



Promoting nature-based solutions:

Guideline for integrating ecosystem-based adaptation into municipal planning and governance

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Guideline aims and structure

This guideline offers local government officers and local politicians **process-oriented assistance for integrating ecosystem-based adaptation within relevant sectors of municipal administration with the aim** of fostering sustainable urban development. It is thus an instrument to support leadership of this integration process. The levels and areas where integration of ecosystem-based adaptation is relevant are systematically presented. This permits the planning and evaluation of potential interventions and measures.

The structure of the guideline is based on the three levels relevant for the integration of ecosystem-based adaptation:

- I. The local level (i.e., operative measures on the ground)
- II. The institutional level (i.e., strategic measures within the municipal administration)
- III. The inter-institutional level (i.e., strategic measures regarding the municipality's cooperation with external actors). See Figure 1 below.

Based on this, the fourth section of the guideline features an analysis table, which allows assessment of the measures taken at levels I-III. Thus, the guideline is a sort of model or grid which can be used to review municipalities' work in order to identify where progress has already been achieved and where there is still need for action. Based on the identified needs and gaps, a second analysis table serves to support systematic planning of the necessary measures for further integration of ecosystem-based adaptation within municipal planning and governance.

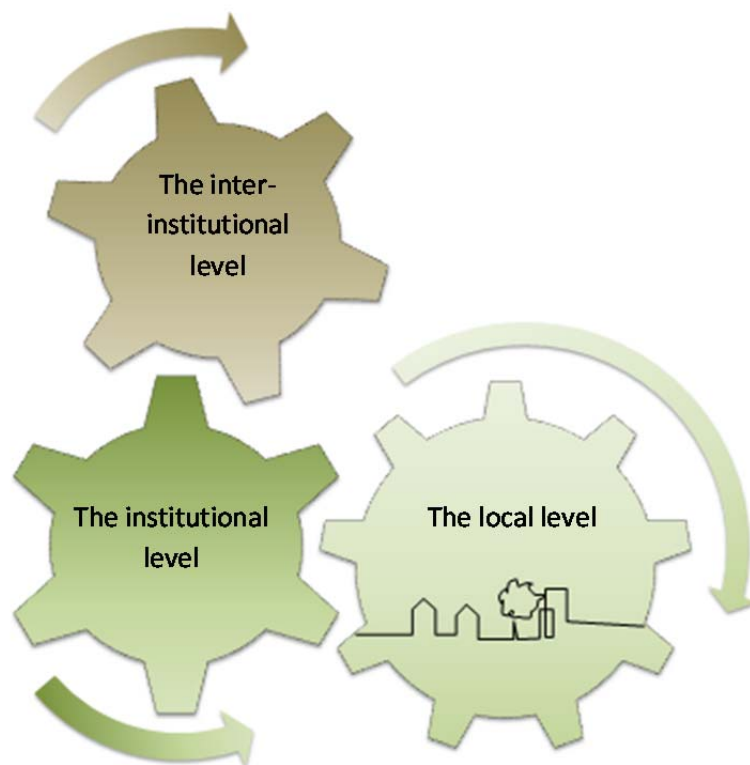


Figure 1 The three levels for strategic integration of ecosystem-based adaptation

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What is ecosystem-based adaptation?

Ecosystem-based adaptation refers to the **use of biodiversity and ecosystem services** as part of an overall adaptation strategy to help municipalities and their inhabitants adapt to the adverse effects of climate change. As illustrated in Figure 2, ecosystem-based adaptation is linked to both natural and societal processes and can be seen as **consisting of the following components**: ecosystem-based adaptation measures (1), which make use of ecological structures, such as trees, wetlands or green roofs (2), more specifically, their functions and capacity (3), which in turn provide benefits or services for climate change adaptation (4). The recognition and valuation of these benefits or services (5) finally influences public and private decision-taking and support for investing in specific measures (1).

Ecosystem-based adaptation measures, and the institutional and inter-institutional practices that sustain them, are the focus of this guideline. They entail the **sustainable conservation, restoration, creation and management** of the ecological structures that provide adaptation benefits and are carried out at all three governance levels: local, institutional and inter-institutional (Figures 1 and 2). Ecosystem-based adaptation measures can be implemented **both with and without the explicit goal of climate change adaptation**.

