

National Market-based Instruments Pilot Program

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

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29 January 2008, UQ Gatton



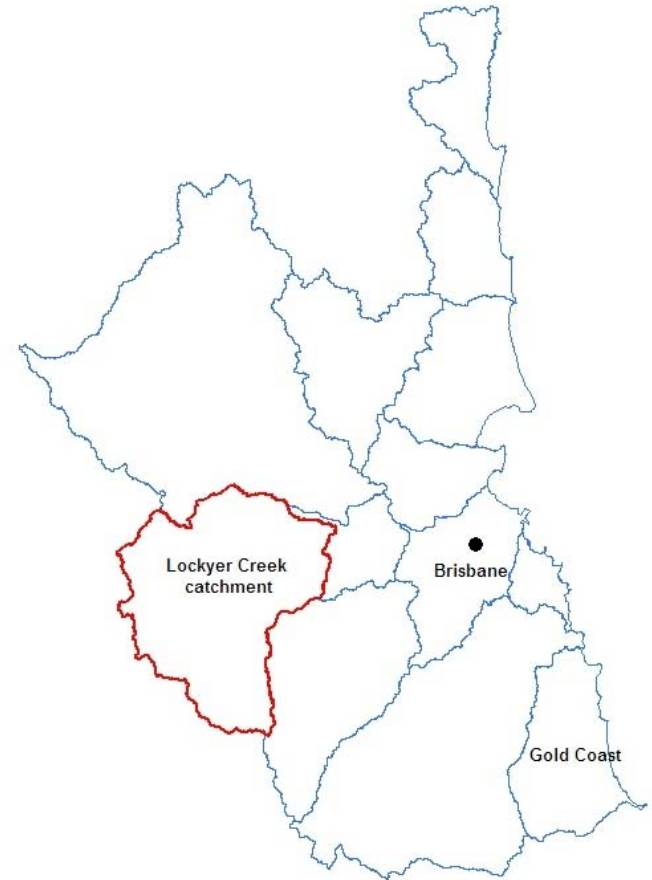
Overview

- Project background
- What are market-based instruments
- Research questions
- Methodology
 - Data
 - Modelling
- 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



Market-based Instruments: An alternative to regulation

- What are market-based instruments (MBIs)?
 - type of policy which manipulates price or quantity in a market environment
- Examples of market-based instruments for environmental management:
 - Subsidies – most widely used in Australia
 - Taxes/charges for pollution or waste e.g. volumetric charges for landfill waste
 - Trading e.g. water trading, emissions trading
- Why MBIs?
 - under certain conditions can achieve environmental targets at lower cost than 'command-&-control' regulation i.e. encourage change by those for whom it is relatively inexpensive
 - More flexible – less prescriptive
 - Improved equity – doesn't target individuals unnecessarily
- No 'silver bullet' - designs need to respond to individual cases

