

Ecosystem-based approaches for climate change adaptation and disaster risk reduction - Exploring the knowledge base, policies and practices

This is a scoping exercise to explore the challenges, potential approaches, methods and sources to be addressed in an EEA Report to be published in 2020.

Annotated Outline

Executive summary

1. Introduction

Lead author: Sergio Castellari (EEA)

Contributing authors: Jelle van Minnen (ETC/CCA), Marianne Zandersen (ETC/CCA, for concepts and definitions)

Objectives of this chapter are:

- *To describe the scope and outline of the Scoping Paper*
- *To describe the key terminology (e.g. vulnerability, resilience, climate risk, climate change adaptation (CCA) and disaster risk reduction (DRR)).*
- *To describe the different terminology used for BES approaches to CCA and DRR*
- *To synthesize the past and current EEA relevant activities.*

a. *Setting the scene*

- **Scope and outline of the Scoping Paper**
 - *Objective, key questions of Scoping Paper.*
 - *Mapping/set-up of Scoping Paper*
- **Concepts and definitions**
 - *Concepts and definitions of vulnerability, resilience, climate risk, climate change adaptation (CCA) and disaster risk reduction (DRR)*
 - *Introducing the (climate) adaptive management and disaster risk management (DRM) cycles*
 - *Introducing also the importance of CCA/DRR integration*

- *Concepts and definitions of ecosystem services, ecosystem-based approaches for CCA (EbA) and DRR (ecoDRR), Nature-Based Solution (NBS), Green Infrastructure (GI) for climate change adaptation (CCA) and disaster risk reduction (DRR)*
- *“Luggage of each concept”: history of terms, users, similarities, differences, overlaps, perceptions, limitations, etc... (also explaining that different terms can be used for similar or the same activities).*
- *Particular emphasis should be given to the positive aspects of the different terms as means to communicate to the different stakeholders and sectors and avoiding a ‘hierarchy’ or competition among terms and stay away from a discussion whether EbA is a subset of NbS or vice versa.*
- *Need to highlight the need to use the various terms at the most efficient manner to foster development and accelerate implementation.*
- *Need to introduce how the use of Ecosystem Services framework can help to address these issues.*

b. Link to other EEA activities

c. Structure of the Scoping Paper

2. Current policy frameworks at different scales

Lead author: Sergio Castellari (EEA)

Contributing authors: Marianne Zandersen (ETC/CCA), Jelle van Minnen (ETC/CCA)

This chapter shows the policy frameworks relevant to ecosystem-based approaches for CCA and DRR, and how their various elements are already included in and relevant for policy processes at multiple scales. In the scoping exercise, this will be only recognition of the existence of these policies:

- **Global**
 - *SDGs (i.e. links to SDGs 5, 6, 13, 14 and more indirectly to most other SDGs; national targets to deliver global ambition), UNFCCC (e.g. Paris Agreement & A-INDC goals), UNCBD (i.e. guidelines), UNCCD (strategic objectives), SFDRR (Sendai targets and priorities), PEDRR, Urban Agenda*
- **Europe**¹
 - *WFD, MSFD, Flood Directive, EU Biodiversity Strategy, Nature Directives, Coastal & marine policies, CAP, Fishery*
- **Member States level**
 - *just mention general criteria for implementation at MS and one good example where something is happening [e.g. EU Legislation on Pesticides]*
- **Sub-national/local**
 - *City networks (mainly in Europe) and possible links to criteria for defining case-studies, often done at more local scales*

¹ see also Naturvation 2018 report

3. Current knowledge base

Lead author: Jelle van Minnen (ETC/CCA)

Contributing authors: Sergio Castellari (EEA, for projects), Marianne Zandersen (ETC/CCA, for section c) ...

