Localising the Sustainable Development Goals

A new research Agenda

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Print (c. 1902) by Albert Robida: a futuristic view of air travel over Paris in the year 2000 as people leave the opera

Our vision

*“We aimed to develop a **general framework***

Our vision

*“We aimed to develop a **general framework** for charting **pathways** to sustainability*

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*“We aimed to develop a **general framework** for charting **pathways** to sustainability to futureproof **local communities***

Our vision

*"We aimed to develop a **general framework** for charting **pathways** to sustainability to futureproof **local communities**, using computer **modelling and participatory** approaches"*

Our goals

Goal 1 Reviewing the state-of-the-art knowledge in local sustainability

Goal 2 Developing adaptive pathways in the Forrest community

Goal 3 Developing adaptive pathways in the Goulburn-Murray region

Goal 4 Developing and communicating a general framework for designing sustainability pathways

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Goal 1

Reviewing the state-of-the-art knowledge in local sustainability

We investigated effective approaches for grassroots transformative change for local sustainability.

Scientific literature

A meta-synthesis across the scientific articles (abstracts):

- 2017–2019
- 4200 publications

Findings:

- Cross-sectoral SDGs are critical.
- Consistent incorporation of local sustainability across all SDGs required.

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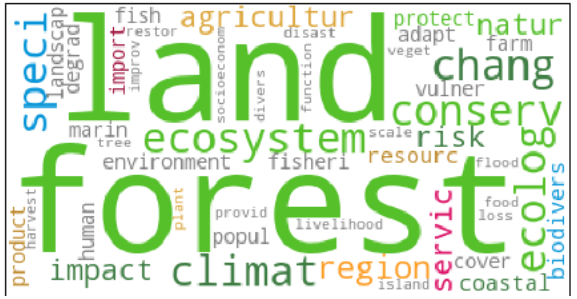
- Consistent incorporation of local sustainability across all SDGs required.

SDGs 4, 16, 17 (34%)

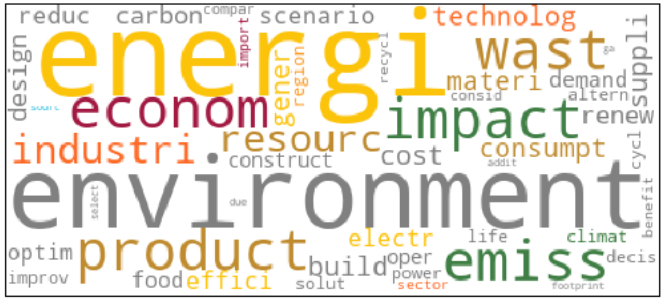
SDGs 13, 14, 15 (13%)



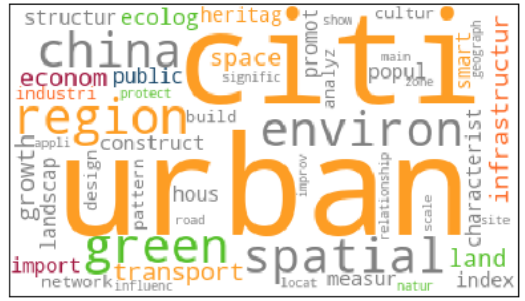
SDGs 1, 8, 9 (13%)

SDGs 3, 5, 10 (7%)

SDGs 7, 12 (15%)



SDGs 11 (12%)



SDGs 2, 6 (7%)

SDGs colour code for the word-clouds

Best policy practices

Started by Local Agenda 21 (LA21), we identified 55 initiatives on local sustainability.

Policy initiatives have evolved gradually:

- Resources
- Agenda
- Scope

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Viable approaches to local sustainability

Downscaling: Identify and prioritise global SDGs according to the community's needs

Trade-offs: Design effective trade-offs across competing, divergent local needs

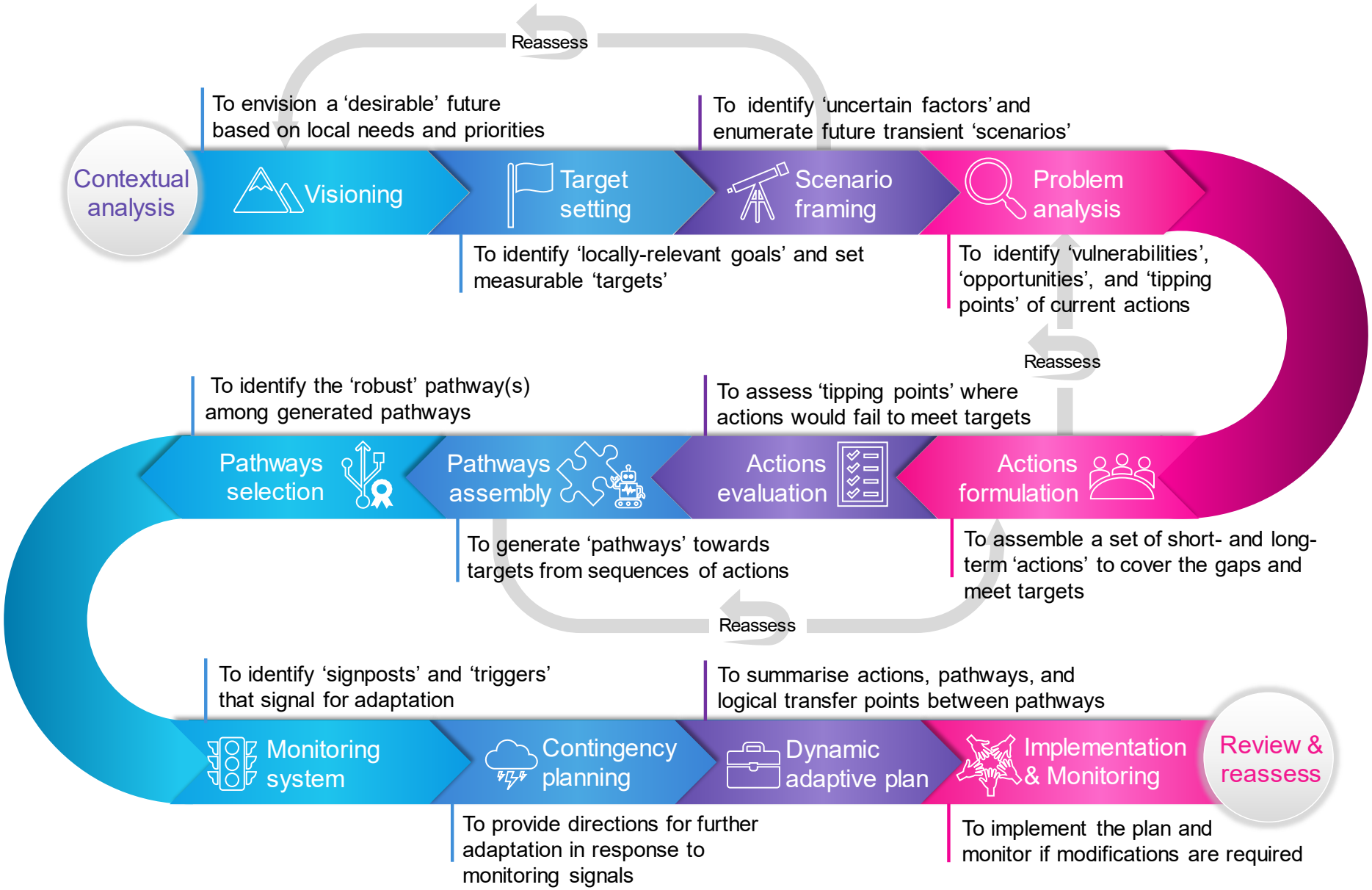
Stress-testing: Remain adaptive in response to future instabilities

