Systems Approach Framework

System Design

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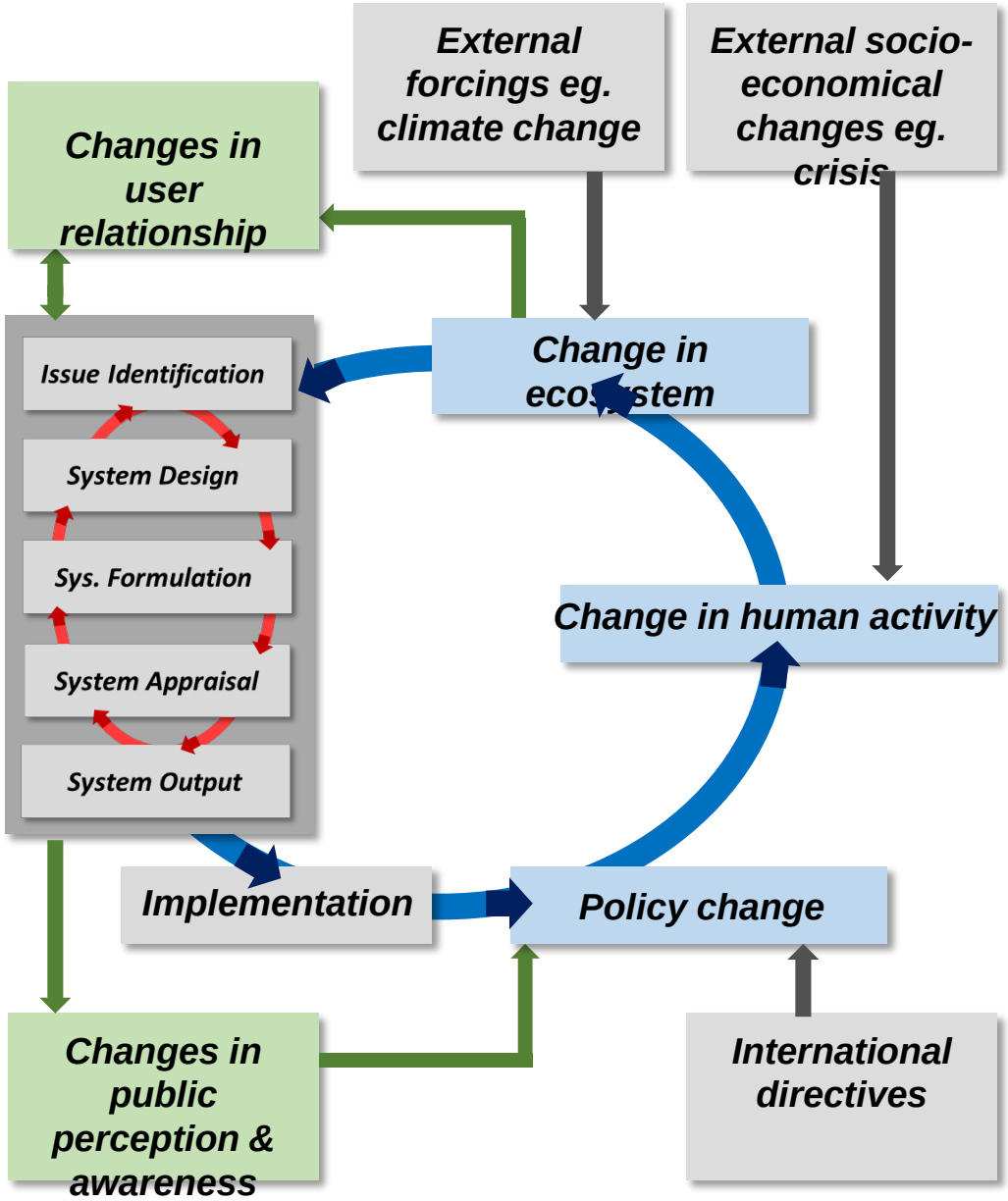
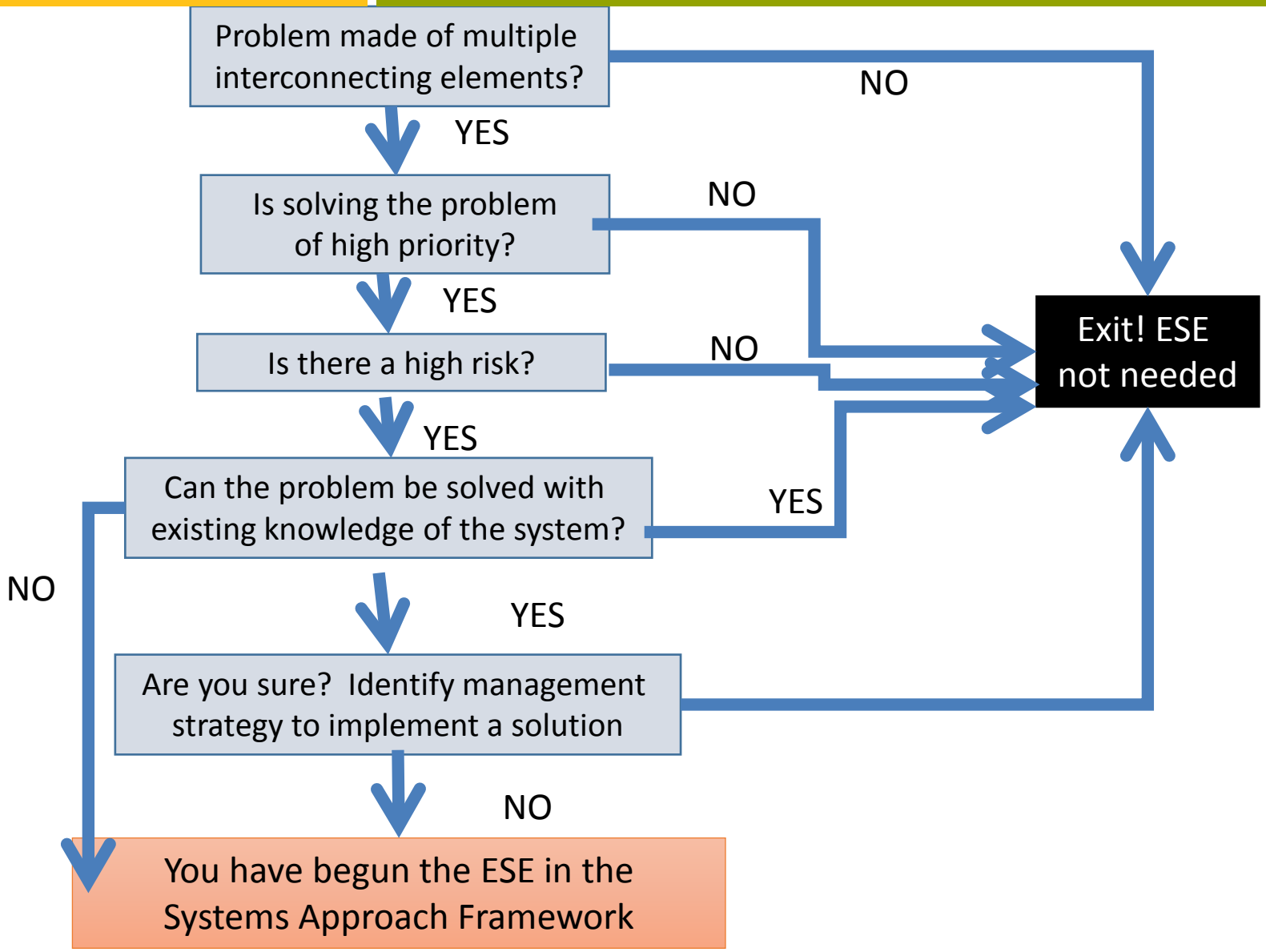
Systems Approach Framework

