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INTERNATIONAL COMMISSION ON IRRIGATION AND DRAINAGE INCORPORATED

ANCID ABN 87 564 736 110

FINAL REPORT FOR LAND AND WATER AUSTRALIA

PROJECT CID 1

BENCHMARKING IRRIGATION SERVICE PROVIDERS

JUNE 2003



Department of
**AGRICULTURE
FISHERIES &
FORESTRY –
AUSTRALIA**



**Hydro
Environmental**



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- those Irrigation Water Provider Organisation which provided data to the project.
- Agriculture, Fisheries and Forestry Australia
- The Murray Darling Basin Commission
- Land and Water Australia.

ANCID acknowledges and thanks these organisation for their generous input to date and looks forward to them continuing to be part of this project, which is important to the future of the industry and ANCID, as it developed and matures.

1.0 Introduction

This is the final report of the Land and Water Australia (LWA) funded project undertaken by Australian National Committee on Irrigation and drainage (ANCID) concerning the Benchmarking of the Irrigation industry in Australia. Details of the project are as follows.

Project Title:	Benchmarking Irrigation Service Providers
Project Reference:	CID 1
Research Organisation:	Australian National Committee on Irrigation and Drainage (ANCID)
Principal Investigator:	John Mapson
Project Leader:	Peter Alexander- Hydro Environmental Pty Ltd
Land and Water Australia Program:	Irrigation Program
Commencement date:	24/04/2000
Completion Date:	29/05/2004
Other Funders of the Project:	<ul style="list-style-type: none">- Australian National Committee on Irrigation and Drainage- Irrigation Water Provider Organisation which provided data to the project.- Agriculture, Fisheries and Forestry Australia- The Murray-Darling Basin Commission- Land and Water Australia.(LWA)

2.0 Abstract

This project has three components:

The first part of the project was to benchmark the performance of irrigation water providers throughout Australia by undertaking a process of annual survey and reporting. In response, ANCID has developed an effective and efficient process for benchmarking the irrigation water provider business in Australia and produced four financial year based reports, three of which were within this project and which have been commended by the irrigation industry both in Australia and internationally.

The second part of the project was to establish future arrangements for the physical and financial operation of the national benchmarking scheme beyond the life of this project. In response, ANCID undertook a comprehensive review of the benchmarking process. In light of the increased focus on business sustainability and confidentiality within Australia, this review led to the development of three reporting categories and the recommended development of a booklet outlining the key characteristics of the Irrigation Water Provider Industry systems throughout Australia. This booklet would be updated and published on a 5-10 yearly basis as part of the data collection process associated with the ANCID benchmarking process. The trialing of the new three tier reporting framework will continue over the next 6 months but it is anticipated that the framework will endure for the next 5-10 years. ANCID has indicated that future benchmarking to be undertaken by it will be focussed on the irrigation supply system, and the businesses which are responsible for that aspect of the irrigation industry in Australia, but not the on-farm aspects of water and drainage service delivery.

The third part of the project was to review past, current and proposed on-farm benchmarking. This involved, undertaking a survey and convening a workshop with industry participants in August 2000, to test the feasibility, establish the level of current on-farm benchmarking and to scope the requirements for on farm benchmarking. A report on the workshop findings was produced on behalf of ANCID, and subsequently a higher level discussion paper was prepared on behalf of NPIRD proposing a number of projects to be undertaken by NPIRD to further this issue.

3.0 Project Objectives

The objectives of the project, as included in the revised contract between ANCID and LWA are:

- i. To benchmark the performance of irrigation utilities throughout Australia by undertaking a process of annual survey and reporting in the following key service areas:
 - (a) Financial/business management
 - (b) Operational management
 - (c) Environmental management
 - (d) Customer management.
- ii. To establish within the timeframe of this project, future arrangements for the physical and financial operation of the National Benchmarking Scheme beyond the life of this project.
- iii. To review past, current and proposed on-farm (irrigation) benchmarking activities throughout Australia and scope the feasibility of incorporating on-farm benchmarking in the national framework.

4.0 Project Process and Results

4.1 The Benchmarking Process

Over the past four years ANCID has managed the data collection, storage and analysis, and benchmark reporting on a range of indicators and their supporting business descriptors relevant to the key business performance areas of Australia's irrigation water providers. Broadly, 'Irrigation Water Providers' are defined as organisations that undertake the retail irrigation water distribution in rural areas of Australia. There are about 30 irrigation water provider businesses distributed across all States and territories of Australia.

After testing the feasibility of the concept with a pilot benchmarking of six (6) irrigation water provider businesses, the first comprehensive benchmarking report, which contained data for the 1997/98 financial year, was published in January 1999 (ANCID, 1999). ANCID (1999) reported on 15 different indicators across 33 separate water provider systems. By comparison the latest benchmarking report for the 2000/01 financial year (i.e. ANCID, 2002) presents data on some 65 indicators across 40 separate irrigation water provider systems. The number of indicators that is now reported is, in part, a reflection of the complexity of the Irrigation Water Provider business in Australia.

The 2000/01 ANCID benchmarking report presents information and indicators that enables individual irrigation water provider businesses across Australia to gauge their performance, from a social, economic and business perspective, relative to their international and neighbouring irrigation water providers.

The ANCID (2002) report presents 65 indicators across 40 water provider systems. These 65 indicators, which cover the key elements of triple bottom line reporting, were grouped into four key activity areas, identified by the industry as the key industry business drivers, namely:

- System Operation (12 indicators)
- Environmental Issues (14 Indicators)
- Business Processes (25 Indicators)
- Financial (14 Indicators).

Data is presented in both a tabular and graphical form. To aid the presentation and visualisation of the relative performance of different irrigation water providers, the indicator values in the graphical presentations were generally ordered from highest to lowest. The majority of the graphs of indicator values show the value for the current financial year as well as the average value and the maximum and minimum values from all historic benchmarking data held by ANCID in its benchmarking database.

As part of the Australian benchmarking project, an easily updated purpose built, tamper-proof data collection, data processing and data storage system has been developed. This system, which uses the universally used and easily understood MS Excel spreadsheet package, enables data to be easily and selectively updated and extracted to meet both domestic and international benchmarking project reporting needs.

