National Market-based Instruments Pilot Program

Improving Water Quality in the Lockyer Creek catchment: Stakeholder Demonstration Workshop

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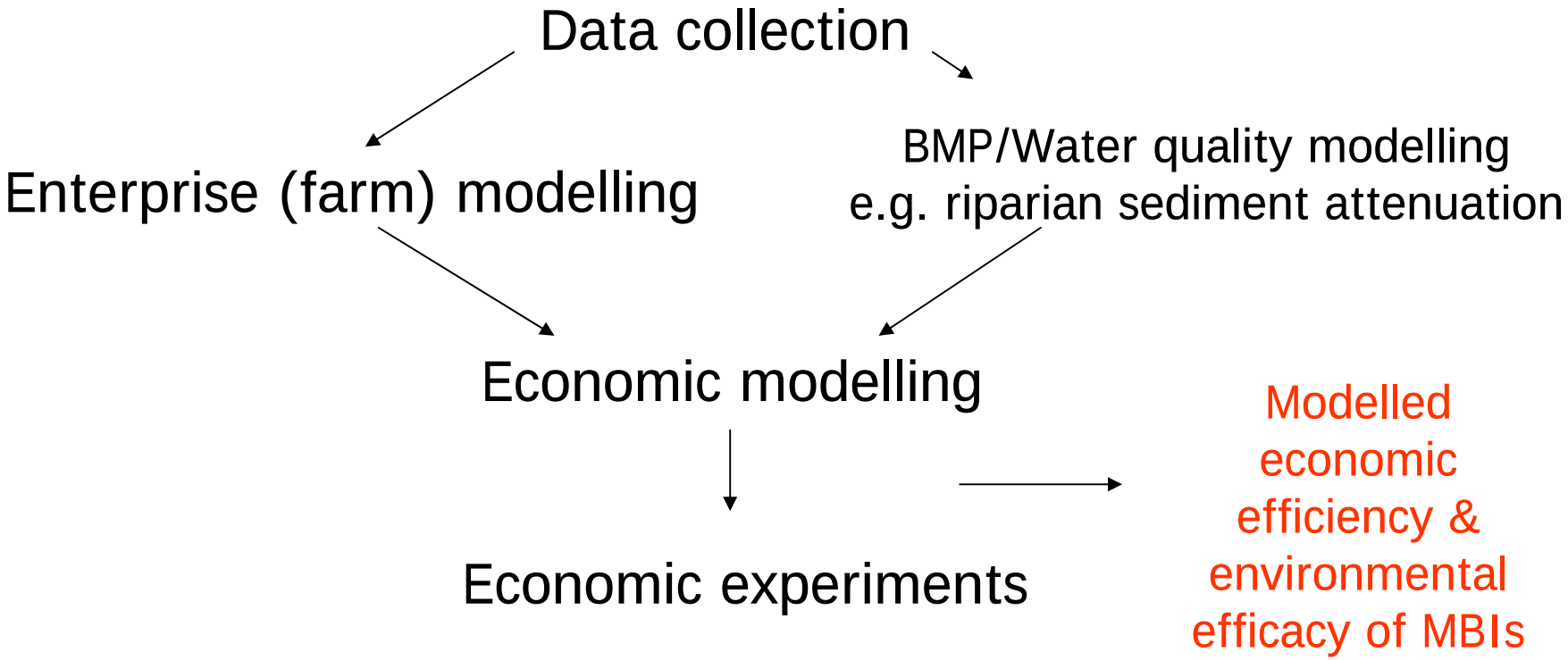
Overview

- Project background
- Methodology
  - Data
  - Modelling
- Experimental design
- Pilot market: ‘hands on’
- Preliminary results

Project Background

- Part of the National Action Plan for Salinity and Water Quality:
  - Funded as part of the National Market-based Instruments Pilot Program Round 2 projects
- Lockyer Creek catchment – one of the priority catchments in Queensland
- The aim of this project is to explore the ways market based instruments could be used to improve the quality of water entering the Lockyer Creek catchment

Methodology



Data

BIOPHYSICAL:

- Catchment water quality and abatement
  - Climate – rainfall and PET
  - Land use
  - Sediment BMPs
  - Efficacy of sediment BMPs e.g. t/ha/yr sediment removed
  - Cost of BMPs (capital, recurrent) ($)

ECONOMIC:

- Enterprise (farm) data from Hardman and Strahan (2000)
  - Derived from land use data
  1. Farm sizes (ha)
  2. Farm types (crop types and rotations, irrigated/non-irrigated, livestock mix)
  3. Farm income/gross margins ($/ha)

Modelling

BIOPHYSICAL:

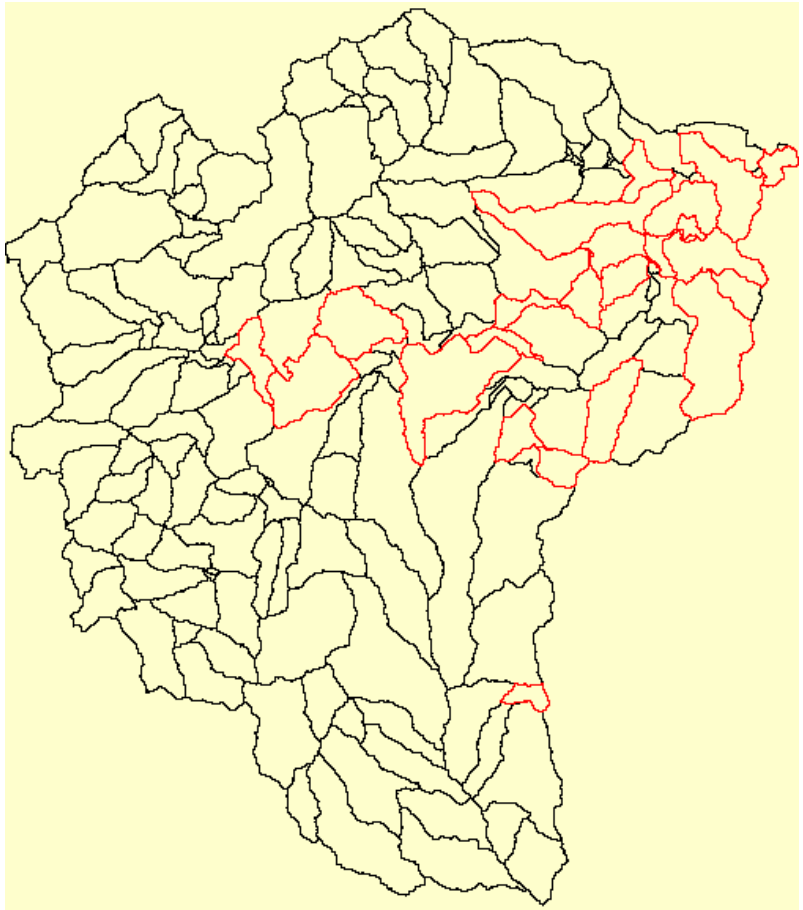
- Water quality modelling using EMSS catchment model developed for SEQ
- Modelled: riparian zone buffers – one of the NRM targets nominated by Healthy Waterways & SEQ (Western) Catchments NRM Plan
- 'Pontius Pilate' approach to biophysical model and associated science

ECONOMIC:

- Farm-based modelling of costs of riparian zone rehabilitation
- Opportunity costs of riparian zone rehabilitation
- Modelling of supply for sediment

Modelling outputs

- 20 model farms based on actual Lockyer data
  - Located in top 20 subcatchments by sediment export
- Priority subcatchments from EMSS
- Farm financial modelling:
  - gross margins & opportunity cost of riparian revegetation ($, $/ha)
  - capital cost of revegetation ($/km)