This chapter highlights the state of the art of knowledge about the science related to the impacts on biodiversity and ecosystem services (BES) (e.g. IPBES assessments, in particular regional assessment on Europe²), the impacts of weather- and climate-related hazards and the base on the benefits and challenges of applying NBS and GI for CCA and DRR]

a. Stockcase of relevant International and European projects on ecosystem-base approaches for CCA and DRR

- **A technical overview of existing information sources³ such as international and European projects relevant for this study**

b. Impacts of socio-economic pressures on biodiversity and ecosystem services in Europe

- **Impacts of socio-economic pressures on biodiversity and ecosystems in Europe**
 - *A review of relevant and recent literature (desk study), including intensive land use practices, unsustainable water consumption. Highlight relevant and recent literature (desk study)⁴.*
- **Lessons learned, knowledge gaps, challenges, measures to take**

c. Impacts of weather- and climate-related hazards on biodiversity and ecosystem services and society in Europe

- **Weather- and climate related hazards (e.g. heatwaves, storms, floods, landslides) on biodiversity and ecosystems services and society in Europe**
 - *Highlight relevant and recent literature (desk study)⁵.*
- **Lessons learned, knowledge gaps, challenges, measures to take**

² <https://www.ipbes.net/assessment-reports/eca>

³ See links in CBD/SBSTTA/22/1 'Toolboxes'

⁴ Relate to ongoing work on MAES Mapping and assessing ecosystems and their services and to recent IPBES assessment report on Europe and Central Asia (chapter on drivers).

⁵ Relate also to IPCC SR1.5, particular Chapter 3 on impacts of global warming of 1.5°C on natural and human systems

d. Designing EbA, ecoDRR, NBS and GI for CCA and DRR measures in mitigating hazards for economy, society and nature

- Principles, safeguards and characteristics of ecosystem-based approaches for CCA and DRR (e.g. the principles and safeguards adopted by CBD Parties⁶)
- Opportunities and urgency for action
- Ordered by hazards, or sectors (TBD)
- Overview of where the different types of measures are put to use on the ground
 - (e.g. where do they apply, for what purpose?)
- Planning methods for ecosystem-based approaches for CCA and DRR; monitoring/evaluation methods
- Classification and illustration of various benefits provided by ecosystem-based approaches for CCA and DRR

4. Web portals and networks that address EbA, ecoDRR, NBS and GI for CCA and DRR at European, national (and sub-national levels)

Lead author: José Ramón Picatoste (EEA)

Contributing authors: Valentina Giannini (ETC/CCA), Sergio Castellari (EEA)

This chapter provides a technical overview of existing web portals and networks (mainly on European level and some relevant national and sub-national level) as information sources⁷.

5. Case studies across Europe of EbA, eco-DRR, NBS and GI for CCA and DRR

Lead authors: Mika Marttunen (ETC/CCA), Marianne Zandersen (ETC/CCA)

Contributing authors: Mike Harley (Climate Resilience Ltd.), ...

[We will need to define how to approach the cases studies]

- Definition of the criteria for case studies selection used in this study
- Objectives and (expected) outcomes of case studies
- How are ecosystem-based approaches for CCA and DRR applied in the case studies (similarities, differences, overlaps, including opportunities for accelerating implementation)?
- Set-up, including *governance* issues
- Multiple benefits /synergies/trade-offs with other sectors of society
- Barriers to implementation (specific for the case studies)

⁶ <https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-05-en.pdf>

⁷ See links in CBD/SBSTTA/22/1 'Toolboxes'

- Effectiveness/what is the evidence of success (and what didn't work)?
- Policy implications of implementation of ecosystem-based approaches for CCA and DRR
- Lessons learned

6. Financing EbA, ecoDRR, NBS and GI for CCA and DRR

Lead author: Jaroslav Mysiak (ETC/CCA)

Contributing authors: Marianne Zandersen (ETC/CCA), Elena Lopez Gunn (ICATALIST)

a. Financing EbA, ecoDRR, NBS & GI:

- **Introduction:**
 - *discussion of multiple benefits and capacity to reduce risk, an overview of studies addressing economic value of ecosystem services and NBS; as well as their benefit costs ratio (along with comparison to hybrid or grey solutions). Ecosystem services have an economic value in the context of DRR and CCA, even if no price actually is paid for their provision and/or maintenance. The failure to account for their true social value leads to market distortion and, ultimately, insufficient level of protection with lasting, in some cases irreversible, damage*
- **Review:**
 - *a review of the various financing options for implementation of green solutions, including PES, incentives/prices/penalties associated with ES and biodiversity protection, financial (investment) instruments (such as green bonds) and ESG (environmental, social and governance) criteria and standards for business operations (including disclosure of climate related financial risks and taxonomy developed by Technical Expert Group on sustainable finance)*
- **Examples:**
 - *Case studies in which innovative financial instruments have been applied, such as coral reef insurance scheme in Mexico realized with the help of The Nature Conservancy. The selection of examples will draw also on other EEA reports*

b. Opportunities and challenges in integrating EbA, ecoDRR, NBS and GI for CCA and DRR with insurance and broader disaster risk finance

