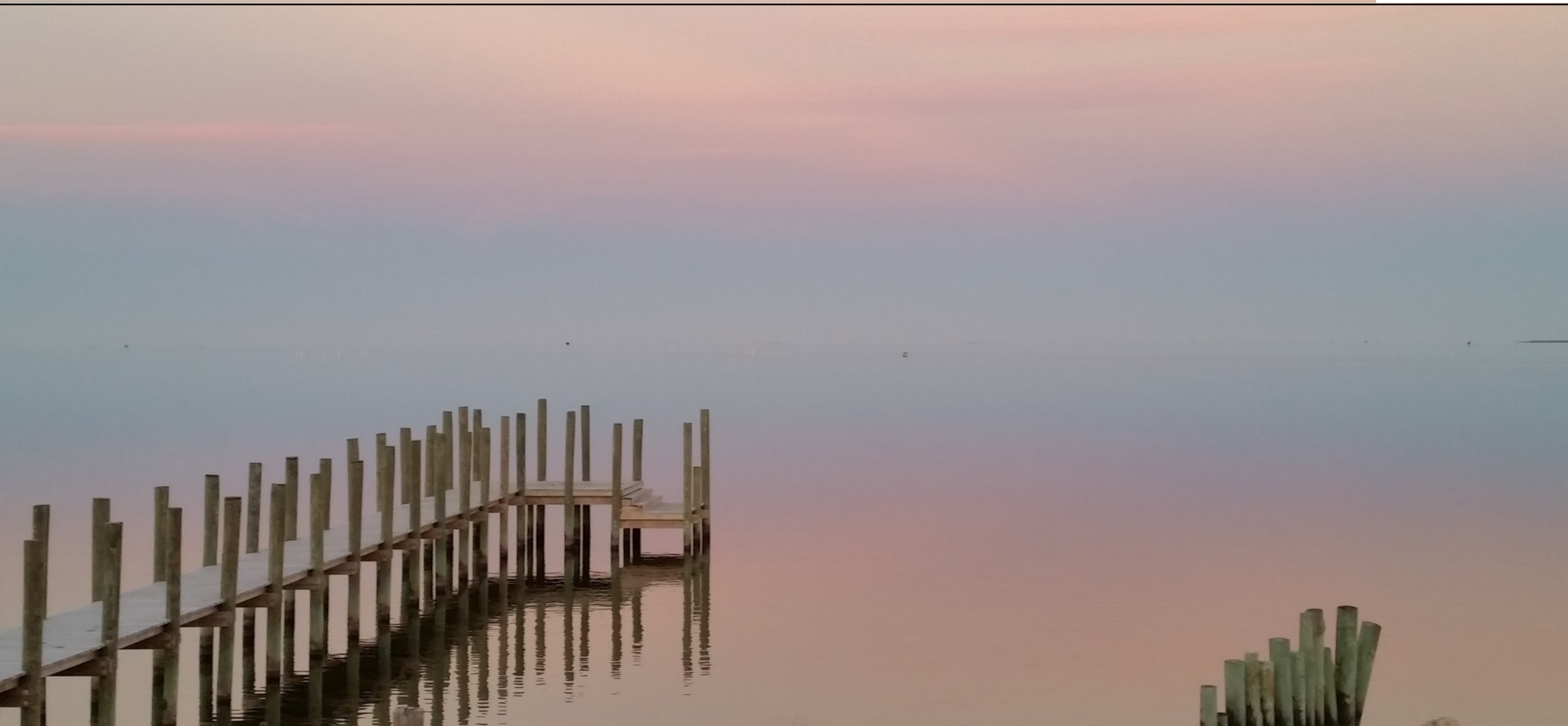
Sustainability Leadership



Sustainability Leadership

Class 7:

Part 1: Scenario-Based Planning

- Sustainability Science
- Exploring Possible Futures
- Scenarios
- Developing Scenarios
- Scenario-Based Planning
- Scenario-Based Assessments

Part 2: Decision making

Foreseeability and Foresight:

- What might happen?
- Possible threats and hazards
- Knowing the system trajectory

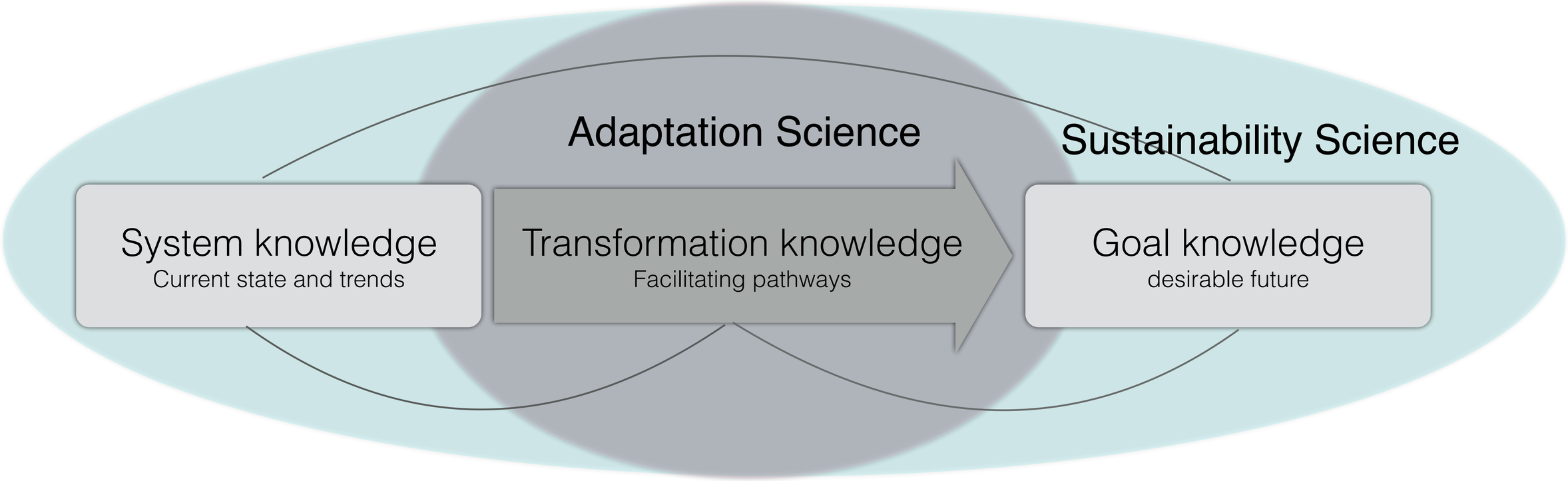
} System Knowledge

- What do we want to happen?

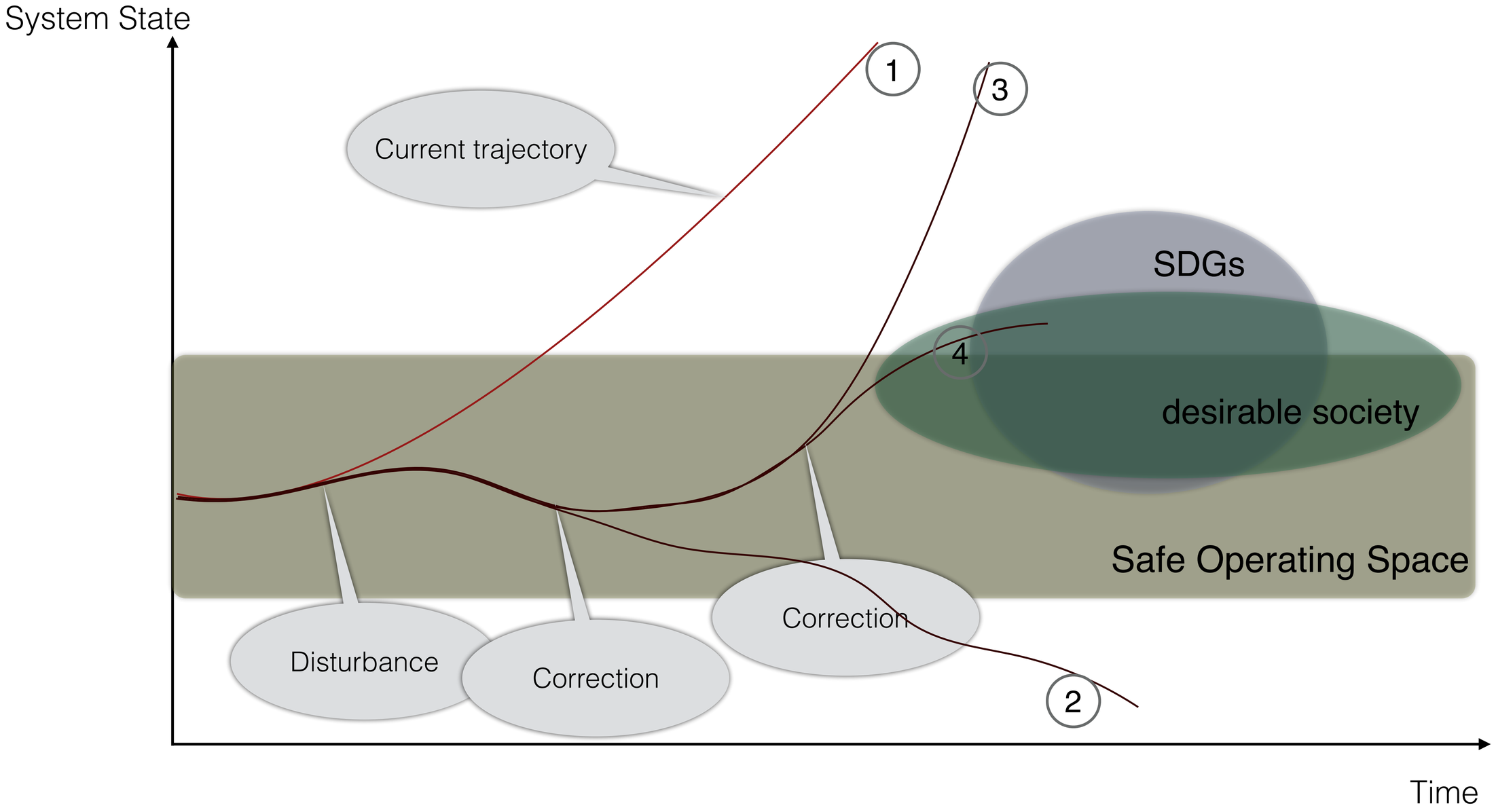
} Goal Knowledge

- How can we impact the system trajectory?

} Transformational Knowledge



Sustainability Science



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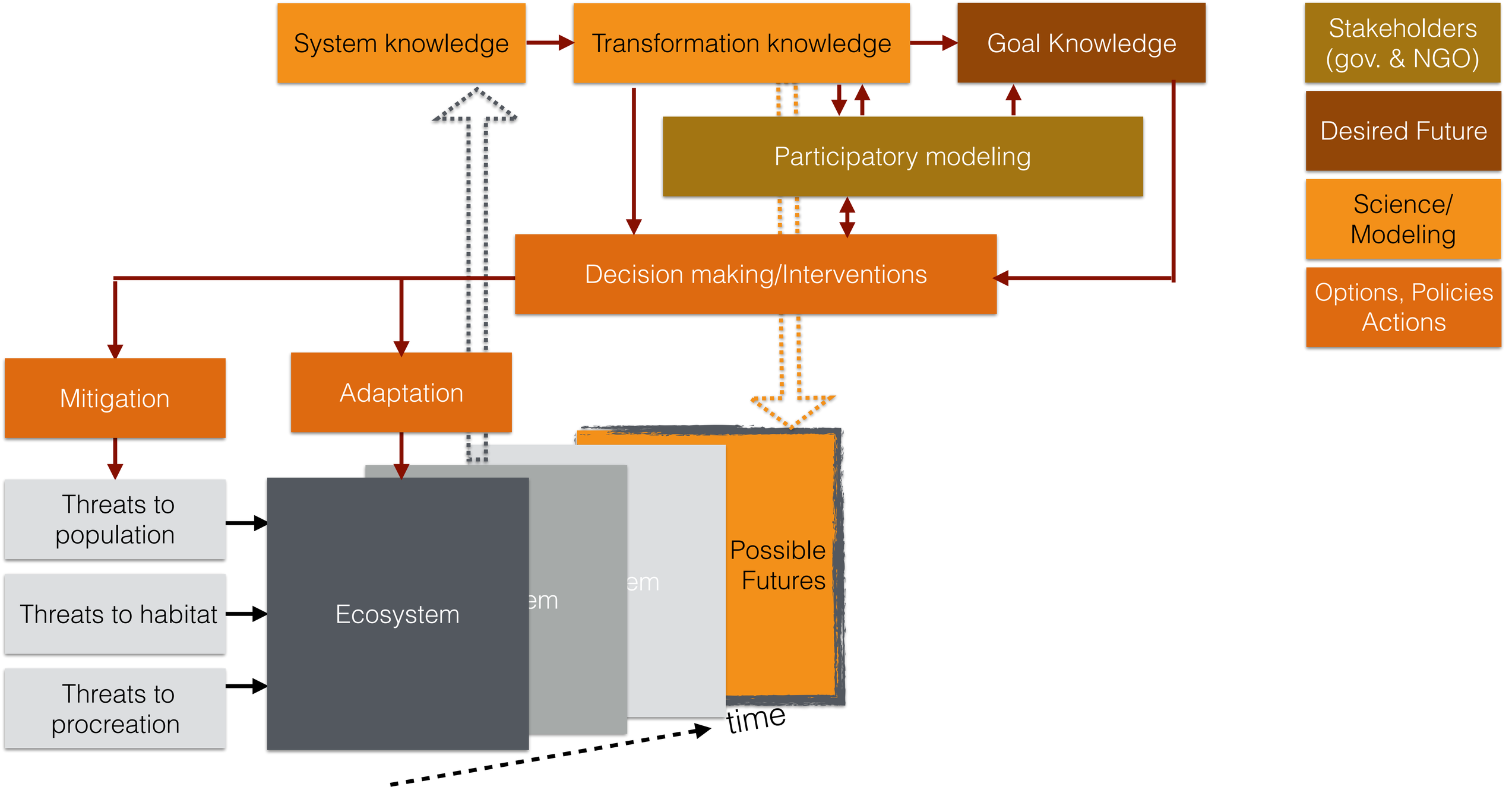

