NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Irrigation Profile - Readers' Note

This document is part of a larger publication. The remaining parts and full version of the publication can be found at:

http://www.dpi.nsw.gov.au/agriculture/resources/water/irrigation/regions

Updated versions of this document can also be found at the above web address.

Lachlan Catchment Irrigation Profile

compiled by Meredith Hope, for the Water Use Efficiency Advisory Unit, Dubbo

The Water Use Efficiency Advisory Unit is a NSW Government joint initiative between NSW Agriculture and the Department of Sustainable Natural Resources.

NSW Agriculture (2003)

ISBN 0 7347 1416 5 (individual)

ISBN 0 7347 1372 X (series)

This Irrigation Profile, *Lachlan Catchment Irrigation Profile*, is one of a series for NSW catchments and regions. It was written and compiled by Meredith Hope, NSW Agriculture, for the Water Use Efficiency Advisory Unit, 37 Carrington Street, Dubbo, NSW, 2830.

job # 3607
Editorial assistance: Helen Gosper
Cover design: Nicky Parker, Nicole Irvine
Maps: Udai Pradhan

NSW Agriculture, Locked Bag 21, ORANGE NSW 2800 AUSTRALIA
http://www.agric.nsw.gov.au/

TABLE OF CONTENTS

List of Figures

List of Tables

Acknowledgments

Thanks to the NSW Water Management Fund for providing initial financial support to undertake this work.

Thanks to the following individuals and groups:

- Water Analysis and Audit Branch, Sustainable Water Management, Department of Land and Water Conservation (DLWC), Parramatta, now Water Management Systems, Natural Resources Products Division, Bridge Street, Sydney
- Licence Administration Branch, DLWC, Parramatta, now Water Management Systems, Bridge Street, Sydney
- NSW Agriculture staff, especially Greg Markwick, Eddie Parr, Mike Robbins, Ian Smith and Udai Pradhan
- Lachlan Valley Water, Forbes, NSW

for their assistance in preparing this document.

1. EXECUTIVE SUMMARY

The *Lachlan Catchment Irrigation Profile* was developed from a study to obtain catchment and industry-based assessments of water use efficiency (WUE)[1] and irrigation efficiency (IE)[2].

Readily accessible irrigation data were collected from State and Commonwealth sources, from published research and industry reports and from unpublished reports. These data were assigned a reliability rating using a system developed by the National Land and Water Resources Audit (1999).

The report summarises, where possible by water source and by catchment, what is known about:

- the number of irrigators
- the number of licences
- the entitled volume or area authorised for irrigation
- the area irrigated and water used in total and by crop type
- irrigation methods
- yields of irrigated crops
- the value of irrigation to agriculture

in the Lachlan catchment.

This Profile does not attempt to calculate or analyse catchment or industry based estimates of WUE or IE. This will be carried out in a subsequent report.

Users of this document are advised to proceed with caution. The data presented in this report should be treated carefully and with respect for the various collection, storage and retrieval processes that can impact on information reliability.

[1] WUE refers to the volume of crop produced (harvested dry matter) per unit of water delivered to the crop. This is usually expressed as tonnes per megalitre (t/ML) (Alexander & Foley 1998).

[2] IE is a measure, expressed as a percentage, of the volume of water used or delivered by a system relative to the total volume of water entering the system (Alexander & Foley 1998).

1.1 An overview of the Lachlan catchment

The Lachlan catchment is in central NSW west of the Great Dividing Range. It has an area of 84 700 square kilometres, representing 8% of the total land in the Murray-Darling Basin. The landscape ranges from undulating hilly country in the east to flat riverine plains in the west.

Annual rainfall in the catchment decreases from around 780 mm in the east to 370 mm in the west while evaporation increases from 1351 mm in the east to 1825 mm in the west. The catchment is affected by two weather systems: to the south, winter rainfall dominates, whereas to the north, summer rainfall is dominant.

The Lachlan catchment has a diverse range of irrigated crops, from pasture, cereals and oilseeds grown on the alluvial soils of the riverine plain to vegetables, wine grapes and stone fruit grown on the riverine plain and the tableland region. Pasture (summer and winter) and lucerne are the predominant irrigated crops, followed by cereals. Smaller irrigated areas of cherries are grown around Young and wine grapes are grown around Cowra. Cotton is now grown around the Hillston area.