Each year the ANCID benchmarking process involved seeking feedback from participants on how to improve the:

- data collection process;
- data sought;
- way the data is used;
- way the data is analysed; and
- way the data is presented.

Based on this feedback the data collection, processing, storage and access system was updated. Data was then collected from participating Irrigation Water Providers in all States, analysed, returned to the data providers for checking and incorporated into a format suitable for publication. The publication was in the form of a hard-copy booklet for the first three years. Last year for the first time the booklet was burned onto a CD-ROM, and a summary document was prepared to accompany the CD. Copies of the 1998/99, 1999/00 and 2000/01 publications are included in **Attachment A**.

All data is referenced and stored in a database for future use if required.

4.2 The Process for the Future Benchmarking of Irrigation Water Providers

Privatisation and the establishment of independent water businesses and pricing regulators, combined with the strict privacy laws in Australia, has lead to increasing concern over the level and detail (particularly financial detail) divulged to the public as part of the ANCID benchmarking project. As a result ANCID decided to undertake a comprehensive review of the Australian irrigation water provider benchmarking project. This review process commenced with a workshop held in Melbourne, Australia on 24 and 25 June 2002.

The workshop was attended by 28 people representing different data user interest groups. These included data providers, State and Federal regulators, industry data users within Australia and internationally, irrigators and financial sponsors of the project. The irrigation water providers represented at the workshop managed some 40 irrigation water supply systems across the States of Queensland, New South Wales and Victoria (These systems included about half of systems presented in ANCID (2002)).

Over the course of the workshop there was agreement on a number of key outcomes. The most significant of these outcomes, which was endorsed by the ANCID Executive, was agreement to change from the current all encompassing framework to a segmented and more focussed reporting framework.

While the benefit of the existing ANCID reports as a source of industry information both nationally and internationally was clearly acknowledged, with the increased focus on business sustainability and confidentiality within Australia, the workshop developed three tiers of reporting categories, which it believes will provide a more useful framework for the industry benchmarking into the future.

The three reporting categories are outlined as follows:

- Tier 1. **General Irrigation Water Provider Statistics (“Who we are?”)**. Reporting key statistics on the irrigation industry (e.g. area watered, crops grown, watertable level, water quality, length of supply system by type, water application system, etc.).
- Tier 2. **Performance Reporting (“How we interact?”)**. Reporting on indicators which address specific external or internal regulatory/compliance/promotional needs which can be released publicly (e.g. change in watertable levels, proportion of supply points metered, system conveyance efficiency, etc.).
- Tier 3. **Confidential Internal Business Performance Benchmarking (“How we improve?”)**. Reporting on indicators that are specifically targeted at improving the business performance of irrigation water providers, individually and collectively. The indicators referred to as ‘Tier Three Indicators’ will remain confidential to the respective data providers (Hydro Environmental, 2002) (e.g. renewal fund contribution relative to loss in asset value, ratio of cost to sustain the business and revenue, ratio of value of debts outstanding to accounts rendered, etc.).

It was also acknowledged at the workshop that ANCID had not undertaken to audit the data provided and that if additional funds were not to be made available for this purpose the integrity of the project must rely upon the data providers applying additional effort to the issue of data quality when providing information to ANCID for reporting.

This change in reporting structure resulted in the need to undertake a detailed assessment of all of the historically reported benchmarking measures and indicators to determine their merits for inclusion under one of the three new reporting categories. This process involved considerable consultation with the different irrigation data provider businesses. A second workshop was held at Griffith in September 2002 to assist in this review.

The questionnaire to progress this revised reporting framework is being progressed by ANCID in 2003, and collection of data for the 2001/02 financial year on Tier 1 statistics and Tier 2 indicators is expected to commence in June 2003. This trial will be concluded with an industry workshop to discuss the results and the next steps in the benchmarking process to be held in August 2003.

Identification and agreement on Tier 3 indicators will be sought through a separate workshop, involving irrigation water provider businesses that wish undertake Tier 3 reporting. Tier 3 will be a confidential benchmarking process and be undertaken separately on a user pays basis.

At present about 75% of the irrigation water provider organisations in Australia are involved in the ANCID benchmarking project and ANCID is hopeful that in future the project will involve a greater proportion of the industry in all three reporting Tiers.

4.3 On-Farm Benchmarking

In order to scope the requirements for on-farm benchmarking, a survey was conducted to obtain an indication of the types of on-farm surveys that have been carried out during the 5 years up to the middle of the year 2000. Following this survey a workshop was convened in August 2000 at which representatives of the cross section of potential stakeholders identified the issues surrounding on-farm benchmarking.

A report was prepared setting out the findings from the survey and workshop, and making a number of recommendations. Subsequently NPIRD commissioned a further report from Rendell McGuckian to scope the requirements in on-farm benchmarking. The November 2001 Rendell McGuckian report, which drew information from the ANCID’s report and the ANCID workshop, outlined a number of projects for NPIRD’s involvement in this area. A copy of the ANCID report titled “*A scoping of the Requirements for National Benchmarking of On-Farm Aspects of Irrigation Water Management September 2000*”, which is also an output from this project is **Attachment B** to this report.

It is understood that progression of a number of the initiatives recommended by the ANCID and the Rendell McGuckian report are still awaiting funding by L&WA.

5.0 Project Management

The project was designed and undertaken by Hydro Environmental, a small water resources consulting firm based in Melbourne, and was closely directed by a steering committee comprising members of the ANCID Executive, LW&A and MDBC. Through the workshops and data acquisition process, significant and valuable input was also provided by other Irrigation Water Providers and Australian Bureau of Statistics.

6.0 Communication and Publications

6.1 International Communication

As a result of the efforts by ANCID in the area of irrigation water provider benchmarking, it has been able to significantly contribute to the establishment of a holistic international benchmarking project, which is being undertaken by the International Commission on Irrigation and Drainage (ICID), in conjunction with the World Bank, for the Irrigation and Drainage sector. The process they are using is based on that successfully used by ANCID.

ICID, through the World Bank, has arranged for the International Water Management Institute (IWI) to establish a website to facilitate the coordination and presentation of the 35 agreed international Indicators and 45 system Descriptors from at least 77 systems across 6 countries (Morocco, Sri Lanka, China, India, Mexico and Australia). This project, which is expected to eventually extend to most of the 57 ICID member countries, is now well developed with additional off-line web tools to facilitate irrigation system benchmarking at a farm scale. The website address is www.IWMI.org or <http://www.lk.iwmi.org:82/oibs/LoadBench.htm>.