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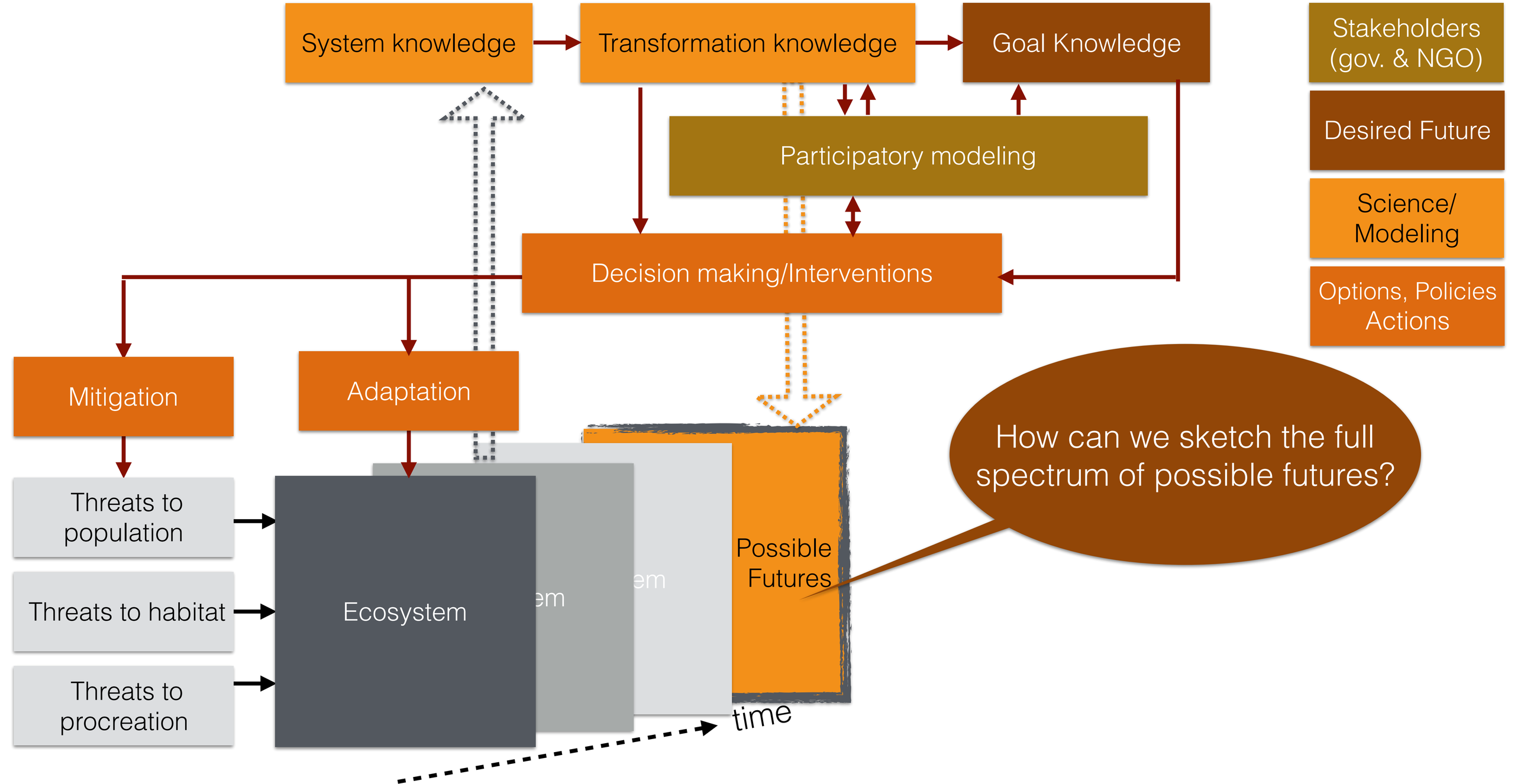

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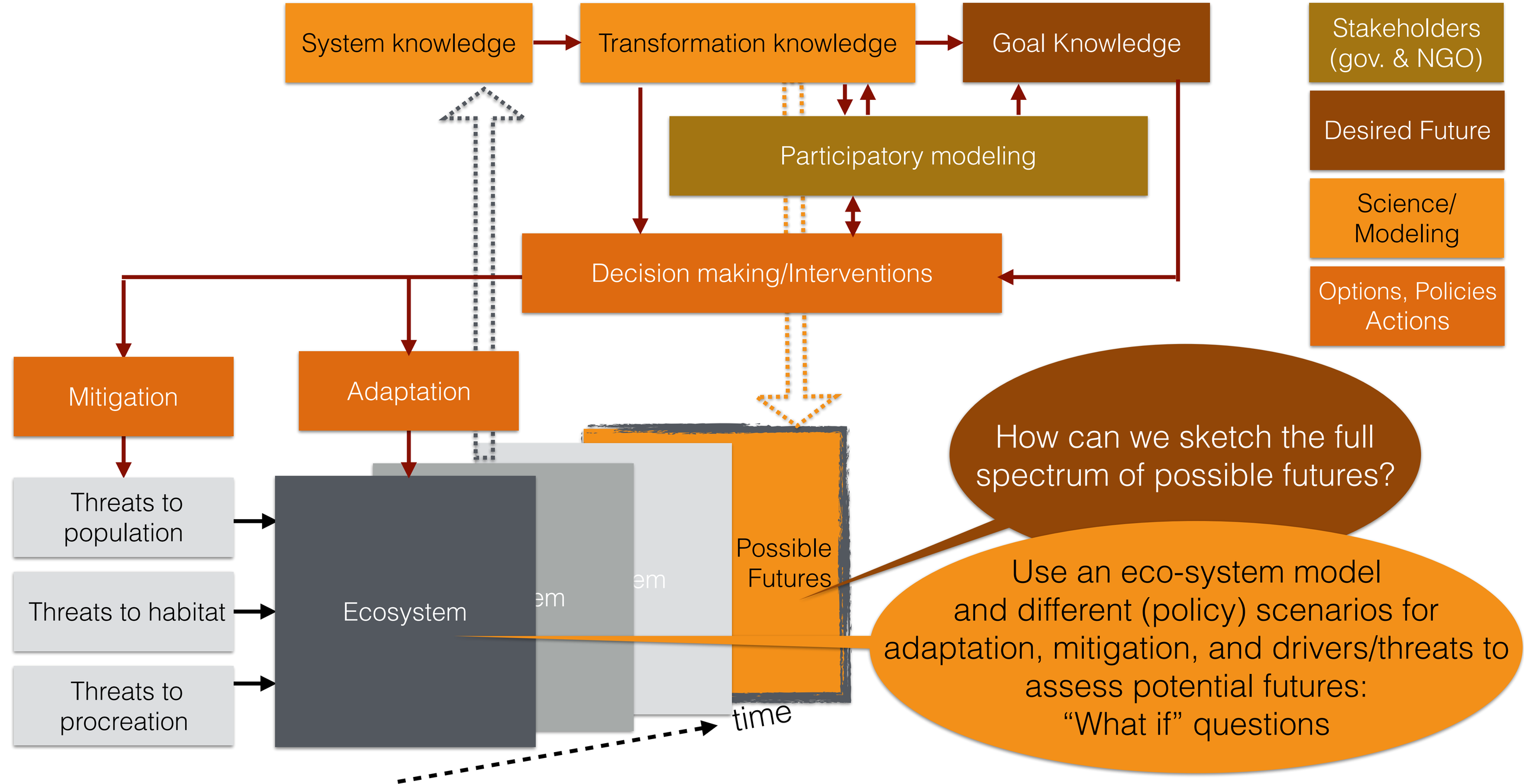
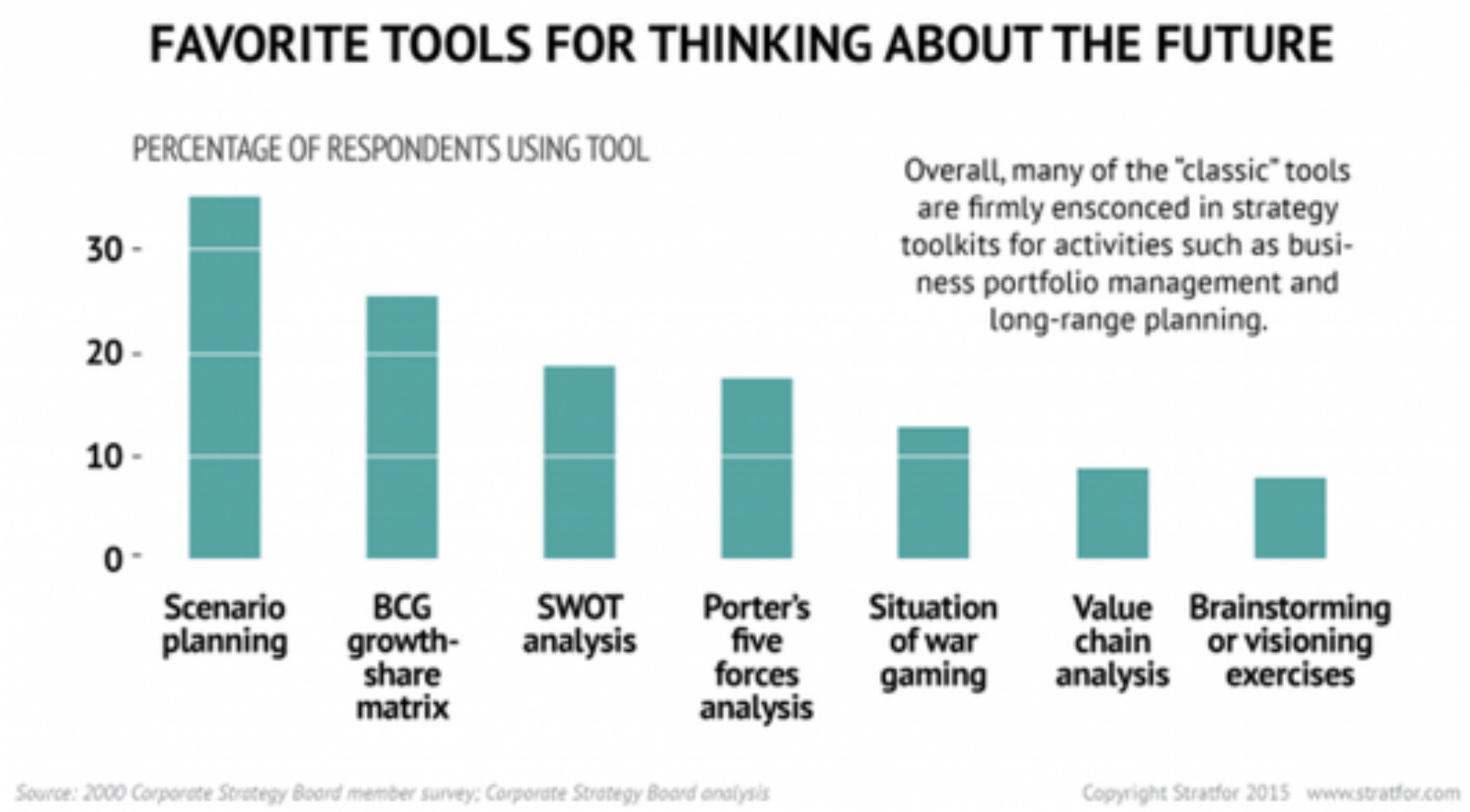
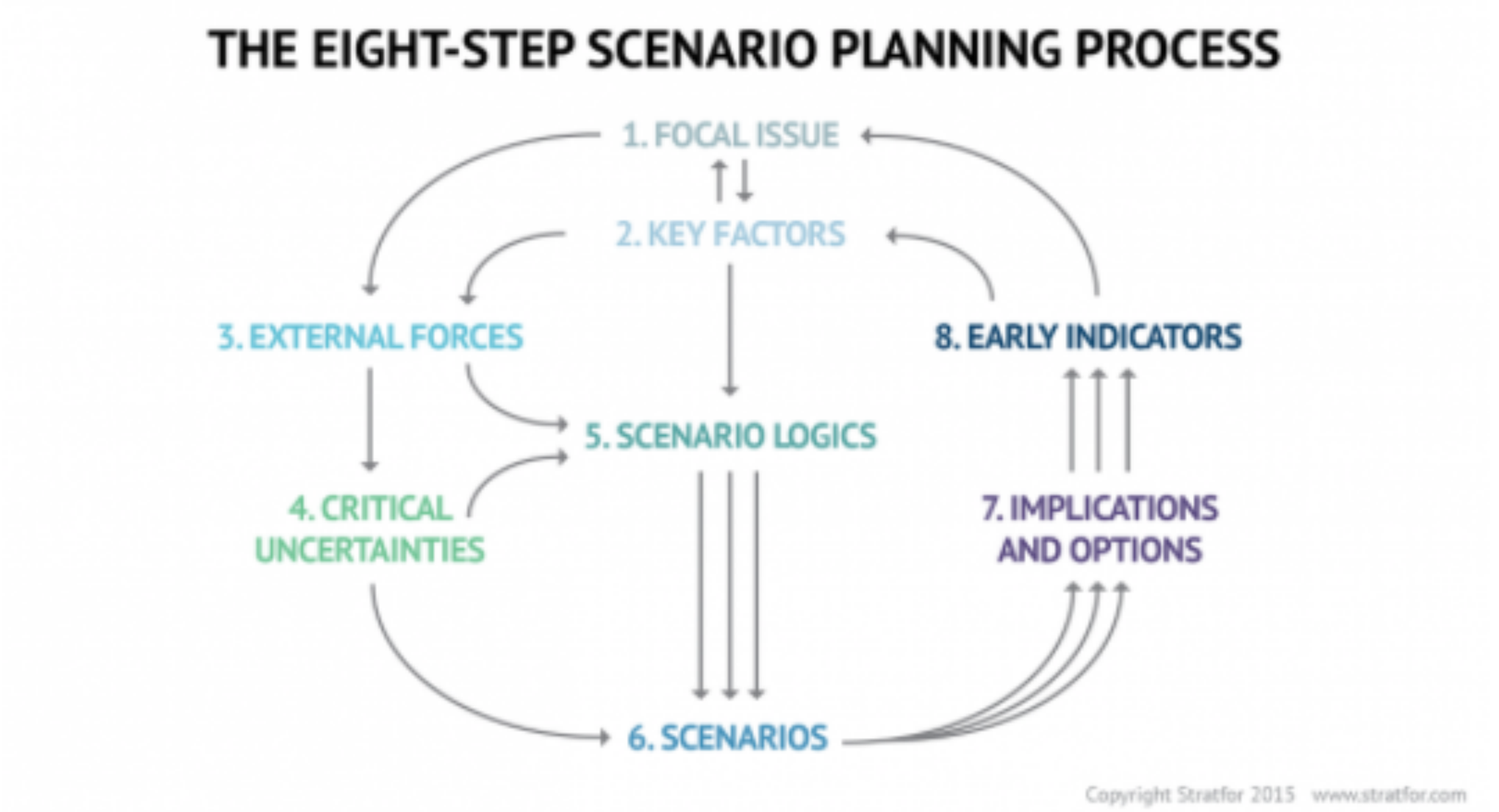