- **Insurance can help dissuade policy-holders from risky behaviour and incentivise risk reduction.**
 - *Premiums and policy terms (e.g. deductibles) can be adjusted to reward good risks and penalise bad ones. Harnessing insurance for DRR becomes particularly significant in the context of increased frequency of disaster events, larger economic exposure, rising vulnerability and climate change.*
- **There is an ample consensus that insurance can and should play an increasingly important role in mitigating disaster impacts, not only through risk sharing, but also through all aspects of the risk management cycle, including risk identification and modelling, risk awareness, damage prevention, risk transfer and recovery**

7. Gaps, challenges, barriers and needs

Lead author(s): Mika Marttunen (ETC/CCA), [Marie Vandewalle (ETC/CCA)]

Contributing authors: ...

a. *The policy and knowledge gaps*

- **Highlighting knowledge gaps already identified by science, policy, practitioners**
 - *e.g. lack of recognition of potential ecosystem service co-benefits and potential disbenefits; challenges in mapping and assessing some ecosystem services, quality, time- and scale sensitivity of EbA, ecoDRR, NBS and GI for CCA and DRR; impacts of EbA, ecoDRR, NBS and GI for CCA and DRR, including deprivation (environmental justice)*

b. *Governance needs of ecosystem-based approaches for CCA and DRR*

- **Showing the need to link European and national (strategic) developments/policies with more regional/local needs and community-driven initiatives**
- **Show opportunities to increase these links**
- **Important issue to tackle are the sectorial policies**

c. *Challenges and barriers to implementing ecosystem-based approaches for CCA and DRR*

- **Here also stimulating but also conflicting impacts of measures for different purposes (e.g. co-benefits and trade-offs between SDGs objectives)**

8. Opportunities for advancing the agenda on ecosystem-based approaches for CCA and DRR at European and national level

Lead authors: Marianne Zandersen (ETC/CCA), Jelle van Minnen (ETC/CCA)

Contributing authors: Sergio Castellari (EEA), Mika Marttunen (ETC/CCA), [Marie Vandewalle (ETC/CCA)]

a. *Opportunities*

- **Multiple/co-benefits of ecosystem-based approaches for CCA and DRR [multi-functionality]**

b. *Planning and evaluation of the different measures*

Assess the NBS Impact Assessment Framework⁸ to:

- enable measuring how NBS projects are against the identified indicators in delivering multiple environmental, economic and societal benefits (incl. list of criteria for assessing the performance).
- show opportunities to improve the assessment of the effectiveness of ecosystem-based approaches for CCA and DRR.

c. Criteria for success

- **What works, what doesn't (e.g. need for local involvement, governance, win-win/no-regret, leadership, financial innovation, etc.)?**

d. Methods to evaluate alternative options, prioritise measures and to identify cost-efficient combination of measures

e. Opportunities for increasing awareness, efficiency and dissemination of ecosystem-based approaches for CCA and DRR practices

- **In terms of science, policy and practice**

9. The relevance of the EEA Report to be published in 2020

Lead author(s): Sergio Castellari (EEA), [Marie Vandewalle (ETC/CCA)], Jelle van Minnen (ETC/CCA)

Contributing authors: Marianne Zandersen (ETC/CCA), Mika Marttunen (ETC/CCA)

The chapters above provided a good overview over the breadth (and not depth) of knowledge on the topics (overview of latest research, publications & reports, networks, platforms and initiatives, policies, case studies, etc...), which can be used as a background document to contact the targeted groups during the scoping phase to understand their needs for a possible EEA Report. This chapter describes the potential usability of the 2020 report by the targeted groups. It explores potential policy relevant questions and topics that the 2020 report could cover.

a. Evaluation of needs of the recipients of the report

This section aims to describe how the task team will identify the most relevant needs and questions of the target groups.