Additional information to that initially requested for ANCID's reporting purposes (including a number of on-farm indicators) was sought for the international benchmarking project. ANCID has therefore integrated the data needs of the International benchmarking into its data collection process, and forwarded the information from 28 Australian systems for the 2000/2001 irrigation season to the ICID/IPTRID IWMI website. These 28 systems cover all States and irrigation water delivery system types used in Australia.

ANCID has also presented at the following international conferences on Benchmarking as part of this project:

- An international Benchmarking in Johannesburg in September 2001.
- A World Bank Workshop on Benchmarking in Washington in May 2002
- An international workshop on Benchmarking in Montreal in September 2002

6.2 National Communication

ANCID has actively promoted the Benchmarking of Irrigation Water Providers by;

- Ensuring it is part of the agenda at ANCID national conferences
- Preparing a presenting a formal paper at the Toowoomba National conference of ANCID in 2000
- Presenting to conferences of Irrigation Association of Australia on Benchmarking
- Working with the Urban Water Provider Benchmarking organisations (Victorian Water Industry Association and Water Services Association of Australia) to ensure duplication of effort is minimised
- With the approval of individual data providers, providing data to the MDBC, Institution of Engineers Australia and Australian Bureau of Statistics
- Actively providing copies of the publication and advice on their contents to the wider irrigation industry data users.

6.3 Publications

In addition to producing the publications provided in **Attachment A**, as part of this project ANCID has also:

- prepared a paper for the next special edition of the ICID Journal on Irrigation and Drainage which is to be dedicated to Benchmarking,
- reviewed a World Bank paper for the next special edition of the ICID on Journal on Irrigation and Drainage which will be dedicated to Benchmarking
- contributed to the 2003 progress report on international benchmarking to be presented to the ICID Working Group on the issue.

7.0 Reference for Further Information

Any enquiries or additional information concerning this project should be referred to the ANCID website www.ancid.org.au or Peter Alexander, whose contact details are as follows:

Hydro Environmental Pty Ltd
PO Box 347
Camberwell VIC 3124
Telephone: 03 98134353
Fax: 03 9813 4783.

xxxXXXxxx

ATTACHMENT A

- 1. 1998 / 99 Australian Irrigation Water Provider Benchmarking Report**
- 2. Australian Irrigation Water Provider Benchmarking Report for 1999/2000**
- 3. Australian Irrigation Water Provider Benchmarking Report for 2000/2001**

ATTACHMENT B

**A scoping of the Requirements for National Benchmarking of On-Farm
Aspects of Irrigation Water Management September 2000**

**A SCOPING OF THE REQUIREMENTS FOR
NATIONAL BENCHMARKING OF ON-FARM ASPECTS
OF IRRIGATION WATER MANAGEMENT**

PREPARED FOR

**AUSTRALIAN NATIONAL COMMITTEE OF THE INTERNATIONAL
COMMISSION ON IRRIGATION AND DRAINAGE**

BY

HYDRO ENVIRONMENTAL

SEPTEMBER 2000

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SCOPING THE REQUIREMENTS FOR NATIONAL BENCHMARKING OF ON-FARM ASPECTS OF IRRIGATION WATER (AND ASSOCIATED ENVIRONMENTAL) MANAGEMENT

Executive Summary

Background

LWRRDC commissioned ANCID to report on the issues involved in complementing their current national benchmarking survey of Irrigation Water Providers with a national benchmarking survey of irrigation farms. ANCID engaged Hydro Environmental to provide this report.

In order to scope the requirements for on-farm benchmarking:

- a survey was conducted to obtain an indication of the types of on-farm surveys that have been carried out in the last 5 years; and
- a Workshop was held at which representatives of a cross-section of potential stakeholders identified the issues surrounding on-farm benchmarking.

What is benchmarking?

The workshop agreed that: -

- *“Benchmarking is a process whereby organisations pursue enhanced performance by learning about their own organisation through comparison with their own historical performance and with the practices and outcomes of others.”*
- The purpose of an on-farm benchmarking project would be:
 - ❖ to recognise what irrigators are currently doing/achieving
 - ❖ to provide information for the setting of goals to foster continuous improvement
 - ❖ to monitor change in irrigation infrastructure, processes and activities; and
 - ❖ to influence irrigators to operate in a more sustainable and efficient manner.

National activities currently undertaken with respect to on-farm benchmarking

A survey of indicative on-farm surveys being carried out showed that Irrigation Supply Authorities and industry commodity groups in particular are currently carrying out a number of surveys to measure on-farm performance. These surveys vary in content and scope and are frequently carried out within one region. If the regional water authority and industry commodity group surveys are combined they could form the basis of a national benchmarking project. Regional water authorities have the experience and expertise to conduct the surveys but do not have national coverage. Industry commodity groups also have experience and expertise and have national coverage albeit commodity specific.

Key outputs from Workshop

The Workshop agreed that a national benchmarking project would provide benefits to key stakeholders and identified stakeholders to include primary-funding stakeholders, primary –management stakeholders, primary-irrigator stakeholders, secondary, tertiary and quaternary stakeholders.

Key issues in developing a national approach to benchmarking were also identified at the Workshop and a number of guiding principles essential for the success of the project were developed.

The guiding principles include:

- Establishment of a common data collection framework.
- Adoption of a rigorous methodology with objective reporting.
- Adoption of a comprehensive scope with biophysical, environmental, economic and social information being collected.
- Objective reporting being established.
- There must be recognised credibility of the process and of the data.
- Targeting of needs of key stakeholders and, in particular, recognising that the process must meet the needs of individual irrigators in order to enlist their co-operation and therefore ensure the integrity of the data provided.
- The criteria must be agreed for determining survey parameters.
- To the extent that they are able, the process should link and complement other surveys (not duplicate).
- Appropriate cost sharing between primary users must be agreed.
- A long-term commitment to the approach is required.
- The extent of the process should be limited at the beginning to enable the approach to be confirmed and tested and evolve over time.

