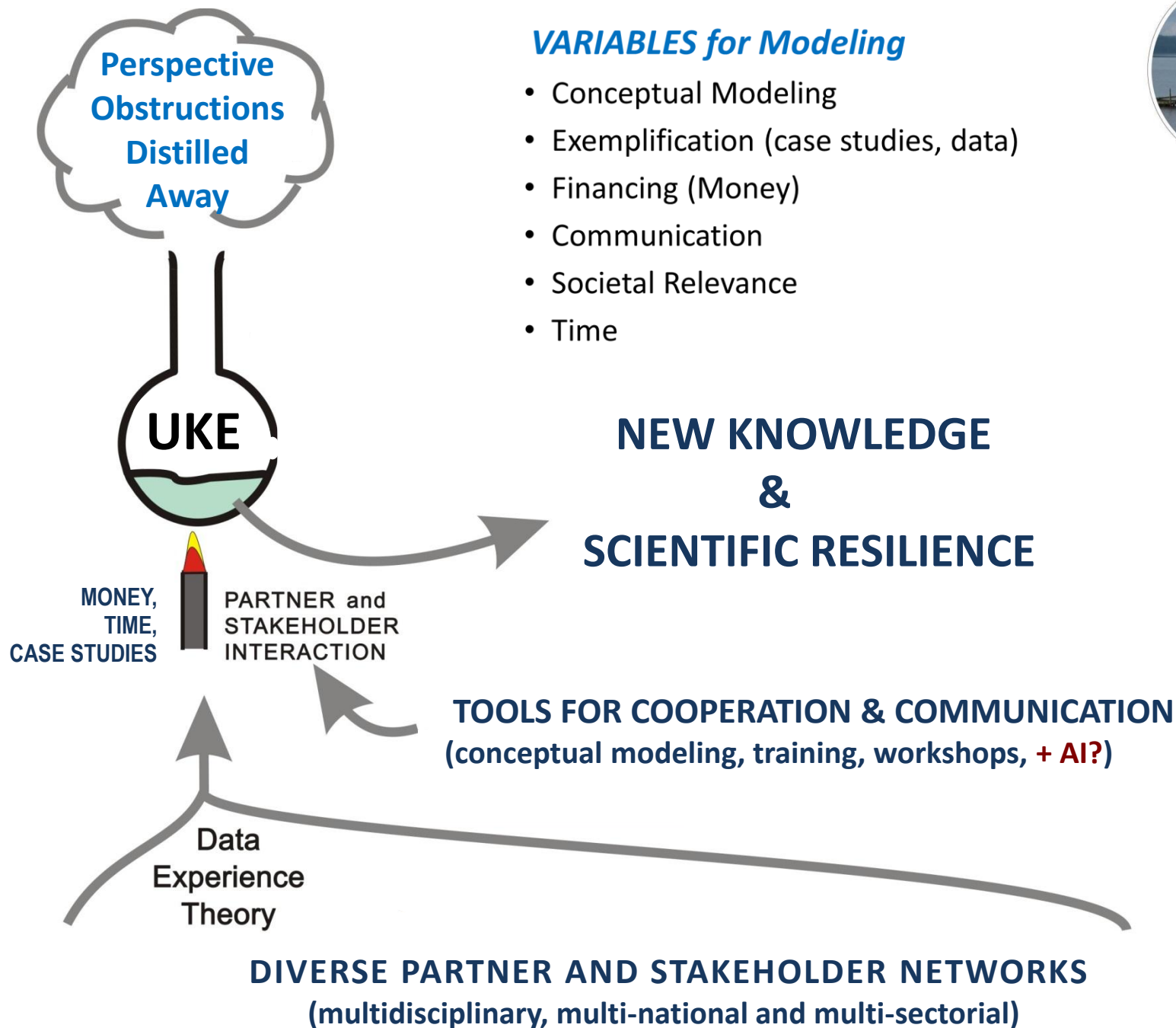




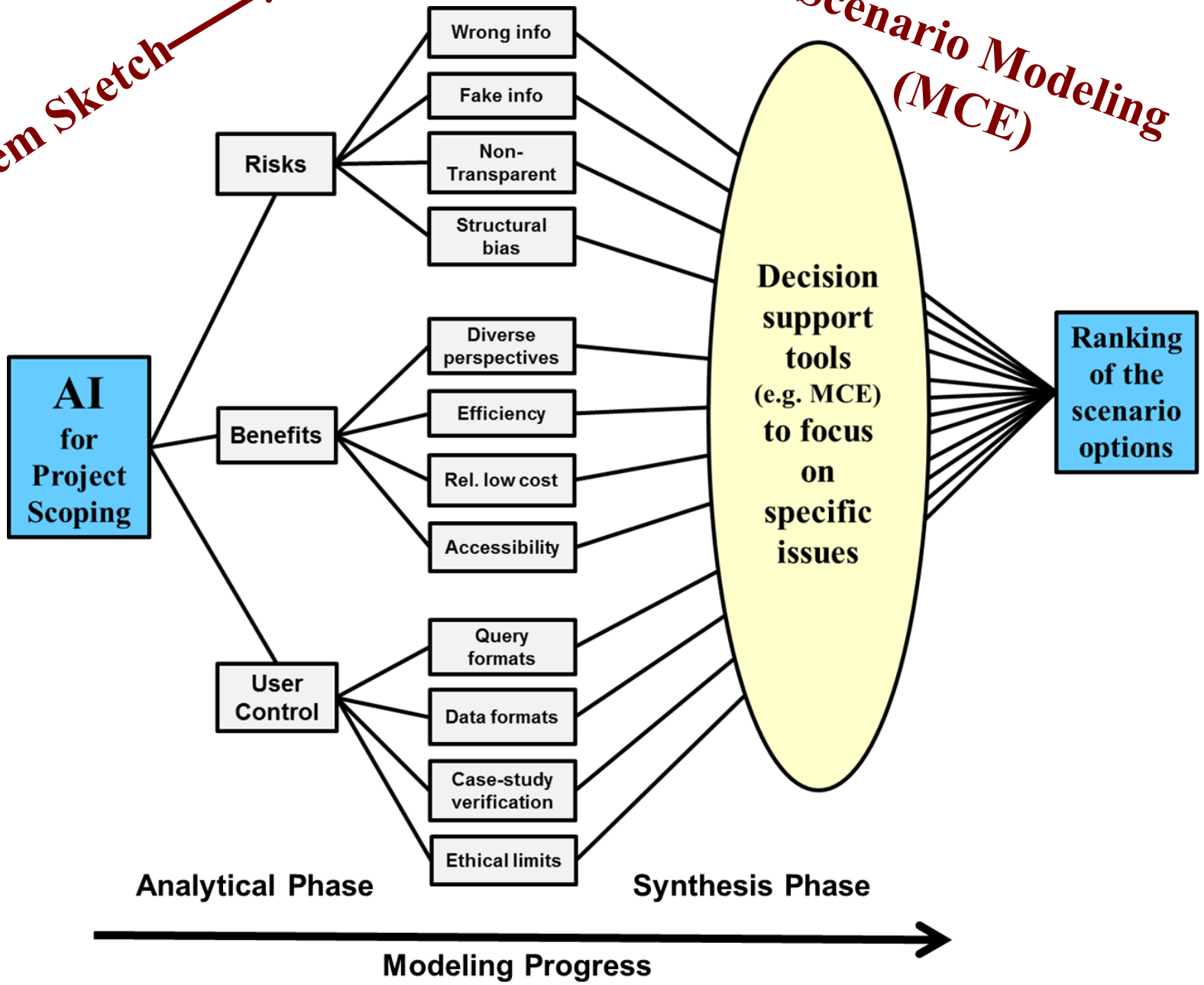
VARIABLES for Modeling

- Conceptual Modeling
- Exemplification (case studies, data)
- Financing (Money)
- Communication
- Societal Relevance
- Time

