

Projected changes in land use in the lowland case study

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Input scenarios

SSP
scenario

Shared Socio-economic Pathways (SSPs)

describe future global socioeconomic conditions including emissions of GHG

RCP scenario

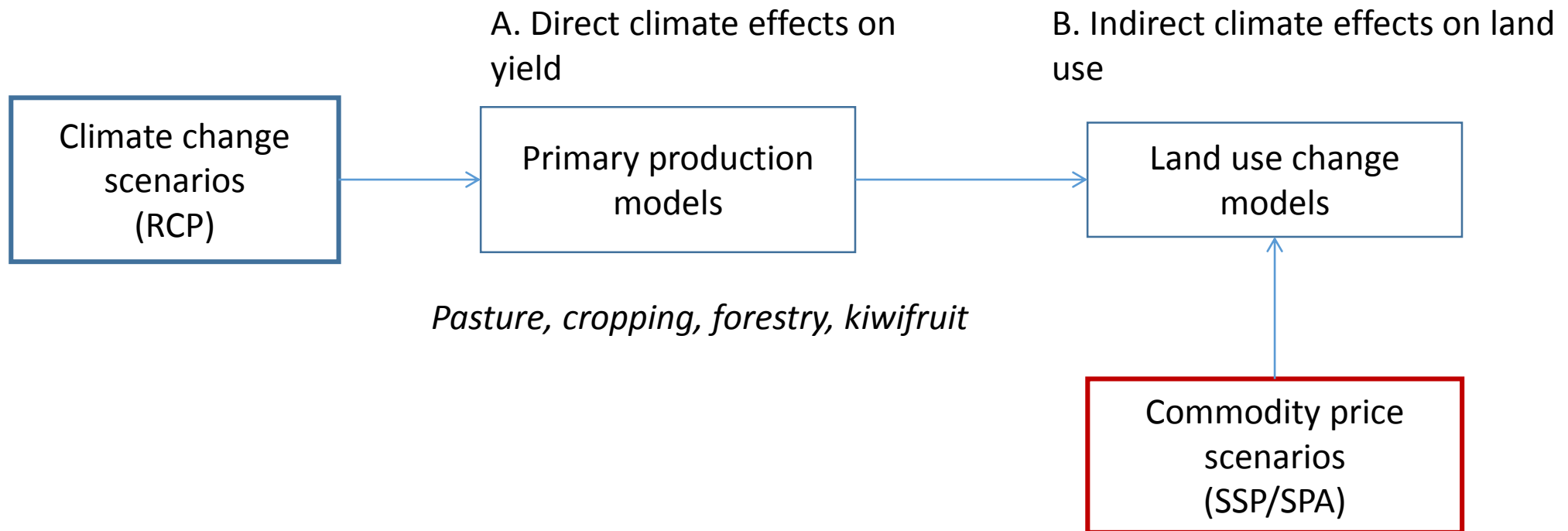
Representative Concentration Pathways (RCPs) describe the global atmospheric radiative forcing associated with varying levels of GHG concentrations