Goal 4

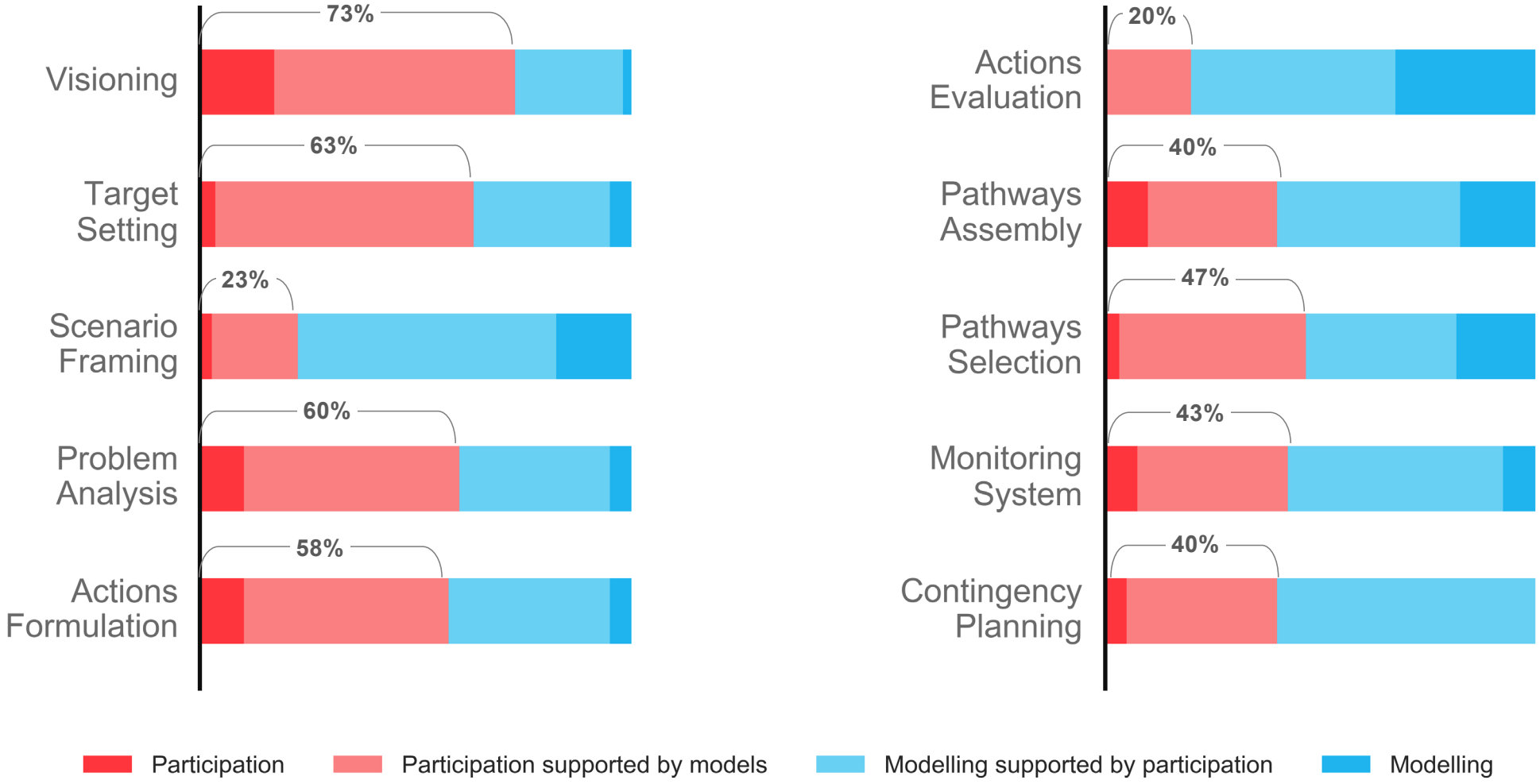
Developing a general framework for designing sustainability pathways

We developed a unifying framework to guide how scientists and stakeholders for co-creating viable sustainability pathways.

Overview of steps in co-developing pathways



Viewpoints of experts about the co-development of pathways



Survey views of 20 practitioners on method combination. The percentage shows the combined role for participation and participation supported by models.