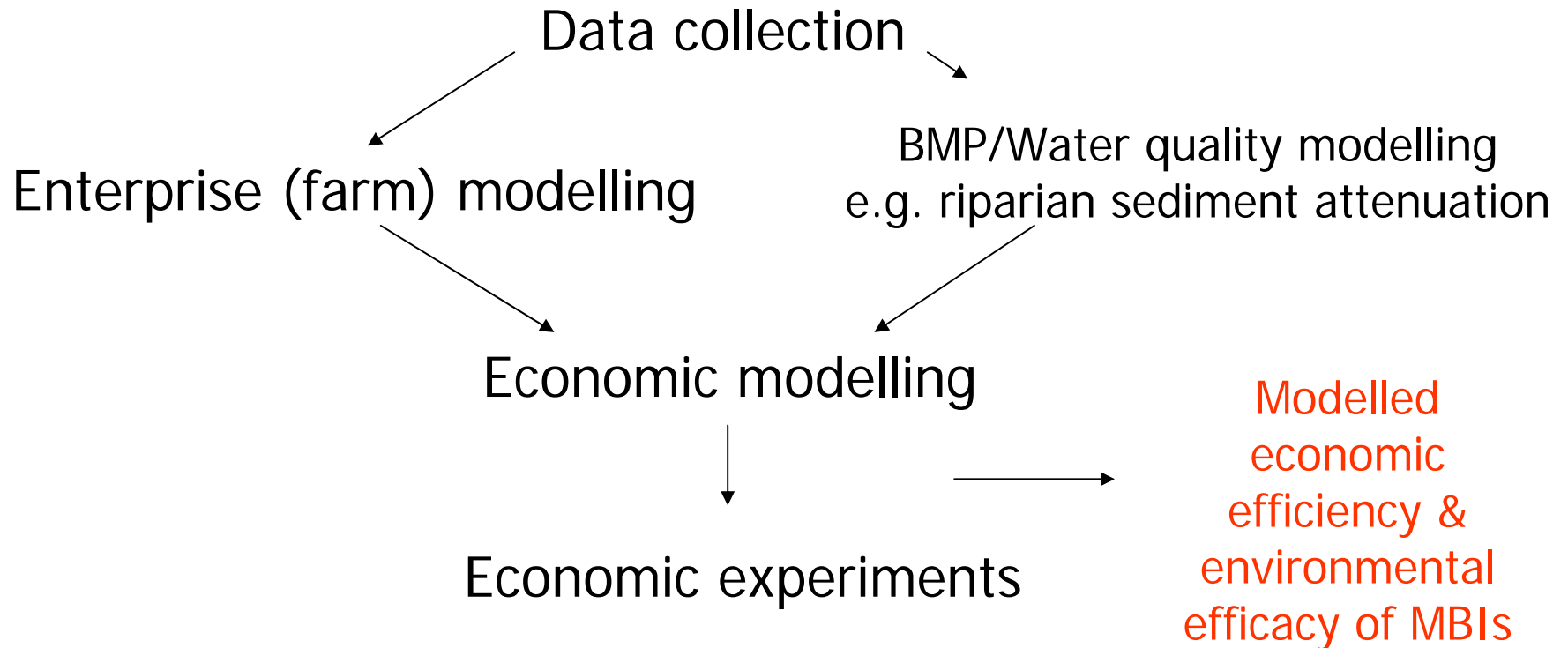


Research Questions

- Are market-based instruments which target outcomes, such as end-of-river target, superior to farm-based adoption instruments in terms of their environmental and economic performance?
- Are market-based instruments appropriate for tools for delivering water quality improvements in the Lockyer Creek catchments and if so, which instruments offer the best potential in terms of economic and environmental performance and stakeholder/community acceptance and capacity?



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



Outputs from data collection & modelling

- Model farms
 - Farm size (ha)
 - Farm cash income (\$)
 - Gross margins (\$/ha)
 - BMP types
 - BMP capital costs (\$)
 - Opportunity cost of BMP (\$, \$/ha)
- In this case:
 - Horticulture (15 firms)
 - Grazing (2 firms)
 - Rural residential (2 firms)
- For each farm:
 - Total abatement per farm (t & t/yr & t/ha/yr)
 - Km of revegetation (km)
- Combined with data on farm financials :
 - Cost of revegetation (\$/ha, \$/km)
 - Opportunity cost of abatement (\$)
 - Abatement costs per farm (\$/t, \$/t/ha, \$/t/ha/yr)