Need for On-farm Benchmarking

There are currently no accurate nationally, and in most cases regionally, collated statistics related to on-farm irrigation activity and infrastructure. It has been identified by irrigators, natural resource managers, researchers, academics, policy makers and government departments that this information would assist in improving the image of irrigation both nationally and internationally, assist in improving the availability of information to support informed decision making (at a farm, regional, State and National scale) and policy formulation.

Conceptual Framework

After considering four alternative approaches, the preferred conceptual framework is to build on the surveys already being undertaken by the Irrigation Supply Authorities and industry commodity groups and to enlist the support of both of these groups to implement the project.

A core set of national data could be developed to which regional and commodity specific data could be added and reported by involved industry groups. The survey could then be implemented regionally and nationally by an agreed lead organisation in each region and nationally with joint sponsorship of the industries involved.

Analysis of the various activities required within the conceptual framework

- **Feasibility** of the proposal depended upon adequate funding, a “national champion” being found, a project coordinator managing the process and most importantly, landholder and industry commitment to the project. A one-year pilot study undertaken in one region would test the proposed methodology, develop the draft protocols and test landowner reaction to the project. As the project cannot succeed without the support and commitment of the irrigators it is important not to add to the existing “survey fatigue” identified in some regions. A 3-5 year cycle would therefore be feasible whereas an annual survey would not. Payment of the data providers should be tested in the pilot.
- **Information required** to undertake the benchmarking project will need to be agreed by the primary stakeholders but the data collected should provide an industry overview, data on farm water system infrastructure and operation, data on environmental issues and non-financial data on business management.
- **Data collection, storage and retrieval protocols** must be established including storage and/or access at a regional level to enable local reports for irrigators to be produced. Confidentiality of data must be protected.
- **Major Hurdles** for the project will include potential negative reaction from irrigators due to “survey fatigue” and a perception by irrigators that the data collected could be used to increase government regulation and interference. This could result in lack of irrigator participation and diminishing reliability of the data collected. Availability of adequate funding is another potential constraint.
- **Costs** will vary according the degree of contact with irrigators, the size and extent of the questionnaire, the size of the sample population surveyed, the extent to which overheads are included in the costing and whether data providers are initially paid for their time. However, based on surveying approximately 20% of the estimated 33,000 irrigated farms in Australia, the cost is estimated at about \$1.0M per national survey. The industry commodity groups and regional water authorities in carrying out their current surveys are already incurring some of this cost.
- **Future Direction** should include discussions with key industry groups to gauge support, determine a lead agency and establish a steering committee for the project. Following the securing of commitment and financial support a detailed implementation paper should be developed and a workshop held with potential pilot area representatives and potential project funding organisations to develop protocols and detailed data needs. A pilot survey should then be undertaken, the pilot should then be reviewed and if satisfactory the scope should be expanded to undertake a national survey.
- **Timeframe:** It is envisaged that a realistic timeframe would enable the national survey to be conducted in approximately June - July 2003 to collect data for the 2002/2003 southern Australian irrigation season.

Conclusion

- National on-farm benchmarking is feasible and desirable provided that there is sufficient funding and industry and landowner ownership and co-operation.
- Survey fatigue” amongst landowners will make an annual survey impracticable. A 3-5 year survey cycle is considered to be feasible. However payment of landowners for time spent providing data may offset this and improve the quality of data.
- Regional water authority and industry commodity groups are already carrying out a number of on-farm surveys and these should form the basis of a national project.
- A national standard format for data collection should be established including a standard set of core questions to which local questions can be added.
- As the quality of the data collected will be directly related to perceived value of the process to the irrigators it is essential that the process produces useful farm level information.
- The feasibility of the project should be gauged by a pilot study to be held in one region.
- The cost of a national on-farm survey would be about \$1.0M.
- A national coordinator and sponsor will be required to ensure the project proceeds, is focussed and meets the needs of stakeholders nationally. ANCID have indicated it does not want this role because it sees on-farm activities as being outside its core business. However because the on-farm activities heavily influence its business ANCID do wish to be on the Steering Committee for the project.
- The extent and quality of data will be improved if, at least initially, landowners are paid for their time spent in providing data.

Recommendations

- A national on-farm benchmarking project should be undertaken on a 3-5 year cycle rather than on an annual basis.
- The conceptual framework for this benchmarking project should be to build on the surveys already undertaken by Irrigation Supply Authorities and industry commodity groups at a regional level.
- Discussions should be held with key industry groups to gauge support and decide on a lead agency/champion for the project, to establish a steering committee and agree on details of the process.
- A pilot study should be undertaken in one region by an irrigation water authority and/or commodity group to test the feasibility of the process ahead of implementing a national project.
- As part of the pilot study which will be directed by the steering committee data providers should be paid for their time to encourage participation and better quality data.
- If the pilot study is gauged to be a success the project be implemented on a national scale.
- Funding should include the cost of data provision, data collection, data storage, data analysis reporting and communication.

SCOPING THE REQUIREMENTS FOR NATIONAL BENCHMARKING OF ON-FARM ASPECTS OF IRRIGATION WATER (AND ASSOCIATED ENVIRONMENTAL) MANAGEMENT

1.0. Background

LWRRDC commissioned ANCID to report on the issues involved in complementing their current national benchmarking survey of Irrigation Water Providers with a national benchmarking survey of irrigation farms. ANCID engaged Hydro Environmental to provide this report.

Terms of reference for the report are to:

1. Scope requirements of the on-farm benchmarking with LWRRDC.
2. Analyse the various national activities being undertaken with respect to on-farm benchmarking.
3. Develop a conceptual framework within which on-farm benchmarking could be undertaken on a regular annual, national basis.
4. Analyse the various activities in light of the conceptual framework and assess feasibility, information requirements, physical and financial resource requirements and limitations.

In order to scope the requirements of on-farm benchmarking, Hydro Environmental, in consultation with LWRRDC:

- conducted a survey to obtain an indication of the types of on-farm surveys that have been carried out in the last five years.
- conducted a workshop in Melbourne on 4 August 2000 (hereinafter called the Workshop) at which a cross section of stakeholders, including representatives from Research and Development Corporations (RDC's), Irrigation Supply Authorities, Commonwealth and State agency representatives, and irrigation and commodity industry representatives, attended. (The list of attendees is provided at Attachment 1).