Exploring Possible Futures



https://www.forbes.com/sites/stratfor/2015/01/08/scenario-planning-and-strategic-forecasting/2/#3cef39e06bbf

Exploring Possible Futures



Step 1: Focal Issue

https://www.forbes.com/sites/stratfor/2015/01/08/scenario-planning-and-strategic-forecasting/2/#3cef39e06bbf

Exploring Possible Futures

Scenario studies as a basis for decision making:
Here we openly recognize our inability to deliver sharp predictions and focus on conducting a rigorous scenario analysis instead. A scenario can be described as a possible future. It is not a prediction, but it is considered sufficiently plausible or critical to be worth preparing for. Scenarios are not aiming to predict the future, not even to identify the most likely future. Instead they map out a “possibility space” that provides in-depth insights about the behavior of the system and can be used to inform the decisions of the present.

…

The use of scenario analysis as a methodology for planning under uncertain conditions is relatively common [Alcamo, 2001], … Perhaps the most important function of scenarios is that they can act as a crucial bridge between environmental science and policy making. It is important to emphasize that we do not see scenario analyses and traditional forecasting methodologies as competing approaches; their goals are fundamentally different. Our aim is not to provide short-term predictions, but to gain long-term understanding.

Galan et al., 2007

Exploring Possible Futures

USE OF SCENARIO PLANNING:

The use of scenarios can ensure that planning is forward-looking and stays ahead of potential events rather than reacts after they occur.

Exploring Possible Futures

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The use of scenarios can ensure that planning is forward-looking and stays ahead of potential events rather than reacts after they occur.

ADDRESSING UNCERTAINTIES:

Socio-economic and environmental uncertainties are clouding policy and decision making. This highlights the importance for policy and decision makers to incorporate scenario-based planning into their processes. Especially those who are embracing a greater strategist role, using scenario-based planning for a wide variety of events can enhance the quality of policies and decisions.

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TOOLS:

The basic materials of scenario building are trends and emerging issues. The basic tools of participatory scenario building are the techniques of group process facilitation, particularly provoked brainstorming.

Scenarios

Merriam-Webster SINCE 1828

JOIN MWU | GAMES | BROWSE THESAURUS | WORD OF T

scenarios

DICTIONARY | THESAURUS

Definition of SCENARIO

plural **scenarios**

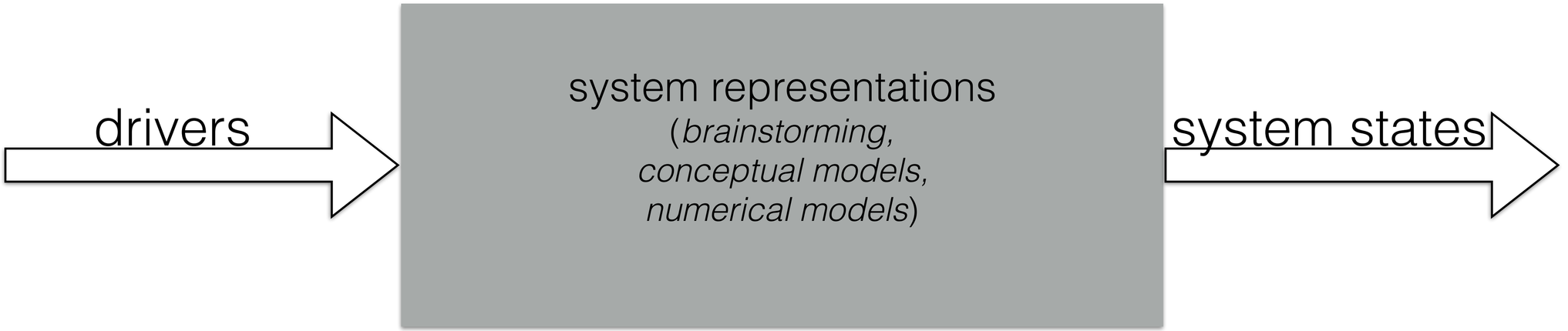
1 **a** : an outline or synopsis of a play; *especially* : a plot outline used by actors of the commedia dell'arte
b : the libretto of an opera

2 **a** : SCREENPLAY
b : SHOOTING SCRIPT

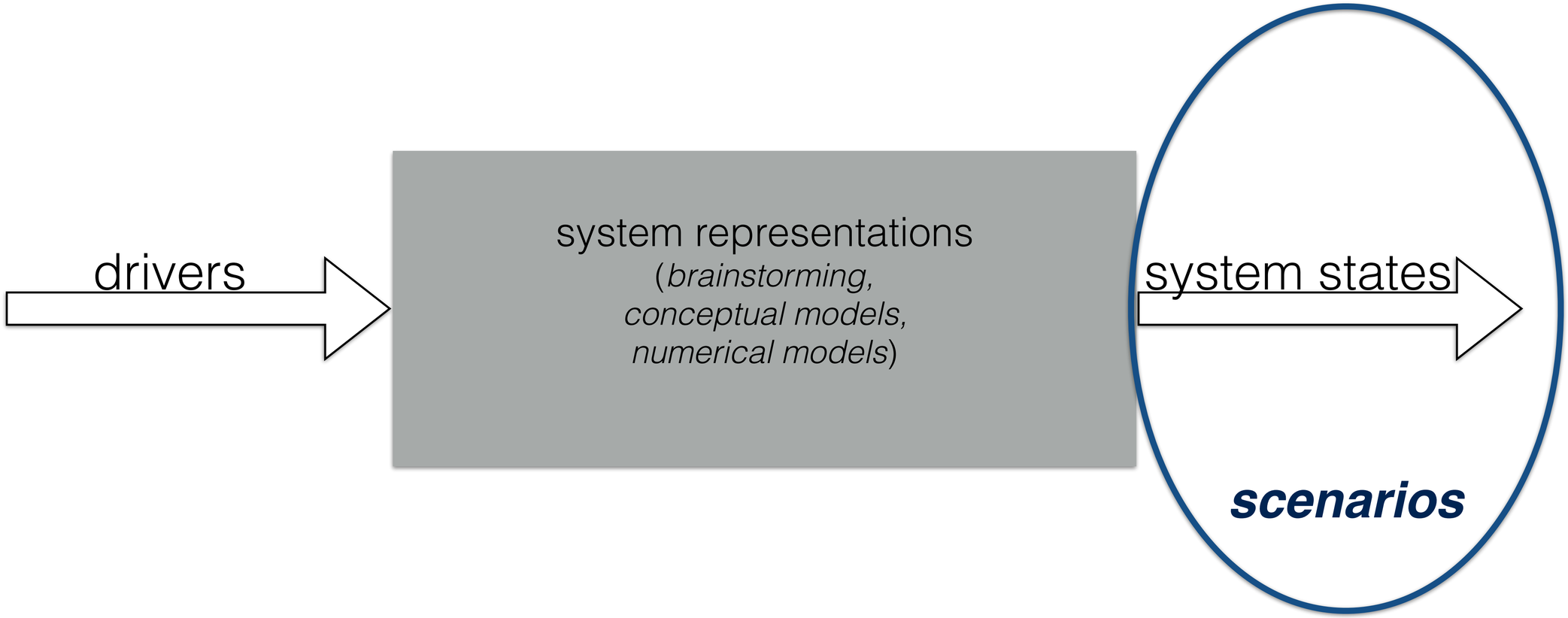
3 : a sequence of events especially when imagined; *especially* : an account or synopsis of a possible course of action or events

- his *scenario* for a settlement envisages ... reunification — Selig Harrison

Scenarios


drivers
system representations
(*brainstorming,*
conceptual models,
numerical models)
system states

