[PS]Understanding Enterprise and Industry Transition Through the Use of Coal Seam Water in Agriculture: A Case Study of Chinchilla District, Queensland*

David Monckton[1], Jim Cavaye[1], Sue Vink[2], and Neil Huth[3]

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[1] School of Agriculture and Food Sciences, St Lucia Campus, The University of Queensland, Brisbane, Queensland, Australia
[2] Centre for Water in the Minerals Industry, St Lucia Campus, The University of Queensland, Brisbane, Queensland, Australia
[3] Gas Industry Social and Environmental Research Alliance (GISERA), CSIRO, 203 Tor Street, Rockville, Toowoomba, Queensland, Australia

Abstract

This study examines the feasibility of using coal seam water (CSW) for irrigation in different and innovative ways, which will enable a 'win-win' for gas and agricultural producers. It will do this by demonstrating enterprise feasibility and evaluating industry and regional-scale impacts. The impediments to CSW use by primary producers will be examined by evaluating such things as management practices and risk factors. The scope of the project involves using Chinchilla District as a case study to examine three sub-projects namely;

1. Undertaking financial analysis of on-farm CSW irrigation development - using modelling and farm case study interviews to obtain quantifiable measures capable of economic evaluation.
2. Understanding how the use of CSW affects industry establishment – how producers collectively incorporate CSW in farm production systems, how they determine optimal use and maximise economic returns such that new industries are established.
3. Estimating the cumulative impact of use of CSW at the regional-scale covering issues such as;
    - regional economic impacts
    - different effects in different regions
    - sustainability of production systems
    - community impacts - does this enhance co-existence?
    - environmental impacts – benefits may include increased environmental flows to streams.

The scope of analysis undertaken here will evaluate economic costs and benefits now and into the future and as such will provide social benefits to producers, their families and workers in supporting industries. These changes will be evaluated from an economic perspective quantitatively and qualitatively. This work will combine application of theoretical economic modelling with practical on-the-ground survey of

current and potential water users in the Chinchilla District.

An important aspect of this thesis is to combine biophysical modelling (APSIM) with economic modelling tools (DAM EA$Y and others) as referred to in (Lisson et al., 2003). This study analyses the costs and benefits of various irrigation scenarios involving investment in on-farm water storages (OFWS) and how to best manage water from all sources. The use of modelling tools such as this is seen as being particularly useful here because of its ability to model particular characteristics of CSW supply compared with alternative water sources and determine which scenario will provide the best economic returns.

Reference Cited

Lisson, S.N., L.E. Brennan, K.L. Bristow, B.A. Keating, and D.A. Hughes, 2003, DAM EA$Y- Software for assessing the costs and benefits of on farm water storage based production systems: Agricultural Systems, v. 76, p. 19-38.

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AIMS

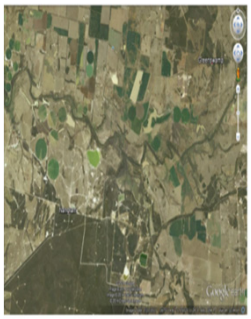
1. Estimate the number of producers and irrigable crops
2. Quantify the potential economic benefits
3. Explain basis for choice
4. Estimate maximum beneficial use.

METHODS

1. APSIM to model changes in biophysical parameters
2. Farm Case Studies to validate input parameters and determine the basis for farmer decision making
3. Farm Surveys to determine farmer decision criteria.

WHAT'S NEXT?

1. Confirm 20 farms for survey in early 2015
2. Commence APSIM modelling for representative farms
3. Complete literature review
4. Collate all results.



Source: www.derm.qld.gov.au/mapping-data/queensland-globe
Aerial view if Condamine River within study area

NPLNG water supplied to private irrigator in study area

NPVs for four different irrigation scenarios

GROSS MARGIN ($/ha)	STORAGE CAPACITY AND CAPITAL COST			
	952 ML $2.8 million	1905 ML $3.7 million	2857 ML $4.7 million	3810 ML $5.6 million
	5% discount rate			
$500	-$3,089,809	-$3,804,798	-$4,520,286	-$5,235,774
$1000	-$494,395	-$1,209,883	-$1,925,371	-$2,640,859
$1500	$2,100,520	$1,385,031	$669,543	-$45,945
$2000	$4,695,434	$3,979,946	$3,264,458	$2,548,970
$2500	$7,290,349	$6,574,861	$5,859,372	$5,143,884
	7% discount rate			
$500	-$3,093,177	-$3,873,187	-$4,653,197	-$5,433,208
$1000	-$816,198	-$1,596,208	-$2,376,219	-$3,156,229
$1500	$1,460,780	$680,770	-$99,240	-$ 879,251
$2000	$3,737,759	$2,957,749	$2,177,738	$1,397,728
$2500	$6,014,737	$5,234,727	$4,454,717	$3,674,706

Source: (CSIRO, 2013)