This report addresses each of the terms of reference in the order listed above and is based on the outputs of the workshop and the survey.

What is Benchmarking?

The Workshop agreed that benchmarking is a process of learning from your own past performance and the performance of others in pursuit of continuous improvement. Accordingly the following definition of benchmarking was agreed:

“Benchmarking is a process whereby organisations pursue enhanced performance by learning about their own organisation through comparison with their own historical performance and with the practices and outcomes of others.”

It was agreed therefore that the purpose of an on-farm benchmarking project would be:

- to recognise what irrigators are currently doing/achieving and, to monitor change;
- to provide information for the setting of goals to foster continuous improvement;
- to influence irrigators to operate in a more sustainable and efficient manner; and
- to provide information for informed decision making and policy formulation.

Some of these purposes could be achieved by regional based data collection and reporting, however, there is a need to monitor change at a state and national scale to assist in natural resource management and decision making and policy formulation at this level. National statistics are also required to present the basis and achievements of the Australian irrigation industry internationally and to the community as a whole.

Context of Farm Water Management in Overall Irrigation Industry

The COAG Strategic Framework for Water Reform 1994 made it clear that Governments (and the community) are demanding both efficiency and sustainability in water services and water resource management. The package of reforms that has followed the implementation of this Framework has had widespread effect on the industry and of course on irrigators as the end users of irrigation water. The question that remains however is whether overall performance in the industry has improved or is improving? This question can only be answered if there are reliable tools available that can measure performance.

Currently there is no tool by which the on-farm section of the irrigation water industry as a whole can readily measure its performance or demonstrate its efficiency to Government or to the wider community. The annual national benchmarking of irrigation water providers has provided this tool for the provider businesses and therefore the challenge is now to determine whether a similar tool can be developed for the diverse on-farm section of the irrigation industry.

Accordingly the focus of this study is the feasibility of on-farm benchmarking. The context within the overall irrigation industry is shown in Figure 1. The current Irrigation Water Provider benchmarking boundary is also shown in Figure 1.

Irrigation Farms in Australia

Although the number of irrigation farms in Australia is not readily available, ABS figures and figures collected through the Irrigation Water Provider benchmarking project, indicate that there is approximately 145, 000 farms in Australia. Of these, approximately 33,000 irrigate for commercial gain. The 1996-97 ABS figures show a total irrigated area of 2,056,580 hectares.

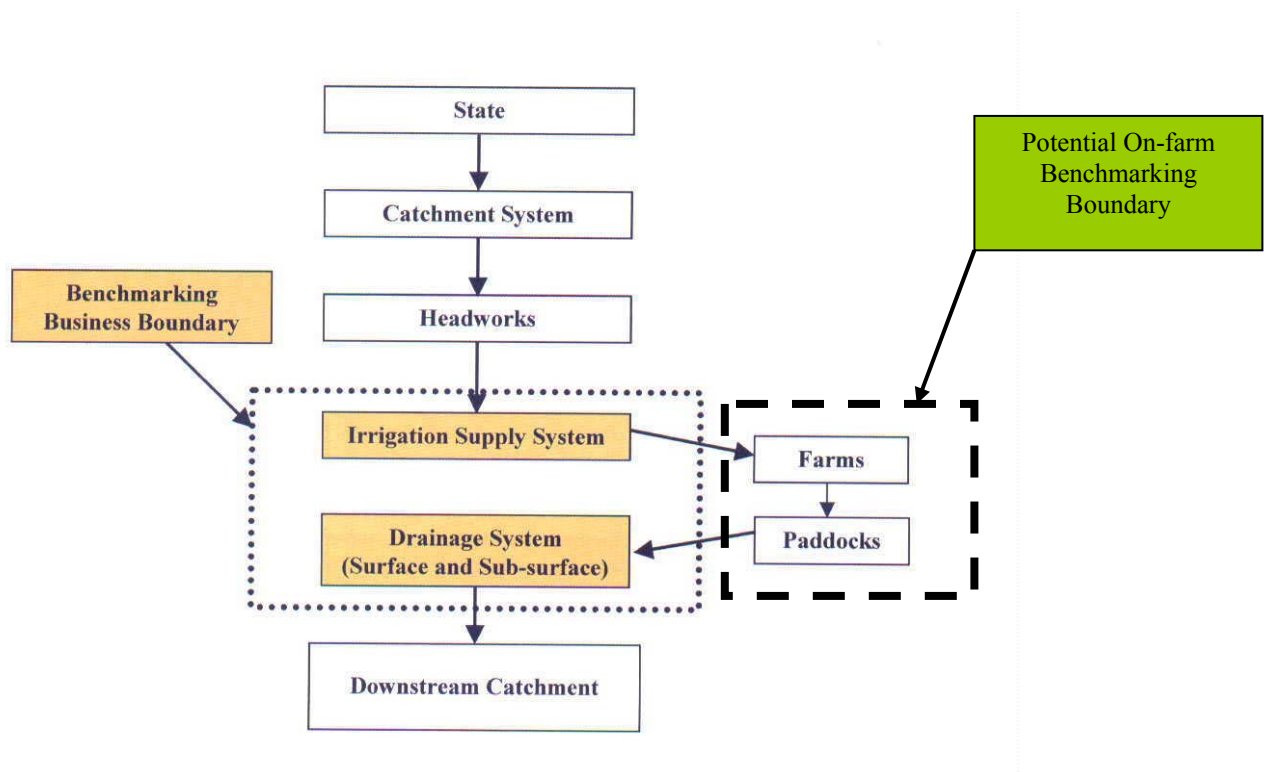


Figure 1: Current Irrigation Water Provider benchmarking boundary shown in relation to potential on-farm benchmarking boundary.

2.0 National Activities currently being undertaken with respect to on-farm benchmarking

On- farm surveys of various scales and intensity are being carried out by various groups and for differing reasons. These groups include:

- Land care groups
- Local action groups
- Rural water providers (domestic and irrigation)
- Natural resource managers
- Industry groups
- Commodity processors
- Industry suppliers
- Commodity research and development corporations
- Government agencies
- Government
- Marketing organisations

The degree of rigour applied to these surveys in terms of validity of the data, consistency of data, repeatability of the survey and data storage systems varies significantly.