Scenarios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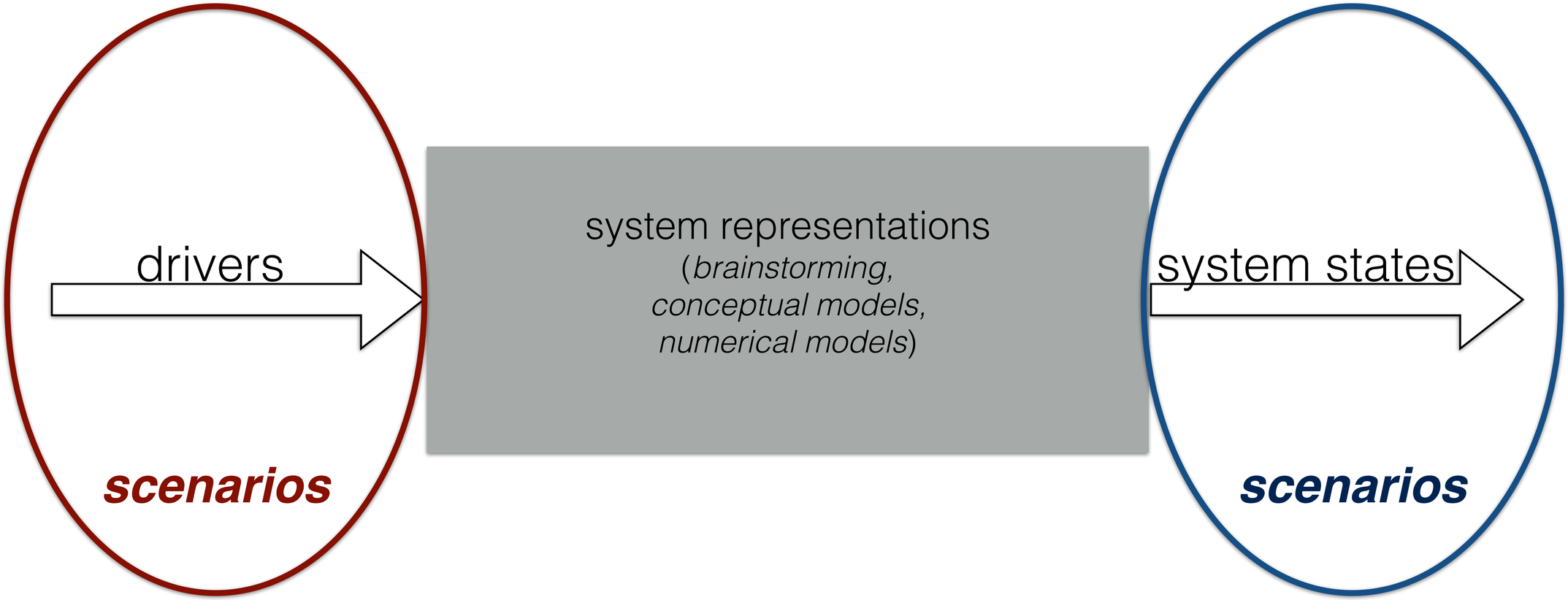
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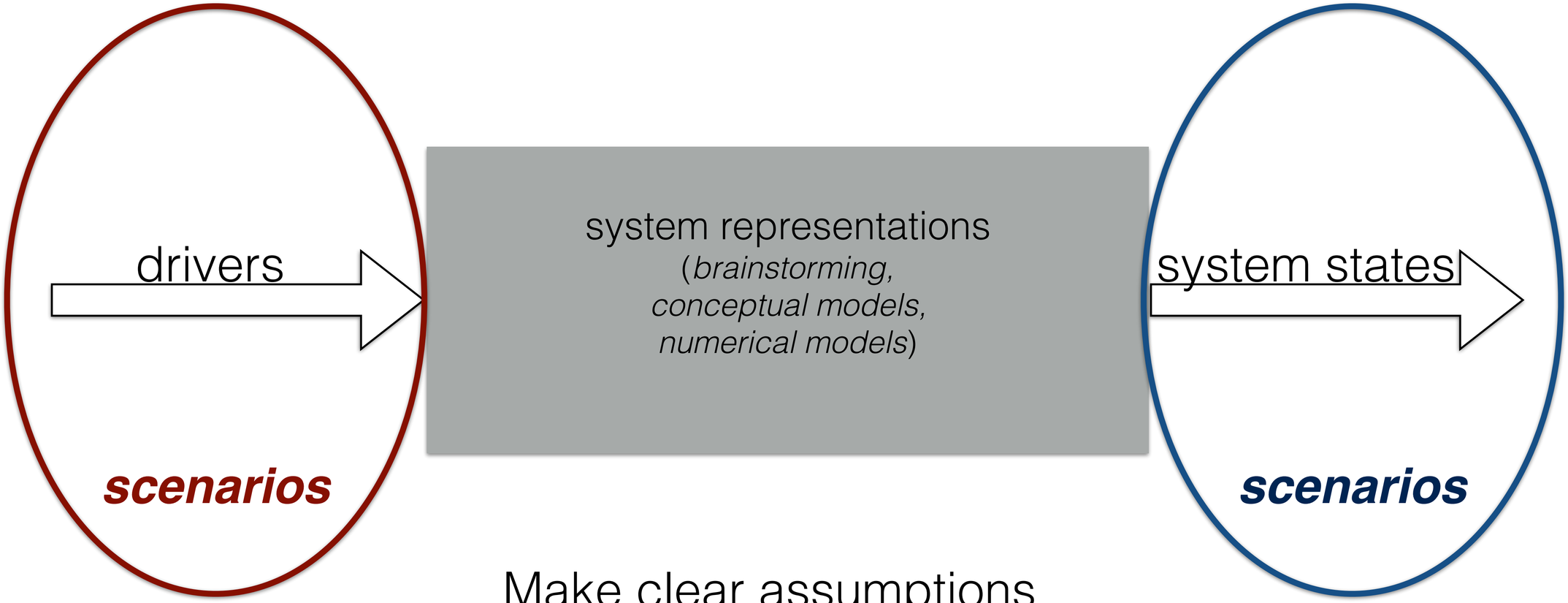

Make clear assumptions

Scenarios

- Scenarios are plausible, provocative, and relevant stories about how the future might unfold.
- They can be told in both words and numbers.
- Scenarios are not forecasts, projections, predictions, or recommendations, though model projections may be used to quantify some aspects of the scenarios.

Modified from Carpenter et al. (2005)
https://www.millenniumassessment.org/documents/document.771.aspx.pdf

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- The process of building scenarios is intended to widen perspectives and illuminate key issues that might otherwise be either missed or dismissed.
- By offering insight into uncertainties and the consequences of current and possible future actions, scenarios support more informed and rational decision-making in situations of uncertainty.
- Scenarios are a powerful way of exploring possible consequences of different policies.
- They force us to state our assumptions clearly, enabling the consequences of those assumptions to be analyzed.
- Scenarios, and the products of scenarios, are not predictions.
- Rather, they explore consequences of different policy choices based on current knowledge of underlying socioecological processes.

Modified from Carpenter et al. (2005)
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Scenarios

What are scenarios?

The **term scenario** is widely used in different ways and contexts, making it necessary to arrive at a common understanding of how the term is used. Based on the OpenNESS Glossary (OpenNESS, 2016), scenarios are defined as “plausible, but simplified descriptions of how the future may develop, based on a coherent and internally consistent set of assumptions about key driving forces and relationships. Scenarios are no predictions of what will happen, but ore projections on what might happen or could happen given certain assumptions about which there might be great uncertainty”.

Priess and Hauck (2016)
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There are **several types of scenarios** that can be distinguished along different lines (van Notten et al., 2003). Trend scenarios explore the continuation of (and deviations from) currently dominant trends in society and policy and are often combined with policy scenarios to show consequences of future policies, while explorative scenarios explore plausible alternative futures. Another option is to develop normative scenarios, for instance possible futures versus desired futures. This is often used in combination with back casting, aiming at identifying, prioritizing and characterizing management strategies and policies. Which type of scenarios to develop depends on the objectives and the intended use and the users of the scenarios (e.g. quantified drivers as input for models; 'policy-free' storylines to test different policies).

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Types of scenarios:

- Trend scenarios explore the continuation of (and deviations from) currently dominant trends in society and policy and are often combined with policy scenarios to show consequences of future policies.
- Explorative scenarios explore plausible alternative futures.
- Normative scenarios are often used in combination with back casting, aiming at identifying, prioritizing and characterizing management strategies and policies. They, for example, compare possible futures versus desired futures.

Type of scenarios depends on the objectives, the intended use, and the users of the scenarios, for example:

- quantified drivers as input for models;
- 'policy-free' storylines to test different policies.

Modified from http://www.openness-project.eu/library/reference-book/sp-scenarios

Developing Scenarios

For the **development of scenarios** different inputs can be used, e.g. based on stakeholder or expert consultations during workshops, interviews or questionnaires, but also using input from other scenarios or literature in general. Likewise different methods can be applied, like back casting, visioning, storytelling, fuzzy cognitive maps, and others (Alcamo et al., 2008; Keune et al., 2013; Kok, 2009). There are also multiple ways to check scenarios for internal consistency, e.g. using expert rounds, models or cross table approaches.

http://www.openness-project.eu/library/reference-book/sp-scenarios

Developing Scenarios

SCENARIO BUILDING: THE BASIC PROCESS

MATERIALS

- Identify three trends of change or emerging issues, e.g.:
- increase of population and/or changes in land use;
- sea-level rise;
- climate change: increase of temperature and changes in precipitation.

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PROCESS

- Brainstorm the **impacts of each trend,** one by one: Ideas should bounce off each other rather quickly; when the storm begins to die down after ten or fifteen minutes on each trend, move on to the next one.

- **Review the list of impacts** from all three trends for two or three minutes: Post the wall-notes from all three trends where the whole group can see them.* consider potential collisions of trends; brainstorm their impacts for fifteen minutes:
- how will they affect each other?
- what new pattern results?
- what new opportunity/threat arises?

- **Consider the entire list**; cluster groups of impacts of particular interest

- Characterize your scenarios:
- try to imagine two or three headlines that sum up the tenor of each of them
- think of bumper-sticker phrases that capture their essence
- if this were a short story, what would be its title for each scenario?

Developing Scenarios

PROBES AND PROVOCATIONS

- Have you listed a wide range of impacts, covering different aspects of reality?
- community;
- economy;
- governance;
- work;
- arts & leisure:
- ecology & the environment;
- media & communication;
- transportation;
- education;
- religion & myths;
- subcultures;
- family
- vices/crimes...

Use these as probes during the brainstorming of impacts to broaden the field.

- Have the participants freed themselves of normal patterns of thinking?
- have they exaggerated the chosen trends to the point of absurdity?
- have they challenged their assumptions about present conditions continuing?
- have they combined trends or impacts in a way that distorts something familiar in the present?
- have they reversed constraints or threats that presently exist -- or reversed strengths or opportunities they presently take for granted?

Use these questions as provocations during brainstorming to deepen the degree of change imagined.

Developing Scenarios

RELEVANCE/PRACTICALITY

- what do the draft scenarios suggest for your goals, current activities, and required adaptation?
- can you succinctly characterize your current activities and plans or mission?
- what patterns or themes in the scenarios most affect your goals?
- do the scenario offer you more opportunities, or more threats?

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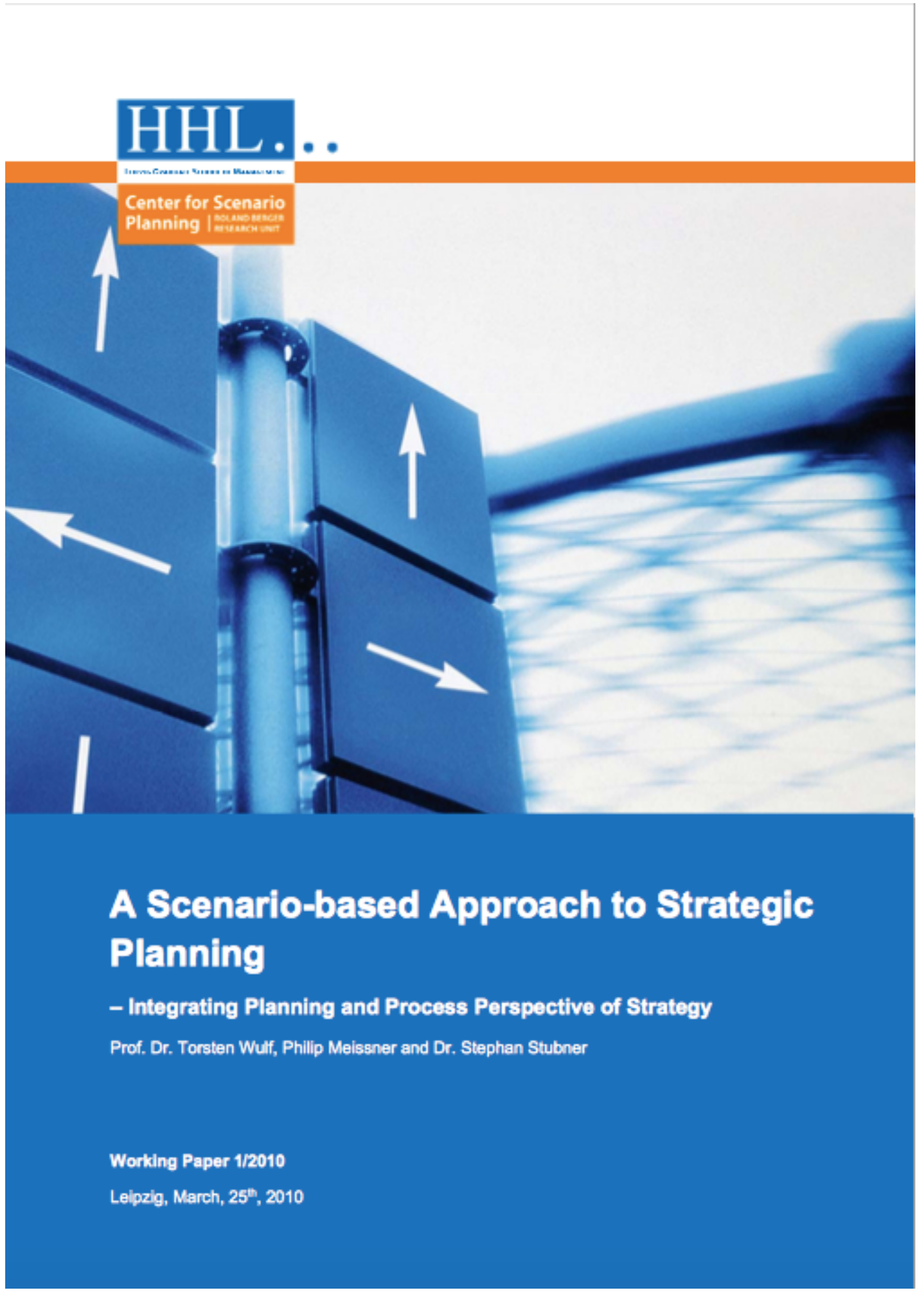
CLOSURE

- can your group see an emerging story in this scenario?
- Set aside time to evoke vivid images of the future scenarios you have constructed.
- Draft a narrative for each scenario. The narrative should loosely link the scenario to the present by discussing the emergence and acceleration of the trends that formed your seeds of change. Tracing the trends into the future, the narrator may then let the scenario unfold.
- Many of the brainstormed impacts will seem to contradict each other. If these contradicting impacts are related in some consistent fashion, a few contradictions should be allowed to remain because the present reality also contains contradictions.