- **Short introduction to target groups**

⁸ EKLIPSE Report "An impact evaluation framework to support planning and evaluation of nature-based solutions projects" (2017) - http://www.eclipse-mechanism.eu/apps/Eclipse_data/website/EKLIPSE_Report1-NBS_FINAL_Complete-08022017_LowRes_4Web.pdf

- **Proposed approaches/methods to collect the needed information from the target group → decision on the approach we will use**
- **Summary of information and knowledge needs of target audience (=lessons learned)**
 - *this might also show that the needs differ among the audience (e.g. vary between different DGs → need for different reports or chapters with different focus within the 2020 report)*
- **Highlighting of the knowledge gaps between policy/target groups' questions/needs and the existing knowledge base**

The scoping paper could propose different potential scopes for the final chapters of the 2020 report, e.g.:

- **Opportunities for future research**
- **Opportunities to improve the efficiency of success of ecosystem-based approaches for CCA and DRR**
- **Emerging issues**

b. Plan for the 2020 EEA Report

- **Work plan**
- **Authorship**
- **Review process**
- **Annotated outline (see Annex 2)**

ANNEX 1:

Table 1 - Inventory of projects and initiatives that address ecosystem-based approaches for CCA and DRR, at European, national and sub-national levels (non-exhaustive) – TO BE COMPLETED

Name of Projects/initiatives	Call #	Terminology used	Scale levels	Focus	Funded by	Goals
CLEVER cities	SCC-02-2016-2017	NBS	Global	Urban	EU H2020	The CLEVER Cities project uses nature-based solutions to address urban challenges and promote social inclusion in cities across Europe, South America and China.
RECONNECT	H2020-SC5-2017	NBS	European	Hydro-meteorological risks	EU H2020	RECONNECT aims to contribute to European reference framework on Nature Based Solutions (NBS) by demonstrating, referencing and upscaling large scale NBS and by stimulating a new culture for 'land use planning' that links the reduction of risks with local and regional development objectives in a sustainable way.
PHUSICOS	H2020-SC5-2017	NBS	European	Hydro-meteorological risks - mountains	EU H2020	The project demonstrates how nature-inspired solutions reduce the risk of extreme weather events in rural mountain landscapes.
OPERANDUM	H2020-SC5-2017	NBS	European + China	Hydro-meteorological risks – natural & rural areas	EU H2020	The project aims to reduce hydro-meteorological risks in European territories through co-designed, co-developed, deployed, tested and demonstrated innovative green and blue/grey/hybrid NBS
NATURVATION		NBS	European	Urban	EU H2020	The project seeks to develop our understanding of what nature-based solutions can achieve in cities, examine how innovation can be fostered in this domain, and contribute to realising the potential of nature-based solutions for responding to urban sustainability challenges by working with communities and stakeholders.
proGInreg project	SCC-02-	NBS	Europe, China	Urban	EU H2020	“productive Green Infrastructure for post-industrial urban regeneration”: nature for renewal. Demonstrating innovative

Name of Projects/initiatives	Call #	Terminology used	Scale levels	Focus	Funded by	Goals
	2016-2017					nature-based solutions in cities with 3 European front runner cities (Dortmund, Turin and Zagreb) and one Chinese (Ningbo)
URBINAT Project	SCC-02-2016-2017	NBS	Europe, Iran, China	Urban	EU H2020	URBINAT focuses on the regeneration and integration of deprived social housing urban developments through an innovative and inclusive catalogue of Nature-Based Solutions (NBS), ensuring sustainability and mobilising driving forces for social cohesion.
EdiCitNet Project	SCC-02-2016-2017	NBS, ECS	Europe, Africa, China, South America	Urban	EU H2020	The project seeks to leverage the benefits of Edible City Solutions (ECS) at local level to EU- and world wide level by launching a fully open and participatory network of cities, and to empower their inhabitants by a common methodology
UNaLab		NBS	European	Urban	EU H2020	The UNaLab project sets out to provide a framework for future upscaling of nature-based solutions in the demonstration cities. The UNaLab partner cities commit to addressing climate and water related challenges within an innovative and citizen-driven paradigm. The UNaLab cities aim to develop smarter, more inclusive, more resilient and increasingly sustainable societies through innovative nature-based solutions.
Grow Green		NBS	Europe		EU H2020	GrowGreen aims to create climate and water resilient, healthy and livable cities by investing in nature-based solutions (NBS). Making nature part of the urban living environment improves quality of life for all citizens and will help business to prosper. High quality green spaces and waterways provide innovative and inspiring solutions to major urban challenges, such as flooding, heat stress, drought, poor air quality and unemployment and will help biodiversity to flourish
ReNature		NBS	Malta		EU H2020	ReNature aims to establish and implement a strategy and research cluster to step-up and stimulate scientific excellence and innovation capacity in the area of nature-based solutions for sustainable development
NAIAD		NBS	Europe		EU H2020	NAIAD develops concrete Nature Based Solutions (NBS) approaches in response to flood and drought risks at 9 demo sites

