

## Our Land and Water National Science Challenge

*Toitū te Whenua Toiora te Wai*

# Land Use Suitability Programme

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Herzig, Amy Whitehead, Simon Harris, Tony Vanderweerden



# What is the need?

## **General observations**

- Managing primary enterprises within (resource use) limits is imperative.
- Land use choices, land management and contaminant losses occur at land-parcel scales... but contaminant transport, attenuation, and effects on values occur at catchment-scales.

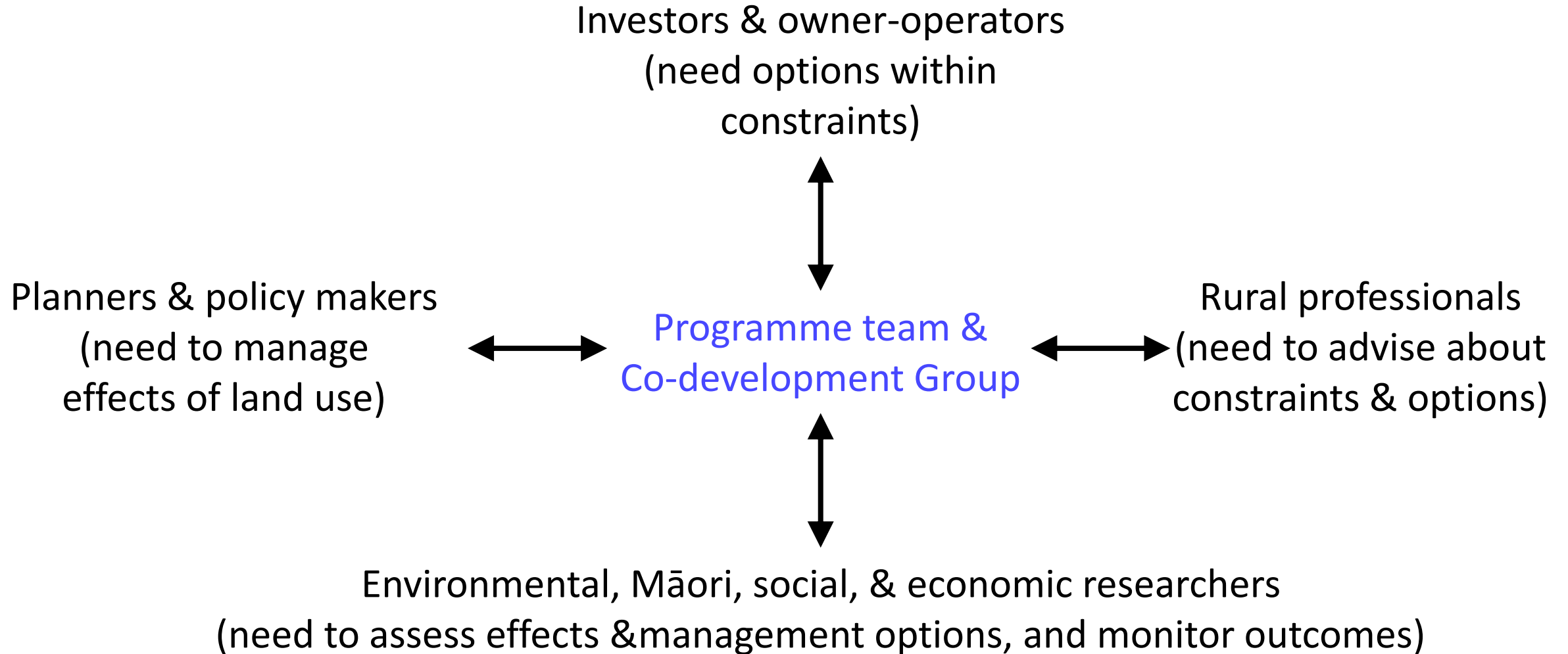
## **The need**

Concepts and tools that account for land-use suitability (LUS) in plans, decisions, investments.