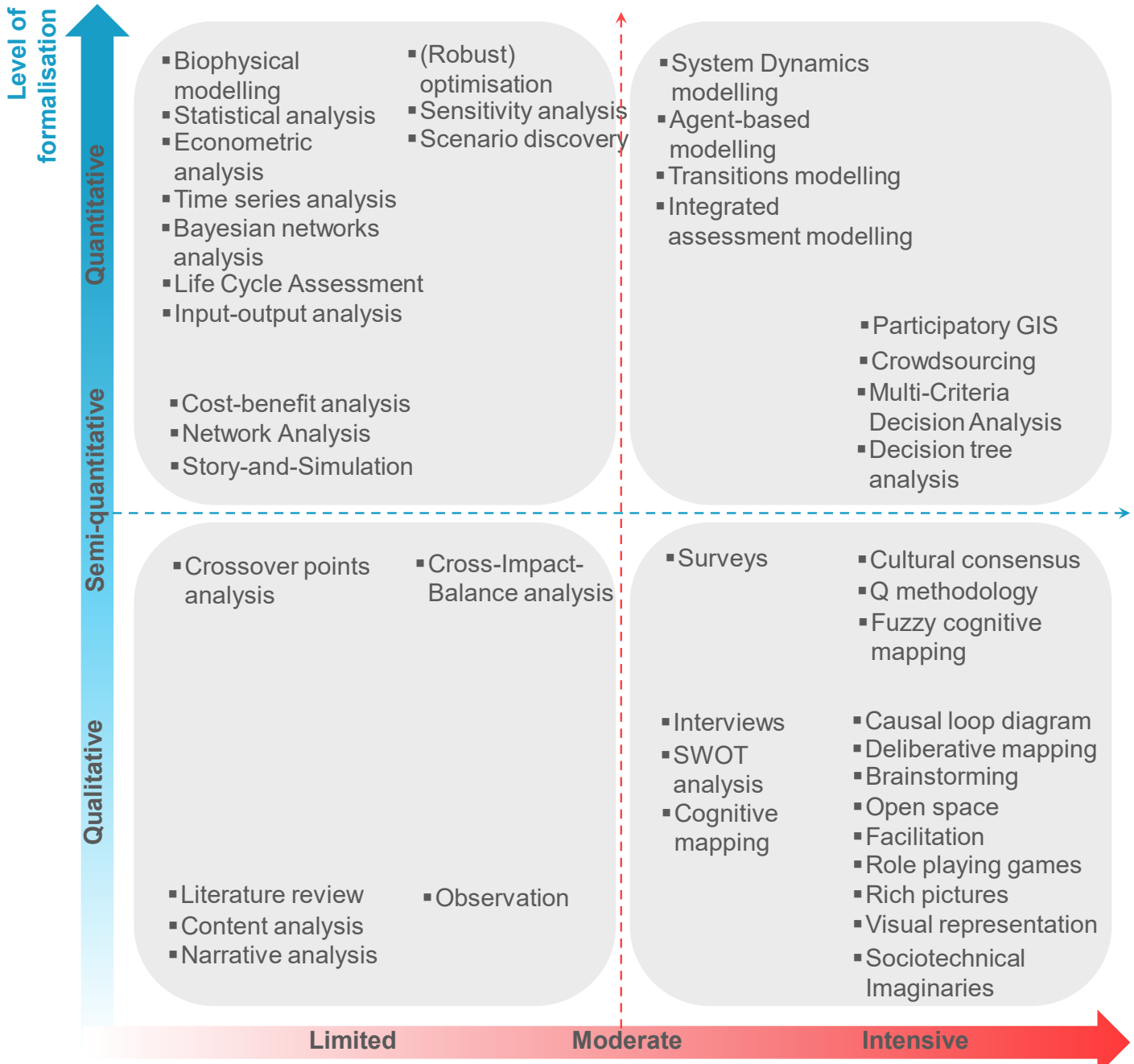
Methods for co-developing pathways

A total of 43 methods identified across sciences for developing pathways.

- Level of participation
- qualitative vs. quantitative

Methods are compared based on:

- Decision problem
- Analytical approach
- Role of modelling
- Role of participatory
- Examples