Systems Approach Framework (SAF)



Do we need to run an ESE assessment?



Systems Approach Framework

ISSUE Identification

- ✓List Human Activities (Preliminary actions)
- ✓Institutional Mapping (Preliminary actions)
- ✓Stakeholder Mapping
- ✓Form Stakeholder group (Reference group)
- ✓Agree Issue and rank importance with Stakeholder group
- ✓DPSIR & CATWOE
- ✓Identidy Social and Economic components relevant to the Issue
- ✓List the main Ecosystem Goods and Services.

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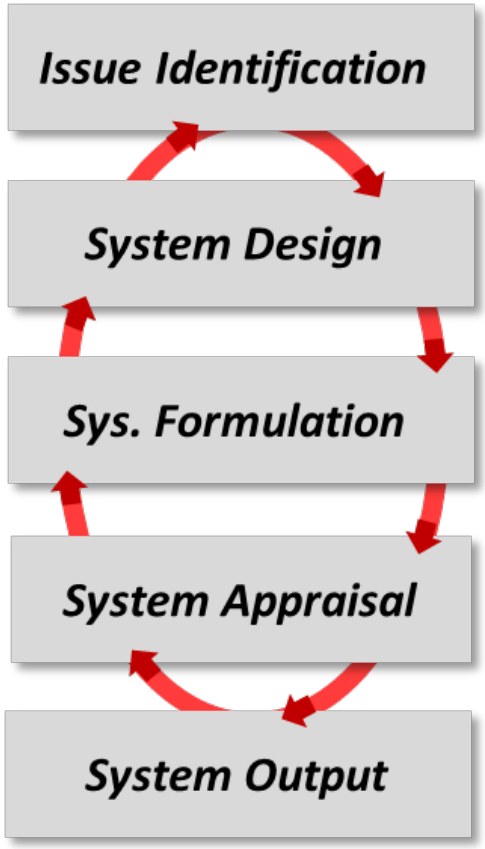

- System Definition
- Conceptual Model
- Data and Analytical Methods
- Problem Scaling

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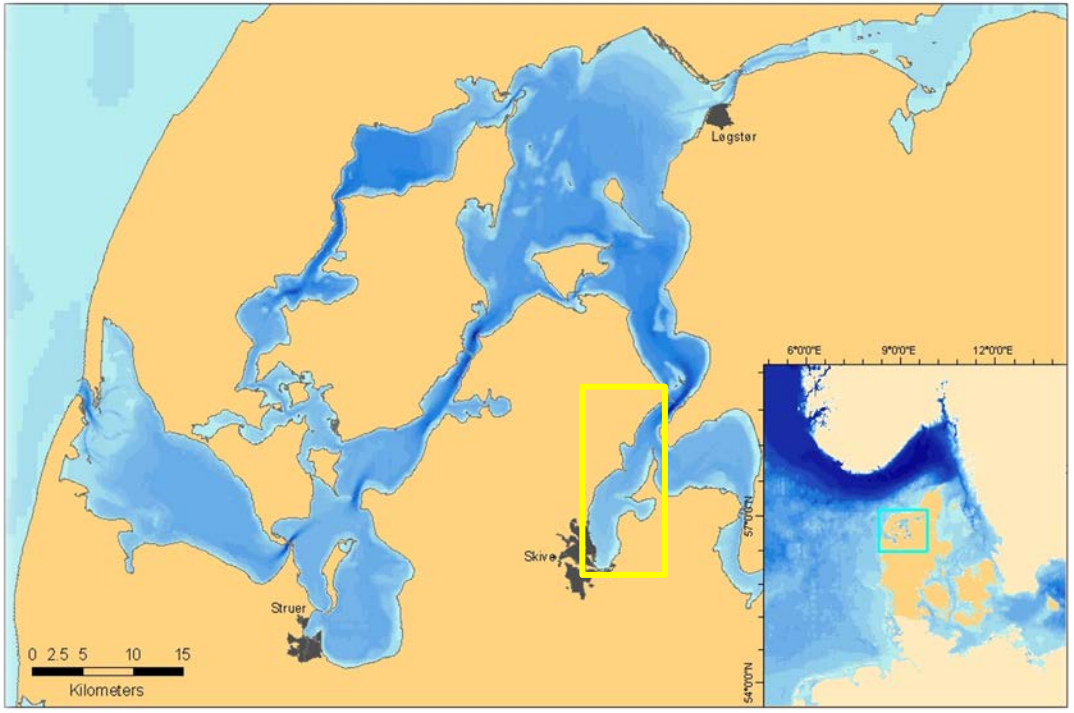
System Definition

- Define Virtual System (boundaries)
- Define Administrative boundaries
- Define linkages between the three ESE components



Geographic & virtual System

Limfjord: Social & Economic components

Skive Fjord: Ecological component

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System Definition

✓Define Virtual System (boundaries)