## **Basic requirements**

- Provides feedback about receiving-environments responses to land-use considerations.
- Identifies options for stakeholders, who need to manage within limits, cost-effectively.
- Mapable and predictive.

# Who are we working with?



# How is the programme structured?

Project 1. The LUS concept

Project 2. Resilience & interventions in receiving environments

Project 3. Critical points

Project 4. Climate change impacts on land use suitability

Project 5. Land Use Suitability Spatial Explorer

**Strawperson**



**Co-develop with  
stakeholders**



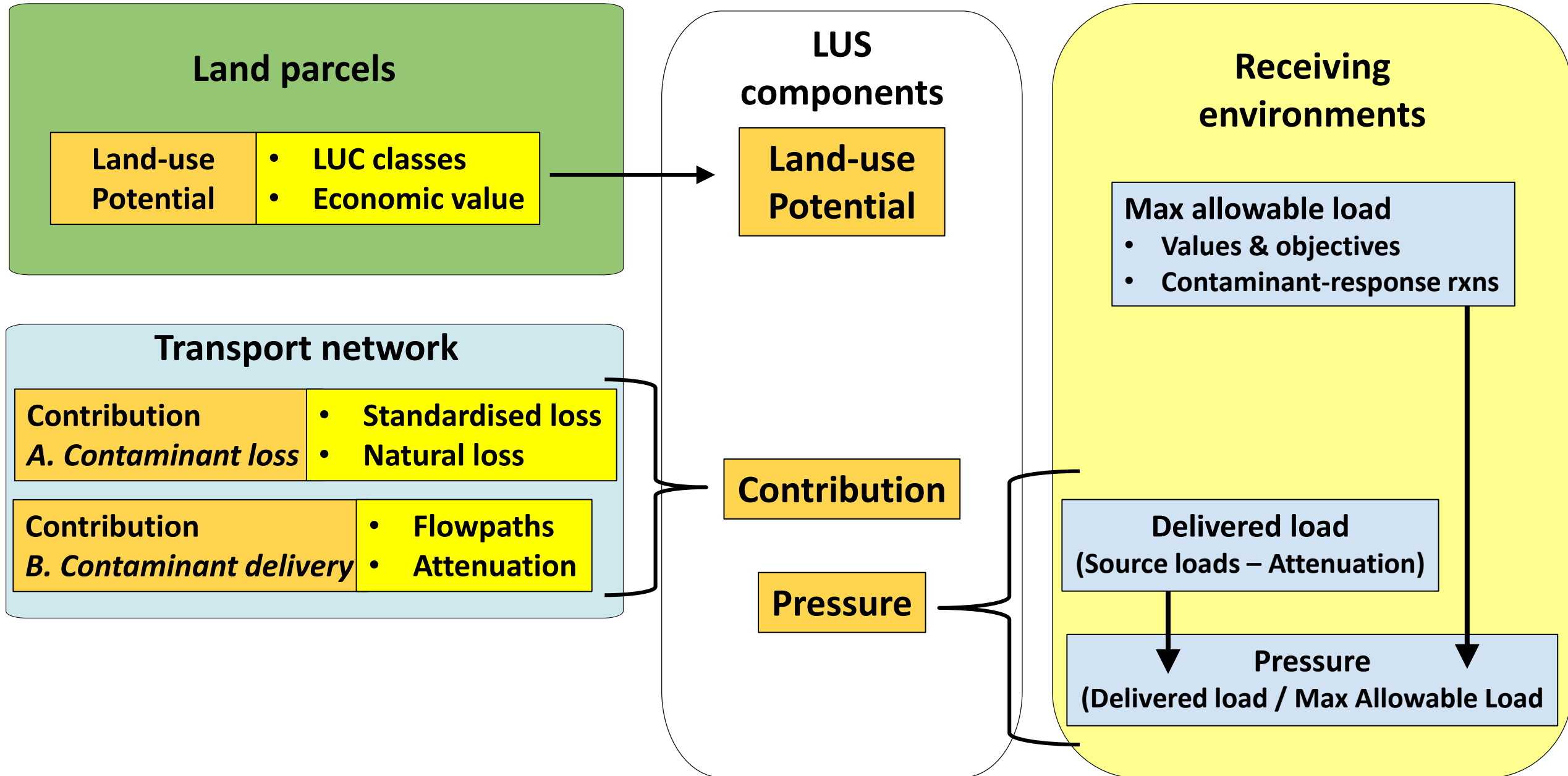
**Discussion  
paper**



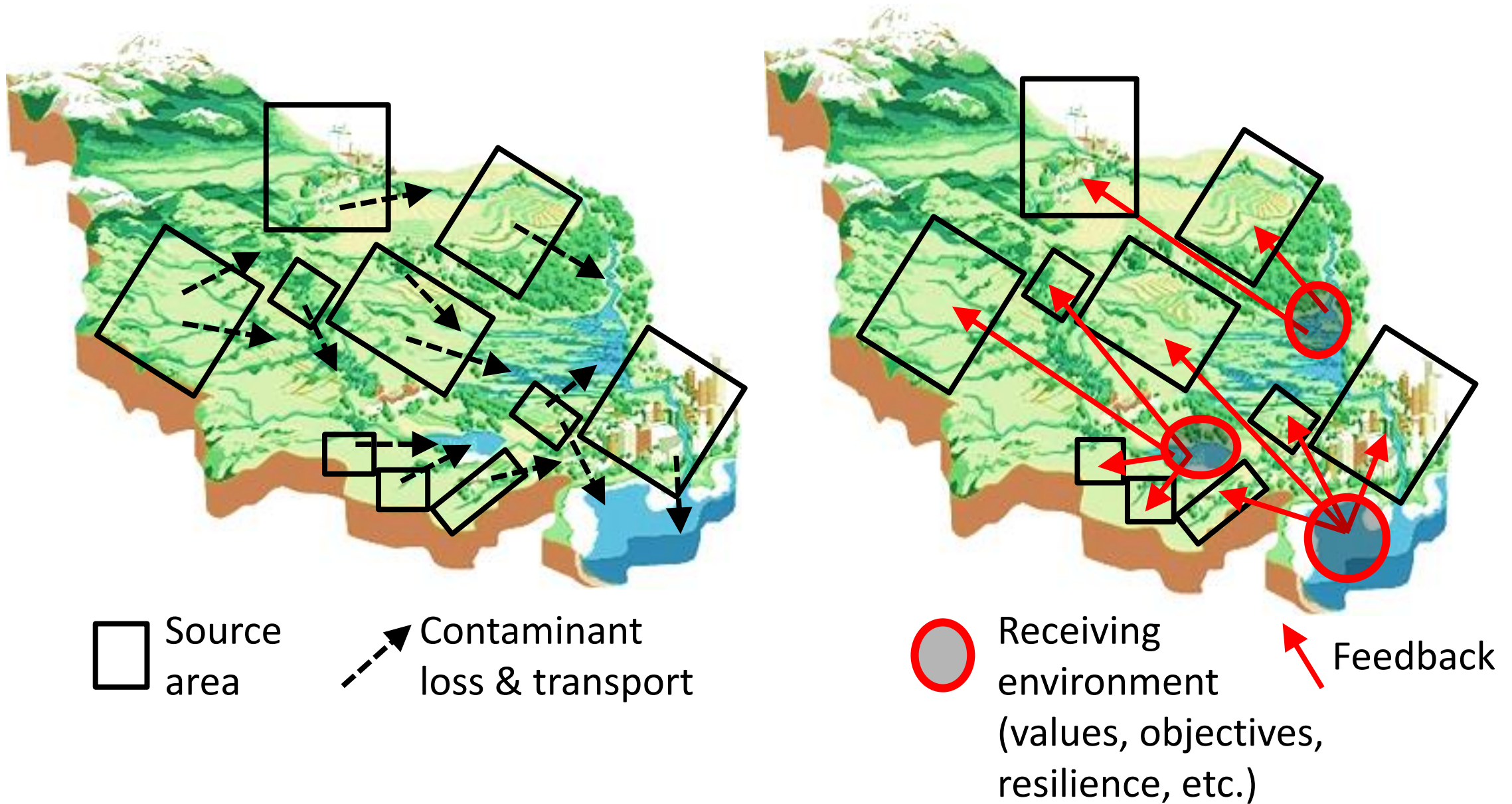
**Prototyping  
Case studies  
Collaborative projects  
Socialisation**