Selection criteria for choosing suitable methods

Outcome-oriented factors represent the analytical objectives

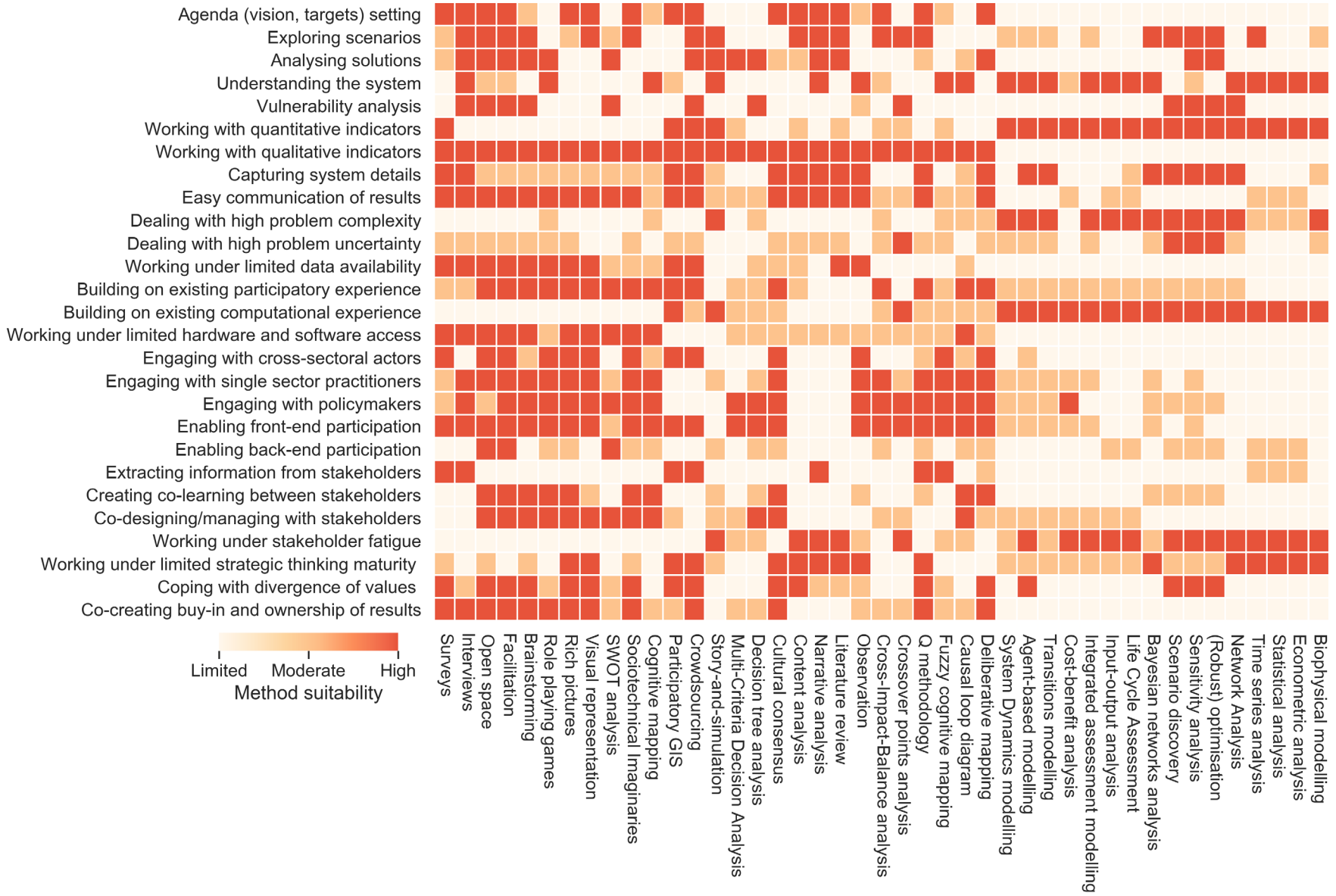
Research-oriented factors represent the scientific rigour of methods and the availability of resources for a specific context

Stakeholder-oriented factors represent stakeholder characteristics and their requirement

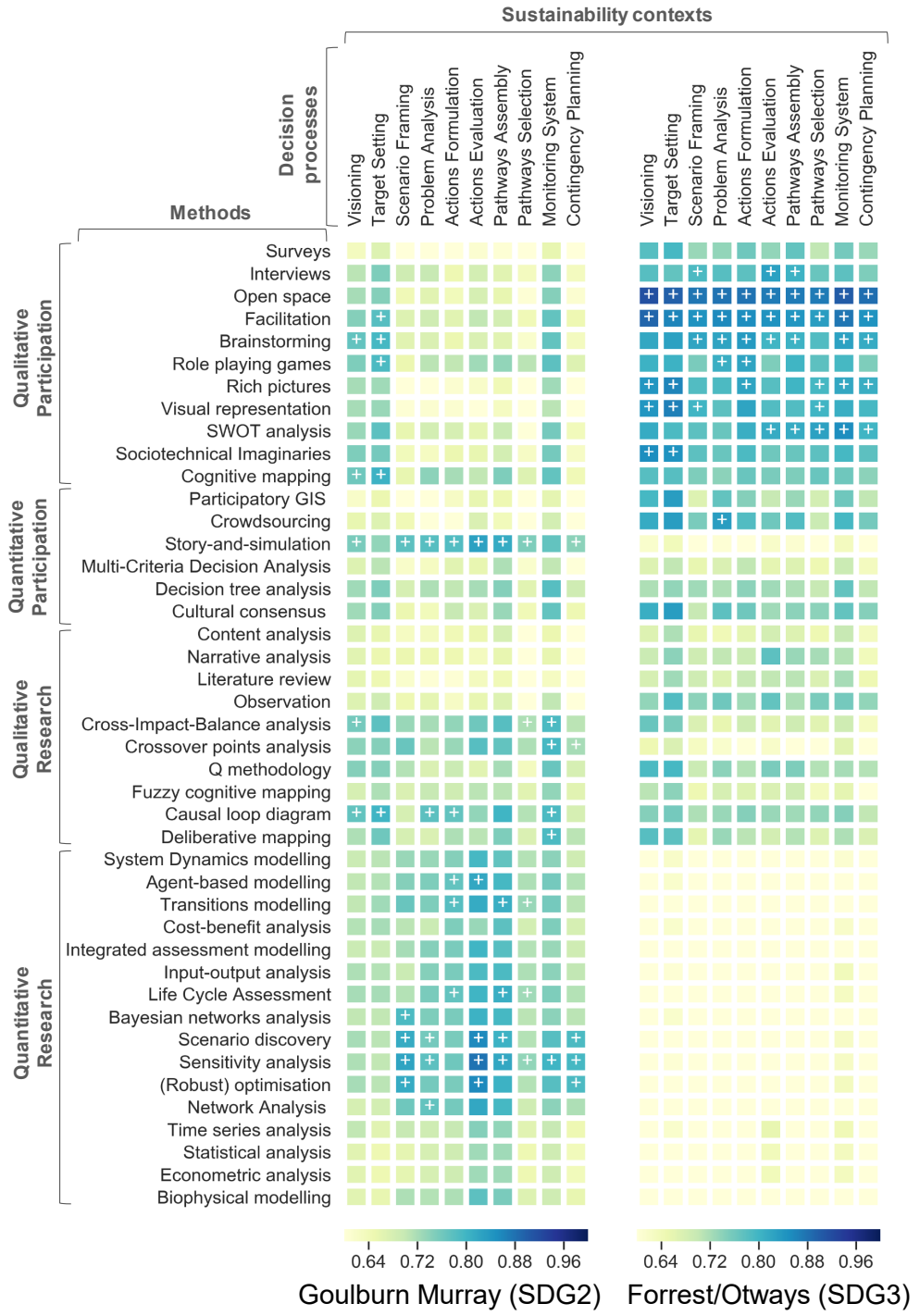
Outcome-oriented	Analytical objective	**Agenda setting** to develop a vision and downscale global goals
		Exploring scenarios to generate and identify important future uncertainties
		Analysing solutions to formulate policies and evaluate their effectiveness
		Understanding the system to analyse complex real-world interactions
		Vulnerability analysis to stress test policies under uncertainty
	Type of results	**Working with quantitative indicators** in form of numerical value and descriptive statistics
		Working with qualitative indicators in form of pattern, ranking, quality, and storyline
		Capturing system details to represent heterogeneities instead of pre-mature aggregation
		Easy communication of results for understandability with minimum misinterpretation
Research-oriented	Problem characteristics	**Dealing with high problem complexity** in form of feedback interactions, conflicting trade-offs
		Dealing with high problem uncertainty in form of limited knowledge/agreement about the system
	Resources	**Working under limited data availability** and access to information
		Building on existing participatory experience in form of qualitative skills
		Building on existing computational experience in form of modelling skills
		Working under limited hardware and software access in form of technical/model fidelity