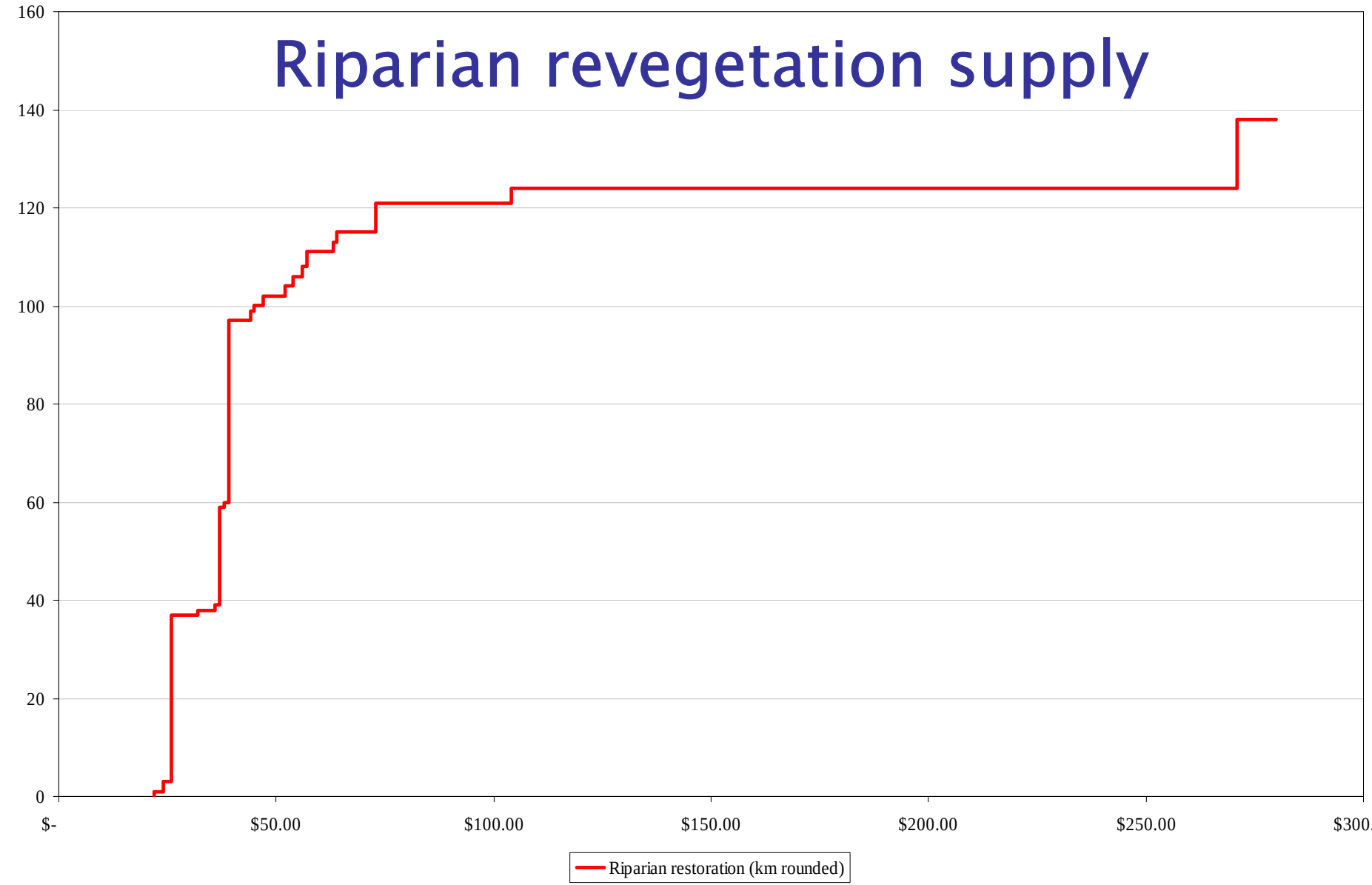
Experimental Economics

- Why experiment in economics:
  - Test policies in a 'controlled' setting e.g. ~ new crop varieties, medicines
  - Benefits include:
    - Information on potential efficacy of policy alternatives
    - Less costly (& controversial) than running 'field trials' of policies
  - Wide-ranging applications from auctions for cargo space on the Space Shuttle to water trading and greenhouse gas emissions trading

