Environmental Scenario Analysis

METIER Training Course No 7

- MODULE 2 -

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Module 2
How to develop environmental scenarios

Introduction

Module 1 : What are environmental scenarios

Module 2 : How to develop environmental scenarios

Module 3 : How to analyse environmental scenarios

Module 4 : How set up an environmental scenario exercise

Module 5 : How to use environmental scenarios

Reflections
How to develop scenarios

Main aim: A structured discussion about an uncertain future.

Depends on the goals of the scenario exercise!

Scenario exercises aim to be relevant, credible, and legitimate.

Ideally, scenario development process is supported and run by experienced facilitation.

Each scenario exercise needs tailor-made approaches.
Approaches to scenario development

Different approaches can be used to develop scenarios:

**Deductive approach**
- ‘Linear’ approach, based on narrowing down uncertainty (see next slides).

**Inductive approach**
- ‘Non-linear’ approach, based on loosely discussing critical uncertainties.
- Focussed events (thus also referred to as ‘emblematic events approach’)

**Incremental approach**
- Ask: What must come true in the ‘official future’? What could go wrong?
‘Stylised‘ deductive approach

STAGE 1

Establish Focal Issue

Identify Driving Forces

STAGE 2

Label Critical Uncertainties

Select Scenario Logics

STAGE 3

Elaborate Scenarios

(Stage 4)

Analyse Scenarios

Environmental Scenario Analysis - Thomas Henrichs
METIER Training Course 2009 - Module 2, Slide No 5
Identify and establish focal issue (Stage 1)

The focal issue of a scenario exercise can range from:
- Clear decision (i.e. “yes/no” type of question)
- Strategy and Planning
- Explore implications of possible futures

It is important to be clear (and outspoken) about the focal issue of a scenario exercise to avoid confusion and focus discussions.

Interviews and consultation with key stakeholders and experts can help identify and test the focal question.
Example: focal issue and ‘outside-in thinking‘

Often, it is useful to identify a ‘narrow‘ focal issue ...

... and to then develop scenarios that explore the future(s) of wider contextual changes.

(This set-up may make it easier to test different response options later on ...)

Source: Figure from Scearce and Fulton (2004)
Identify driving forces (Stage 2.1)

Driving Forces are any processes that influence a system - Thus a good system understanding is imperative! Useful to distinguish:

- **Direct drivers**, i.e. those that equivocally influence system processes and can therefore often be identified and measured and
- **Indirect drivers**, i.e. those that operate by altering the level or rate of change of one or more direct drivers.

‘STEEP checklist’ for types of driving forces:

- **S** - Social drivers
- **T** - Technological drivers
- **E** - Economic drivers
- **E** - Environmental drivers
- **P** - Policy drivers

*(plus demographic and legal driving forces)*
Label critical uncertainties (Stage 2.2)

A critical uncertainty is a driver that is especially important in determining how the future might evolve, but whose development is highly unpredictable.

Often useful to cluster related and similar driving forces before selecting critical uncertainties.

Based on your critical uncertainty, identify a few uncertainty axes relevant to your focal issue and label them.
Select scenario logics (Stage 2.3)

Construct matrixes from pairs of uncertainty axes. Ideally, axes that span the matrixes should be independent and unrelated.

Determine which uncertainty matrix relates best to focal issue.

Use axes to deduce scenario logics for the four quadrants of the matrix (and name them).
Examples: scenario logics (deductive)

Millennium Ecosystem Assessment

Intergovernmental Panel on Climate Change

Elaborate scenarios & storylines (Stage 3)

Tell a story! Narratives useful to capture step-wise changes. Storylines are descriptions of possible developments.

Systematically address how key driving forces (those that are most important for the focal issue) develop in each scenario.

Highlight the relationships and interactions between drivers, and how they play out under the respective scenario logics.

Important: Keep scenarios plausible, internally consistent, and combine analytical rigour with creativity.
How to develop scenarios
(quick reference sheet)

Phase 1: How to set up a scenario exercise

(1) Identify a focal issue (STAGE 1)
   (a) identify main concerns and stakeholder questions
   (b) understand how past changes have come about

Ensure focal issue matches the purpose identified in Phase 1

(2) Establish scenario development procedure; decide on the overall approach to scenario development
   (i.e. whether inductive, deductive or incremental)

(3) Select main driving forces, scenario logic (STAGE 2)
   (a) analyze main drivers of change in the future
   (b) discuss possible trends for each driver
   (c) identify the main uncertainties for the future
   (d) develop a set of scenario logics

How this is done is governed by the approach selected in step 2 of this Phase

(4) Describe scenario assumptions, storylines (STAGE 3)
   (a) develop a set of qualitative stories about the future based on identified drivers and scenario logic
   (b) optional: use models to quantify main trends and driving force assumption

If necessary revisit main uncertainties and scenario logics identified in step 3 of this Phase

Continue with Phase 3: How to analyse scenarios