Factsheet 6

Analysis of vulnerabilities and opportunities ('detailed analysis')

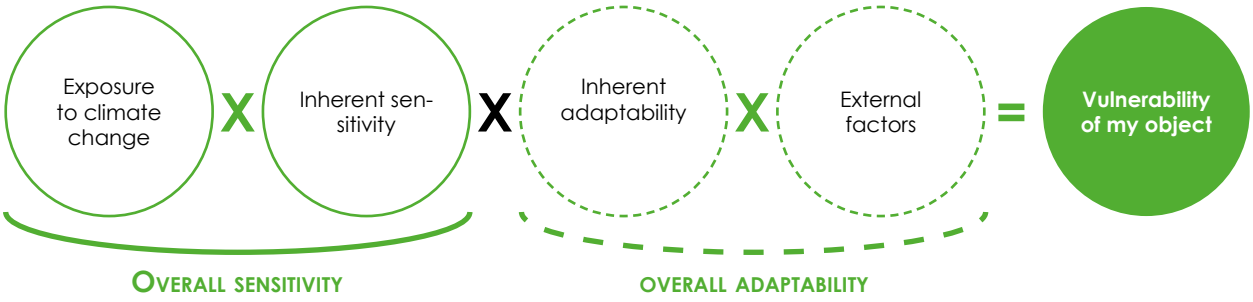
For this phase:

IMMERSION AND PLANNING ▶ **PROSPECTIVE ANALYSIS** ▶ MANAGEMENT ADAPTATION ▶ ASSESSMENT AND CAPITALISATION

This framework of **eight** questions is **intended to guide you** in analysing the **potential effects** of climate change (simple analysis) during phase 2, 'Prospective analysis,' of the Natur'Adapt process. Remember that potential effects are the possible positive or negative repercussions of climate change. This analysis makes it possible to carry out a prospective analysis without going through the sometimes-complex concepts underlying vulnerability (detailed analysis). As a reminder, you can choose to carry out **simple analyses** for one component (e.g. human activities) and **detailed analyses** for another (e.g. natural heritage).

For simplicity's sake, **the framework is common to the 'natural heritage,' 'human activities' and 'management tools and resources' components. You are free to adapt it** to suit your context and the choices you make during the planning phase. **Illustrations** are provided for each component as you go through the questions below, and **examples** of analysis are available in the Natur'Adapt guide on pages 36, 40 and 46.

To determine the vulnerability of an object, several concepts need to be combined:



EXPOSURE

The nature, degree and frequency of climatic variations (and their physical consequences) likely to affect human or natural systems.

INHERENT SENSITIVITY

The inherent propensity of a socio-system or ecosystem to be affected (favourably or unfavourably) by climatic variations (and their physical consequences).

Examples of climatic variations: increase in average annual temperatures, decrease in the number of days with frost, etc.
Examples of physical consequences: increase in droughts, decrease in river flows, rising sea levels, etc

INHERENT ADAPTABILITY

The intrinsic quality(ies) that enable a socio-system or ecosystem to reduce the negative effects and/or take advantage of the positive effects of climate change.

External factors

The non-climatic factors external to the object of analysis that may influence its adaptability

Examples of external factors for a 'natural heritage' object: human activities exerting anthropogenic pressures (fragmentation of environments, removal of individuals, etc.), invasive alien species, etc. and environmental limiting factors such as physical barriers to movement, competition between species, etc