# The Land-Use Suitability Concept



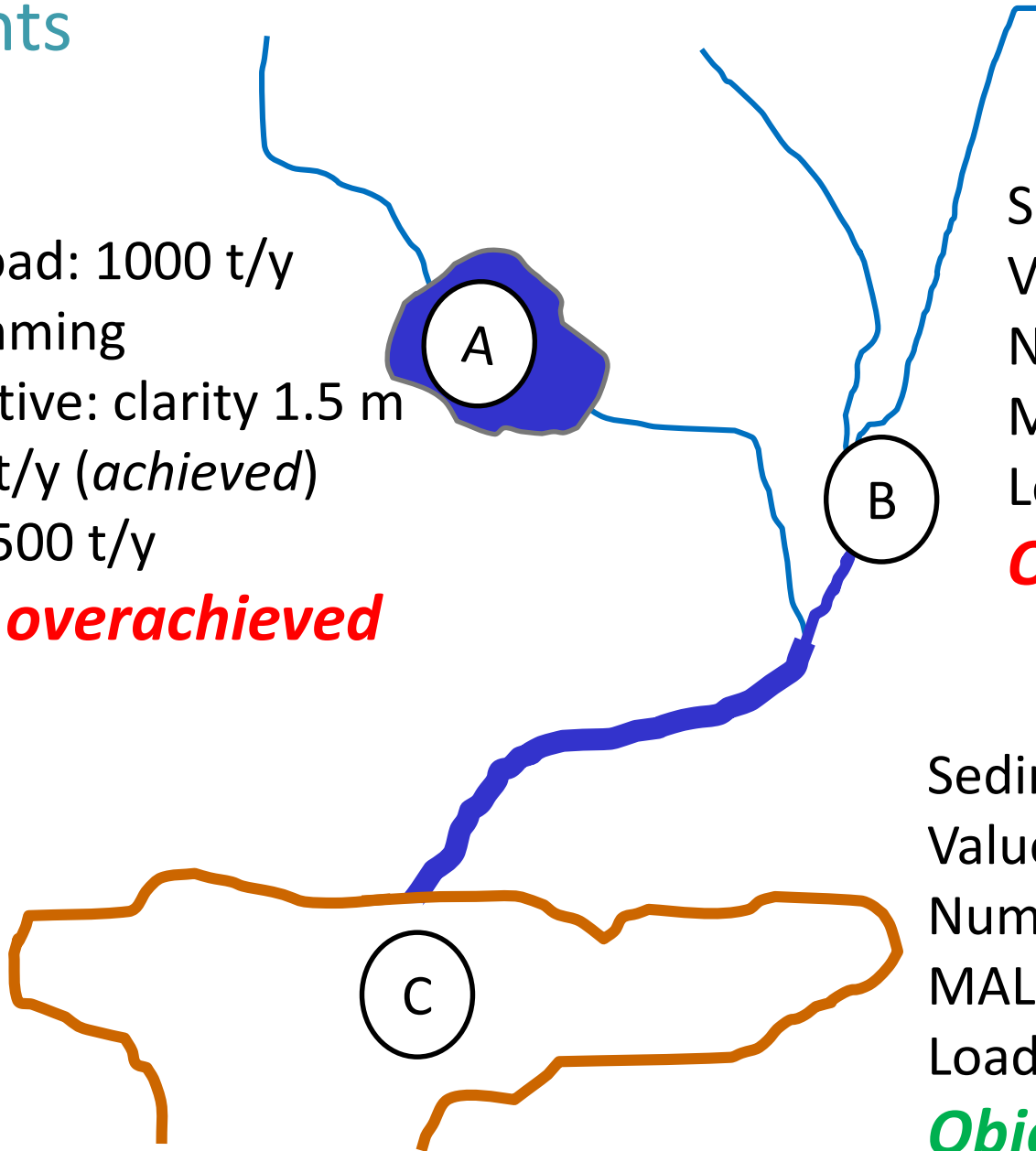
# Feedback from receiving environments to land use decisions at source areas.