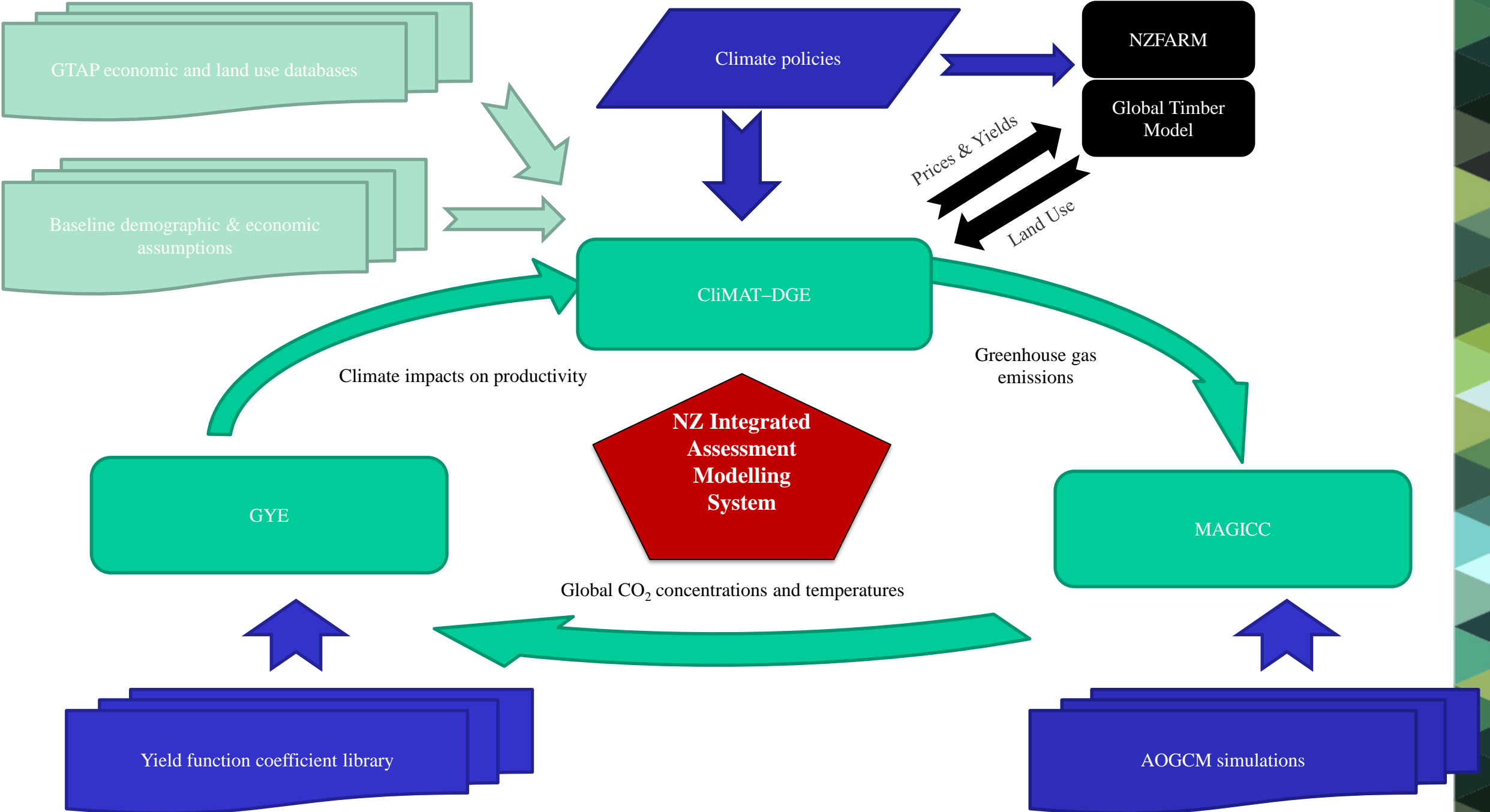
SPA scenario

Shared climate Policy Assumptions (SPAs)

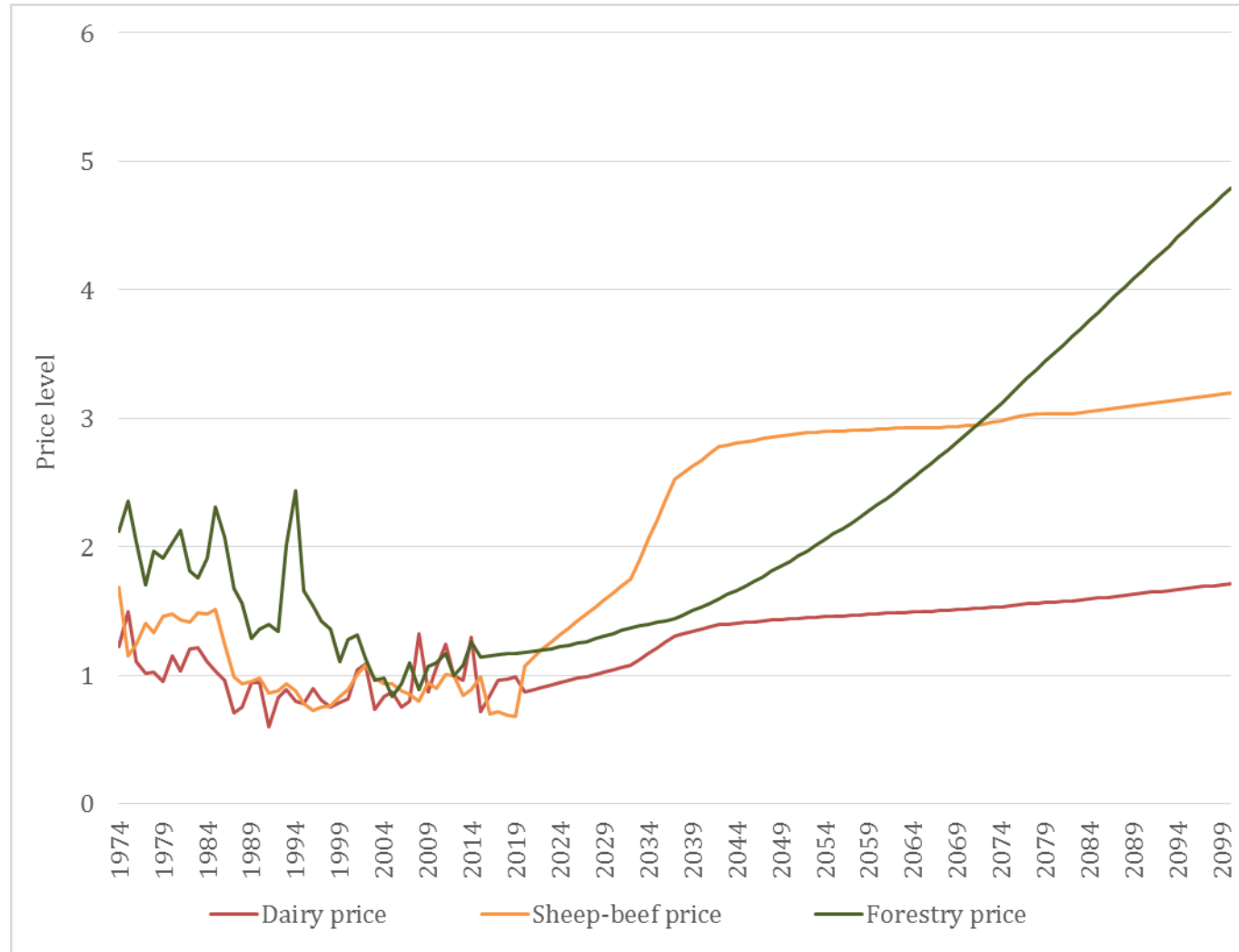
describe potential climate change mitigation and/or adaptation policies specific to New Zealand