A survey of Workshop invitees, including those unable to attend, (38 people in total) conducted prior to the Workshop held on 4 August 2000, identified 31 irrigation industry surveys undertaken in Australia in the last 5 years. Although this is not definitive, it is indicative of the types of on-farm surveys being carried out by Irrigation Supply Authorities, industry groups, government and government agencies and RDC's organisations throughout Australia.

A summary from the information provided is shown in Table 1 with a more detailed summary included as Attachment 2. These surveys can be categorised as follows. The % figures in brackets are the portion of the 31 surveys reported which meet the respective criteria. The sum under each category may be more than 100% because some surveys may fall into more than one division in that category.

Who Carried Out the Surveys?

- 17 (55%) were undertaken by agricultural industry groups or focussed on a specific agricultural industry group (alone or in conjunction).
- 9 (29%) were undertaken by Irrigation Supply Authorities (alone or in conjunction).
- 17 (55%) were undertaken by government agencies alone (DRDC and CRC not treated as government).

Scope of Survey

- 13 (42%) surveyed across industries.
- 18 (58%) surveyed a single industry.

Focus of Survey

- 14 (45%) focussed on Water Use Efficiency (although it was not indicated how this was defined) as a principal objective.
- 13 (41%) dealt with overall assessments of performance including issues such as irrigated culture, trends in broadly defined management practices.
- 7 (22%) included environmental aspects in their survey.

Frequency of survey

- 16 (51%) planned to be undertaken annually.
- 3 (10%) occur every 2-3 years.
- 4 (13%) are undertaken every 4-5 years.
- 8 (25%) are not planned to be repeated at this stage.
- 13 - 18 (42%-58%) are long-term surveys.

Table 1: Summary of details of sample irrigation farm, water management surveys

A	B	C	D	E	F	G	H	I	J	K	L
	On-going	Indust	Cult.	Syst. Type	Water Used	Pract's	WUE	Env	Water source	Water quality	Org'n
1	4	2	Y	Y	N	Y	N	Y	Y	N	RWA
2	1	0	N	N	N	Y	N	Y	N	Y	State/RWA
3	N	1	Y	N	N	Y	N	N	Y	Y	RDC
4	1	1	Y	Y	Y	Y	Y	N	Y	N	State
5	1	1	Y	Y	Y	Y	Y	N	Y	N	State
6	1	1	Y	Y	Y	Y	Y	N	N	N	State
7	2	1	Y	Y	Y	Y	Y	N	N	N	State
8	N	1	Y	Y	Y	Y	N	Y	N	N	RDC/LWA
9	N	1	Y	Y	Y	Y	Y	N	N	N	State
10	1	1	Y	Y	Y	Y	Y	N	N	N	State
11	N	1	Y	Y	Y	Y	Y	N	N	N	State
12	4	1	Y	Y	Y	Y	Y	N	Y	N	RDC
13	1	1	Y	N	Y	N	N	Y	N	N	State
14	1	1	Y	N	Y	N	N	Y	N	N	State
15	1	2	Y	Y	Y	Y	Y	N	N	N	RWA/Ind.
16	1	1	Y	N	Y	N	N	N	Y	N	RWA
17	N	0	N	N	N	N	N	N	Y	Y	RWA
18	5	0	N	Y	N	Y	N	Y	Y	N	RWA
19	3	0	N	N	N	N	N	Y	N	N	RWA
20	1	0	Y	Y	Y	Y	Y	N	N	N	State
21	N	0	Y	Y	N	N	N	N	N	N	State
22	1	1	Y	Y	Y	Y	Y	Y	N	N	State
23	1	1	Y	Y	Y	Y	N	N	Y	N	State
24	4	2	Y	N	Y	N	N	N	N	N	ABS
25	1	2	Y	Y	N	N	N	N	Y	N	ABS
26	3	1	Y	Y	Y	Y	Y	N	N	N	State
27	1	1	Y	N	Y	N	Y	N	N	N	State
28	N	2	Y	N	Y	N	Y	N	N	N	State
*	-	-	-	-	-	-	-	-	-	-	-
30	N	2	Y	N	Y	N	N	N	N	N	State/other
31	1	0	Y	N	Y	Y	Y	Y	Y	N	RWA
32	1	1	Y	N	Y	N	Y	N	N	N	RWA

- Survey No. 29 Repeated Survey No. 8 and therefore omitted from table.
- Gaps in Table 1 indicate where information provided did not allow evaluation.

Column Legend

- A: Survey Number (see Attachment 2)
- B: On-going Survey of farms (Frequency, yr)
- C: Industry not identified = 0; Industry Specific = 1; multiple industries identified = 2
- D: Area of crop/pasture cultures identified (Y/N)
- E: Irrigation system type identified (Y/N)
- F: Farm Water Use reported (Y/N)
- G: Farm Water Management Practices: eg. Whole Farm Plans, scheduling drainage, water harvesting, recycling reported (Y/N)
- H: WUE reported (\$/ML or t/ML) (Y/N)
- I: Farm environmental activities reported (e.g. tree planting, wetland management) (Y/N)
- J: Farm source of water identified (surface, groundwater) (Y/N)
- K: Quality of water used for irrigation reported (Y/N)
- L: Organisation undertaking survey (ISA = Irrigation Supply Authorities, State = State agency, RDC = Research & Development Corporation, Ind. = Industry Commodity Group; LWA = National Land and Water Audit; State/other = compilation and analysis of surveys conducted by others.

Of the 31 surveys, about 50% (1, 2, 5, 6, 7, 9, 12, 18, 20, 21, 22, 23, 24, 26, 27 and 31) appear to be broadly based along the lines that an industry wide survey might take and are likely to occur on an on-going basis. Most of these focussed on one industry (7 surveyed across industries on a regional basis). Overall many of the questions being asked by the surveys were common across surveys although specifically targeted at an industry. In relation to an industry wide survey, it is likely that there could be a core national set of questions with scope to add and report on questions to address local regional and industry needs.

