

**SOCIO-ECONOMIC BENEFITS OF
METEOROLOGICAL AND HYDROLOGICAL SERVICES**

CASE STUDIES

Irrigation Water Demand – Case Study

ITEM	DESCRIPTION
Sector	Water - Engineering
Sub-sector	Irrigation water demand
Case Study Name	Improved Seasonality of Flows through Irrigation Demand Management and System Harmonisation
Case Study Description	The goal of the project was to identify opportunities to manipulate irrigation demand and supply in a way which optimises the social, environmental and economic outputs from all available water resources within a catchment. Possible options to achieve this goal may include improved cropping mix incentives, groundwater – surface water substitution, intra and inter-seasonal water trading and harmonisation of on farm and off farm storage, distribution, application, and drainage infrastructure with environmental outcomes.
Location	Murrumbidgee River system, Australia
Tools employed	A combination of hydrological and economic models
Description of application	A combination of hydrological and economic models was used to evaluate the scope of different irrigation demand management options to improve seasonality of flows in the Murrumbidgee system. Linking hydrology and economics models permits the relative ranking of benefits and costs of possible irrigation management options.
Outcomes of application	The results of dynamic system modelling and optimisation showed that 10% to 15% of peak water demand during summer can be shaved from the annual water demand of 1400 MCM. However, this may result in reduced agricultural return or require private and public investments in the form of on-farm water saving technologies, canal lining or construction of en-route storages. However, if we value the saved/substituted water at current market prices then benefits are expected to be higher than the costs involved.
Cost/Benefits	Spreading water demand over summer and winter season through new crop mixes promises to be the most cost-effective irrigation demand management option for improving seasonality of flow in the rivers.
Characteristics of the Case Study	This project was a scoping study with the main output being a comprehensive review and scoping of the key aspects related to the improvement of seasonality of flows. The study took a truly integrated and cooperative approach to addressing water reform, environmental degradation and declining rural communities by developing a stakeholder driven framework for evaluating demand management option. As a result of this approach farm, scheme and catchment managers will ultimately be in a position to collectively optimise water resource management and investment decisions within a triple bottom line framework at both the short term (tactical) and long term (strategic) levels.
Consultation mechanisms	This project has a multi-disciplinary and integrated approach. That is, every relevant form of expertise has been sought to be harnessed and ideas captured. These have been brought together to fashion a cohesive, whole-of-valley solution to the

	water sustainability challenge.
Structural interface	Work undertaken in a cooperative research environment
Delivery mechanism	Reports and Internet sites
Feedback mechanism	Discussion sessions and internet based feedback
Review Mechanism	Not available
Other	
Lessons learnt	<p>In the Murray-Darling Basin the major concern is the availability and quality of water under current and future climatic, economic and environmental scenarios. The urgent needs of river ecosystems and a possible decline in future rainfall and runoff mean that supplies for irrigation may become more limited.</p> <p>Research is showing that big water savings are possible while maintaining crop yields and reducing negative environmental impacts.</p> <p>Production from irrigation need not decline with reduced water availability. There are good opportunities to improve the efficiency of delivering and using irrigation water through targeted application of technology, smart water management and better climate forecasts.</p>
Best Practise Advice	Tools represent current best practise methods.
Possible future advances	Research will continue to assess options for increasing efficiency of irrigation in other irrigation regions.
Comments	
URL	http://www.mssanz.org.au/modsim05/papers/elmahdi.pdf