Modelling approach

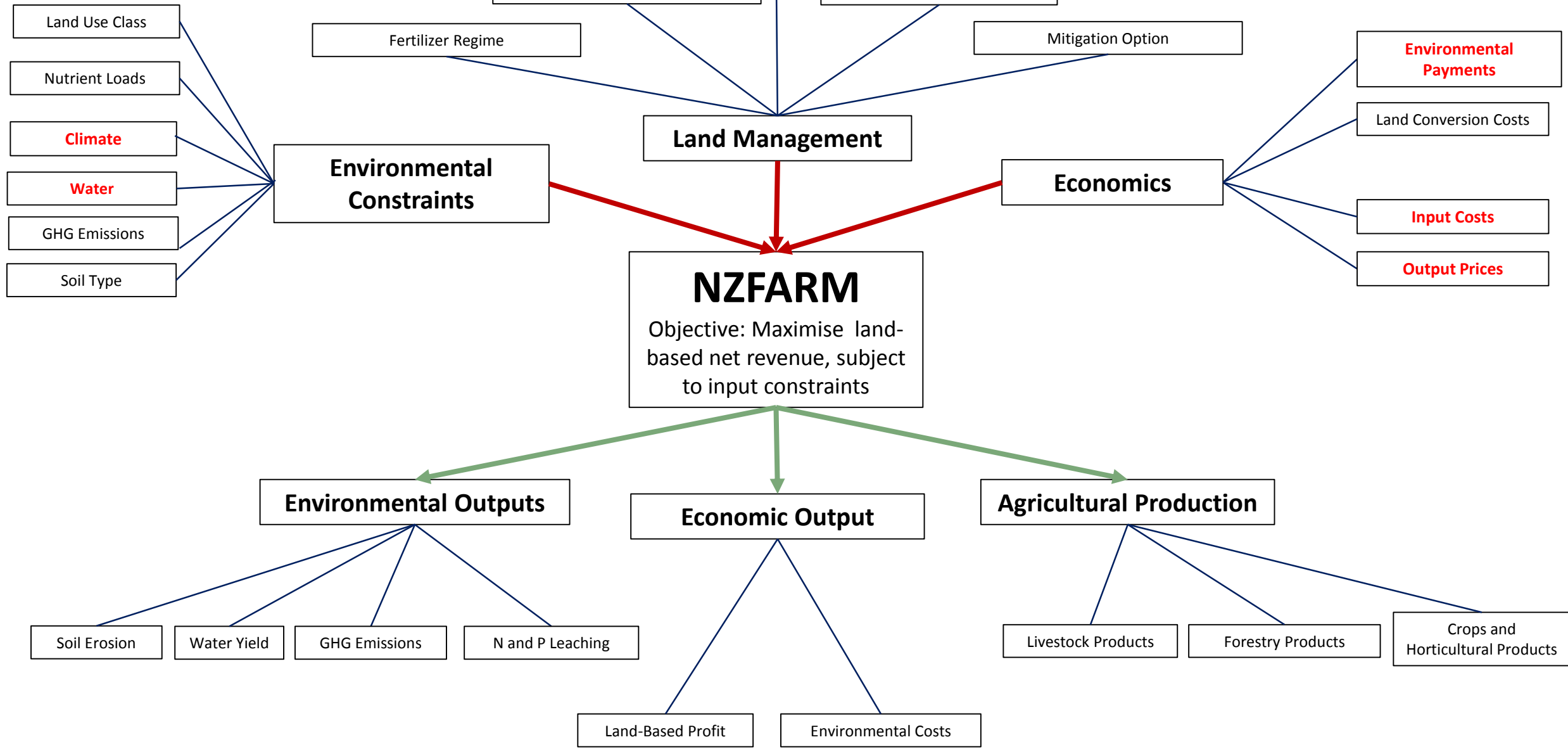




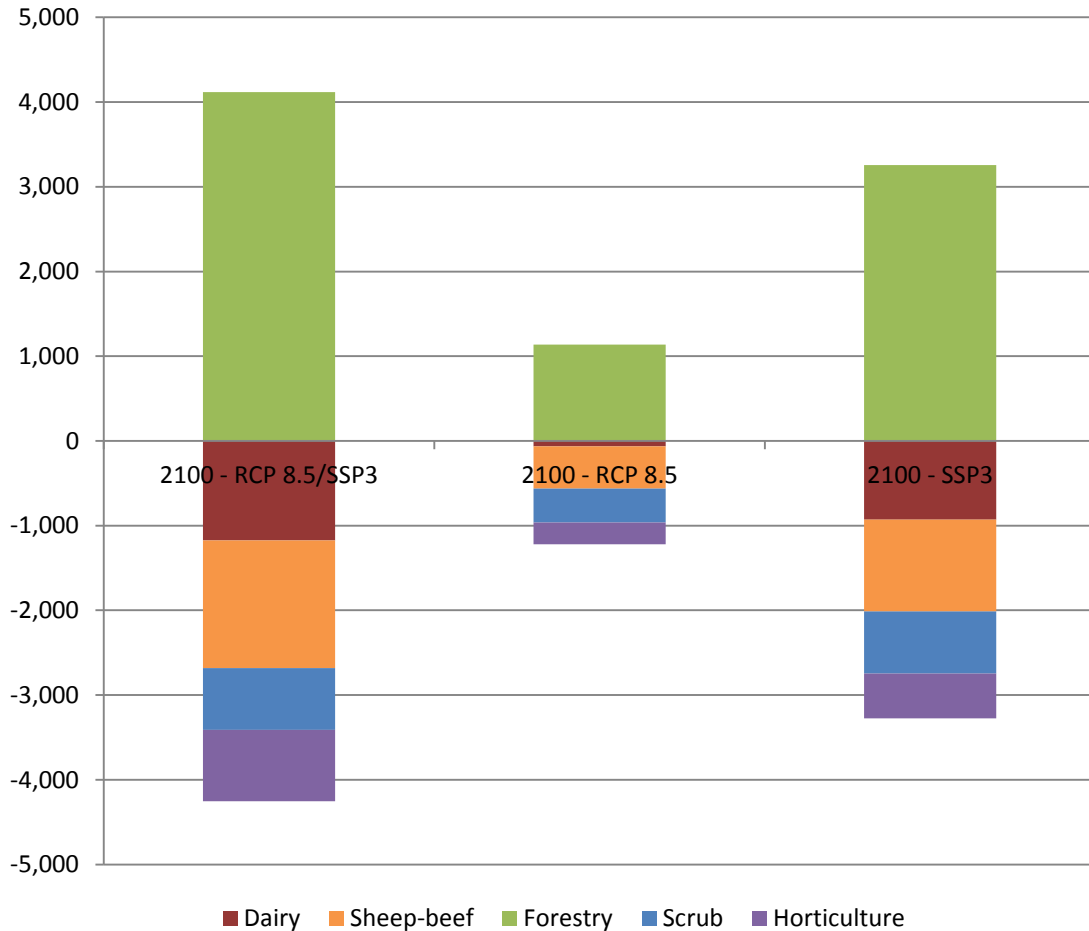
Output for commodity prices (SSP3)