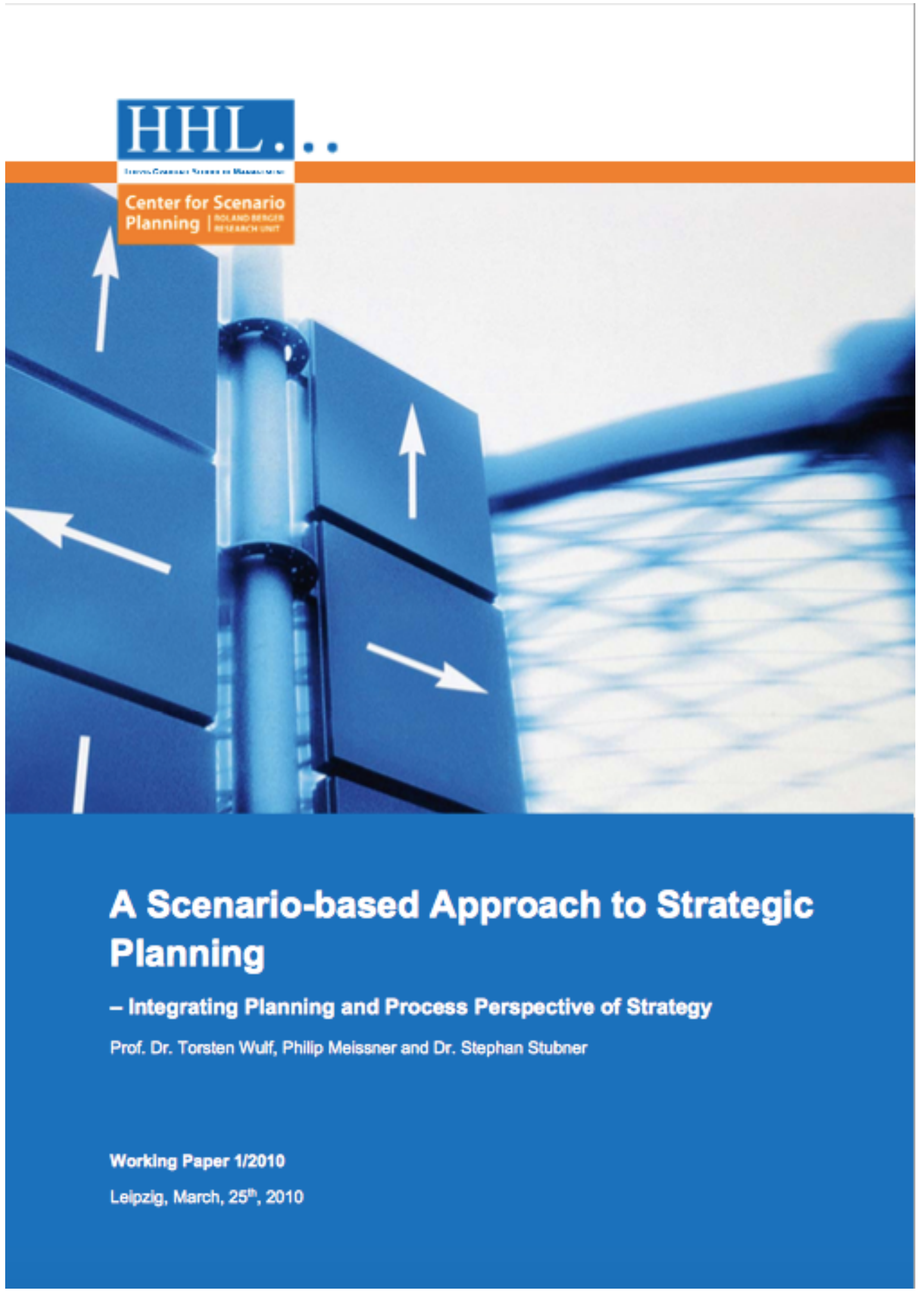
Scenario-Based Planning



Here we argue that a scenario-based approach to strategic planning can serve as an innovative management tool in the field with the potential to overcome discrepancies between the two opposing schools of strategy. The scenario-based approach to strategic planning builds on the strengths of traditional scenario planning. It is an open and creative approach that considers multiple strategy options and takes multiple perspectives into account. Simultaneously, it overcomes the weaknesses of traditional scenario planning by offering a systematic process to scenario creation that is built on specific management tools and is thus easy to implement. The outcome of this approach is a core strategy that is complemented by several strategic options derived from different scenarios.

http://www.scenarioplanning.eu/fileadmin/user_upload/_imported/fileadmin/user_upload/Scenario-based_strategic_planning_WP.pdf

Scenario-Based Planning



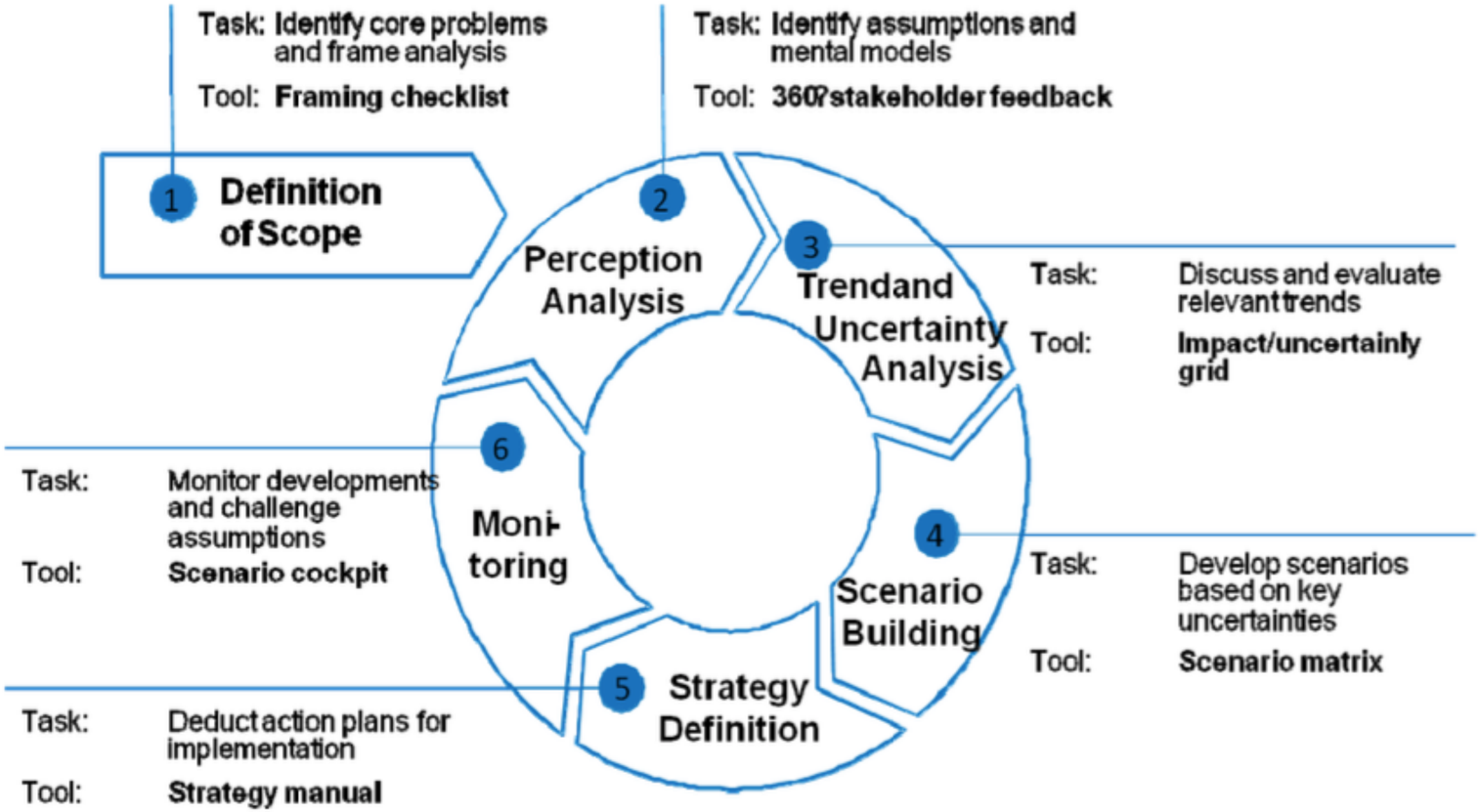
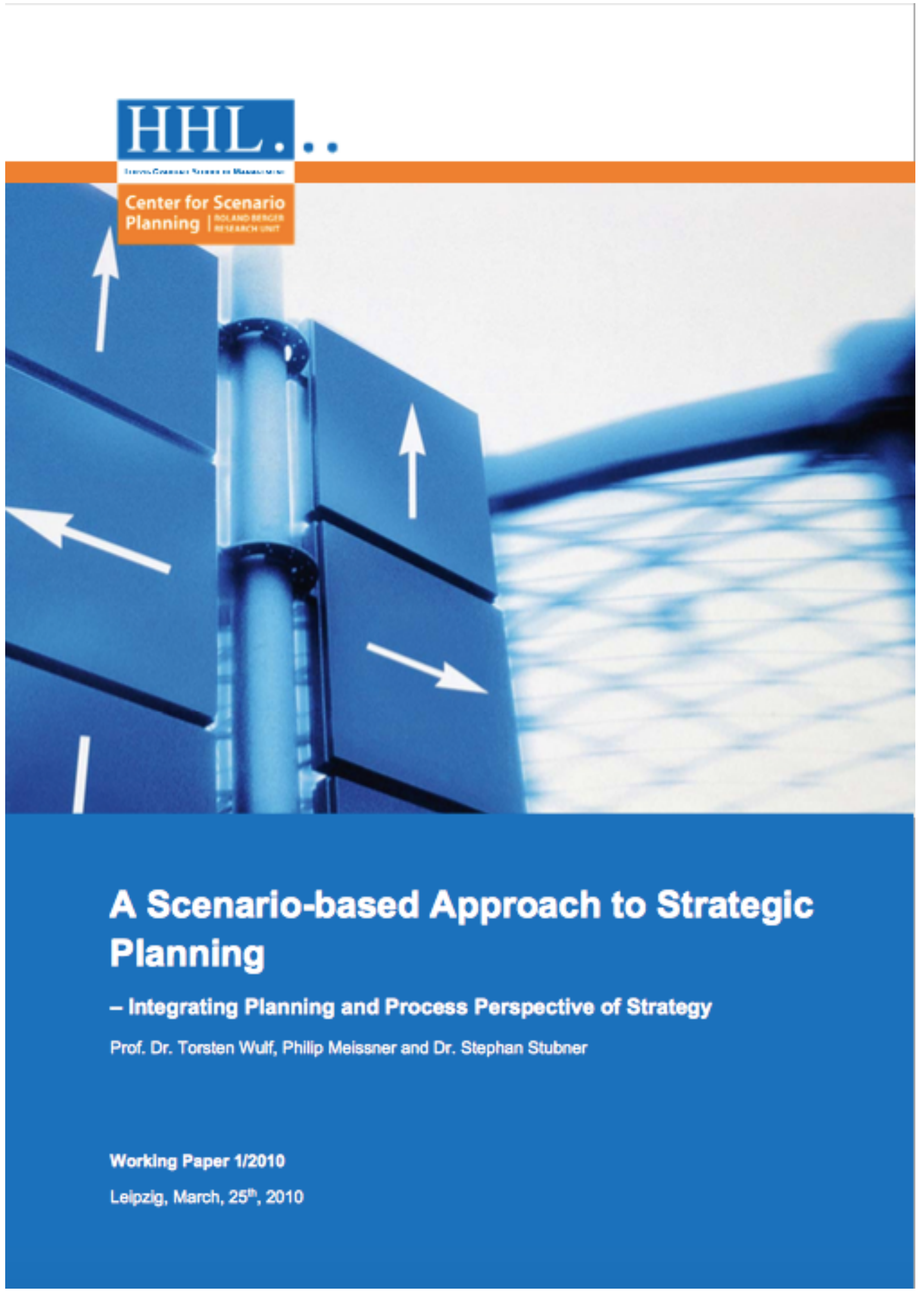


Figure 1: Overview of the scenario-based approach to strategic planning

Scenario-Based Planning



Goal of scenario project

Definition of the question to be solved: Focus of the scenario analysis

Strategic level of analysis

Shall the scenario planning process be conducted for the macro, industry, corporate or business level?

Definition of Stakeholder

Which key stakeholder shall be involved in the 360° Stakeholder Feedback?