Name of Projects/initiatives	Call #	Terminology used	Scale levels	Focus	Funded by	Goals
						across EU, deliver replicable methods for its implementation, work on development of financial instruments and novel business models in support of their implementation, and contributes to academic knowledge on NBS planning, increase the capacity of policy decision makers to integrate NBS in development planning and contribute to the general awareness of the need of NBS and socio-economic opportunities arising with their implementation at local, regional or EU level.
PLACARD		CCA and DRR	Europe		EU H2020	PLACARD will tackle current challenges by 1) providing a common 'space' where CCA and DRR communities can come together, share experiences and create opportunities for collaboration; 2) facilitating communication and knowledge exchange between both communities; and 3) supporting the coordination and coherence of CCA and DRR research, policy and practice.
BRIGAID		CCA	Europe		EU H2020	BRIGAID provides integral support for innovations for climate adaptation, focusing on climate-driven disasters like floods, droughts and extreme weather. BRIGAID strives to bridge the gap between innovators and end-users.
Espresso		CCA, DRR	Europe		EU H2020	Aims to contribute to a new approach to natural risk reduction and climate change adaptation, and opening new frontiers for research and policymaking. The project structure is focuses on three main challenges: (1) Helping to create coherent national and European approaches on disaster risk reduction, climate change adaptation and resilience strengthening; (2) bridging the gap between science and legal/policy issues at local and national levels in six European countries; (3) exploring efficient management of trans-boundary crises.
Nature4Cities		NBS	Europe		EU H2020	Nature4Cities creates a comprehensive reference Platform for Nature Based Solutions (NBS), offering technical solutions, methods and tools to empower urban planning decision making.

Name of Projects/initiatives	Call #	Terminology used	Scale levels	Focus	Funded by	Goals
						This will help addressing the contemporary environmental, social and economic challenges that face European Cities.
Connecting Nature		NBS	Europe	Urban	EU H2020	We will form a community of cities that fosters peer to peer learning and capacity building among our front runner cities who are experienced in delivering large scale nature-based solutions, and our fast follower cities who have the desire to implement large scale nature-based solutions but lack the expertise. As knowledge and expertise increases, so too will our community to include new members (multiplier cities).
EKLIPSE		BES	Europe		EU H2020	The project aims to develop a sustainable mechanism (to be in place for many years) to facilitate linkages between science, policy and society, through different actions, such as knowledge synthesis, identifying research priorities, and building the Network of Networks that will support the other actions.

Table 2 - Inventory of web-portals, networks and initiatives that address ecosystem-based approaches for CCA and DRR, at European, national and sub-national levels (non-exhaustive)

Name of webportal/ network/initiative	Terminology used	Scale levels	Funded by	
ClimateAdapt	Ecosystem-based approaches	Europe	EC	To support Europe in adapting to climate change helping users to access and share data and information relevant for CCIVA.
BISE	GI and, ecosystem restoration	Europe	EC	single entry point for data and information on biodiversity supporting the implementation of the EU strategy and the Aichi targets in Europe.
DRMKC	ecoDRR	Europe	EC	Enhancing the knowledge base to support DRM
OPPLA	ES, NBS, Natural Capital	Europe	FP7	EU repository of NBS; knowledge marketplace
ThinkNature	NBS	Europe	H2020	A continuous dialogue and interaction on NBS; broad multi-stakeholder platform; identify, communicate and promote successful NBS; identify potential barriers; develop synergies across EU projects
BiodivERsA	EBS	European + French DOM TOMs	H2020	network of national and regional funding organisations promoting pan-European research on biodiversity and ecosystem services, and offering innovative opportunities for the conservation and sustainable management of biodiversity
NWRM platform	Natural water retention measures		EC	To gather information on NWRM at EU level.
Urban Nature Atlas	NBS	Europe	EC	It contains almost 1000 examples of Nature-Based Solutions from across 100 European cities.
Friends of EbA???	EbA	International		

ANNEX 2:

Annotated outline of the 2020 EEA Report