

Real or unreal water savings?



Determining whole-of-system water use efficiency for NSW river valleys What are real or unreal water savings?

A National Program on Irrigation Research and Development (NPIRD) funded project

No physical system can be 100% efficient; irrigation systems are no exceptions.

Recent figures suggest Australian irrigation schemes are about 80% efficient and irrigation farms are between 30-90% efficient¹. Simplistically, the difference between the quoted efficiency and 100% represents the water lost and can be considered a potential water saving. However, not all water savings are real.

Water losses from one system are often gains for another system and, reducing or eliminating these losses may not produce any real water savings. This situation can be demonstrated by the example in surface irrigation, large volumes of water are applied to fields however some of this water is excess and is removed by surface drainage. If the field is viewed in isolation then the surface drainage water can be considered as a loss, as the water was not beneficially used, however if the volume of surface drainage water is reduced then a water saving is made. However if the drained water is recaptured and reused, which is typical practice in many agricultural industries, then any increase in efficiency (reduction in the volume of water drained) at the field will not produce any real water savings at the farm level. The water lost from the field may be beneficially used at a later date. This concept that water can be recaptured, recycled and reused is very important and must be considered when determining what is a real water saving.

Real water savings are made when losses that cannot be recaptured are reduced or eliminated. For example if a field is irrigated and water is left lying on the field for an extended period, water may be lost to evaporation, and it may not be possible to recaptured and recycled this water. If the water is drained quickly and recycled the loss of water to evaporation may be reduced and there is more water available for reuse. Improving irrigation manage-

ment may reduce the losses and may then provide a real water saving.

Unreal water savings arise when a component of a system is viewed in isolation. To find real water savings the system must be viewed holistically that is where the water comes from (sources) and where the water goes to (sinks).

Community expectations demand more efficient water use and for this to be achieved, while maintaining profitable and sustainable irrigation industry, real water savings must be identified and realised.

WHAT DOES "WHOLE-OF-SYSTEM" MEAN?

Water used for irrigation is initially captured in a catchment, then diverted by a scheme, distributed to farms and then used to irrigate fields. As water moves across these four spatial scales (catchment, scheme, farm, and field) for the purpose of irrigation, losses from and additions to each spatial scale occur. To understand how losses from one system may be additions to another, the water balance for each spatial scale must be determined, and the links between each spatial scale identified. This whole-of-system approach to identifying and measuring the losses and linkages will enable a more informed development of water policy.

WHAT IS BEING DONE?

In NSW there is increasing competition for the scarce water resources. This requires irrigators and resource managers needing to find ways to maintain or increase agricultural production with the same or reduced volumes of water. A whole-of-system assessment of the current levels of losses (potential savings) and a method for ongoing assessment are required to identify and measure these losses. This assessment will also provide a realistic estimate of any possible increase in water use efficiency.

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Land and Water Australia (L&WA) through the National Program on Irrigation Research and Development (NPIRD) have funded a project to identify water losses throughout the system in the Macquarie and Murrumbidgee valleys. The project will assess the whole of system water use efficiency for these valleys. The methodology of this approach will be documented and a framework developed to assess whole of system water use efficiency.

WHAT IS THE AIM OF THE PROJECT?

The project aims to:

- assess and prioritise the losses and gains of water at four spatial scales:- field, farm, scheme, and catchment level;
- quantify potential water savings through increased catchment, scheme, farm and field efficiencies; and,
- better define and develop a more rigorous modelling of irrigation delivery and application systems at catchment, scheme, farm and field levels.

HOW WILL THE PROJECT ACHIEVE THE AIM?

A first step was to review which irrigation performance indicators are currently used to measure the performance of irrigation systems.

To successfully assess irrigation performance, components of the water balance from the four scales (field, farm, scheme, and catchment), have been identified and quantified. A conceptual framework to construct water balances was developed based on the International Water Management Institute (IWMI) Water Accounting system.

The major drivers for irrigator decision making will be determined in the Macquarie and the Murrumbidgee and

these will be integrated into the framework to better understand irrigator risk perception.

The combination of the conceptual water balance framework and the improved understanding of risk perception will provide a basis for a comparative assessment of current levels of water use efficiency. On- and off-farm management practices that may lead to improved water use efficiency will be identified by using the current Department of Land and Water Conservation IQQM model framework.

WHEN WILL THE RESULTS BE AVAILABLE?

Monthly updates are available on request from NSW Water Use Efficiency Advisory Unit at Dubbo. The final report is due December 2003. Stakeholder meetings are scheduled to begin in July 2002 to present interim results.

WHO IS INVOLVED WITH THE PROJECT?

The project is funded by:

- National Program on Irrigation Research and Development (NPIRD) a program of Land & Water Australia
- NSW Agriculture
- Department of Land and Water Conservation.

The project is being undertaken by David Mitchell at the NSW Water Use Efficiency Advisory Unit at Dubbo.

CAN YOU HELP?

If you are have an interest in how efficiently water is used, and would like to discuss the project please contact David Mitchell at the address below.




National Program for
Irrigation Research and Development


NSW Agriculture


LAND & WATER
CONSERVATION

Further information

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