Stakeholder-oriented	Type of stakeholders	**Engaging with cross-sectoral actors** brought together by geography and community interest
		Engaging with single sector practitioners (e.g., water practitioners, engineers, etc.)
		Engaging with policymakers who may not be directly involved in the on-ground management
	Participation timing	**Enabling front-end participation** by engaging from the early stage (e.g., problem definition)
		Enabling back-end participation by engaging towards the end (e.g., validation)
	Engagement type	**Extracting information from stakeholders** (e.g., interviews)
		Creating co-learning between stakeholders to exchange knowledge (e.g., focus group)
		Co-design/managing with stakeholders in decision-making
	Stakeholder characteristics	**Working under stakeholder fatigue** in form of unwillingness to participate
		Working under limited strategic thinking maturity when stakeholder knowledge is limited
		Coping with divergence of values in form of disagreement and plurality of views
		Co-creating buy-in and ownership of results to support the implementation of the results

Assessing method capabilities under criteria



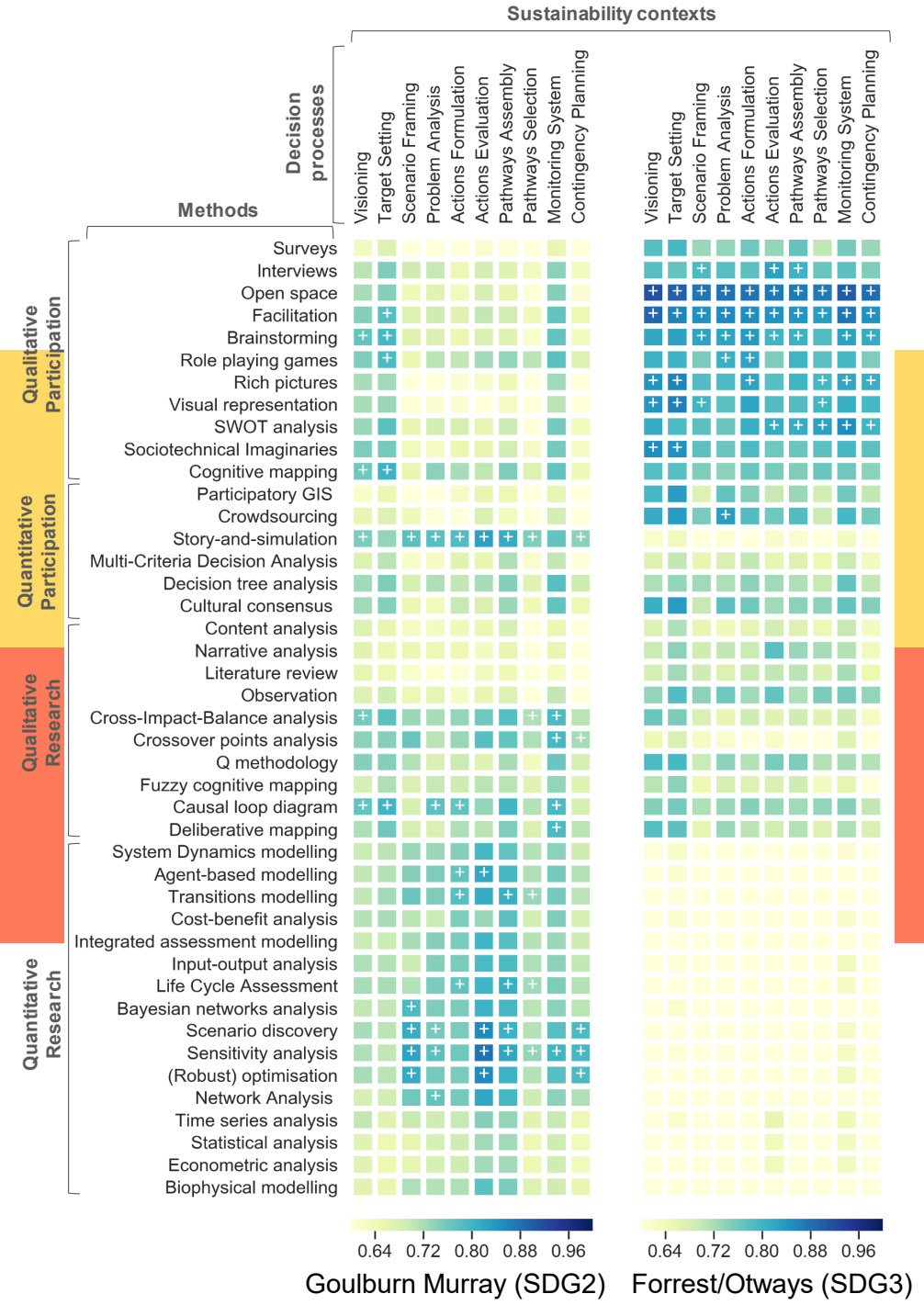
Selecting methods for the case studies



Selecting methods for the case studies

Effective methods vary across cases and *one-size-fits-all* solutions are not feasible.