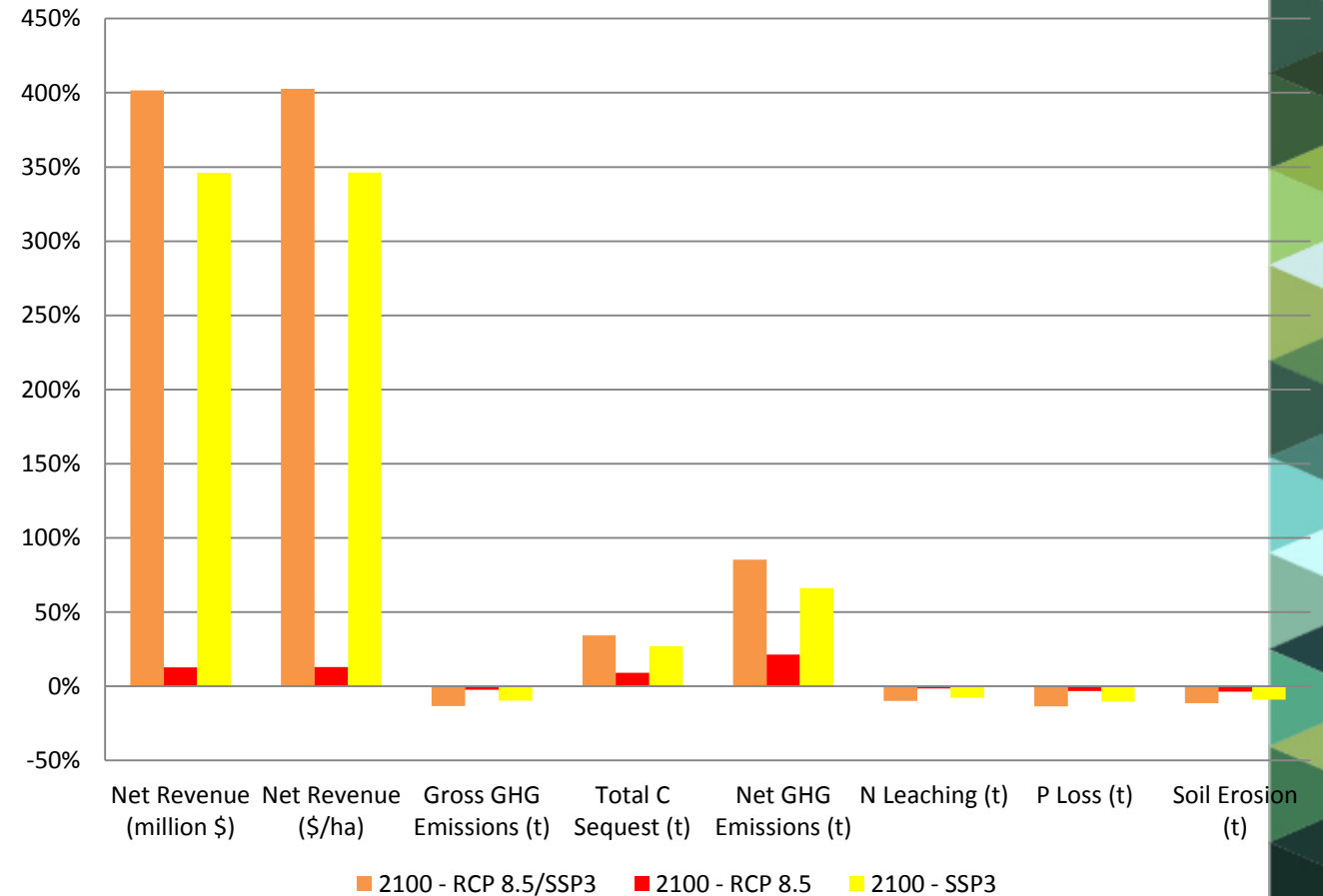
CCII: Adjusted prices and yields



Results – NZFARM (RCP8.5/SSP3)

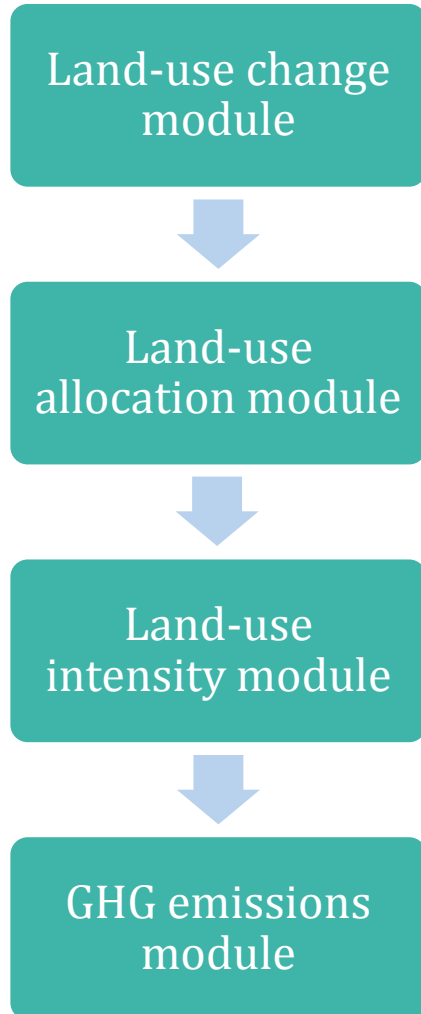


HadGEM2 - RCP 8.5 SSP 3 NZFARM Estimates - Kaituna Catchment
% change from 2015 baseline yields and prices