Survey Costs

Not all responses identified the cost of the survey and in many cases the survey was part of a larger project and so the specific cost of the survey was difficult to separate. From the information provided the cost for the surveys seems to vary significantly depending on the level of contact (inevitably the level of accuracy of the data provided will also be proportionate to the degree of contact). The level of the data collection organisation's overhead costed to the survey also significantly affects the cost. From the figures obtained in the survey costs can be estimated as follows:

- Up to \$1500 per farm which would include farm visit (usually) filling out the survey, manual tabulation and entering into a database, analysis of results and report writing and production,
- \$40 per farm using a mail out of a pre-designed form that could be scanned and analysed using a computer and tabulated in a database format plus costs of survey design, analysis of survey results, and report preparation and production.
- Assuming a telephone survey (of say 3 hours) to collect and enter the data into a database, the cost would be of the order of \$200 - \$300 per farm plus the costs of survey design, analysis of survey results, and report preparation and production.

Other Surveys and Reviews

The thirty one surveys reported on in this report are only a representative sample of a large number of surveys currently being undertaken of farmers by government, semi-government, industry groups, agricultural equipment manufacturers, banks and the like.

In addition to the large number of surveys sponsored by individual industries, reviews of the methods and approaches adopted in the surveys have been undertaken.

The budget for this report does not allow a deeper analysis of these surveys and reviews to be undertaken but, if it is decided to proceed with a national project, it would be useful to analyse, in detail, at least some of the reviews before embarking on that project.

Conclusion in respect of current activities

There are a large number of surveys frequently undertaken in one region but in different industries.

These surveys could form the basis of a national benchmarking project. The most obvious options for undertaking the national program is through either:

- Irrigation Supply Authorities; or
- Industry groups.

Both groups have the advantage of being much closer to the irrigators than government departments or agencies and therefore more likely to garner irrigator support and thus potentially be able to collect better quality and more data. Both groups are currently involved in undertaking a number of on-farm surveys. The disadvantage of attempting to conduct a national program through the Irrigation Supply Authorities is that they do not have a national coverage. Although strong in Victoria, New South Wales and South Australia, there are few Irrigation Supply Authorities throughout the remainder of Australia. The Irrigation Water Supplier benchmarking is estimated to cover less than 50% of the irrigation in Australia. On the other hand industry groups have a nation-wide coverage although this coverage in many cases does not include the whole farming enterprise. The workshop strongly believed that using ABS to undertake such a survey would not result in data which is as reliable as could be obtained through either the Rural

3.0. Key Outputs from Workshop

3.1 Benefits of Benchmarking On-farm Performance

The Workshop agreed that benchmarking would provide key stakeholders with:

1. An objective appreciation of the status of irrigation farm performance (broadly defined to include irrigation system, environmental and farm management aspects).
2. A basis for influencing farmers to adopt better practices to improve ecological sustainability, productivity and profitability.
3. A measure to monitor change.

The workshop also agreed that benchmarking undertaken at the national level offers the following potential benefits:

- An opportunity to present the Australian irrigation industry to both a national and international audience as a progressive and responsible industry using objective information.
- The development of more informed and better government and industry (water, commodity, catchment) policies to achieve long term sustainability in the irrigation industry.
- Support for the irrigation industry in developing Better Management Practices and monitoring the progress of their implementation.

3.2 Stakeholders

The Workshop identified a wide range of potential stakeholders and users of the information gathered from a benchmarking project. Potential stakeholders of a national approach are categorised into the levels of primary, secondary, tertiary and quaternary groups.

Examples in each of these stakeholder groups are shown in Table 2.

Primary- Funding Stakeholders: Those organisations that may have an interest in funding the survey and will place importance on the results for their own purpose. As funding bodies, their needs must be closely targeted.

Primary- Management Stakeholders: Those organisations that have management responsibilities. They will be significant users of the information but will supplement the results with additional information that they will collect. They are stakeholders that can directly influence the direction of the irrigation sector and so their higher level needs should also be catered for if possible.

Primary –Irrigators: Although much of the data collected will not be specific enough to be of direct use by irrigators, ranking, trends and the opportunity to influence policy makers will be of prime concern to irrigators. If more detailed information of benefit to irrigators could be collected locally as part of the national process, the irrigators would be more likely to support the initiative. As the providers of the data, the irrigators’ confidence in the project and the benefits of the project are essential to its success.

Secondary Stakeholders: These stakeholders will have a close interest in the results that they may use for their own purpose. A well-designed survey should provide a range of high level information required by these groups.

Tertiary Stakeholders: These stakeholders may have use for the information in the results but are unlikely to be regular users.

Quaternary Stakeholders: These stakeholders will have a general interest only.

Table 2: Example of Key Stakeholders by Categorises

Primary - Funders	Primary- Management	Primary Irrigators	Secondary	Tertiary	Quaternary
National and State policy makers	State extension providers	Irrigators	Regional irrigator groups	Members of Parliament	Local Government
R&D Corporations	R&D Corporations		Agri-politicians	Equipment manufacturers	Education sector
Water Supply Agencies	Water Supply Agencies		Conservation Groups	Universities	Equipment retailers
MDBC	State and National Irrigator Bodies		State Research Groups	International Trade bodies	Retail Sector (e.g. Coles)
	Commodity Groups			Consultants	Wider community
	Catchment Management Authorities				
	LWMP groups				

Selection of the key primary target group (probably the Irrigators and the Primary-Management Group) will be important at the time of formulation the survey because it will influence the format and content of the questionnaire and reporting.

3.3 Key Issues in Developing a National Approach to Benchmarking Farm Performance

Key issues identified at the Workshop that should be considered in developing and successfully implementing a national approach to benchmarking on-farm irrigation are:

Purpose

- The purpose and objectives for the study should be clearly defined and agreed with the key stakeholders.
- The uses of the data that will be collected should be clearly defined at the outset.
- The results must be relevant to the needs of stakeholders.
- The purpose and results should be owned by key stakeholders/industry.