Experimental Design

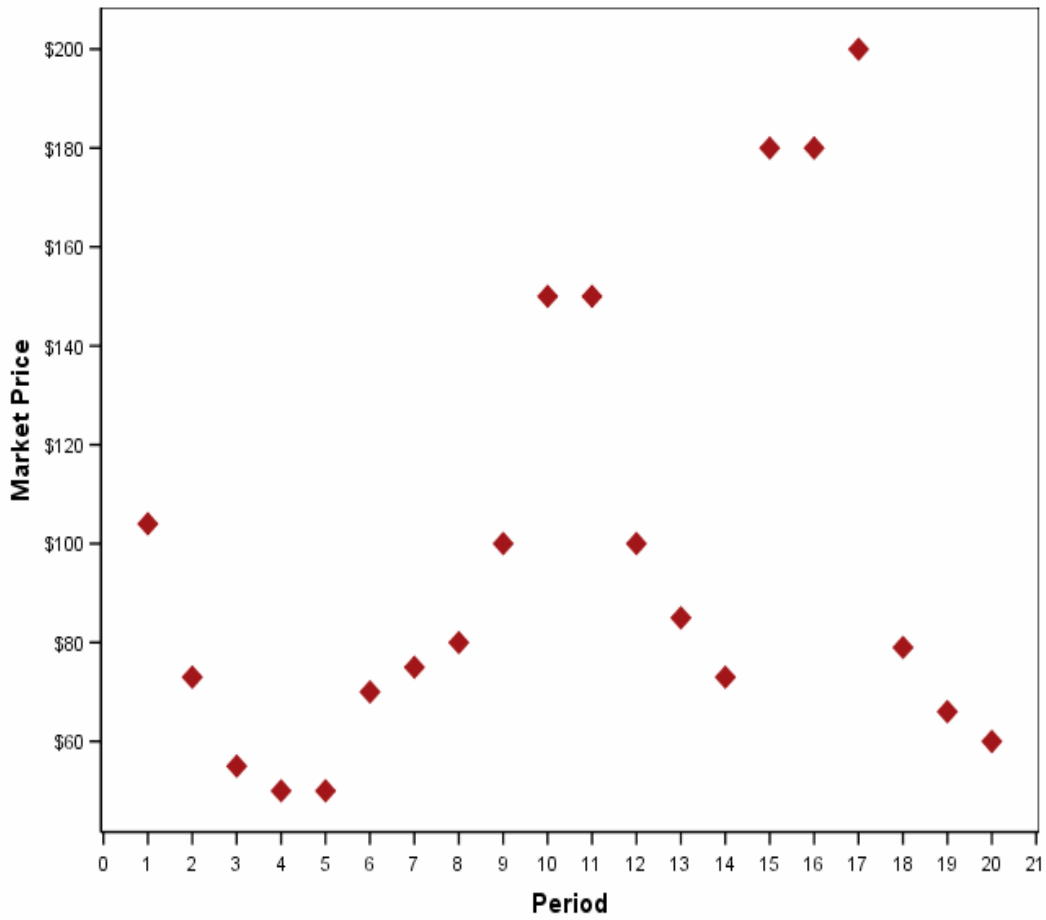
	Management Practice (km revegetation)	Outcome Based Target (kg abatement)	
	Fixed	**Fixed (Metric)**	**Stochastic (Actual / modelled)**
No budget constraint	3 replicates	3 replicates	3 replicates
Budget constraint	3 replicates	3 replicates	3 replicates

Riparian revegetation supply



Selected results

- When the budget is **not constrained** and the target is 100km of stream revegetation:
  - Price volatility
  - Observed effect is caused by modelled grazing property having ‘market’ power
  - Reason for ‘market power’ is that this farm has a large property area and therefore a large amount of stream revegetation is possible
  - Based on the modelling: 27% of all available revegetation within the market
  - Position within the market and relative to others allows them to leverage price



Selected results

- Tender for revegetation as km (km) versus stochastic abatement (t) with no budget constraint
  - experimental results converted & interpreted as t & $/t
- Results suggest that:
  - Km targets yields greater abatement (t) than stochastic abatement ($p<0.01$)
  - No significant difference in the overall cost ($)
  - Km targets are more cost-effective ($/t abated) than stochastic $/t abatement ($p<0.01$)

Questions & Discussion

Thank you for your attendance