Participants

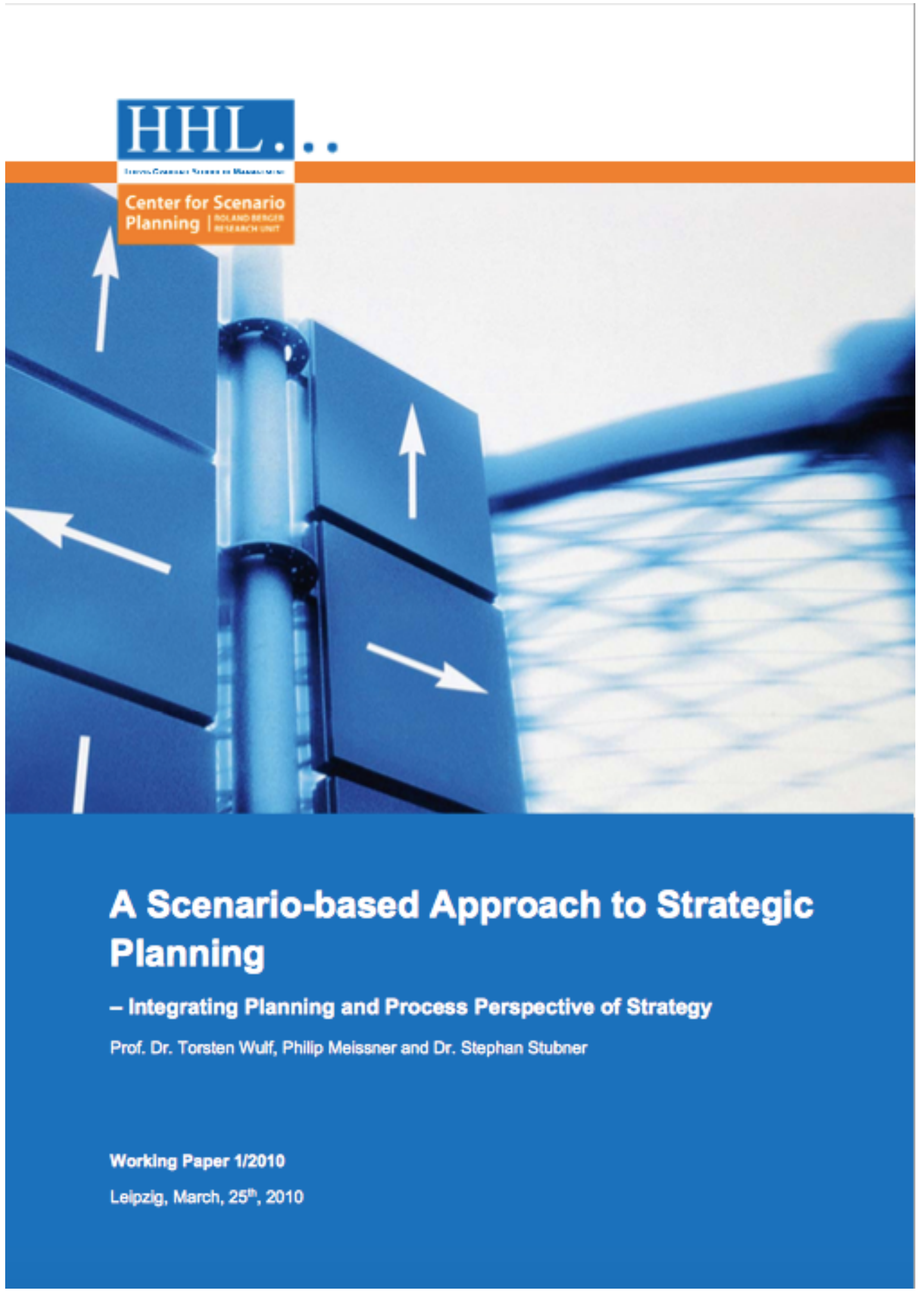
How closely is the top management involved in the process? Which members of the respective departments participate in the workshops?

Time horizon

What time horizon is the planning process catered to (1,2,5 years or longer)?

Figure 2: Framing Checklist

Scenario-Based Planning



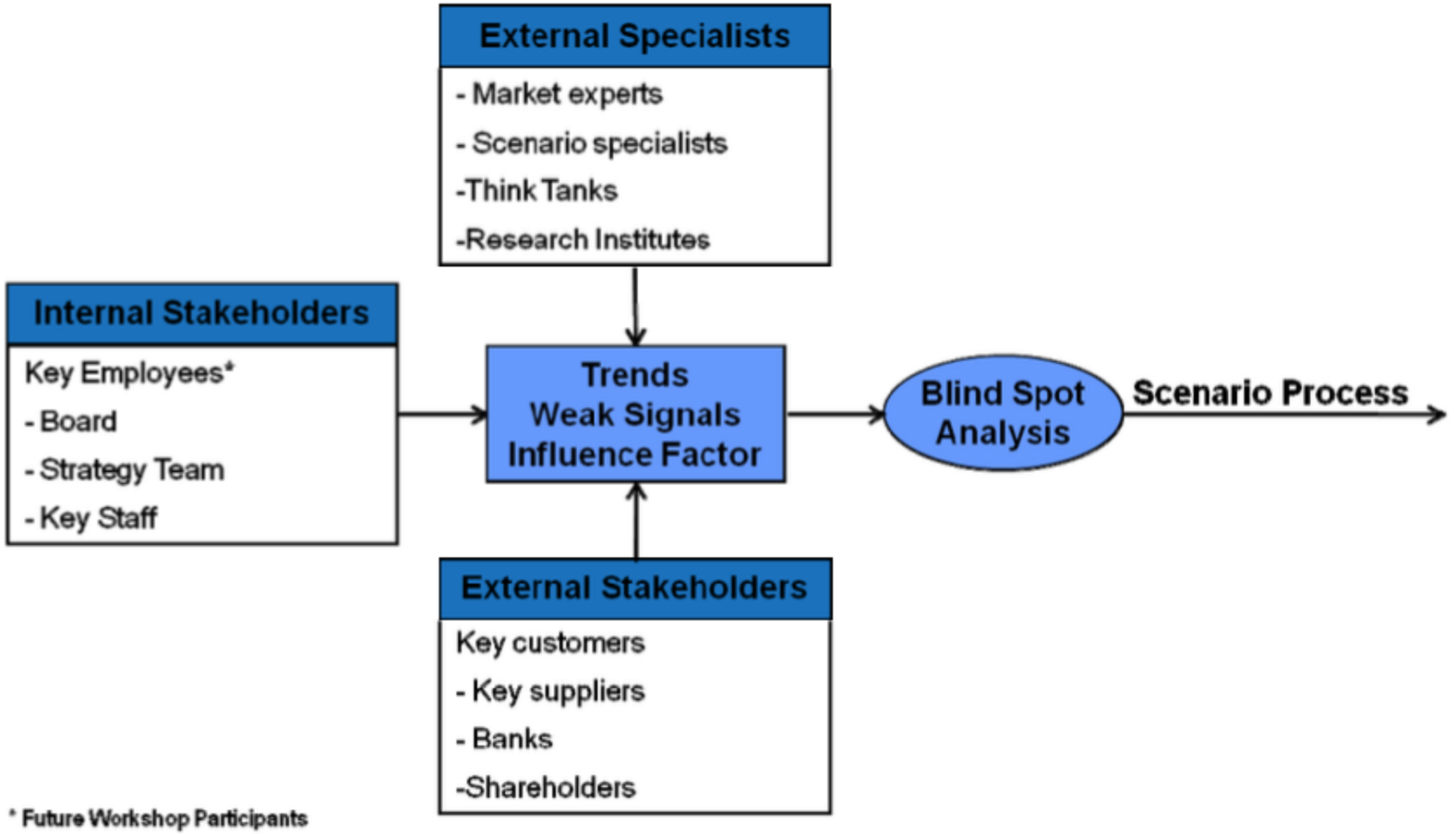


Figure 3: 360° Stakeholder Feedback

Scenario-Based Planning

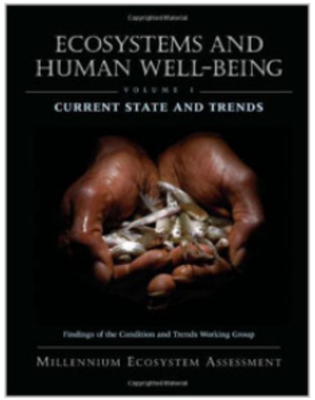
Scenario-Based Planning

Scenario-based planning may be used in conjunction with other planning approaches and tools to ensure planners undertake truly strategic thinking. The model may be useful, particularly in identifying strategic issues and goals.

1. Select several external forces and imagine related changes, which might influence the organization, e.g., change in regulations, demographic changes, etc.
2. For each change in a force, discuss three different future organizational scenarios (including best case, worst case, and reasonable case), which might arise with the organization as a result of each change.
3. Suggest what the organization might do, or potential strategies, in each of the three scenarios to respond to each change.
4. Planners soon detect common considerations or strategies that must be addressed to respond to possible external changes.
5. Select the most likely external changes to effect the organization, e.g., over the next three to five years, and identify the most reasonable strategies the organization can undertake to respond to the change.

http://ncjp.org/strategic-planning/overview/additional-planning-tools/alignment-model-scenario-based-planning

Scenario-Based Assessments



Ecosystems and Human Well-Being: Current State and Trends

Findings of the Condition and Trends Working Group
948 pages
8.5 x 11

Millennium Ecosystem Assessment

https://www.millenniumassessment.org/documents/document.771.aspx.pdf

Ecosystems and Human Well-being: Scenarios, Volume 2

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Findings of the Scenarios Working Group
of the Millennium Ecosystem Assessment

Scenario-Based Assessments

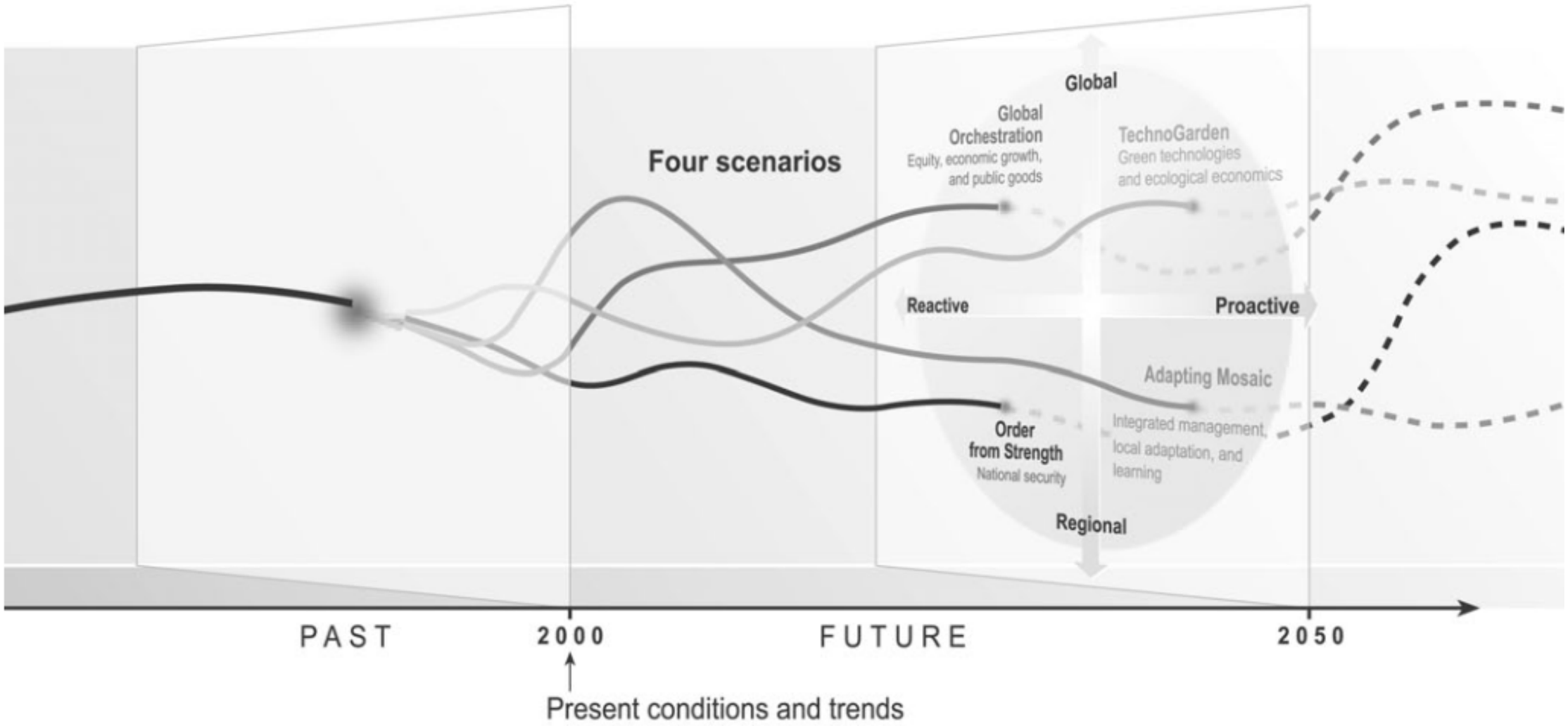
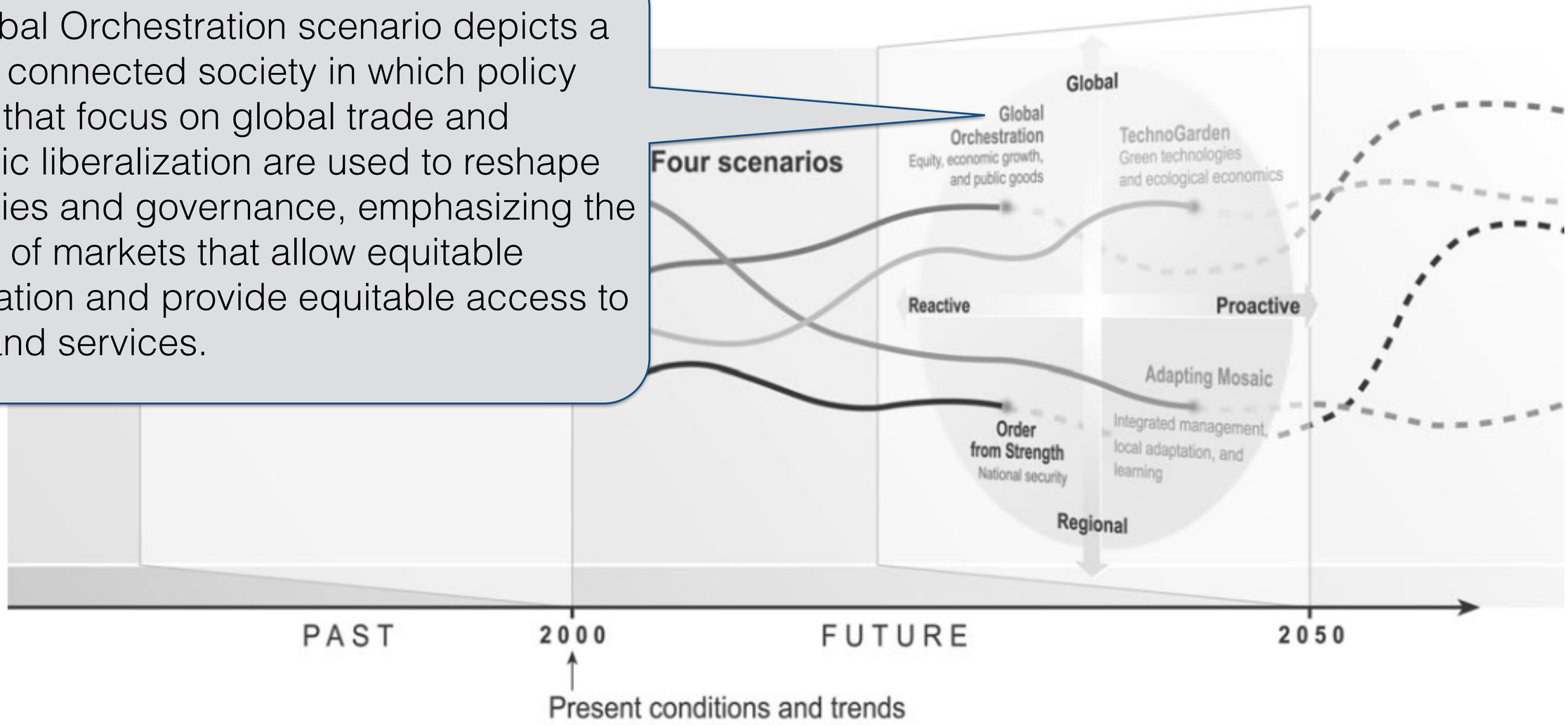