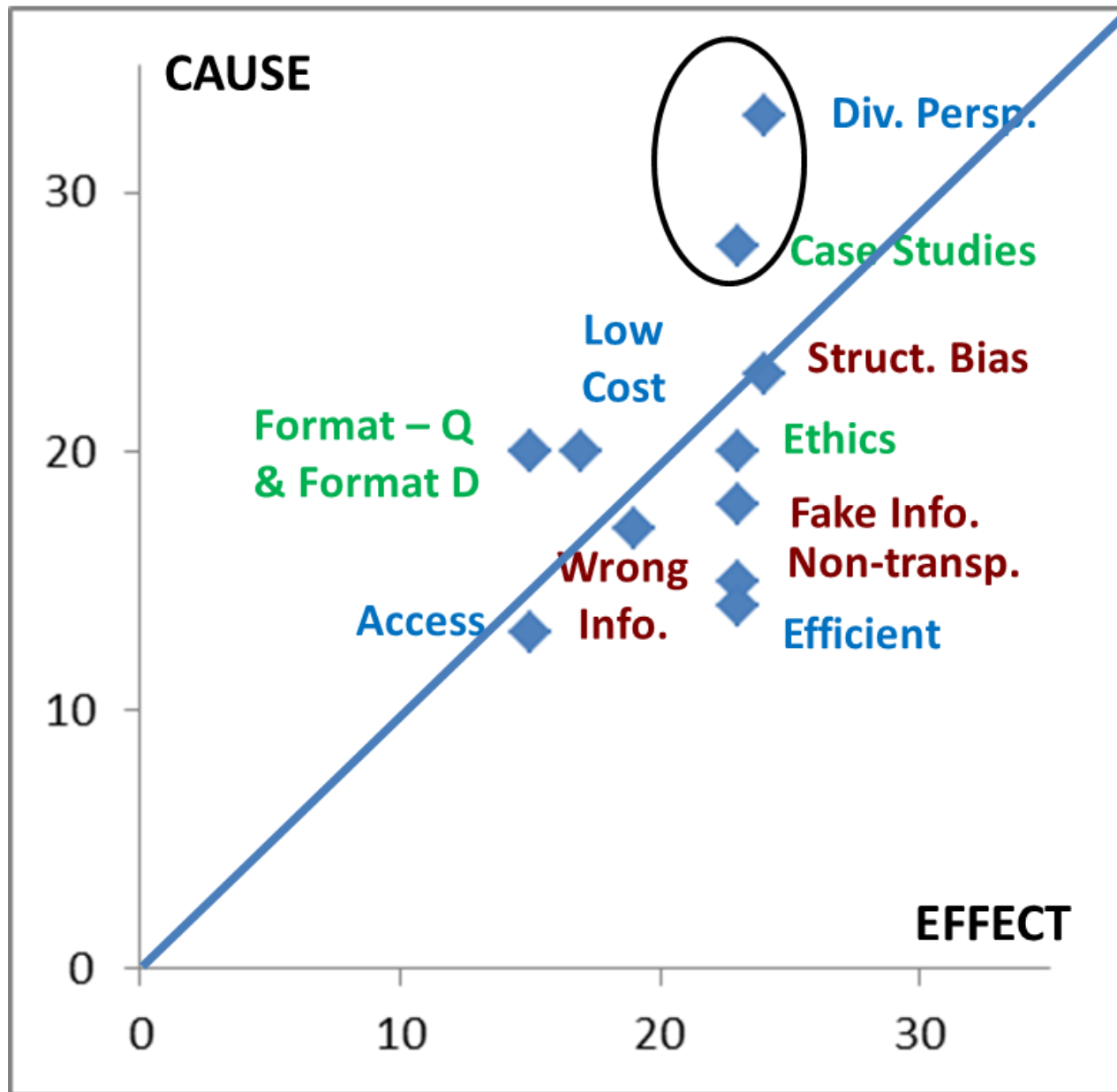


AI-Scoping Model

System Sketch → *System Analysis* → *Scenario Modeling (MCE)*



System Structural Analysis



Benefits

User Controls

Risks

Multi-Criteria Evaluation - AI Scoping



Questions

AI Scoping to create ***“New Knowledge”***

AI Scoping to strengthen ***“Scientific Resilience”***

AI Scoping to limit AI risks, i.e. ***“AI Risk Management”***

User-control variables

- Case studies

- Input structure (both data and prompts)