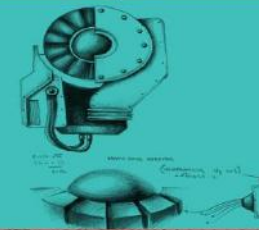


LURNZ

Land Use in Rural New Zealand

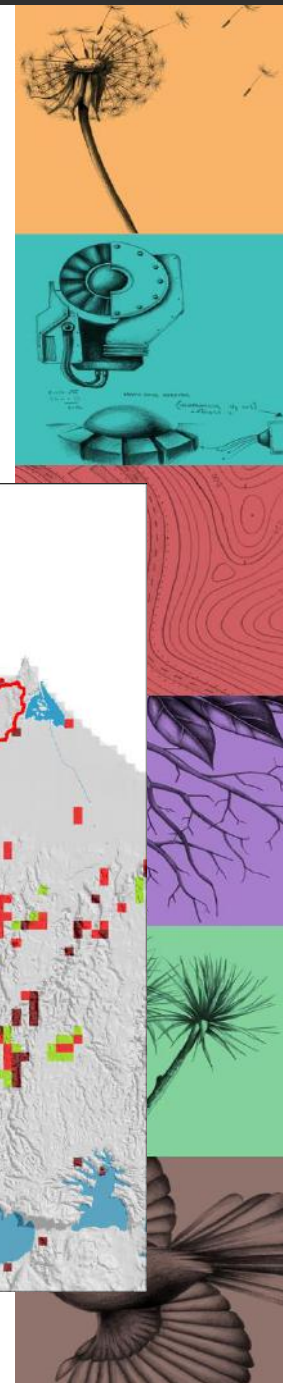