The development of pathways requires context-specific method *integration*.



Comments

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How to model the SDGs?

Problem definition

System conceptualisation

Model formulation

Simulation

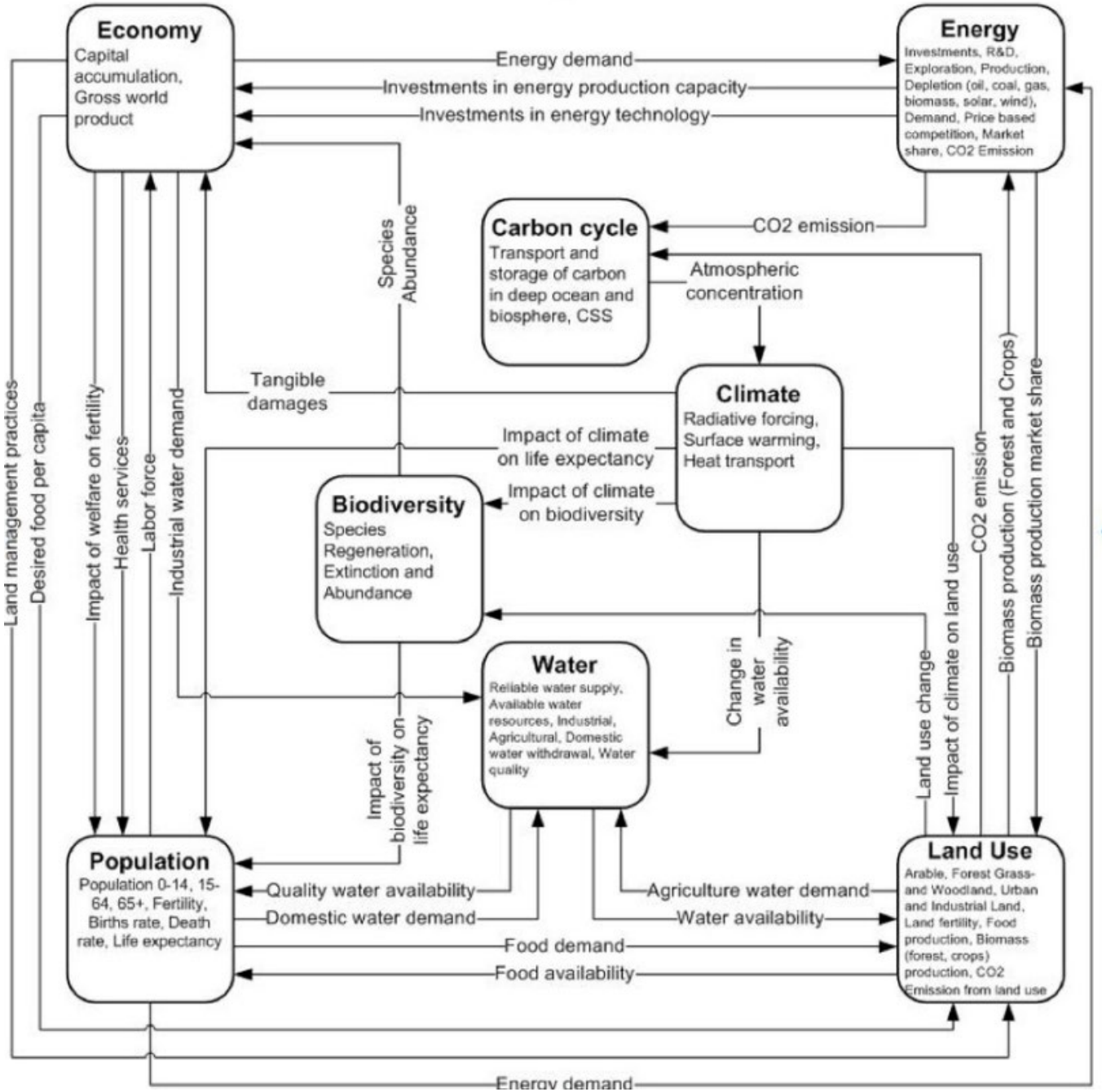
Figures: Courtesy of the Felix Model

Problem definition

What are the priority challenges that each community is facing?

- Water scarcity
- Increasing risk of bushfires
- Increasing energy demand
- Regional economy
- Etc.

System conceptualisation



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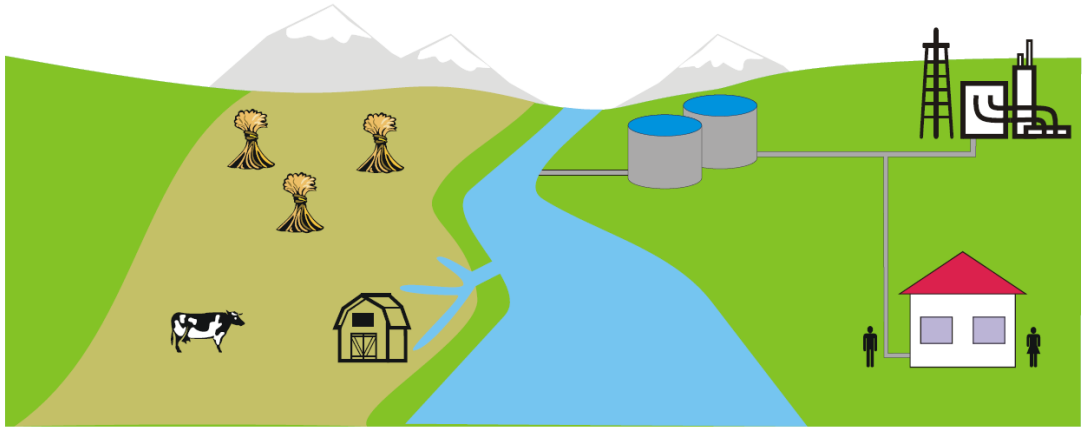