# Critical points

Sediment load: 1000 t/y  
Value: swimming  
Num. objective: clarity 1.5 m  
MAL: 1500 t/y (*achieved*)  
Load limit: 500 t/y

***Objective overachieved***



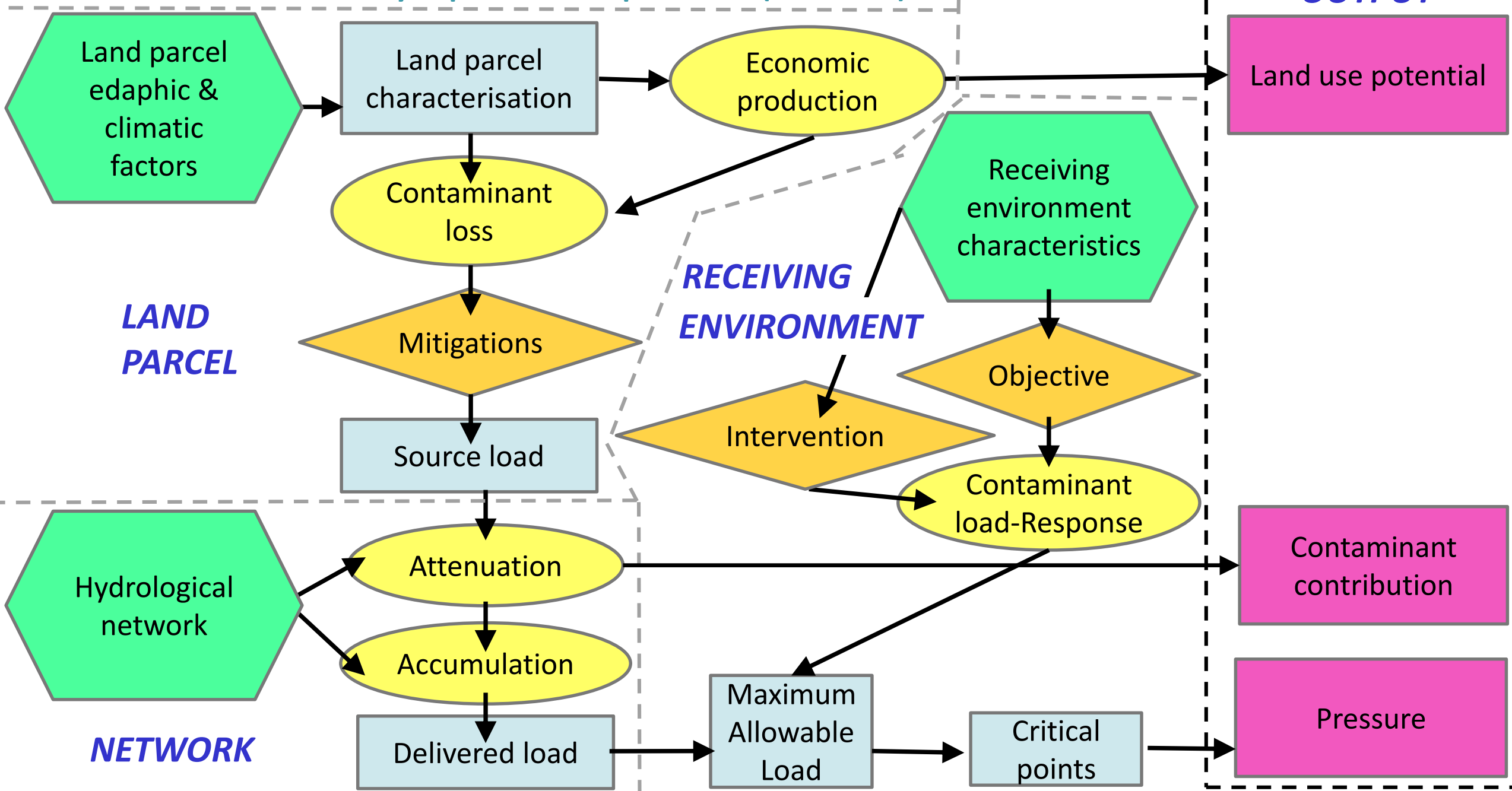
Sediment load: 1000 t/y  
Value: ecosystem health  
Num. objective: sediment cover 10%  
MAL: 1200 t/y (*achieved*)  
Load limit: 500 t/y