The term **'nature-based solutions'** is closely related. It can be seen as an **umbrella term** for approaches that capture the distinct contributions that natural systems provide (such as ecosystem services and ecosystem-based adaptation) to turn challenges into innovation opportunities.

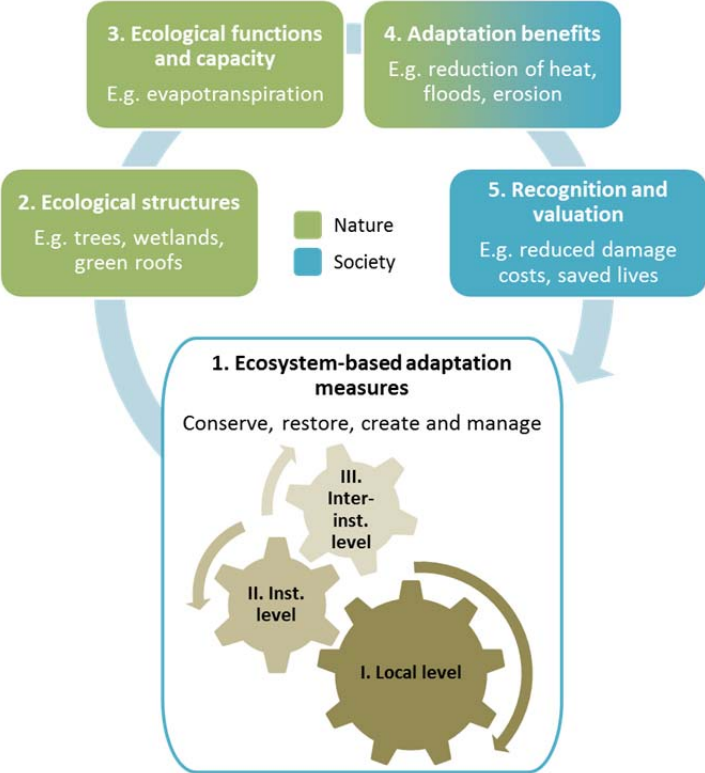


Figure 2 Ecosystem-based adaptation as a linked process that spans nature and society.

I OPERATIVE measures: local level

1 Measures on the ground (city – neighborhoods – properties)

Key question: Which ecosystem-based adaptation measures are already implemented on the ground by the municipality or are in planning?

⇒ Orientation values

Step 1

- The use of ecological structures for adaptation generally receives low attention within the city's on-the-ground operations.

Step 2

- Some ecosystem-based adaptation measures are sporadically implemented on the ground. However, there is still no systematic or comprehensive implementation of ecosystem-based adaptation measures.

Step 3

- The function and/or use of ecological structures for adaptation is taken into account within all on-the-ground operations.
- Ecosystem-based adaptation measures are systematically implemented on the ground with consideration of all relevant aspects (e.g. comprehensive consideration of existing and future climate risks; see section 9).

II STRATEGIC measures: institutional level

2 General planning strategies and visions

Key question: Are there general urban planning strategies or visions within the municipality that support the integration and implementation of ecosystem-based adaptation at the local and administrative levels?

⇒ Orientation values

Step 1

- The use of ecological structures for adaptation receives only limited attention within general urban planning strategies and visions (and is only seldom, or superficially, addressed within related texts and statements).

Step 2

- There are initial attempts to integrate ecosystem-based approaches with the aim of supporting adaptation: at the municipal level in planning strategies and visions; at the level of individual departments and units within their strategic aims and areas of operation.
- The subject of ecosystem-based adaptation is not yet approached in a comprehensive way and is thus still inadequately addressed within urban planning strategies and visions.

Step 3

- Ecosystem-based adaptation is an explicit component of the municipality's planning strategies and vision as well as of the strategic aims and areas of operation of relevant departments and units. Related documents emphasize the importance of ecosystem-based adaptation to achieve sustainable urban development and indicate pathways towards systematic integration of the topic at local and institutional levels, (see section 9).