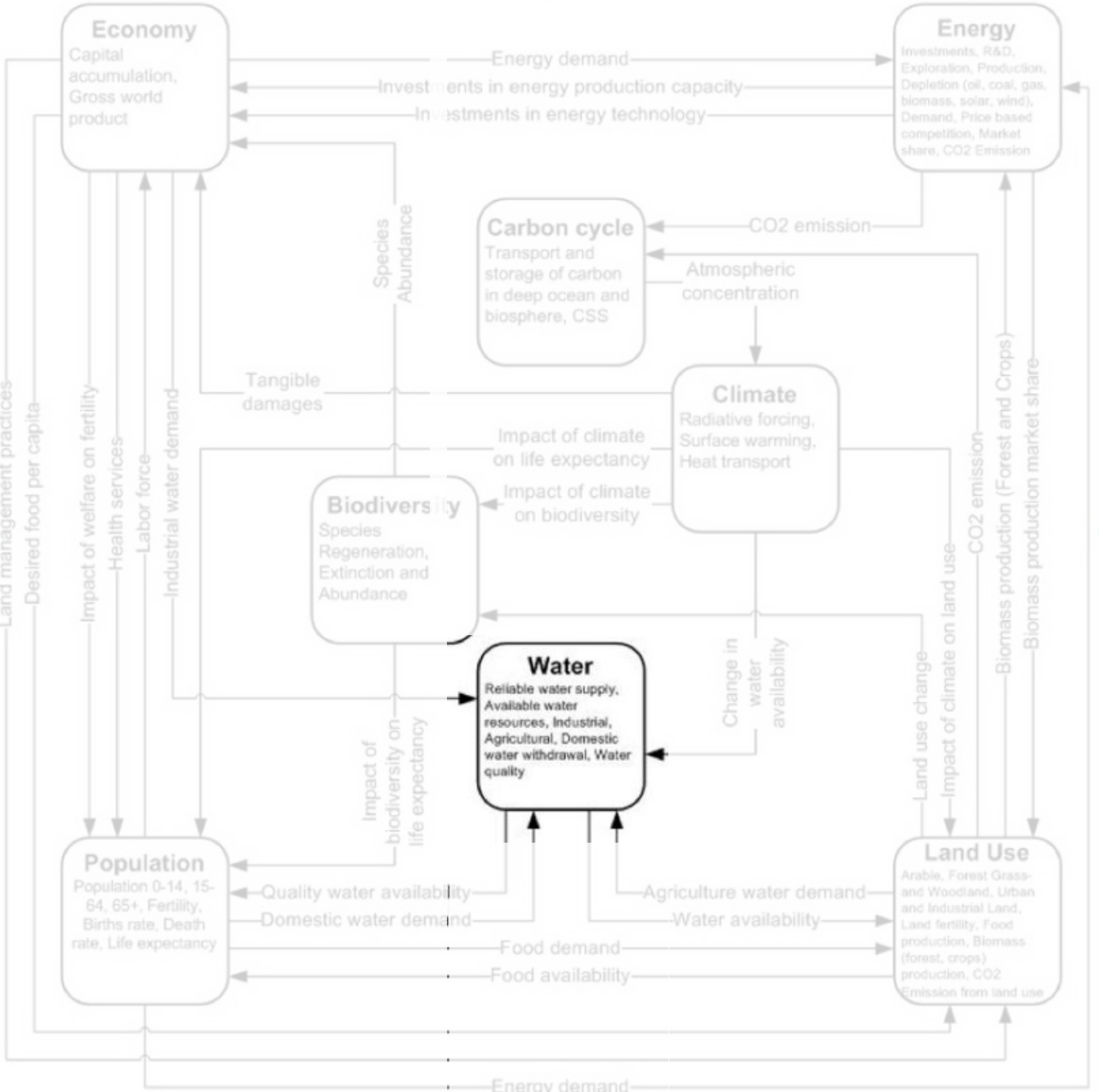

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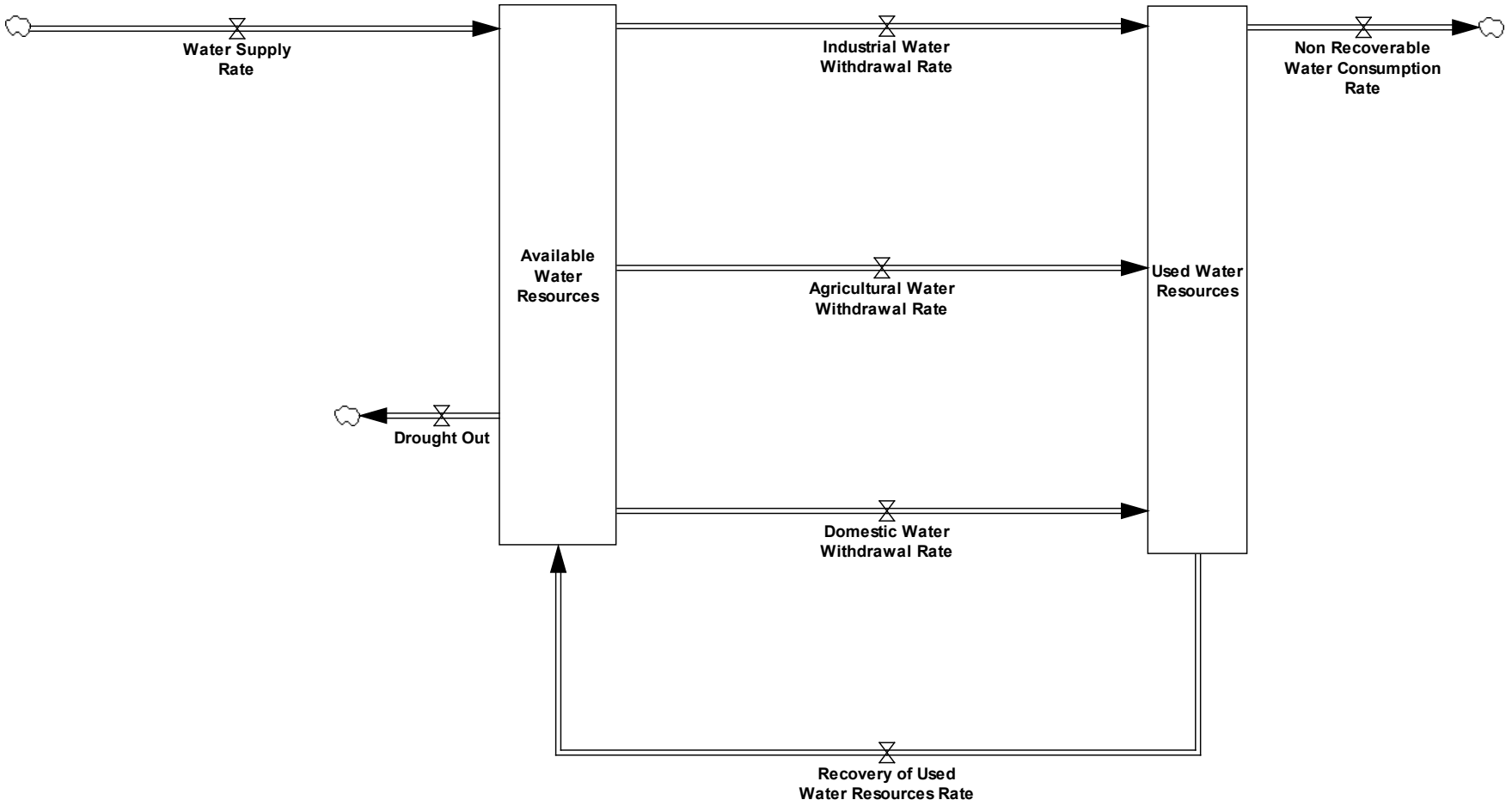
Model formulation