***Objective overachieved***

Sediment load: **2000 t/y**  
Value: shellfish  
Num. objective: sedimentation 1 mm/y  
MAL: 1000 t/y  
Load limit: 1000 t/y

***Objective exactly achieved***

# Land use suitability spatial explorer (LUSSE)





# OLW-Deep South joint project

Incorporating climate and climate change in land-use suitability

Theme 1 OL&W)  
Climate Attributes  
in Land Suitability

Theme 2 (DSC I&I)  
climate change scenario  
& socio-economic  
implications

- Workshop to define scope & assessment framework
- Identify climate attributes affecting LUS (production & environmental impacts)
- Develop hypotheses for Theme 2

- Biophysical modelling
- Climate change scenarios
- Change in LUS due to climate change
- Decision making implications

# Vision Mātauranga in the Land Use Suitability programme

## Aim

Contribute to mātauranga-Māori-based systems that facilitate the incorporation of Māori values into land use decisions and investment planning.

## Milestones

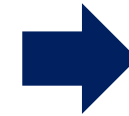
- Māori conceptions of the resilience of wahi taonga that are subject to land use pressures are compiled through interviews.
- Relationships between land use pressures and iwi-based environmental health ratings are assessed for South Island waterways.
- LUSSE is linked to a land evaluation system for Te Taitokerau being developed by the Te Tumu Paeroa land development team.

# How are we engaging and co-developing with end-users?

**Co-develop with  
stakeholders**



**Discussion  
papers**



**Socialisation**

## Co-development group

Representatives from Beef & Lamb, Dairy NZ, Fert NZ, Fonterra, Rabobank, Environment Canterbury, Ministry for the Environment, Environment Southland, Horizons Regional Council, Waterways Centre, University of Waitako, Department of Conservation



Thank you

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National  
**SCIENCE**  
Challenges





## Benefits of land use suitability in planning & decision-making

### **Owner-operators and investors**

Enables long-term planning

Rural valuation

Future proofing (e.g., for evolving limits)