- Ethical limits

Advantages to stress/strengthen

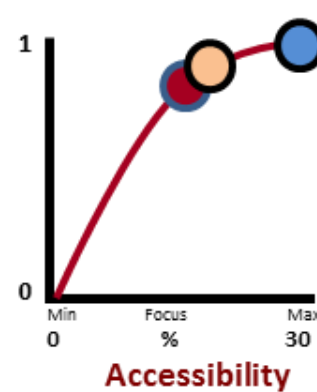
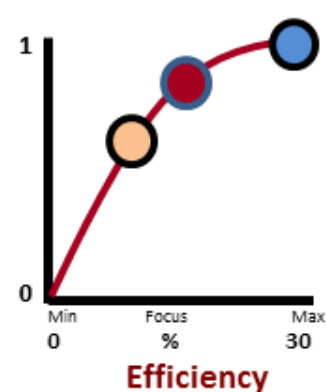
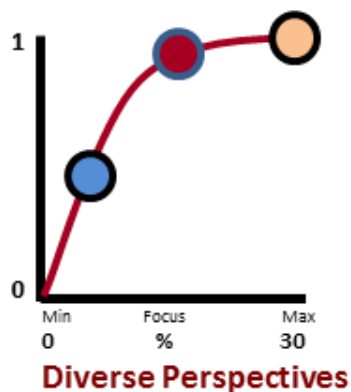
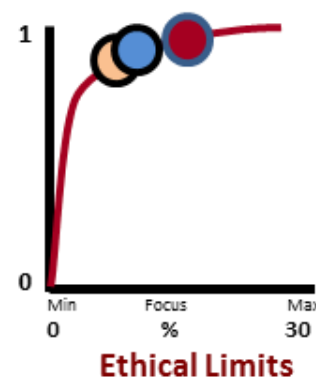
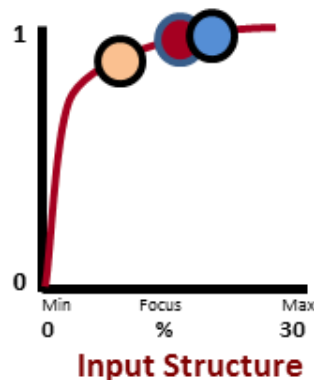
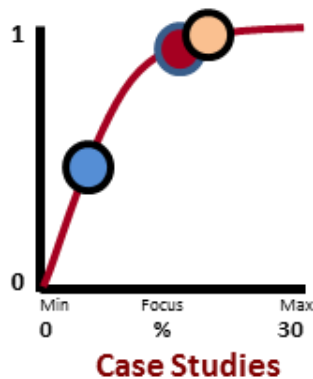
- Diverse perspectives

- Efficiency

- Accessibility (incl. low costs)



Utility Functions in relationship to *“New Knowledge”*



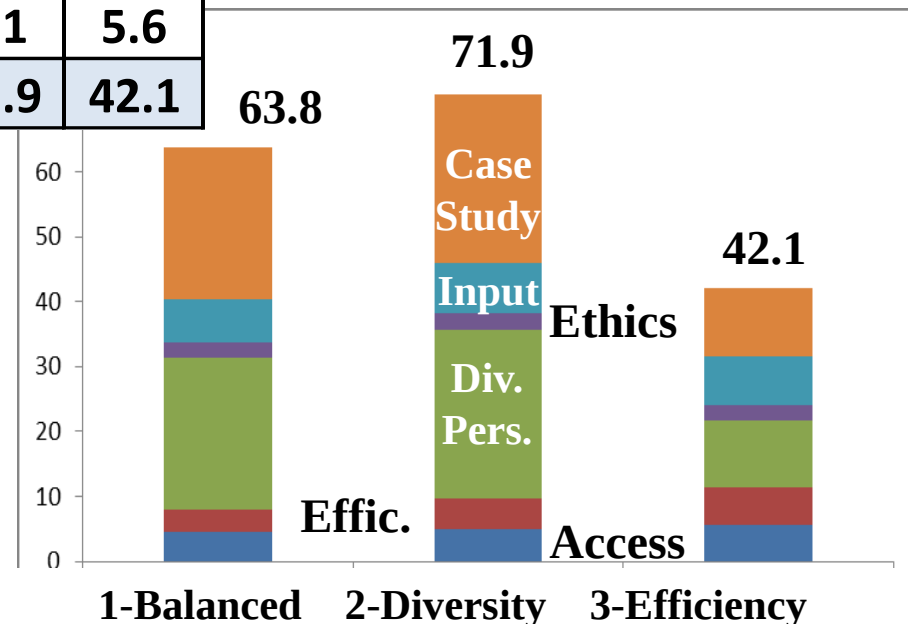
- Scenario 1 **Balanced emphasis on all project characteristics and activities.**
- Scenario 2 **Emphasis on diversity factors**
- Scenario 3 **Emphasis on efficiency & accessibility**