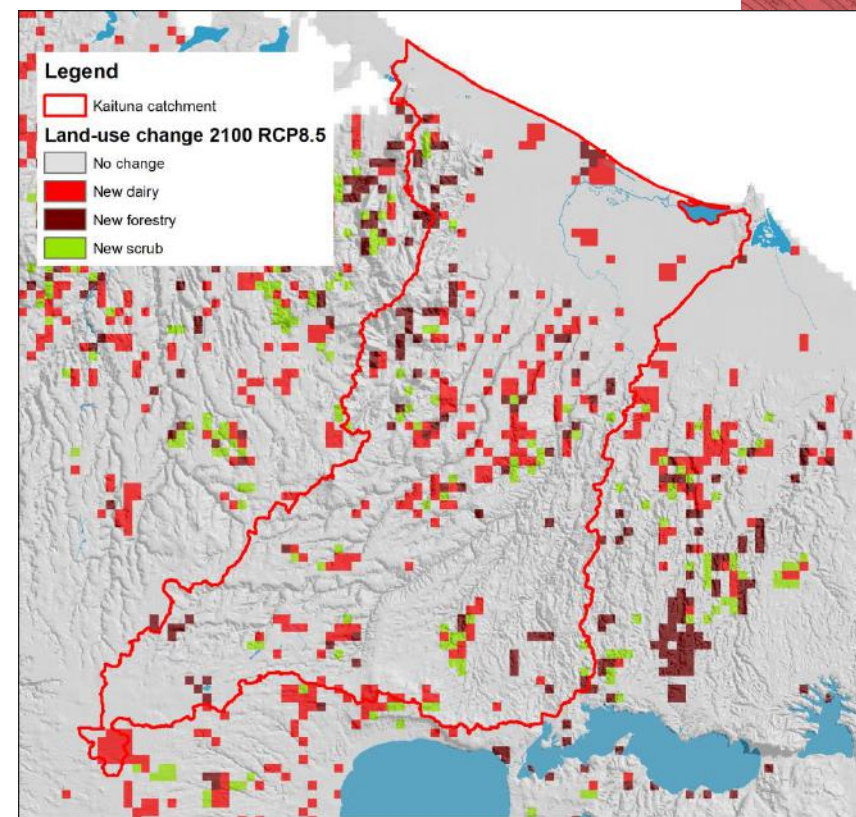
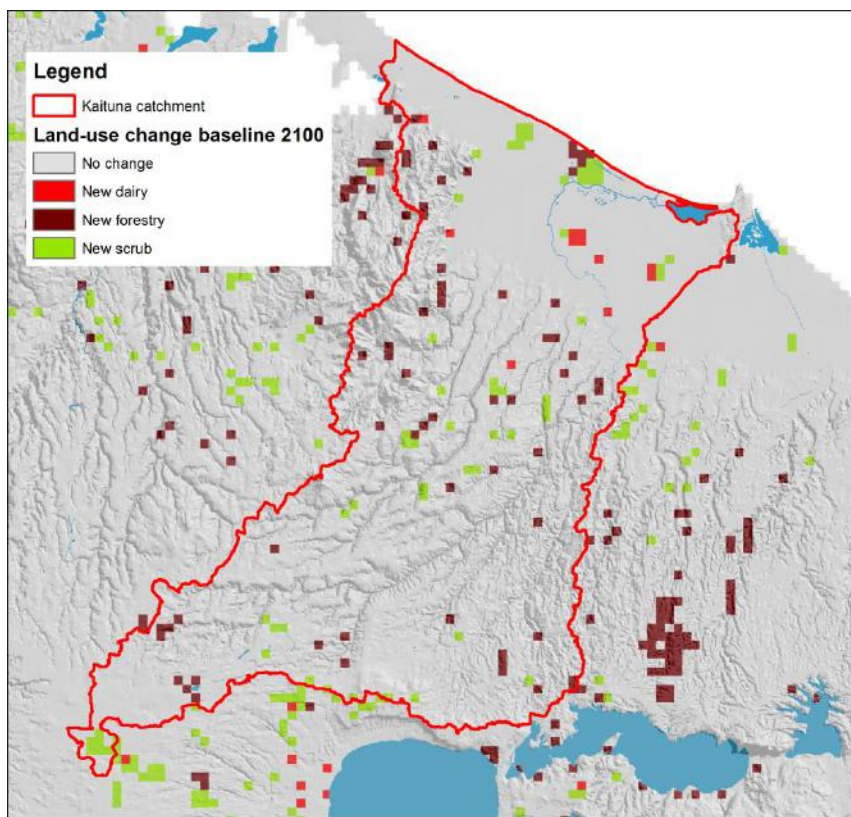
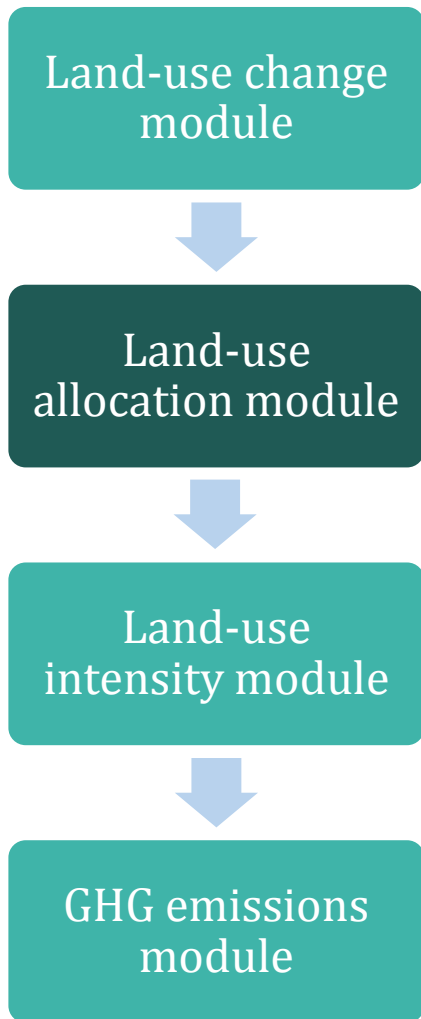