### **Catchment communities**

Enables achievement of catchment objectives

Management of ecological, economic, social & cultural values

### **National communities**

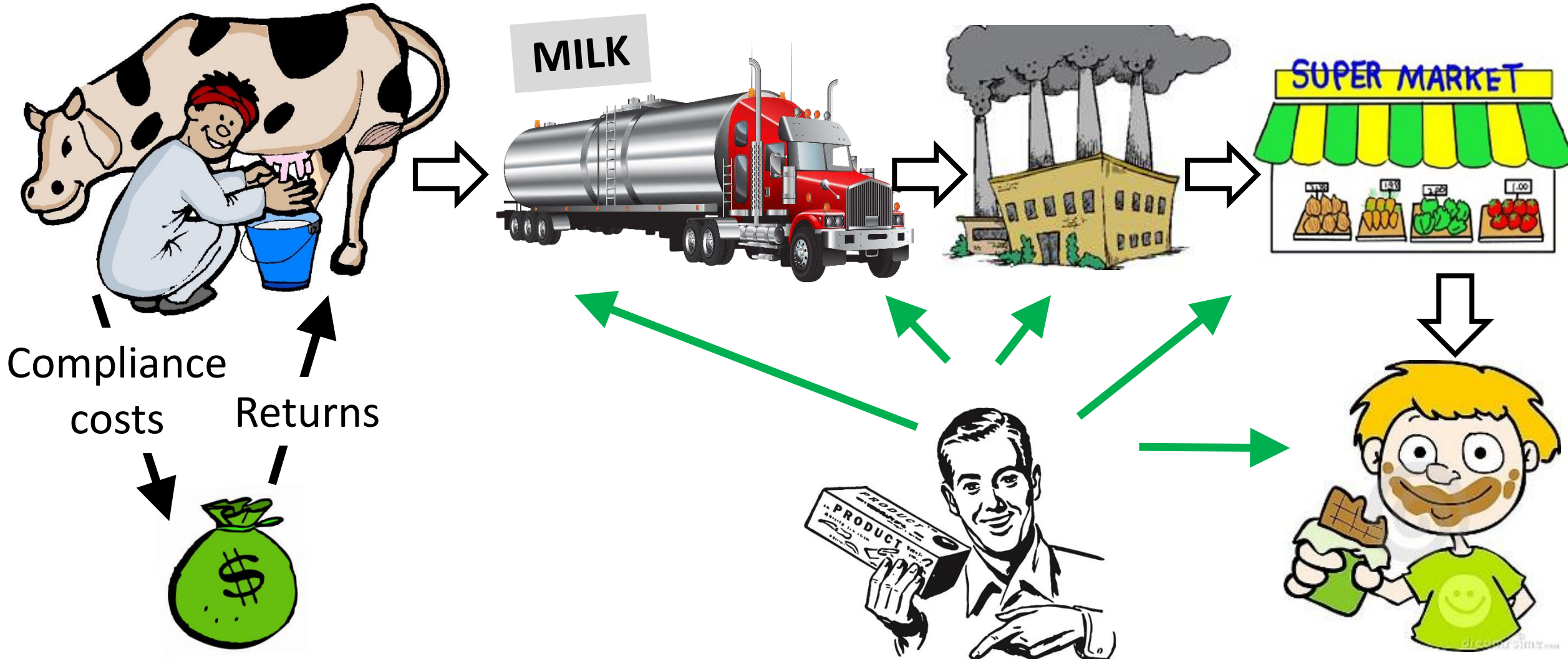
Enables achievement of national objectives

Standardised approach for land use planning

# How does the LUS programme Integrate With the Value chain concept?

Land use is the first step in the PP value chain.

Producers can only produce if the costs of managing to environmental limits (i.e., reducing contaminant losses) are offset by economic returns.





# How does the LUS programme integrate with the value chain concept?

Key requirements set out by the Challenge Directorate

Better understanding of the ways in which production systems **interact with and are limited by environmental systems and processes.**

Identification of high productivity land use options which sit comfortably within those environmental constraints.

Processes and tools for decision making about productive landscapes that fully **use the wisdom of communities and cultures.**

## Research team

Scott Larned, Richard McDowell, Ton Snelder, Marc Schallenberg, Mal Green, Clint Rissmann, Mike Beare, Gail Tipa, Shannan Crow, Chris Daughney, Alex Herzig, Amy Whitehead, Simon Harris, Tony Vanderweerden

## Stakeholder partner

Graham Sevicke-Jones – Environment Southland

## Co-development group

Representatives from Beef & Lamb, Dairy NZ, Fert NZ, Fonterra, Rabobank, Environment Canterbury, Ministry for the Environment, Environment Southland, Horizons Regional Council, Waterways Centre, University of Waitako, Department of Conservation