3 Climate change adaptation strategy/ strategies

Key question: Is there an existing strategy for the integration of climate change adaptation within municipal planning and governance, which supports ecosystem-based approaches?

⇒ Orientation values

Step 1

- Existing climate change adaptation measures, including ecosystem-based approaches, take place on an ad-hoc basis.

Step 2

- There are initial attempts towards creating a municipal adaptation strategy or towards its implementation.
- The subject of ecosystem-

Step 3

- A comprehensive municipal adaptation strategy exists that also indicates pathways towards systematic integration of ecosystem-

- The importance of a strategic approach towards climate risk reduction is recognized only to a small degree.

- based adaptation has not yet been conceptualized.
- The link between ecosystem services and climate change has not yet been recognized in a far-reaching manner or only receives recognition within the context of climate change *mitigation* strategies.

- based adaptation at local and institutional levels (see section 9).
- The adaptation strategy is accepted, supported, and implemented at all levels.

4 Formal planning frameworks and related instruments

Key question: Do the formal planning frameworks (i.e., the detailed and comprehensive plans) support the integration and implementation of ecosystem-based adaptation at the local level?

⇒ Orientation values

Step 1

- There is little awareness regarding the linkages between ecosystem-based adaptation and comprehensive and detailed planning.
- There is only limited interest in integrating the subject of ecosystem-based adaptation within the instruments of comprehensive and detailed planning.

Step 2

- There are initial attempts to create support for ecosystem-based adaptation in comprehensive and/or detailed planning.
- The municipality works on creating a process for the systematic integration of ecosystem-based adaptation within *future* comprehensive and detailed planning.

Step 3

- The subject of ecosystem-based adaptation is an explicit component of comprehensive and detailed planning, is based on adequate risk analyses and is addressed comprehensively (see section 9). Both the influence of climate impacts on projects/measures and the influence of projects/measures on climate risk are taken into consideration.

5 Informal planning frameworks and related instruments

Key question: Are there any informal planning frameworks or instruments in place that support the integration and implementation of ecosystem-based adaptation at the local level?

⇒ Orientation values

Step 1

- There is very little interest in creating support for the subject of ecosystem-based adaptation within informal planning frameworks and instruments.

Step 2

- There are initial ideas or attempts towards creating support for ecosystem-based adaptation within informal planning frameworks and instruments.
- The municipality works on creating a process for the systematic integration of ecosystem-based adaptation within informal planning instruments.

Step 3

- The subject of ecosystem-based adaptation is an explicit component of all informal planning frameworks and instruments, is based on adequate risk analyses and is addressed comprehensively (see section 9).
- Related processes for monitoring and learning have been established. Related results are considered in the ongoing revisions of existing planning approaches.

6 Internal organizational structure

Key question: Is there an organizational structure in place that supports the integration and implementation of ecosystem-based adaptation at local and institutional levels (e.g., through appropriate cooperation, networking, operational procedures and communication)?

⇒ Orientation values

Step 1

- The existing organizational structure does not sufficiently support systematic integration of ecosystem-based adaptation within municipal governance and planning.

Step 2

- The city works on creating an organizational structure that permits systematic integration of ecosystem-based adaptation within municipal governance and planning.
- Initial measures to enable improved cooperation, networking or communication around ecosystem-based adaptation have taken place.

Step 3

- An organizational structure is in place that fosters the integration and implementation of comprehensive ecosystem-based adaptation measures at local and institutional levels (see section 9).

7 Personnel and financial assets

Key question: Are there human and financial resources in place that can support the integration and implementation of ecosystem-based adaptation at local and institutional levels?

⇒ Orientation values

Step 1

- The municipal administration has only limited human and financial resources to support the subject of ecosystem-based adaptation within municipal governance and planning.
- There is only limited knowledge or awareness of the importance of supporting/integrating ecosystem-based adaptation in municipal governance and planning.

Step 2

- The municipal administration has made initial efforts regarding staff and funding to support adaptation, including ecosystem-based approaches.
- Staff has opportunities for further training in the field of ecosystem-based adaptation.