- Spatially explicit econometric model of land use in New Zealand
- Simulates annual changes in dairy, sheep-beef, plantation forestry and scrub in response to commodity price changes
- Spatially allocates land use change based on physical characteristics



LURNZ

Land-use allocation module



Results LURNZ



Key differences NZFARM/LURNZ

	NZFARM	LURNZ
Land uses	Dairy, sheep/beef, crop, forestry, kiwifruit, others	Dairy, sheep/beef, scrub, forestry
Objective	Maximise farm profit (economic-driven only)	Calibrated on historical land-use changes (empirical, mix of socio-economic drivers)
Outputs	Area share Coarse spatial allocation Environmental outputs Economic outputs	Area share Spatial allocation
Climate change impacts	Yield-change for cropping, dairy, sheep/beef and forestry	Yield changes for dairy, sheep/beef
SSP scenario	High forestry prices, most profitable	Historical legacy

Framework to assess impacts and implications

SSP
scenario

RCP
scenario

SPA
scenario

Resources

Demographics

Economic development

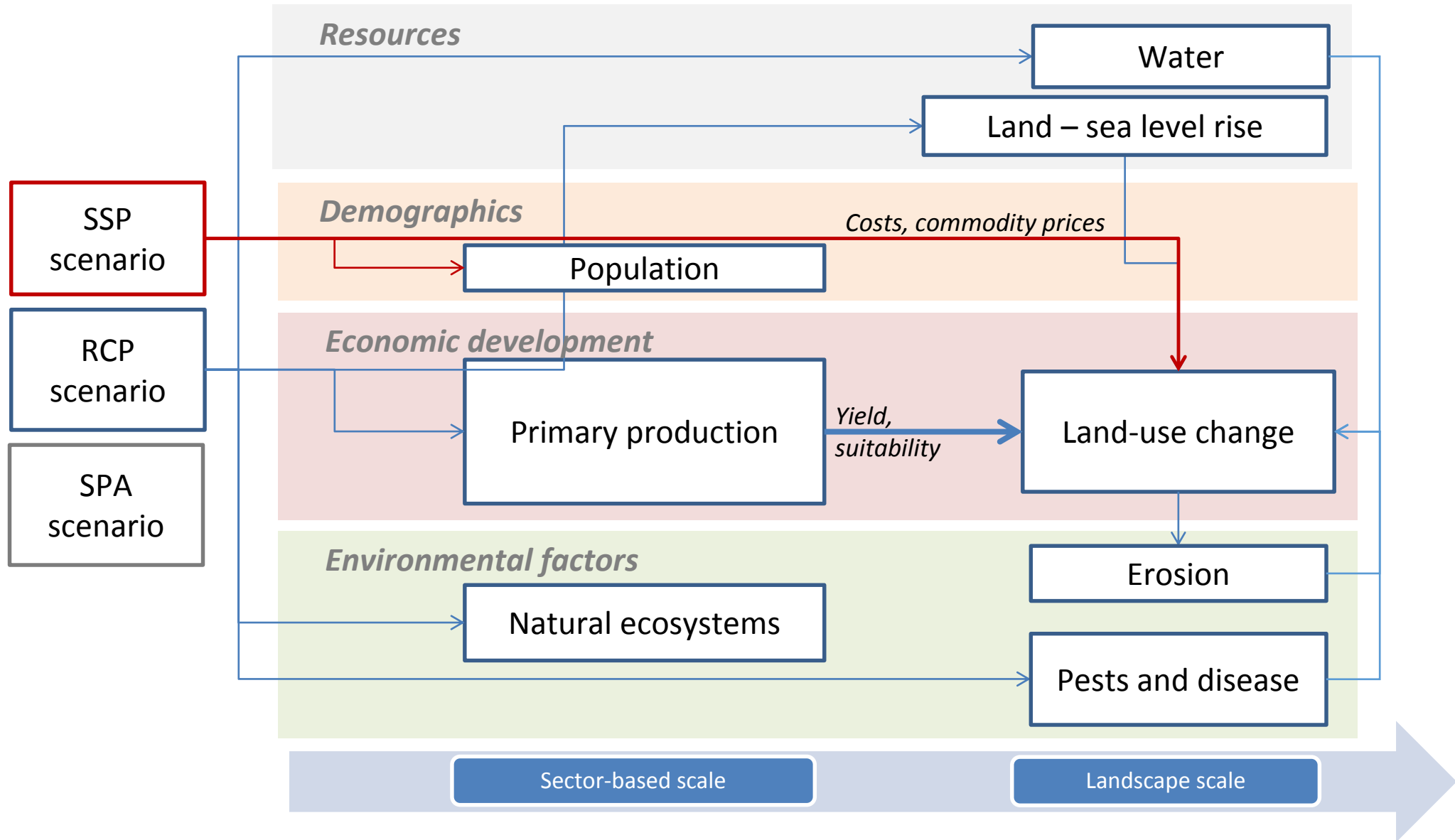
Environmental factors

*Welfare, institutions, technological development,
Broader societal factors, policies*

Mixing
quantitative and
narrative statements

narrative statements

Framework to assess impacts and implications



Sea level rise – land at risk



Results: RCP8.5/3/A

Resources:

*Fuel cost increase,
Loss of productive land due to sea level rise*

Demographics

Aging population, rural population declining

Economic development

*Decline in economic health
Food security a major driver, increasing likelihood of
local markets
Increased cost of production*

Environmental factors

*Reversion to natural wetlands?
Increased risk of pest invasion, sedimentation, water diversion*

***Welfare, institutions, technological development,
Broader societal factors, policies***
*Increased risk of flooding due to limited investment in infrastructures
Decline in coastal property values
No new climate change mitigation option development
Disconnection from nature
Ad hoc coastal protection*



Thanks for your Attention!

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