		Balance	Diverse	Efficiency	Balance	Diverse	Efficiency
Variables	Weights	Utility 1	Utility 2	Utility 3	W x U1	W x U2	W x U3
Case St.	26	0.9	1	0.4	23.4	26.0	10.4
Input Str.	8.4	0.8	0.9	0.9	6.7	7.6	7.6
Ethics	2.95	0.8	0.9	0.8	2.4	2.7	2.4
DivPersp	26	0.9	1	0.4	23.4	26.0	10.4
Efficiency	5.73	0.6	0.8	1	3.4	4.6	5.7
Access	5.62	0.8	0.9	1	4.5	5.1	5.6
				sum	63.8	71.9	42.1

“New Knowledge”

$$\text{Total utility} = \sum w_i \cdot u_i$$



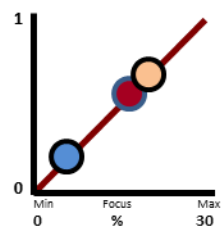
- Scenario 1 **Balanced emphasis on all project characteristics and activities.**
- Scenario 2 **Emphasis on diversity factors**
- Scenario 3 **Emphasis on efficiency & accessibility**



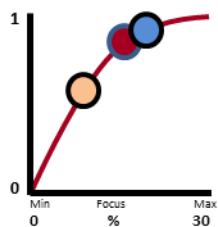
Utility Functions in relationship to

“Science Resilience”

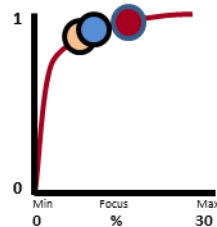
“Risk Management”



