletion.
[7]	Flooding.	Hybrid (concrete and earthen dykes, mangrove forest rehabilitation).	Expected Annual Damage avoided due to adaptation.	Initial investment costs.	Year 2100	3%, 8%, 10%	Results for the combination of grey and green infrastructure: - *DR of 3%*: NPV from 2,098 to more than 4,000 billion USD. BCR: from 110 (SSP4) to 245 (SSP5). - *DR of 8%*: NPV: from 1,084.1 (SSP4) to 1,420.8 billion USD (SSP5); BCR from 177.5 (SSP4) to 212.3 (SSP5). - *DR of 10%*: NPV: from 906.0 (SSP4) to 1103.4 billion USD (SSP5); BCR from 165.2 (SSP4) to 192.1 (SSP5).
[68]	Flooding.	Hybrid (dykes, dunes, floodwalls).	Expected Annual Damage reduction.	Investment and maintenance costs.	200 yrs	3%	- *Baltic Sea*: present value of total costs ranges from 0.54 billion euros for the low strategy (300cm defence height after 100 years) to 1.15B€ to high strategy (270cm defence height after 50 years). - *Mecklenburg-Vorpommern (Germany)*: present value of total costs ranges from 0.85B€ for the low strategy to 2.73B€ to high flood plain strategy.
[43]	Frequent and intense rainfall, flooding, and sea-level rise.	Hybrid (rainwater harvesting, wet proofing houses, drainage retrofitting).	Reduction of Expected Annual Damage.	Initial investment costs.	75 yrs	3%	CBR (from RCP2.6 to RCP8.5) of drainage retrofitting (3.4-11.8), rainwater harvesting (20.6-61.9), flood proofing households (26.6-75.7), drainage followed by flood proofing (3.4-10.5), flood proofing followed by drainage (3.4-11.3); flood proofing followed by rainwater (12.8-37.7), and rainwater followed by flood proofing (12.7-36.2).
[40]	Sea-level rise, coastal erosion, storm surge.	Hybrid (beach nourishment, seawall, and setback).	Beach value calculated using hedonic pricing method	Construction and maintenance cost.	Year 2100	Not specified.	- *Pattaya beach (Thailand)*: BCR of beach nourishment range from 30.3 (RCP8.5) to 31.1 (RCP2.6); BCR of seawall of 1.6 for all scenarios. - *Chalatat beach (Thailand)*: BCR of beach nourishment range from 2.62 (RCP8.5) to 2.68 (RCP2.6); BCR of seawall of 0.09 for all scenarios.

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[15]	Sea-level rise.	Hybrid (e.g., beach nourishment; elevation of buildings; highway elevation; breakwater; wet flood proofing).	Flood risk reduction in terms of Expected Annual Damage.	Initial investment costs.	100 yrs	4%	- *Dynamic coast strategy* (beach nourishment, elevation of buildings, pacific coastal highway elevation, dry floodproofing, breakwater, groins, bulkheads). Highest BCR (2.28) and NPV ($331.8) obtained for 75 cm of sea-level rise. - *Dynamic coast enhanced-I strategy* (beach nourishment, dyke, wet flood proofing, breakwater, groins). Highest BCR (1.87) and NPV ($576.5) obtained for 200 cm of sea-level rise. - *Dynamic coast enhanced-II strategy* (beach nourishment, dyke, breakwater, groins, elevation of buildings). Highest BCR (2.17) and NPV ($662.8) obtained for 200 cm of sea-level rise. (*NPV in USD million*).
[86]	Sea-level rise and flooding.	Hybrid (elevation of buildings and roads, storm surge barriers, dykes underneath beaches).	Reduction in Expected Annual Damage.	Initial investment costs.	80 yrs	4%	- *Naples (USA)*: NPV range from approximately 0 to 1,000 million USD for current climatic conditions and a sea-level rise of 200cm, respectively. - *Venice Beach (USA)*: NPV range from approximately 0 to 650 million USD for current climatic conditions and a sea-level rise of 200cm, respectively.
[14]	Flooding.	Hybrid (dyke; modify land elevation;; land use change).	Reduction of Expected Annual Damage.	Investment and maintenance costs.	Years 2050, 2100	0%, 2.5%, 5%	Results for a 2.5% DR, RCP8.5-high end, and year 2100: - *Estimates without land use change* for *Ring Dyke* (BCR of -15.7; NPV of $-32,486), *Dryproofing* (BCR of 257.3; NPV of $177,639), and *Elevation + dryproofing* (BCR of 97; NPV of $513,584). - *Estimates with land use change* for *Ring Dyke* (BCR of -0.9; NPV of $-19,479), *Dryproofing* (BCR of -259.1; NPV of $178,889), and *Elevation + dryproofing* (BCR of 62.2 ; NPV of $327,255). (*NPV in USD million*).
[91]	Sea-level rise and coastal storms.	Hybrid (seawalls, land elevation, setback lines).	Total averted damages with adaptation.	Initial investment (construction and maintenance) and social (environmental/amenity) costs.	100 yrs	1%, 3%, 5%, 10%	The authors found that the optimal timing for initiating protection and maximising net benefits was between the first and the twentieth year in most of the analysed areas of the western coastline of Connecticut (USA).
[54]	Sea-level rise and flooding.	Hard (dyke construction and rising dyke height).	Avoided flood damage due to dyke improvements.	Expected annual undiscounted costs of adaptation.	Year 2100	3%, 5%	- *European NUTS2 level*: BCR > 1 in about 82% of the regions under Sustainability scenario (SS), and in 86% of the regions, under Fossil Fuel Based Development scenario (FFBDS). - *European country level*: highest BCRs varying within 16.6 to 25.8 in Belgium, 10.5 to 24.8 in France, and 9.7 to 16.4 Italy for the SS and FFBDS scenarios, respectively.
[55]	Flooding.	Hard (widening of locks; a tunnel to discharge water; a new pumping station, new pump diversions).	Reduction of future expected flood damages expressed in terms of Expected Annual Damage.	Initial investment costs.	Year 2030, 2050, 2070	5%, 8%, 12%	Estimated presented values of achieving full wetland encroachment: - *In 2030*: 5% DR (1.33-2.99); 8% DR (0.65-1.17); 12% DR (0.33-0.49). - *In 2050*: 5% DR (0.97-2.49); 8% DR (0.41-0.84); 12% DR (0.18-0.29). - *In 2070*: 5% DR (0.71-2.00); 8% DR (0.28-0.61); 12% DR (0.11-0.20). (*Values in USD billion, and lower and upper bounds referring to SSP3 and SSP5, respectively*).
[92]	Flooding.	Hybrid (pipe enlargement; infiltration; individual assets protection).	Avoided flood damage costs that correspond to the saved Expected Annual Damage.	Initial investment costs.	Year 2100	3%	The accumulated marginal benefits turn positive before the end year of the project in all measures, with pipe enlargement being the most cost-effective solution.

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[62]	Flooding.	Hybrid (e.g pipe enlargement; Open Urban Drainage Systems – OUDS; green spaces in the urban landscape–).	Reduced flood damage (conventional CBA) plus benefits linked to the potential rise in property prices and tax revenues due to environmental effects (extended CBA).	Initial investment costs for pipes, and initial and further investments needed for infiltration units and OUDS.	100 yrs	3%	NPV for the conventional CBA: -93 DKK (no adaptation), 147 DKK (pipe enlargement), 111 DKK (infiltration) and 157 DKK (OUDS). NPV for the extended CBA: 433 DKK and 557 DKK for two OUDS scenarios, and same results as the conventional CBA for the other adaptation options. (*Values in million Danish Krones*).