✓Define Administrative boundaries

✓Define linkages begtween the three ESE components

- Identify external hazards (risk of events that may happen that affect the Virtual system)
- State of the system and knowledge gaps

System Design – conceptual model

- Build a conceptual model (draw the main components in the real system that are relevant for the Issue and the Virtual System – inlcude the ESE linkages)

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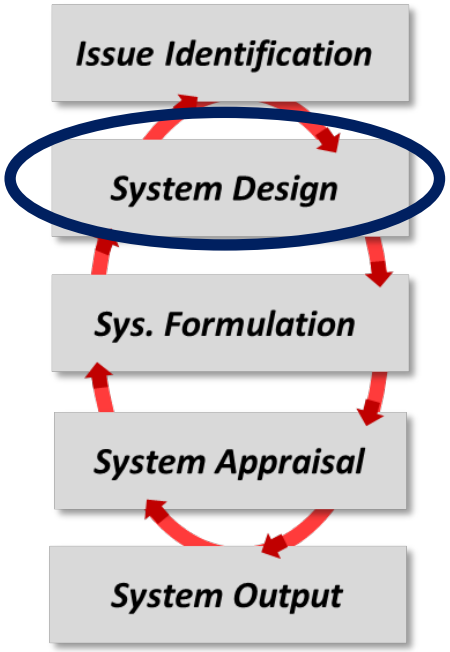
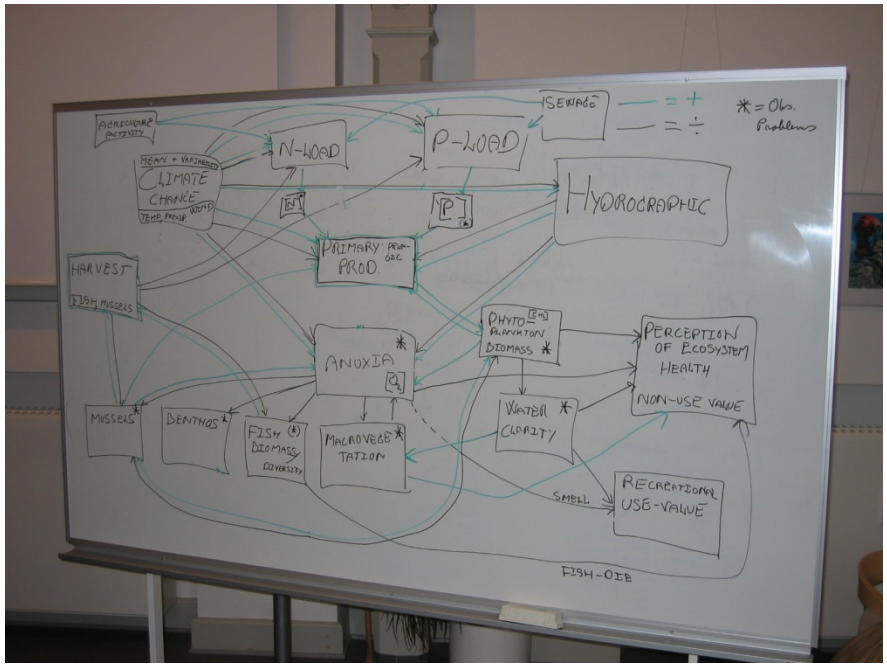
Conceptual model



