

Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction



Planbureau voor de Leefomgeving

Knowledge base on NbS for addressing climate risk

Key findings Chapter 3

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Rapidly expanding scientific evidence base

- > Multiple climate impacts in Europe
- > NbS options to address climate change involves different interventions
 - Conservation and restoration of ecosystems
 - Sustainable management and ‘climate-proofing’ of ecosystems
 - Creation of new, engineered ecosystems
- > Multifunctional as key advantage: increase resilience to climate change while providing many additional societal benefits
- > Biodiversity at the core for successful NbS

	NbS options	NbS benefits	Climate impacts addressed
 Water management (Section 3.6)	Restoration of rivers and floodplains	Regulation of water flows Reduction of floods and soil erosion Recreation and aesthetic appreciation Biodiversity Water quality	Droughts
	River buffers (e.g. vegetation strips)		Floods
	Water sensitive forest management		
 Forests and forestry (Section 3.7)	Protection and restoration of forests	Regulation of water flows Reduction of floods Control of disease and pests Slope stabilisation Carbon sequestration Biodiversity Recreation and aesthetic appreciation	Droughts
	Sustainable forest management		Floods
	Integration of trees/forest into the landscape		Fires
 Agriculture (Section 3.8)	Improved soil and water management	Retention of water and soil retention Mitigation of heat stress Control of disease and pests Carbon sequestration Soil fertility Biodiversity	Droughts
	Crop type diversification and rotation		Floods
	Agroforestry		Heat stress
 Urban areas (Section 3.9)	Parks, forest, street trees	Cooling air temperature Regulation of water runoff Carbon sequestration Biodiversity Human health and well-being Water quality	Floods
	Green buildings (e.g. green roofs, green walls)		Heat stress
	NbS for water management (e.g. bioswales, detention ponds)		
 Coastal areas (Section 3.10)	Rehabilitation and restoration of coastal habitats	Reduction coastal flooding Stabilisation of coast Carbon sequestration Biodiversity Recreation	Sea level rise
	Barrier islands, beach nourishment		Storm surges
	Hybrid solutions (e.g. green dykes, vegetated levees)		Coastal erosion

Overview of key climate impacts & NbS options across five thematic areas

Improving the knowledge base

- › Vulnerability of NbS to climate change?
- › Lack of knowledge on *net* effectiveness of NbS
 - environmental benefits known better than socio-cultural and economic benefits
 - Stakeholder involvement for co-design and assessment of NbS
 - Synergies and trade-offs (incl. cost, disservices) between different NbS & compared to grey infrastructure
- › Need for appropriate indicators, evaluation tools (incl. long-term studies) and integrated assessment method