Step 3

- Clearly defined and sufficient human and financial resources exist for integrating adaptation within municipal governance and planning in a comprehensive way, including ecosystem-based approaches (see section 9).
- The responsible staff receive support from their colleagues within and outside of their department or unit.

III STRATEGIC measures: inter-institutional level

8 Cooperation and networking with external actors

Key question: Are there external cooperation and networks that support the integration and implementation of ecosystem-based adaptation at local and institutional levels?

⇒ Orientation values

Step 1

- Ecosystem-based approaches for climate change adaptation are mostly implemented independently, i.e., without active participation of or cooperation with other stakeholders (e.g., citizens).

Step 2

- Stakeholders relevant to the issue of ecosystem-based adaptation have been identified (at national, regional, municipal and local levels) and initial contacts or collaboration projects have been established.

Step 3

- The city supports other relevant stakeholders at all levels and creates incentives for them to implement or promote comprehensive ecosystem-based adaptation (see section 9).
- Ecosystem-based adaptation is implemented in close cooperation with all relevant actors, including impacted population groups.
- The municipality's public relations reflect its efforts and strategies in the field of ecosystem-based adaptation.

I-III ANALYSIS table: existing measures

The following table assists in analyzing existing measures in regard to their strengths and weaknesses. First, existing measures are identified on the basis of the previous sections I-III and classified according to eight categories (see below). Existing measures listed are then further detailed with information regarding their legal basis (e.g., city council decision) and the actors responsible for planning and implementing them (e.g. specific staff, units or departments). Subsequently, the measures listed can be evaluated according to different aspects (see section 9: classification and evaluation of measures).

I OPERATIVE measures: local level			
1 Measures on the ground (city – neighborhoods – properties)			
List of existing ecosystem-based measures that support climate change adaptation (including implementation timeframe)	Legal basis	Responsibility	Evaluation <i>(Individual and total evaluation of category 1)</i>
• ...			
• ...			
II STRATEGIC measures: institutional / administrative level			
2 General planning strategies and visions			
List of relevant planning strategies and visions (including issue date)	Legal basis	Responsibility	Evaluation <i>(Individual and total evaluation of category 2)</i>
• ...			
• ...			

3 Climate change adaptation strategy (ecosystem-based approaches as part of an explicit municipal climate change adaptation strategy)			
List of existing ecosystem-based adaptation strategies (including issue date)	Legal basis	Responsibility	Evaluation <i>(Individual and total evaluation of category 3)</i>
• ...			
• ...			
4 Formal planning frameworks and related instruments			
List of all relevant formal planning frameworks and related instruments (including issue date)	Legal basis	Responsibility	Evaluation <i>(Individual and total evaluation of category 4)</i>
• ...			
• ...			
5 Informal planning frameworks and instruments			
List of relevant informal planning frameworks and instruments (including issue date)	Legal basis	Responsibility	Evaluation <i>(Individual and total evaluation of category 5)</i>
• ...			
• ...			
6 Internal organizational structure			
List of all relevant organizational structures and operations (including revision date if applicable)	Legal basis	Responsibility	Evaluation <i>(Individual and total evaluation of category 6)</i>
• ...			
• ...			

7 Personnel and financial assets

List of all relevant human and financial resources/assets (including revision date if applicable)	Legal basis	Responsibility	Evaluation <i>(Individual and total evaluation of category 7)</i>
• ...			
• ...			

III STRATEGIC measures: inter-institutional level

8 Cooperation and networking with external actors

List of relevant cooperation and networking activities with external actors (including revision dates if applicable)	Legal basis	Responsibility	Evaluation <i>(Individual and total evaluation of category 8)</i>
• ...			
• ...			

9 Classification and evaluation of measures

The identification of weaknesses and strengths of existing ecosystem-based approaches begins with classifying them according to the three levels (local, institutional and inter-institutional) and the eight categories described in sections I-III. The previous analysis table hereby helps to visualize what concrete initiatives exist in each category. Lack of, or low level of activity in some of the categories may indicate an unbalanced focus of the current initiatives. This initial analysis is important in order to define future areas of action.