The first attempt at a conceptual model



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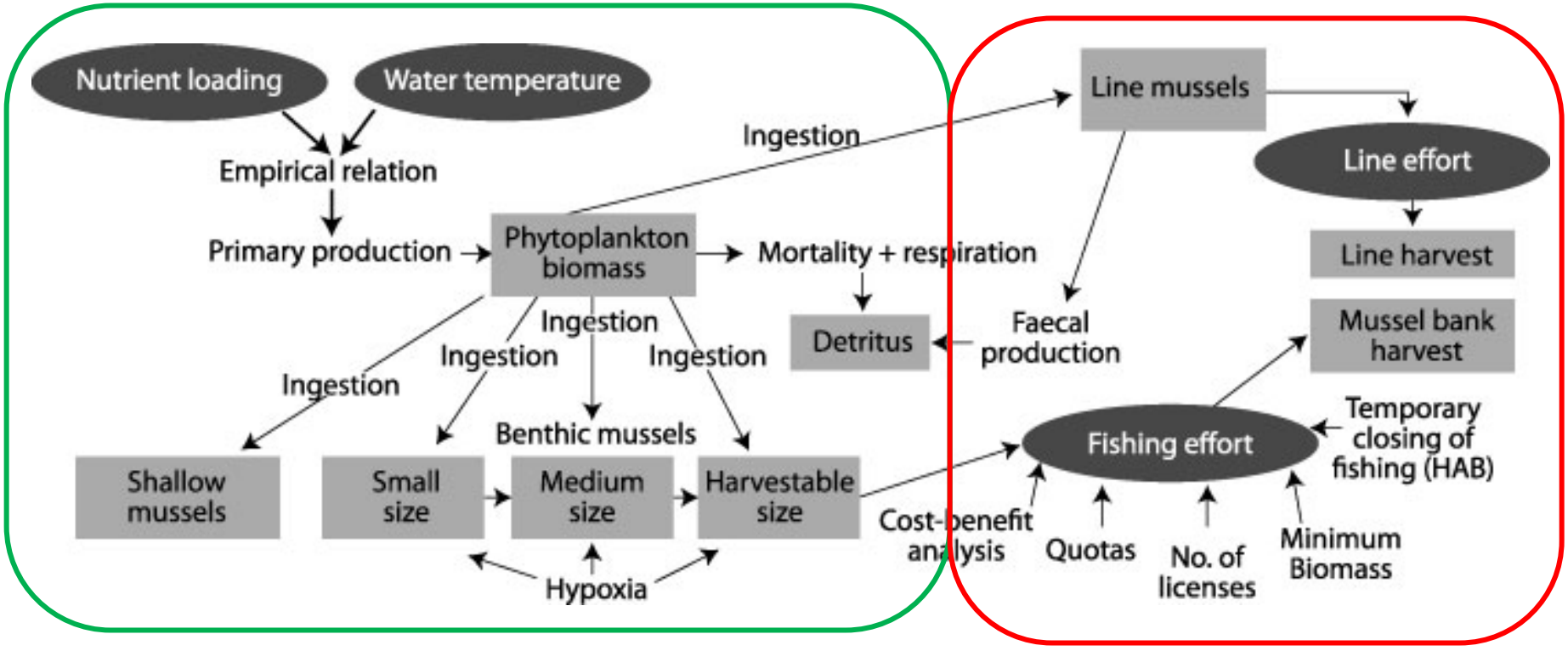
SYSTEM DESIGN - conceptual model developed



System Design

At some point in the development of the conceptual model is where you ask if :

1) you need a quantitative model?

2) you have enough data for such a model?

3) What can you do instead?