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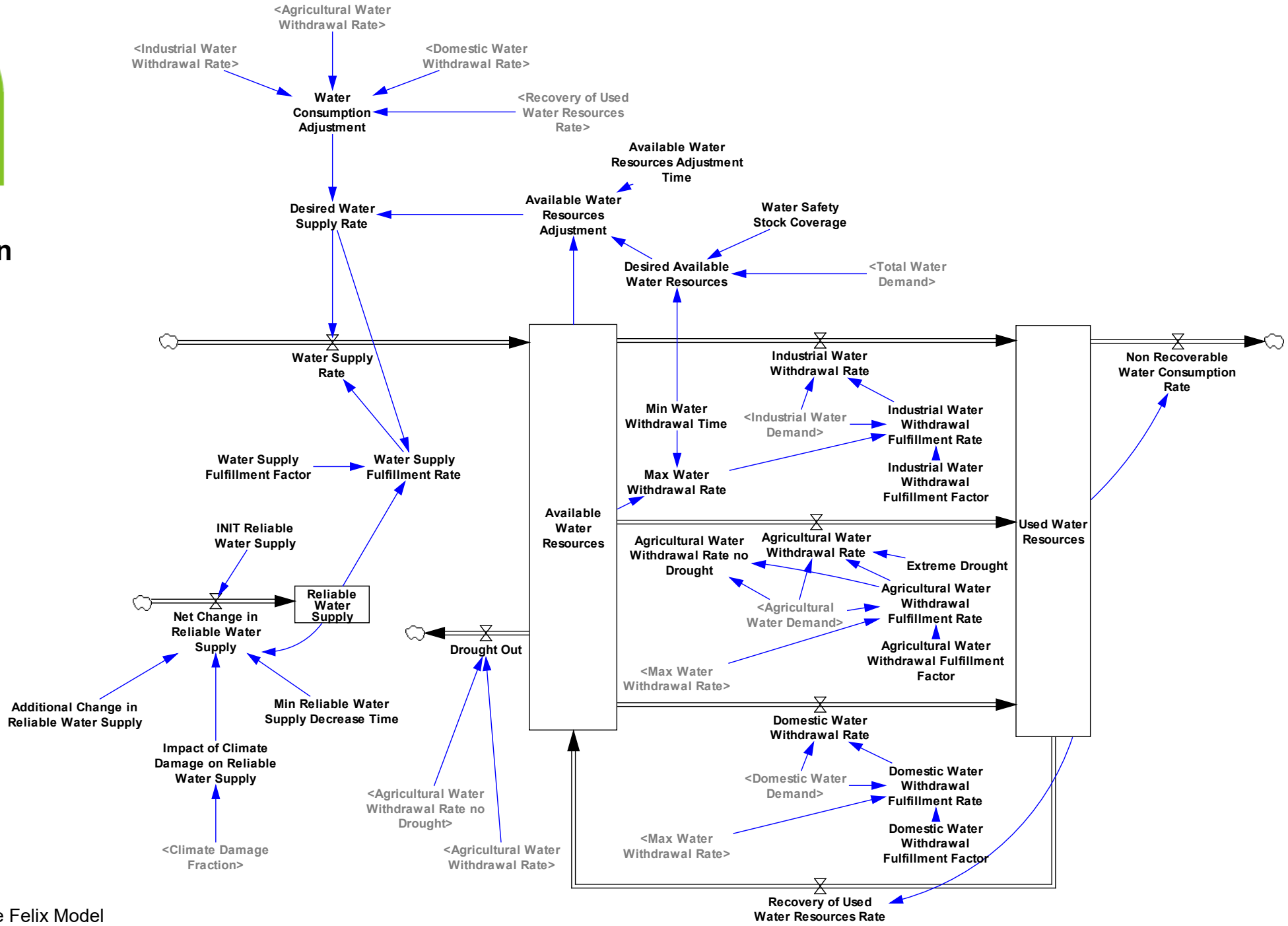

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