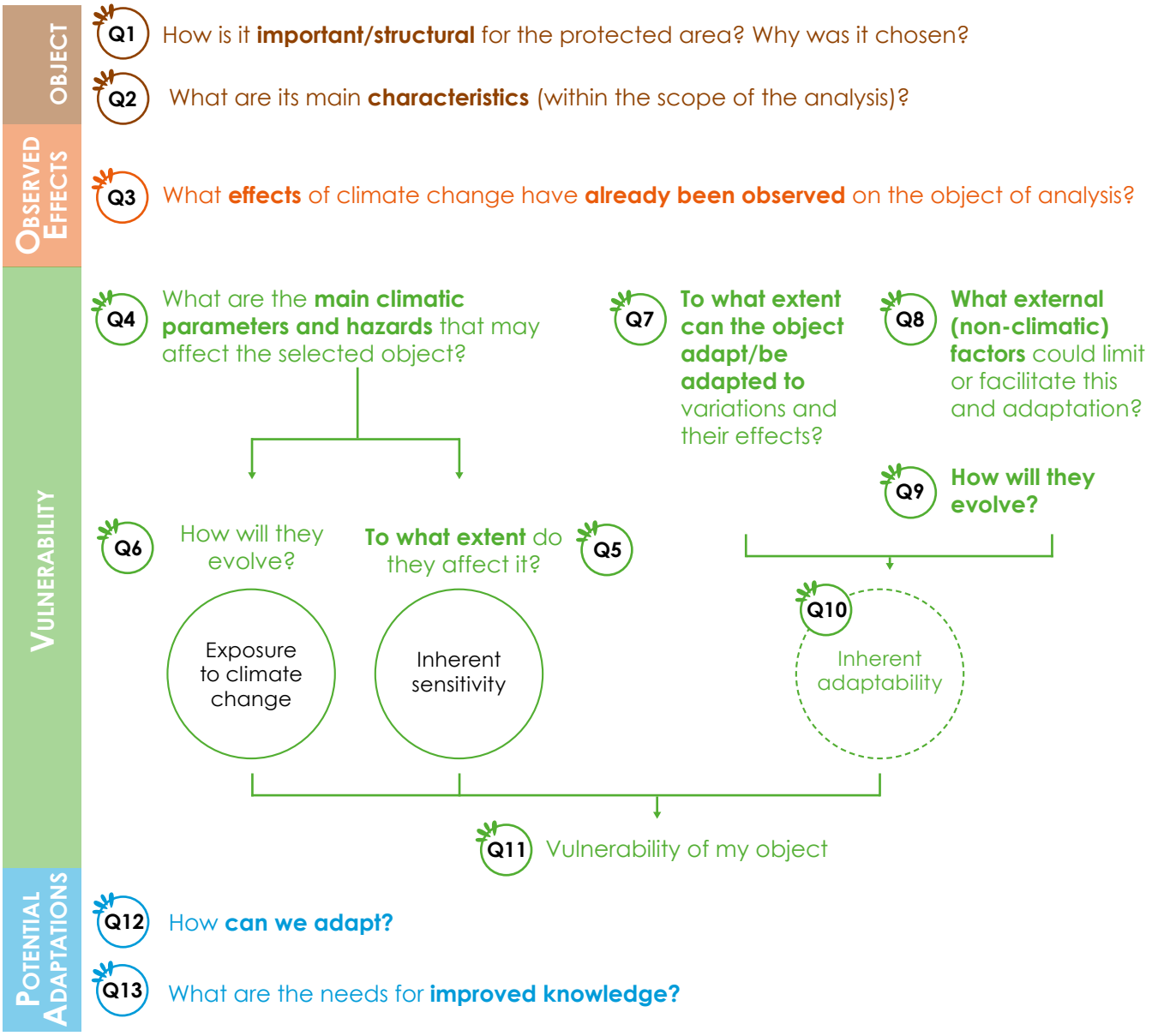
Vulnerability

The propensity of a socio-system or ecosystem to suffer damage, depending on its exposure, sensitivity and overall capacity to adapt to climatic variations (and their physical consequences).

Opportunity

The element through which a socio-system or ecosystem will respond positively to climate change.

These concepts are addressed in the following way in the proposed questions:



Framework of questions for analysing vulnerability ('detailed analysis')

Finally, there are several possible ways of **answering the questions** (bibliography, interviews, workshops, etc.)! It's up to you to define them.