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

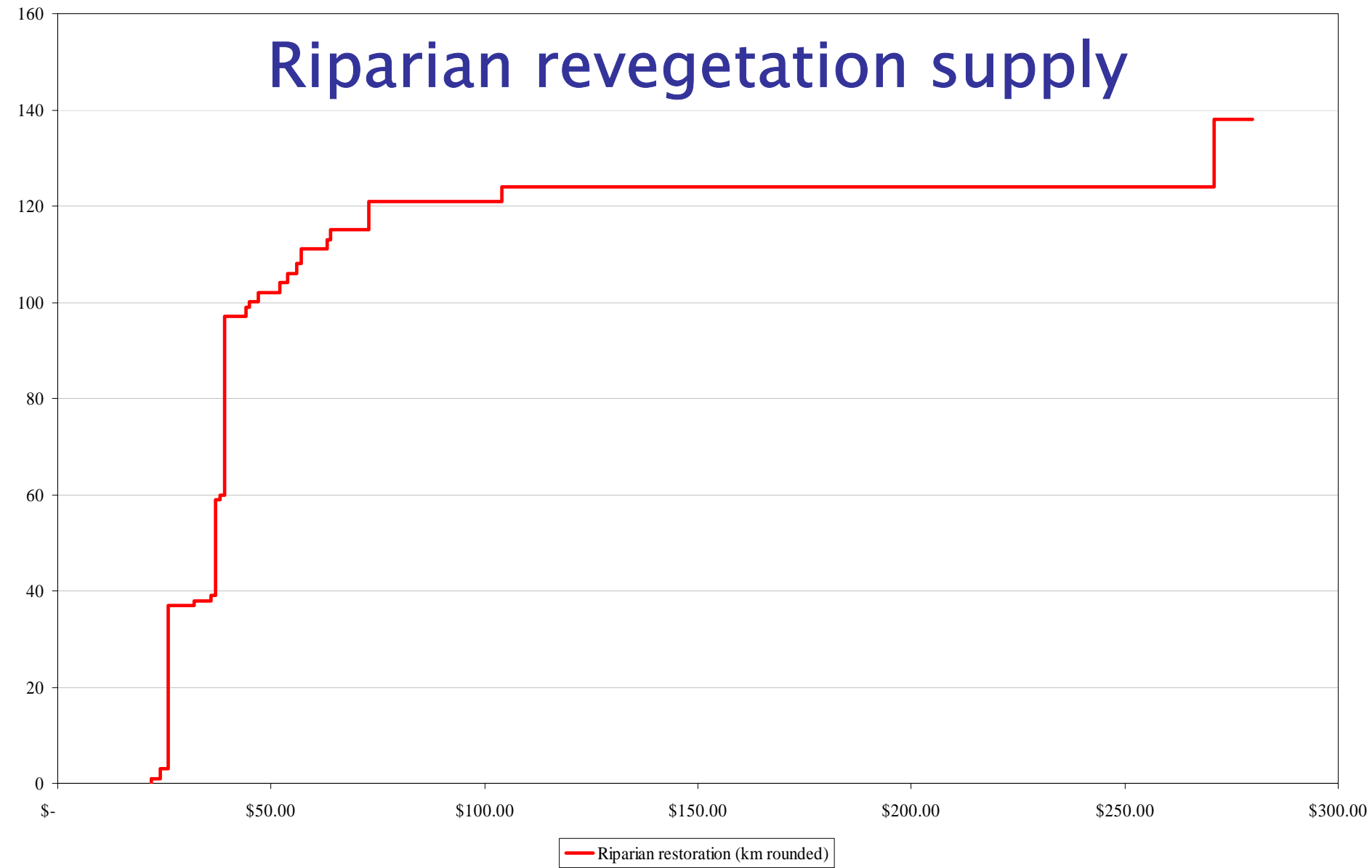


Pilot Market

- Example of a market based instrument developed using the data collection and modelling:
 - Auction for riparian revegetation based on kilometres of revegetation

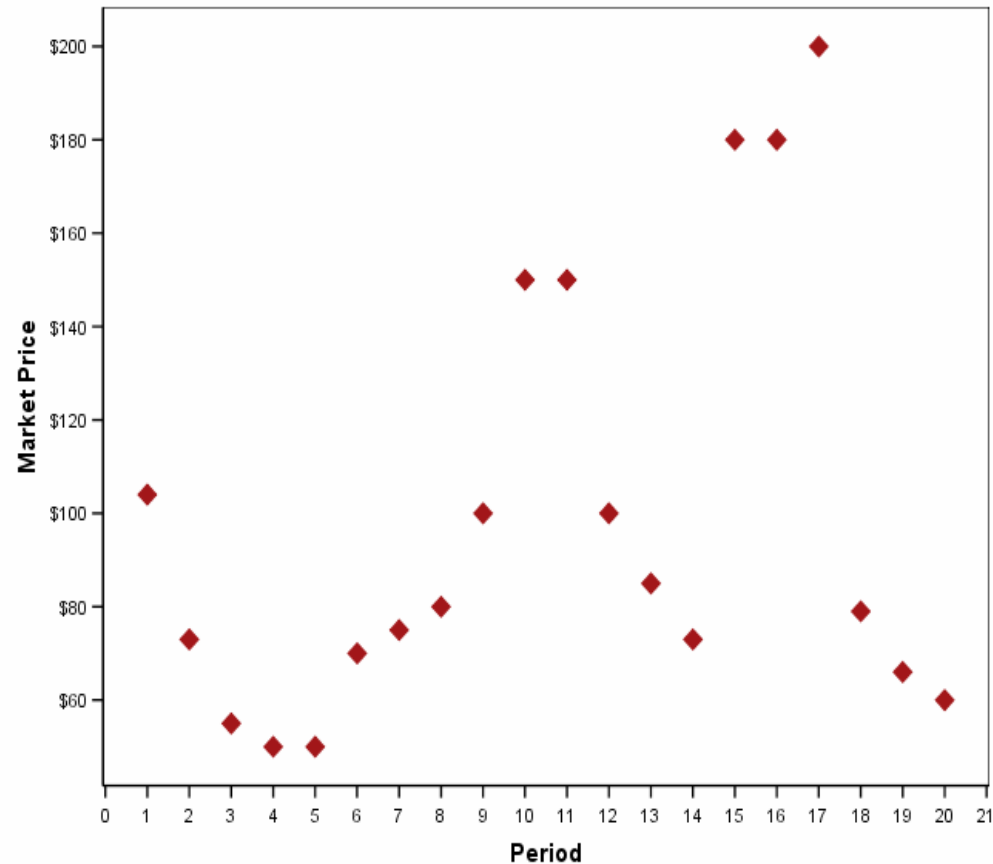


Riparian revegetation supply



Some 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



Questions & Discussion

Thank you for your attendance