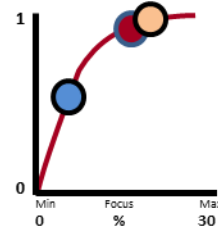
Case Studies



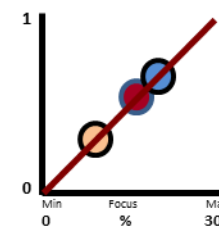
Input Structure



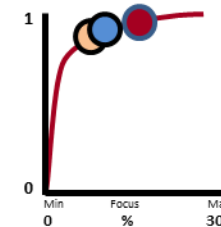
Ethical Limits



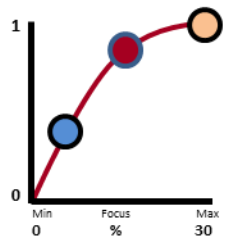
Case Studies



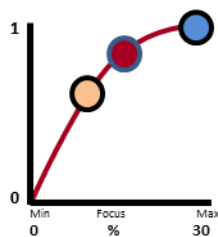
Input Structure



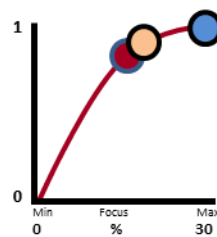
Ethical Limits



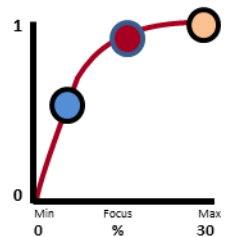
Diverse Perspectives



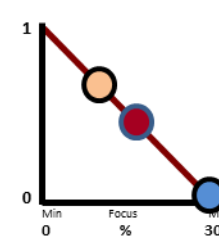
Efficiency



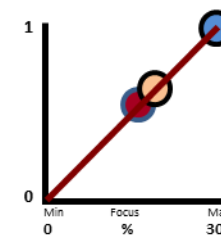
Accessibility



Diverse Perspectives



Efficiency



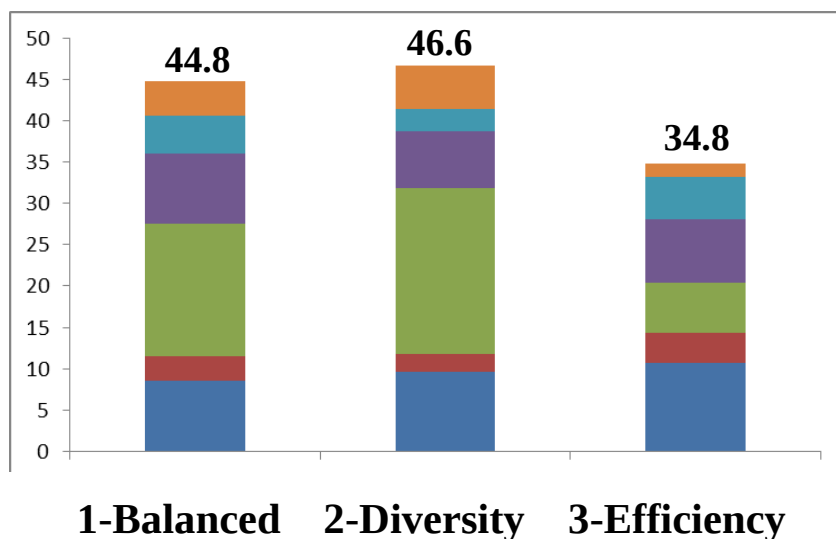
Accessibility

- Scenario 1 **Balanced emphasis on all project characteristics and activities.**
- Scenario 2 **Emphasis on diversity factors**
- Scenario 3 **Emphasis on efficiency & accessibility**



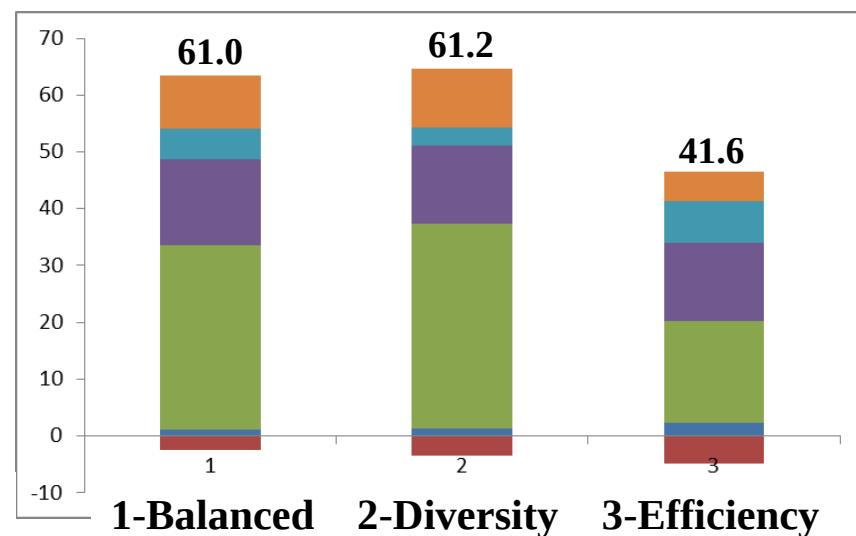
“Science Resilience”

		Balance	Diverse	Efficiency	Balance	Diverse	Efficiency
Variables	Weights	Utility 1	Utility 2	Utility 3	W x U1	W x U2	W x U3
Case St.	8.53	0.5	0.6	0.2	4.3	5.1	1.7
Input Str.	5.6	0.8	0.5	0.9	4.5	2.8	5.0
Ethics	8.53	1	0.8	0.9	8.5	6.8	7.7
DivPersp	20	0.8	1	0.3	16.0	20.0	6.0
Efficiency	3.73	0.8	0.6	1	3.0	2.2	3.7
Access	10.7	0.8	0.9	1	8.5	9.6	10.7
				sum	44.8	46.6	34.8



“Risk Management”

	Balance	Diverse	Efficiency	Balance	Diverse	Efficiency
Weights	Utility 1	Utility 2	Utility 3	W x U1	W x U2	W x U3
10.5	0.9	1	0.5	9.4	10.5	5.2
10.5	0.5	0.3	0.7	5.2	3.1	7.3
15.2	1	0.9	0.9	15.2	13.7	13.7
36	0.9	1	0.5	32.4	36.0	18.0
4.93	-0.5	-0.7	-1	-2.5	-3.5	-4.9
2.31	0.5	0.6	1	1.2	1.4	2.3
			sum	61.0	61.2	41.6





Summary

AI-scoping model

Consistent with the System Structural Analysis, *Diverse Perspectives* is generally the strongest factor within the modelled "AI-scoping system".

Case studies are important for **new knowledge**, but decrease in importance regarding **science resilience** and **AI-risk management**.

Accessibility is important for **science resilience**, as is *Ethics*, which has its greatest influence on **AI-risk management**.

Projects with a **Diversity focus** (scenario 2) have the strongest utility values for all three goals considered.