Figure S1. Millennium Ecosystem Assessment Scenarios: Plausible Future Development Pathways until 2050. The scenario differences are based on the approaches pursued toward governance and economic development (regionalized versus globalized) and ecosystem service management (reactive versus proactive).

Scenario-Based Assessments

The Global Orchestration scenario depicts a globally connected society in which policy reforms that focus on global trade and economic liberalization are used to reshape economies and governance, emphasizing the creation of markets that allow equitable participation and provide equitable access to goods and services.



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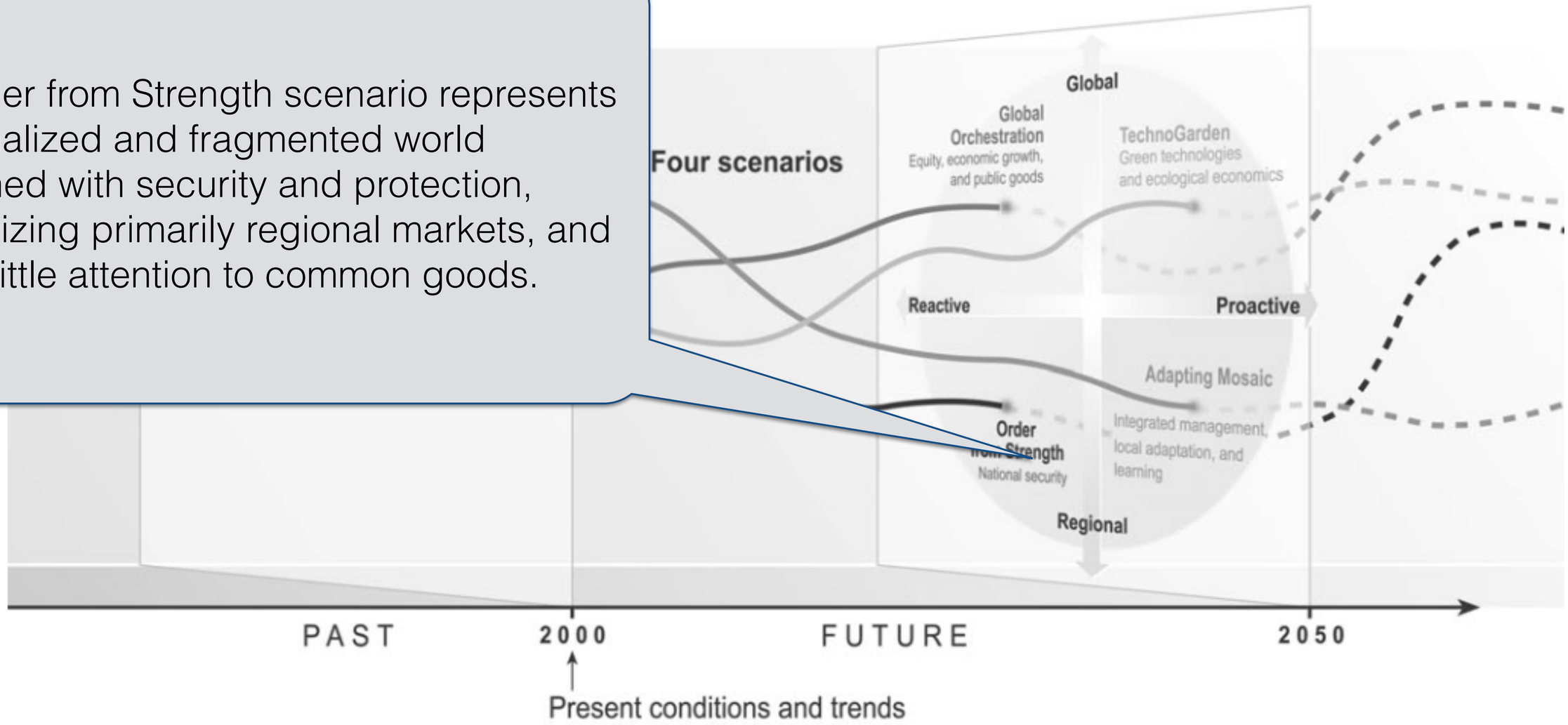
Scenario-Based Assessments

The Order from Strength scenario represents a regionalized and fragmented world concerned with security and protection, emphasizing primarily regional markets, and paying little attention to common goods.



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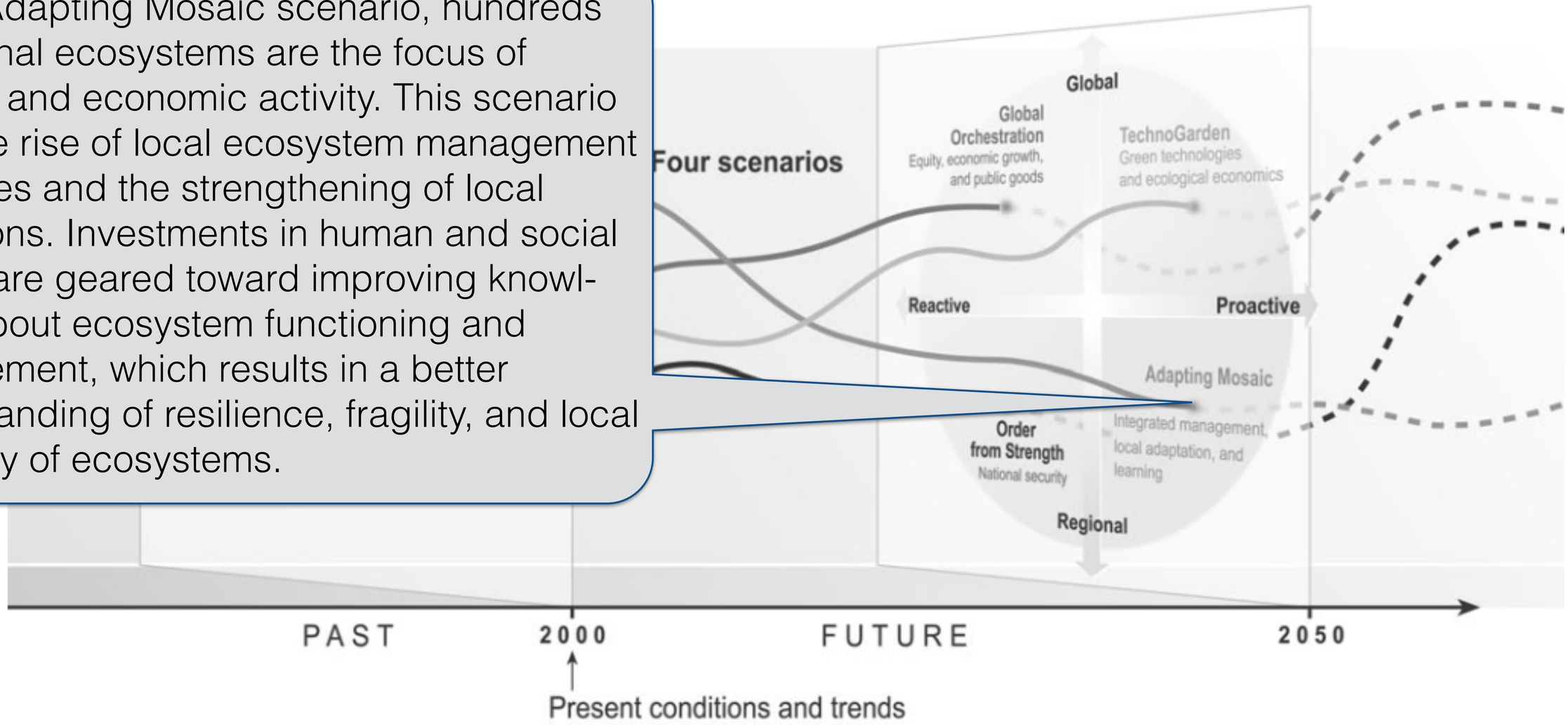
Scenario-Based Assessments

In the Adapting Mosaic scenario, hundreds of regional ecosystems are the focus of political and economic activity. This scenario sees the rise of local ecosystem management strategies and the strengthening of local institutions. Investments in human and social capital are geared toward improving knowl-edge about ecosystem functioning and management, which results in a better understanding of resilience, fragility, and local flexibility of ecosystems.



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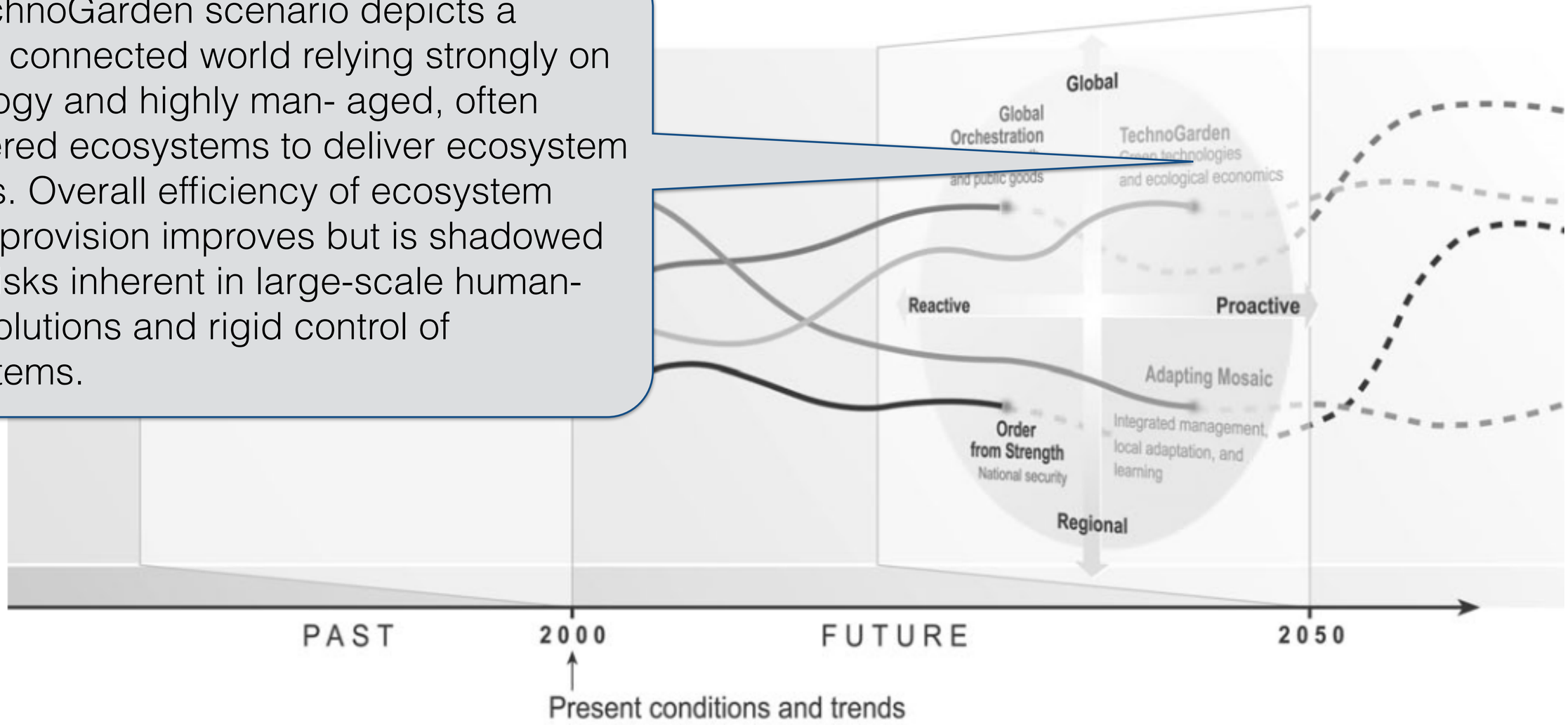
Scenario-Based Assessments

The TechnoGarden scenario depicts a globally connected world relying strongly on technology and highly man- aged, often engineered ecosystems to deliver ecosystem services. Overall efficiency of ecosystem service provision improves but is shadowed by the risks inherent in large-scale human-made solutions and rigid control of ecosystems.