Of the total value of agriculture in the catchment ($981 million), around 17% ($165 million) each year can be attributed to irrigation. The total value of irrigation has increased from $92 million to $165 million between 1991–92 and 1996–97. Of this total irrigated value, around 30% can be attributed to cereal crops and a further 20% to other crops such as oilseeds and legumes.

The sum of the value of irrigated pasture and grasses, meat and livestock products was $36 million, representing 22% of the total irrigated value in 1996–97. Cotton was still a fledgling industry in 1996–97, producing $0.8 million. This value is likely to have increased markedly since then, given that the volume of water used on cotton has increased considerably.

Of the 1 150 000 ha of land irrigated in NSW, approximately 6% is in the Lachlan catchment. Pasture and lucerne have the largest combined irrigated area of all crops in the catchment and represent around 50% of the total area irrigated. By comparison, cereals represented between 30 and 40% of the total area irrigated. When compared to pasture, cereal crops received a higher income for less area.

The total volume of water used by irrigated agriculture is not known with accuracy due to gaps in information for some sources of water. Best estimates suggest that somewhere between 444 400 ML and 477 000 ML were extracted by irrigated agriculture in 1996–97 (Table 1). Generally, the greatest proportion is taken from the regulated river system. Extraction from the remaining sources appears to be relatively minor.