Subsequently, the three-tier orientation values for systematic integration of ecosystem-based adaptation within municipal governance and planning (see sections 1-8) serve to support evaluation of the identified level of engagement. Step 3 always requires *comprehensive* consideration of ecosystem-based adaptation. This comprehensive view relates to the following aspects:

- A. **Hazard:** all potential climate hazards are considered.
- B. **Risk reduction:** all risk aspects are covered.
- C. **Scale:** all relevant levels on both spatial and institutional scales are included (city – neighborhood – and property level as well as unit or department level).
- D. **Relation to core work:** separate (explicit) and integrated (implicit or explicit) implementation of ecosystem-based measures complement each other. The emphasis is, however, on improving existing core work to ensure sustainable urban development.
- E. **City–citizen interaction:** possible city–citizen interactions for adaptation are considered in order to improve citizen support for, as well as the design, implementation and maintenance of, ecosystem-based adaptation measures.

Note

- ⇒ Not all aspects A-E are relevant for every type of measure.
- ⇒ As an alternative to the coding system presented below, a more interactive Excel version of the tool is being developed.

A Hazard

Evaluation question: Is the adaptation measure only focused on particular climate hazards (e.g., flood, heat, etc.) or are all potential/anticipated climate impacts sufficiently covered?

The following codes can be used for the evaluation of the measures within the analysis table(s). The measure is:

- Hazard-specific
 - Flood. Code: F
 - Heat. Code: H

- Cold. Code: C
- Storms. Code: S
- Other climate impact types. Code: O
- o Non-hazard-specific. Code: N

B Risk reduction

Evaluation question: What is the goal of the ecosystem-based measure? What risk aspects are addressed?

The following codes can be used for the evaluation of the measures within the analysis table(s). The measure has the following goal(s):

Risk aspects and related risk reduction:

- o Awareness building (to improve knowledge on climate change, ecosystem-based adaptation and related ecosystem-based approaches). Code: AB
- o Risk assessment (to create an adequate knowledge base for the design of ecosystem-based adaptation measures). Code: RA
- o Reducing or avoiding existing hazards (to keep hazards outside the city). Code: RedH
- o Reducing vulnerability to hazards (to enable the city to resist or live with hazard impacts). Code: RedV
- o Improving response preparedness (to be able to respond to hazards adequately). Code: ResPrep
- o Improving recovery preparedness (to be able to quickly recover after hazards and resume normal functions). Code: RecPrep

C Scale

Evaluation question: Is the measure related to the municipal level or to a particular geographical area (individual neighborhoods or properties, units or departments)?

The following codes can be used for the evaluation of the measures within the analysis table(s). The measure relates to the:

- o Overall municipal level. Code: ML
- o Settlement/neighborhood level. Code: SL
- o Property level. Code: PL
- o And is implemented by a particular unit. Code: UI
- o Or department level. Code: DI

D Relation to core work

Evaluation question: How does the ecosystem-based measure relate to the area of operations of the responsible department? Is the measure implemented independently of the department's core activities or is it integrated into other core activities and measures?

The following codes can be used for the evaluation of the measures within the analysis table(s). The measure is:

- A separate project or a separate project component that has the explicit goal of ecosystem-based adaptation. Code: S-EX
- Improvement of core areas of operation by increased attention being given to the topic of ecosystem-based adaptation. This can be done explicitly (i.e., with the explicit aim to support ecosystem-based adaptation and/or climate change adaptation) or implicitly.
 - Integrated - implicit. Code: I-IM
 - Integrated - explicit. Code: I-EX

E City–citizen interaction

Evaluation question: Are city–citizen collaborations considered and, if possible, planned for in order to support the design, implementation and maintenance of ecosystem-based adaptation measures?

The following codes can be used for the evaluation of the measures within the analysis table(s).

- Citizens' local knowledge, needs and capacities are considered in the design, implementation and maintenance of the measures. Code: PK.
- Citizens are supported in their local efforts to reduce risk through ecosystem-based measures. Code: CS.

I-III ANALYSIS table: potential measures

The same analysis table (see preceding chapter) can be used for the identification and examination of planned or potential measures that are necessary to foster the integration of ecosystem-based adaptation within municipal governance and planning.

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