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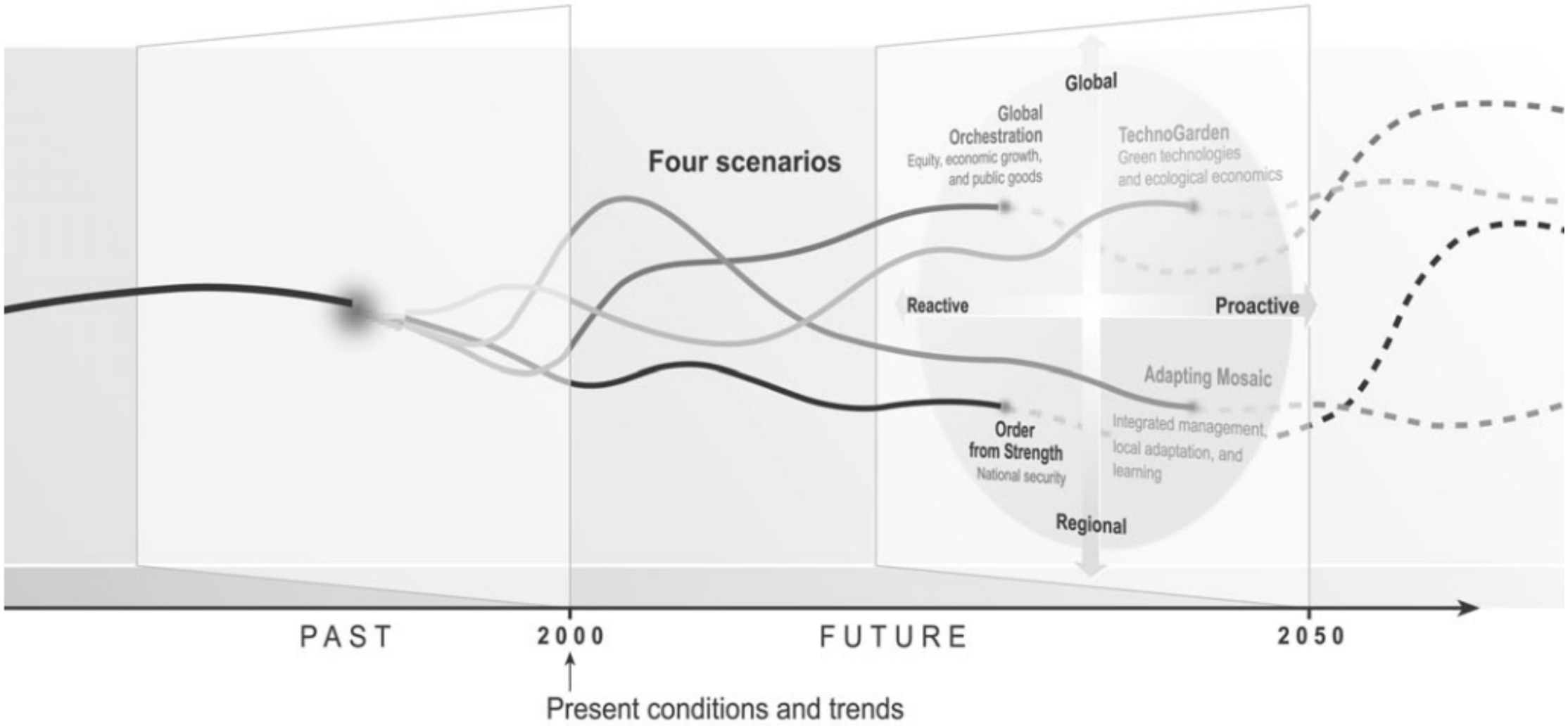

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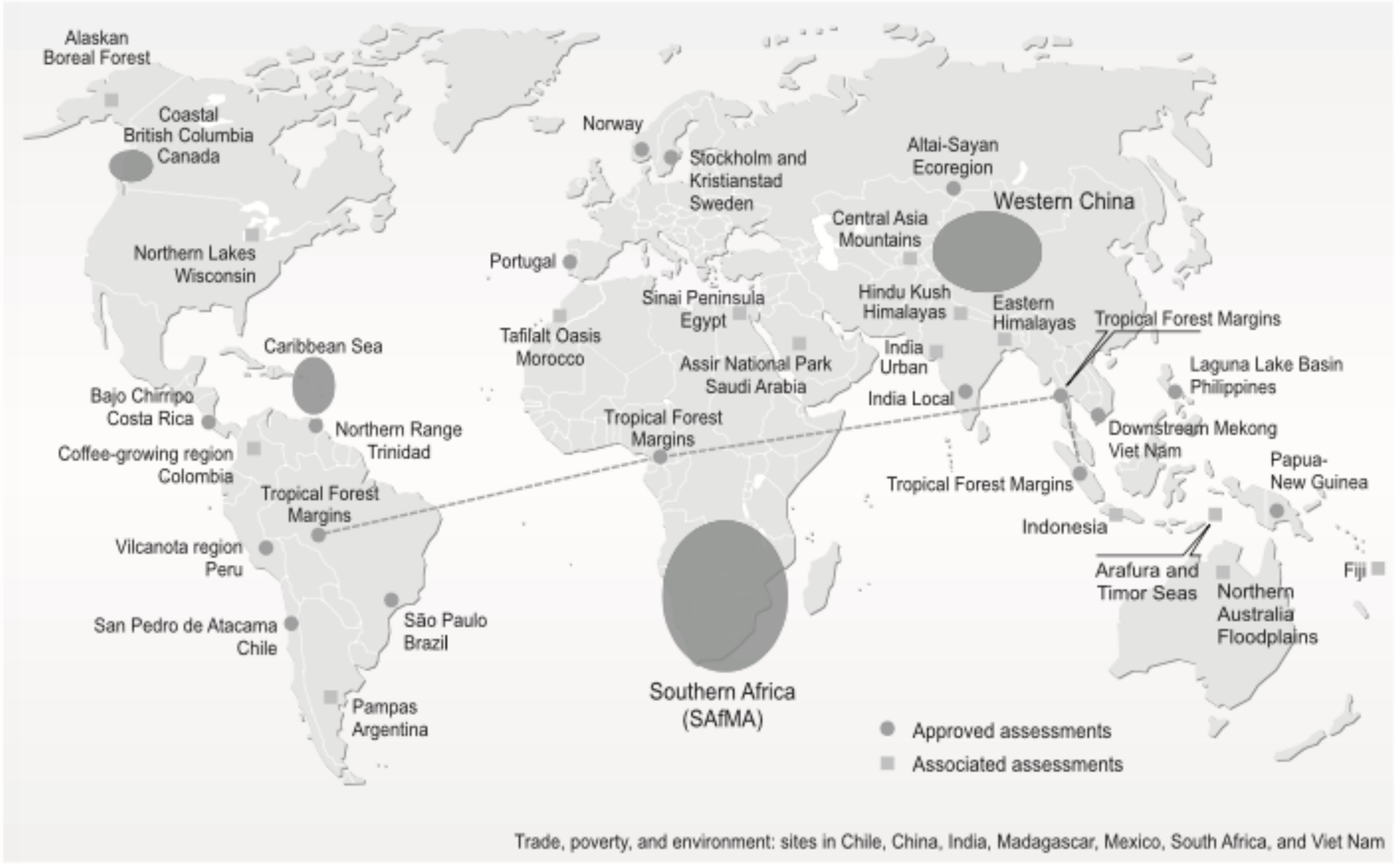
Scenario-Based Assessments



Eighteen assessments were approved as components of the MA. Any institution or country was able to undertake an assessment as part of the MA if it agreed to use the MA conceptual framework, to centrally involve the intended users as stakeholders and partners, and to meet a set of procedural requirements related to peer review, metadata, transparency, and intellectual property rights. The MA assessments were largely self-funded, although planning grants and some core grants were provided to support some assessments. The MA also drew on information from 16 other sub-global assessments affiliated with the MA that met a subset of these criteria or were at earlier stages in development.

Scenario-Based Assessments

SUB-GLOBAL ASSESSMENT	ECOSYSTEM TYPES										ECOSYSTEM SERVICES								
	COASTAL	CULTIVATED	DRYLAND	FOREST	INLAND WATER	ISLAND	MARINE	MOUNTAIN	POLAR	URBAN	FOOD	WATER	FUEL and ENERGY	BIODIVERSITY-RELATED	CARBON SEQUESTRATION	FIBER and TIMBER	RUNOFF REGULATION	CULTURAL, SPIRITUAL, AMENITY	OTHERS
Altai-Sayan Ecoregion			●	●	●			●			●		●	●		●		●	
San Pedro de Atacama, Chile			●		●						●	●		●			●	●	●
Caribbean Sea	●					●	●				●	●		●				●	
Coastal British Columbia, Canada	●			●	●			●			●			●		●	●	●	
Bajo Chirripo, Costa Rica		●		●	●						●	●		●		●		●	●
Tropical Forest Margins		●		●							●	●		●	●	●	●		●
India Local Villages		●		●	●						●	●	●	●		●	●	●	●
Glomma Basin, Norway		●		●	●			●			●		●			●		●	●
Papua New Guinea	●	●				●	●				●	●	●	●		●	●	●	●
Vilcanota, Peru		●	●					●			●	●		●			●	●	●
Laguna Lake Basin, Philippines		●		●	●						●	●		●	●			●	●
Portugal	●	●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●
São Paulo Green Belt, Brazil	●	●		●	●					●	●	●		●	●	●	●	●	●
Southern Africa	●	●	●	●	●					●	●	●	●	●		●		●	●
Stockholm and Kristianstad, Sweden		●			●					●	●	●		●	●	●	●	●	●
Northern Range, Trinidad	●			●	●			●			●	●		●		●	●	●	●
Downstream Mekong Wetlands, Viet Nam	●	●			●						●	●	●	●	●	●	●	●	●
Western China		●	●	●	●			●			●	●		●	●		●		●
Alaskan Boreal Forest				●	●						●					●		●	●
Arafura and Timor Seas	●					●	●				●			●	●				●
Argentine Pampas		●									●	●						●	●
Central Asia Mountains								●			●	●		●					●
Colombia coffee-growing regions		●						●			●	●		●				●	
Eastern Himalayas				●				●			●	●	●	●				●	
Sinai Peninsula, Egypt			●					●						●			●	●	●
Fiji	●					●					●	●	●						●
Hindu Kush-Himalayas					●			●				●		●			●	●	●
Indonesia	●					●	●				●			●					●
India Urban Resource										●	●	●	●	●	●			●	●
Tafilalt Oasis, Morocco		●	●								●	●						●	●
Northern Australia Floodplains					●						●	●		●			●	●	●
Asir National Park, Saudi Arabia		●		●				●			●						●	●	●
Northern Highlands Lake District, Wisconsin				●	●							●				●	●	●	●

Scenario-Based Assessments

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A list of frequently asked questions about the ecosystem services reference book

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Joerg Priess[1] (Helmholtz Centre for Environmental Research – UFZ, Germany) and Jennifer Hauck (Helmholtz Centre for Environmental Research – UFZ, Germany and **CoKnow Consulting**)

INTRODUCTION AND STATE-OF-THE-ART

Assessing uncertain futures

Perceived uncertainties and risks can be considered to be the main motivation behind 'Futures Thinking' or 'Futures Studies' to assess potential economic, environmental, social or technical developments and their expected consequences on society and environment (or from a systems perspective – feedbacks between the components of complex social-ecological systems, e.g. Liu et al., 2007). A broad range of approaches such as Forecasting, Predictions, Trend Analysis, Visions, Collages or Mental Models is used to assess future developments and their consequences on the economy, society

http://www.openness-project.eu/library/reference-book/sp-scenarios

Fieldwork Week

- Saturday, June 9, 2018: Travel to Key Largo
- Sunday, June 10, 2018: Reconnaissance and preparation of fieldwork, shopping for material
- Monday, June 11, 2018: 8:00-5:00: Trip to Everglades
- Tuesday, June 12, 2018: 8:00-11:00: Service project at State Park; 12:00-4:00 Snorkeling.
- Wednesday, June 13, 2018: 8:00-10:00 Crocodile Lake NWR; From 10:00: Key Largo woodrat and Key Largo cotton mouse.
- Thursday, June 14, 2018: 1:00-2:00 PM: Meeting with, and presentation by, Jerry Lorenz, Audubon. Other time: Working on report, presentations and board game
- Friday, June 15, 2018: 1:00-5:00 PM Stakeholder meeting
- Saturday, June 16, 2018: Travel back to Norfolk

Part 2: Foresight

Contents:

1 Introduction
2 Hazards
3 Vulnerabilities
4 Foresight
5 Decision-Making & Stakeholders
6 Options
7 Discussion, Summary, Recommendations