Figure 1. The Lachlan catchment

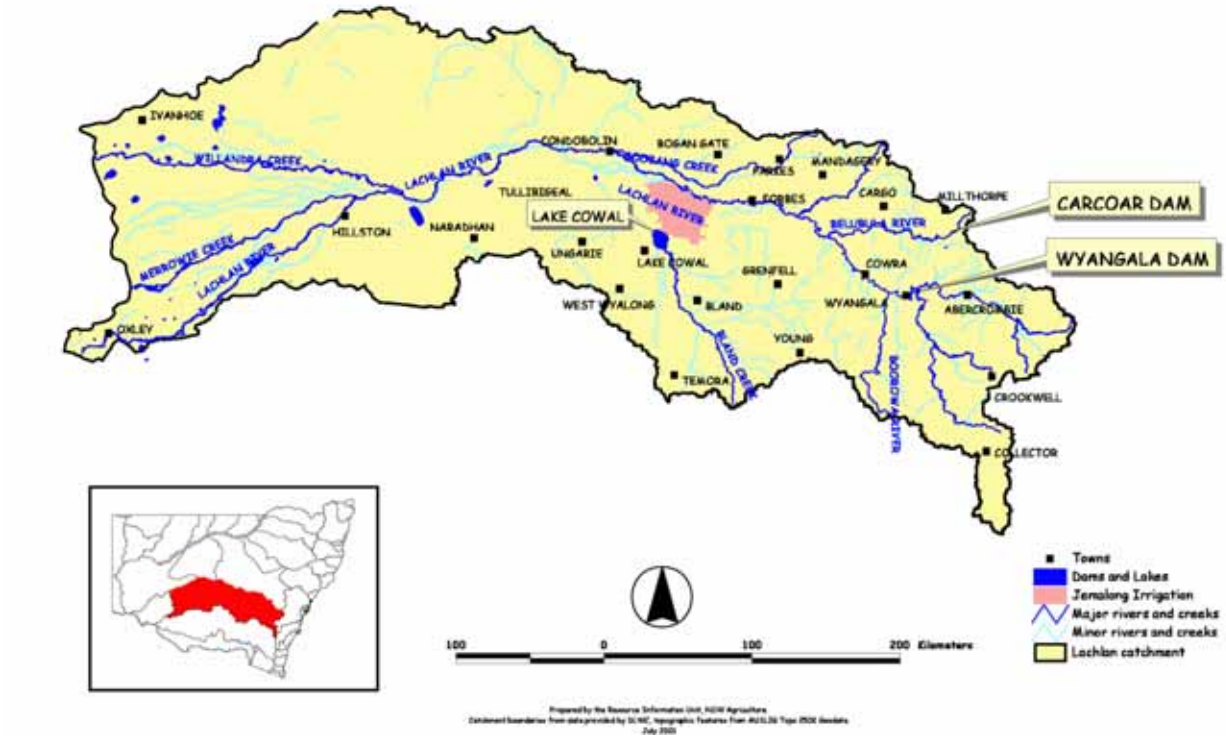

Table 1. Irrigation data for 1996–97 season in the Lachlan catchment

Source of water	Total irrigated area (ha)	Total water used by irrigated agriculture (ML)	Number irrigation licences	Number enterprises irrigating	Value of irrigation ($million)
NSW total	*1 150 000*	*7 700 000*	*24 000*	*7 846*	*2 496*
All sources of water	*est. 81 836 (around 50% is pasture)*	*est. 444 400–477 000*[a]	1 616	515	165 (30% is cereals)
Regulated	95 145	424 400 or 457 000	843	nd *423 (1993–94)*	nd
Unregulated	2 533	nd *3 800 (1989–90 to 1991–92)*	317	nd *438 (1993–94)*	nd
Groundwater	nd *4 223 (1993–94)*	nd *16 200 (1980)*	456	nd *81*[b] *(1993–94)*	nd
Farm dams	nd *4 496 (1993–94)*	nd	nd	nd *96 (1993–94)*	nd
Reticulated	nd *31 (1993–94)*	nd	na	nd *4 (1993–94)*	nd

nd= no data, na = not applicable.

a. When summing extraction volumes from different sources, the maximum extraction by irrigation (3 801) from unregulated rivers was used. Data from farm dams and town water supply were non-existent. However, extraction from these sources is likely to be small and the impact on these total water use figure minimal.

b. The number of active groundwater licences (those that have recorded using water from groundwater supplies) is not known.

Of the estimated 24 000 licences (regulated, unregulated and groundwater) in NSW, 7% exist in the Lachlan catchment. Of the total number of irrigation enterprises in NSW (those with an estimated value of agricultural operations of $5000 or greater), 7% were in the Lachlan catchment. Most of these enterprises use water from either the regulated or unregulated river supply. Far fewer enterprises irrigate crops using groundwater, town water supplies or farm dams (Table 1).

1.2 Irrigation data issues

A number of issues were raised in the *Lachlan Catchment Irrigation Profile*. Generally, these issues relate to the scarcity of irrigation data, the scales at which irrigation data have been collected and disseminated and the reliability of available irrigation data.

1.2.1 Scarcity of irrigation data

Data have been collected for different purposes in the past to those now needed. For example, water management committees (WMC) are developing water-sharing agreements for catchments across the State and require information on how and where water is being used. Information on crop areas and water use, yields of irrigated crops, irrigation methods and the value of irrigation are needed to assist in the development of water sharing plans. This Profile has shown data from most sources (except the regulated system) to be either scant or never collected. Better data need to be collected to inform the water sharing debate.

1.2.2 Scales at which data have been collected

Point-scale data collected by ABS and ABARE are confidential and have been reported at SLA, catchment, groups of catchments or Agro-Ecological Region scales (AER[3]). These scales limit the data usefulness to natural resource managers who are often working at much finer levels (subcatchment or river reach).

1.2.3 Reliability of irrigation data

Reliability of data varied according to water source. For example, data from regulated supplies were more reliable than data from unregulated and groundwater supplies.

There were mismatches in information at different scales. For example, the DLWC estimated the area irrigated from regulated supplies to be about 20,000 ha greater than the ABS estimate for the area irrigated from all sources. It would be reasonable to expect the reverse to be true.

State agencies do not consistently report reliability of irrigation data. Such omissions make it easier for data users to inappropriately manipulate or analyse irrigation data and to draw spurious conclusions.

[3] AER are based on climatic regions which often span catchments and cannot be used to build catchment snapshots of irrigation.

1.2.4 Conclusion

A more comprehensive and consistent approach to the collection of irrigation statistics is needed. This would help to ensure that data are comparable across different water sources and industries. The following are needed to improve the situation:

- Recognition of the need to collect irrigation data on crop area and water used, irrigation methods and value of irrigation. Without these data, the ability to calculate WUE and IE will be limited.
- Data need to be collected at scales large enough to protect point-scale confidentiality but small enough to allow users to aggregate information to useful scales
- Protocols for provision of data to users are needed. This would help users make better decisions about the use of data and to manipulate data appropriately.
- Two-way flow of information between agencies and irrigators needs to be fostered. Typically, data have been obtained from irrigators by agencies. These data need to flow back to irrigators in forms that might assist them make better water management decisions.

Finally, such a comprehensive approach to improving the collection, management and distribution of irrigation data can only be developed with the full involvement of the many irrigators, agencies and community groups who require these data.