Questions

For each object of analysis (selected, at the level of the protected area and based on current knowledge: human activity / natural heritage feature / management action or resource):

OBJECT OF ANALYSIS

OBJECT OF ANALYSIS: .....

Q1 How is it important/structural for the protected area? Why was it chosen?

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Q2 What are its main characteristics (within the scope of the analysis)?

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OBSERVED EFFECTS

Q3 What effects of climate change have already been observed on the object of analysis?

- in the protected area: .....

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- around or in a similar context: .....

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- Source(s): .....

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Level of confidence (Is it fairly high or very low?):

Very high High Average Low

Q4 What are the main climatic parameters and hazards that may affect the selected object AND how will they evolve with climate change?

Some of these parameters and hazards may not have been considered in the climate analysis: consider the relevance and feasibility of adding them to your initial list and analysing them.

List one to five climate parameters and hazards:

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Justification: .....

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Source(s): .....

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Q5 To what extent can these parameters and hazards affect the object? How?

This question determines the inherent sensitivity of the object in question.

- Parameter 1: .....
- Parameter 2: .....
- Parameter 3: .....
- Parameter 4: .....
- Parameter 5: .....

Overall:.....

→ If you want to use the matrix proposed in question 11 to assess the level of vulnerability, evaluate whether its sensitivity is null, low, average, high or unknown:

Response to question 5	Not at all	Slightly	Moderately	Strongly
	▼	▼	▼	▼
Inherent sensitivity	Nulle	Low	Average	High

Justification:.....

Source(s): .....

Level of confidence (Is it fairly high or very low?):

Very high High Average Low

Q6 How will the parameters and climate hazards affecting the object evolve overall?

This question assesses the exposure of the object in question to climate change.

- Parameter 1: .....
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- Parameter 2: .....
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- Parameter 3: .....
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- Parameter 4: .....
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- Parameter 5: .....
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Overall: .....
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NB: The results of the climate analysis are what inform this question!

→ If you want to use the matrix proposed in question 11 to assess the level of vulnerability, assess whether the exposure is favourable, unfavourable, neutral or unknown:

Response to question 6	Favourably	Unfavourably	Difficult to give an overall trend	No evolution
Exposure to climate change	▼ Favourable	▼ Unfavourable	▼ Neutral	▼ Neutral

Justification: .....
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Source(s): .....
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Level of confidence (Is it fairly high or very low?):

Very high High Average Low

Q7 To what extent can the selected object adapt (if it is a natural heritage feature) or be adapted (if it is a human or management activity) to these climate variations and their effects? AND how?

This question determines the inherent adaptability of the object under consideration to climate change.

Examples :

- *For a **human activity**: How can it adapt to climate change? How might the activity evolve: over time / in space / in intensity / in the way it is carried out and used / in the type of users or socio-professional players / etc?*
- *For an element of **natural heritage:***
  ***Species**: In the face of climate change, is the species capable of adapting: habitat / diet / physiology / behaviour / plasticity / ability to disperse?*
  */ If so, how and under what conditions? ... **Habitats/environments:** in the face of climate change, can the habitat adapt? Under what conditions? How could the habitat evolve? Or be recreated elsewhere? etc.*
  ***Abiotic functions and components**: How resilient is the habitat in the face of climate change? How might its physical, chemical, geomorphological and landscape characteristics change?*
- *For a **management** action or resource: In the face of climate change, can the tasks, roles and working tools available to you today be adapted: in time / space / methods / the type of people involved / skills required / governance / funding, etc.?*

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→ If you want to use the matrix proposed in question 11 to assess the level of vulnerability, **assess whether the inherent adaptability is nil, low, average, high or unknown:**

	NO		YES	
Response to question 7	Not at all	Slightly	Moderately	Strongly
	▼	▼	▼	▼
Inherent adaptability	Nil	Low	Average	High

Justification: .....

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Source(s): .....

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Level of confidence (Is it fairly high or very low?):

Very high High Average Low

It is possible to stop the analysis here for component 2, 'human activities./
For components 3, 'natural heritage' and 4, 'management actions and resources,' we will continue...