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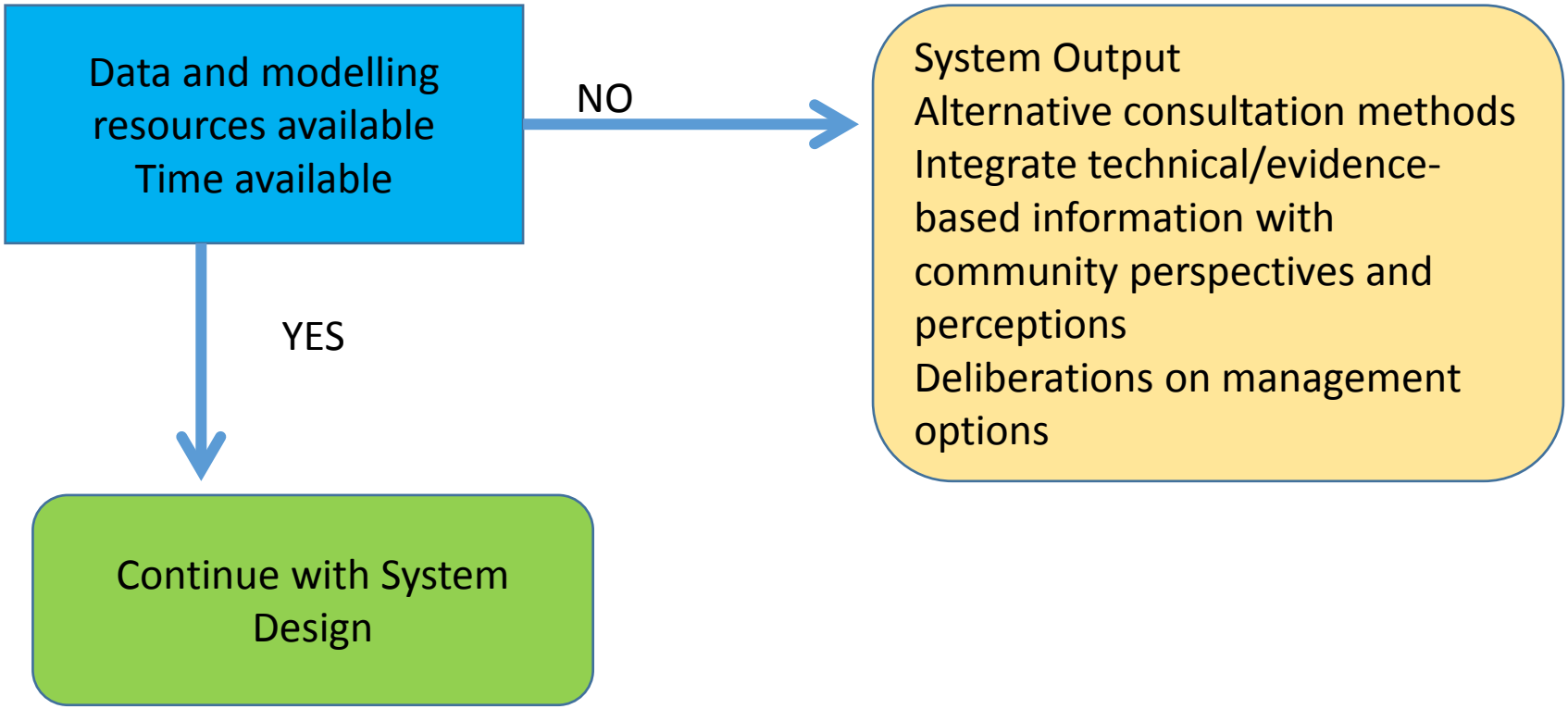
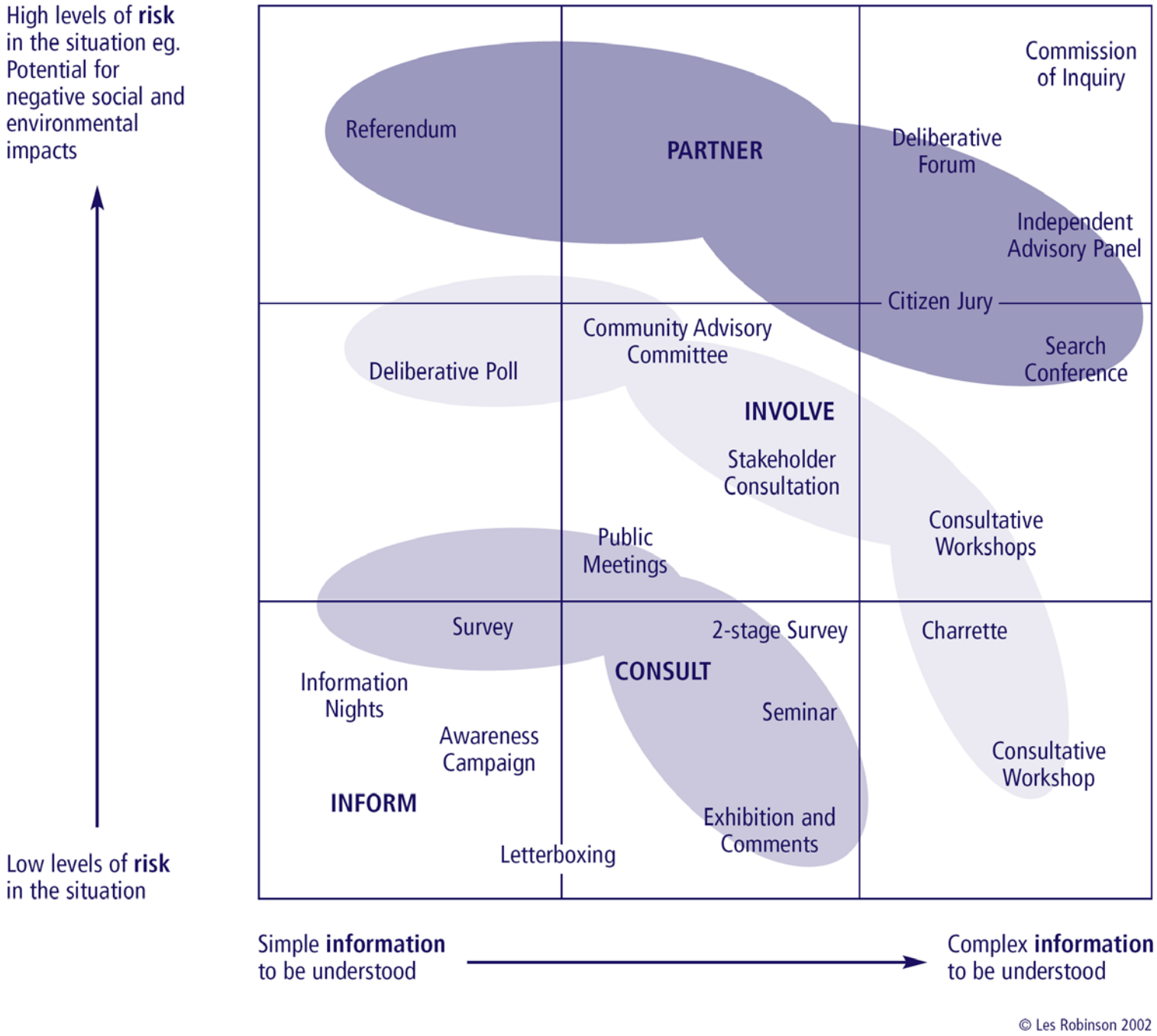
System Design