Q8 What external (non-climatic) factors can limit or facilitate this adaptation?

Example external factors:

- *For a **human activity:** public policies, competition with other sectors, lack of opportunities, scarcity of resources, etc.*
- *For an element of the **natural heritage:** human activities exerting anthropogenic pressures (fragmentation of environments, removal of individuals, etc.), invasive alien species, etc. and environmental limiting factors such as physical barriers to movement, competition between species, invasive alien species, pathogens, etc.*
- *For a **management** action or resource: human activities, available resources, public policies, physical boundaries of the area, available skills and knowledge, etc*

List the main external factors:

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Justification: .....
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Source(s): .....
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Q9 How do these external factors, in the context of climate change, tend to evolve overall?

For the 'natural heritage' and 'management' components, some of these factors are human activities which have been analysed previously: this is the time to use these results again! Others may not have been studied during the analysis of human activities: consider the relevance and possibility of adding them to your selection and analysing them.

- Factor 1: .....
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- Factor 2: .....
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- Factor 3: .....
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- Factor 4: .....
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- Factor 5: .....
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Overall: .....
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→ If you want to use the matrix proposed in question 11 to assess the level of vulnerability, **assess whether the factors are evolving favourably or unfavourably overall:**

esponse to question 9	Favourably	Unfavourably	Difficult to give an overall trend	No evolution
	▼	▼	▼	▼
External factors	Favourable	Unfavourable	Neutral	Neutral

Justification: .....
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Source(s): .....
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Level of confidence (Is it fairly high or very low?):

Very high High Average Low

Q10 Taking into account inherent adaptability (question 7) and changes in external factors (question 9), would you say that the overall adaptability of the object is:

Overall adaptability	Nil	Low	Average	High
Example	*No inherent adaptability X Unfavourable evolution*	*Average inherent adaptability X Unfavourable evolution*	*Low inherent adaptability X Favourable evolution*	*High inherent adaptability X Favourable evolution*

Justification: .....

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Level of confidence (Is it fairly high or very low?):

Very high Good Average Low

Q11 In conclusion, would you say the object is:

Extremely vulnerable	Very vulnerable	Moderately vulnerable	Slightly vulnerable

Indifferent to climate change

Slightly favoured (Weak opportunity)	Moderately favoured (Average opportunity)	Very favoured (Strong opportunity)	Extremely favoured (Very strong opportunity)

Justification: .....

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Level of confidence (Is it fairly high or very low?):

Very high High Average Low

To help you, here is a suggested matrix for assessing object vulnerability:

Exposure to climate change (Q6)	Inherent sensitivity (Q5)	Overall adaptability (Q10): Null	Low	Average	High
Unfavourable	High	Extreme vulnerability	Extreme vulnerability	High vulnerability	Average vulnerability
	Average	Extreme vulnerability	High vulnerability	Average vulnerability	Low vulnerability
	Low	High vulnerability	Average vulnerability	Low vulnerability	Low vulnerability
Neutral	High	Indifferent	Indifferent	Indifferent	Indifferent
	Average				
	Low				
Favourable	High	Weak opportunity	Weak opportunity	Average opportunity	Strong opportunity
	Average	Weak opportunity	Average opportunity	Strong opportunity	Very strong opportunity
	Low	Average opportunity	Strong opportunity	Very strong opportunity	Very strong opportunity

The analysis for component 2, 'human activities,' ends here.
For components 3, 'natural heritage' and 4, 'management actions and resources,' we will continue!

Q12 What adaptation measures can be taken to limit the negative effects or take advantage of the positive effects of climate change on the object?

You do not need to go into detail at this stage. The answers to this question will provide food for thought during phase 3, 'Adapting management,' to define adaptation measures.

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Q13 During this analysis, what needs for improved knowledge emerged?

Don't forget to reuse these tips in the adapting management phase when defining adaptation measures.

Ways of improving knowledge:

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