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RISK

According to Sandman (1986) risk can be divided into two elements:

Risk = Hazard + Outrage

Hazard = technical / evidence-based

Outrage = non-technical / community perspectives & perceptions

Both need to be taken equally seriously
Issue expertise + public input = good public policy

C. Gillgren 2006

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You have sufficient data and resources to set up a quantitative or semi-quantitative bio-socio-economic model.

Continue with System Design

System Design – from conceptual model to quantitative model

- Specify model outputs
- Identify the model variables useful for reliable simulations (time series of state variables or rates or more fuzzy variables)
- Specify system outputs for both qualitative and quantitative analyses

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System Design- data and methods

- Identify software methods and formats for ESE components
- Data mining and compilation

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System Design- problem scaling

- Adjust complexity of science in Virtual system for a feasible model
- Discuss how to present sub-model components to stakeholders (credibility, ownership)
- Discuss methods to run simulations with stakeholders or how to present model results to stakeholders for Systems Output (presentation, visualisation).

System Design-Exercise

- Make your conceptual model
- See how far you get in data, methods and problem scaling.

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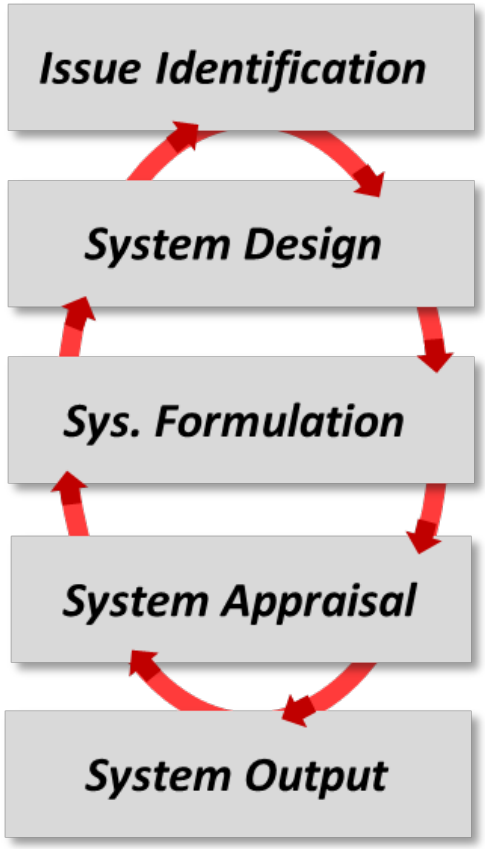
System Formulation



- Data preparations
- Build and test ESE model components
- Document the model components
- Validation and calibration

System Formulation

Data preparations

- Identify and assemble data inputs and variables
- Aquire, analyse and use of Input data
- What to do in absence of existing data?
- Clarify specifics of scenario choices with Reference Group
- Choose social responses linked to Ecological/Economic Component
- Consider if you need auxiliary models for specific processes

- Get data for ESE assessment
- Prepare a table with information on data
- Revise your conceptual model to better illustrate the bio-economic model

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System Formulation

Build and test model components

- Describe model processes and functions
- Make and test functional units
- Assemble and test simulation sub-models

- Describe the formulas used for each model block and component
- Describe software, auxiliary models
- Discuss results of calibration, hindcast simulation and sensitivity analyses

System Formulation

Document the model components (this will be as an Appendix to the report).

- document with references, data, rates and variables used.
- document changes made to your data/model and why

- General model description
- Scenarios chosen

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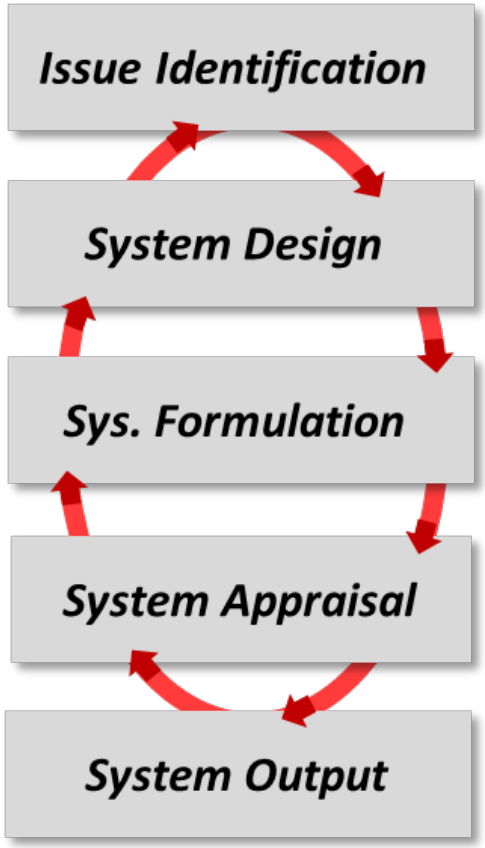
System Appraisal



- Linking ESE model components to generate ESE Systems model
- Calibration, validation and sensitivity tests
- Preparing scenario simulations
- Output preparation

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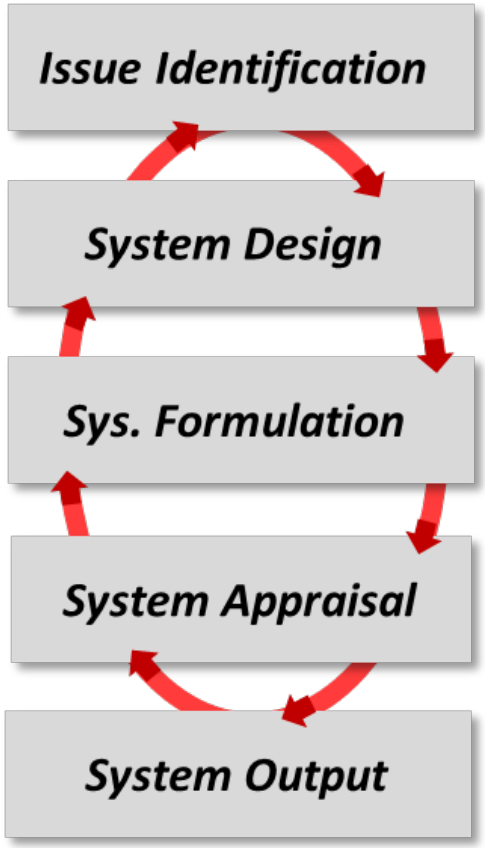
System Output



- Run scenario simulations
- Prepare for Stakeholder presentation of scenario results
- Conduct Stakeholder meeting and management option deliberations for Implementation

BONUS BaltCoast

Questions?

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