Project Planning Issues

- The project should complement current on-going activities and build on these experiences. Key stakeholders in this regard are Irrigation Supply Authorities and regional commodity groups.
- The quality of the data collected will be directly related to the perceived value of the process to the individual irrigator providing the data.
- A national process may not be of sufficient detail to provide value to the individual irrigator unless the data is gathered as part of an industry or regional survey.
- The approach should not be too ambitious in the first instance, so that it can be built on as experience increases and practicalities become understood.
- The process should recognise what is feasible and not try to satisfy everyone's needs.
- Clear and practical results should be emphasised.
- The focus should be on regional and industry (e.g. dairy) data collection with regional and industry reporting and national aggregation of data/results.
- The intensity of data collection and expectations of the process should be realistic.
- The approach should be cost effective and kept simple to increase the likelihood of a long-term commitment and data collection.
- Some industries (e.g. horticultural industries) are highly dispersed with cultural differences and may be difficult to capture.
- Differences in the time of the irrigation season in different parts of Australia may cause problems with the timeliness of surveys.
- Data quality and extent may be improved if data providers are paid at least until the credibility of the project is established.
- Selection of the key primary target group will be important at the time of formulation the survey because it will influence the format and content of the questionnaire and reporting.

- Protocols for the release and reporting of information must be determined and agreed before surveys are commenced to instil confidence and minimise the possibility of misuse of data.

Methodology

- There should be a common framework established so that data collected by regional, water authority and industry survey processes can be aggregated (i.e. a common protocol outlining an understanding of data definition, accuracy and storage).
- The methodology should be rigorous with common well-defined steps and protocols (sample size, standard definition of terms, standard units).
- The approach should ensure that the diversity of the industry is represented (e.g. levels of performance, range of industries, age structures, size etc).
- The approach and framework should be accepted by key stakeholders.
- Questions should be framed so that ambiguity of answers is minimised.
- There should be links between databases with data stored at the appropriate level (regional and national) with appropriate access to both.
- Data at the various levels (regional, state, national) should be stored using the same protocols to facilitate aggregation.
- Data accuracy should be understood and documented.

Data Issues

- An agreed core national data set should be defined. Regional data collectors can then add to that data set.
- Standard data definitions, units are required nationally.
- Data should be collected consistently so that it can be aggregated up to a national picture as well as presented at a regional and industry level.
- The data collected should cover all relevant aspects of irrigated agriculture (infrastructure, economic, environmental and social) - not just water use efficiency.
- Methods of data archival and retrieval must be agreed between the relevant stakeholders.
- The issue of confidentiality of data must be addressed.
- Core data sets should be determined on the basis of stakeholder need rather than national availability as a null response can give a positive response (e.g. lack of water measurement should not preclude asking how much water is used).
- Data collection should be kept simple and the use, accuracy and amount of data required balanced with the cost and complexity of collection.

Resourcing

- The process will require adequate resourcing if it is to be successful.

- Agreed cost sharing arrangements and a long-term commitment to funding are required. Cost sharing may change over time for example initial payment of data providers may be included but be phased out over time. Time commitment from irrigators/landowners for the provision of data at the time of data collection should be limited to less than 1.5 hours to avoid fatigue.
- Organisations will have to see value in the results in order to provide an on-going commitment.
- A national financial sponsor will be required for at least the first 2-3 reports.
- A national co-ordinator /manager will be required to be custodian of the corporate knowledge, develop and implement protocols and to collect, store, analyse and report on the data at a national level. It therefore follows that the coordinator /manager should be part of, or supported by, a national corporation or department.

Equipment

- An appropriate data base system including hard ware and software will be required for data storage, and to enable data transfer and analysis. This equipment will be required both regionally and at the point of national collation.
- Equipment for collection of data will depend on the agreed method of collection and processing of data. However, local data entry, storage and transfer systems will definitely be required.

Reporting

- Reporting should be accurate and with limited careful interpretation due to the risk of misinterpreting data (due to limited accuracy, influence of externalities such as seasonal conditions and individual circumstances).
- Reporting needs to be timely so that at least the key primary target group find the information relevant and useful.
- Data should be qualified where appropriate (accuracy, limitations, etc.).
- In addition to the current year's data, trends based on comparison with previous year's surveys should be reported.

Accountability/Responsibilities

- Agreed organisations, co-ordinators and champions are required at the relevant levels (regional/industry and national).
- Confidence in the accuracy of the data collected is essential.
- A process to ensure confidentiality of data from individual farmers is required.
- There must be clear and agreed responsibilities for data collection, analysis, reporting, storage and cost sharing – at both a regional and national level.

Public Image

- The process and results must be seen as credible and accurate (either by independent analysis and reporting or independent review of findings by periodic audits of data and reports).
- The process should not be seen as part of the COAG process or government wishing to further regulate the industry.
- The process and reporting should avoid being parochial and avoid misusing the data (i.e. objective reporting).
- A communication strategy is required to ensure that water users are willing to participate (see value in doing so) and to ensure that the results are disseminated to all stakeholders.

Water User Perceptions

- There is a concern in some States that water users will not see value in the approach and will be concerned that the survey will result in additional government regulation, land use controls and costs. It is essential that the positive aspects of the process are identified and actively publicised.

3.4 Guiding Principles

There were a number of guiding principles identified at the Workshop as being essential for national on-farm benchmarking to succeed. These guiding principles, which are listed below, emerge from the key issues identified and accordingly may appear in some respects to repeat some of the issues.

Common framework

A common data collection framework including data definitions, measurement, accuracy, storage medium and analysis must be established. Data should be collected by industry, commodity groups, water and land management authorities etc. and aggregated to provide output at a national level.

Rigorous Methodology

A methodology of adequate rigour is required. This needs to detail an appropriate sample size, standard definitions and terms and standard units. However the methodology needs to balance cost, with the likely use of data and the levels of confidence in the data.

Comprehensive Scope

The scope of the methodology would include a comprehensive approach to benchmarking the performance of irrigation farms with biophysical, environmental, economic and social information being collected. The degree of rigour and detail of the survey will however need to be determined in balance with the costs.

Objectivity

Data and information should be reported without bias or value judgement. The level and detail of the reporting and the reporting protocols will need to consider the possibility of data being taken out of context or being misreported by others.

Public Credibility

The process should be a highly credible and recognised as such.

Water users will need to be confident that there are adequate confidentiality arrangements in place. On the other hand, the wider public and non-government organisations need to have confidence in the accuracy of the results.

Targeting the Needs of Key Stakeholders

The key stakeholders are identified in Table 2. The needs of LWRRDC and industry RDC's, MDBC, Irrigation Supply Authorities and national and state policy developers need to be closely targeted as they are the most likely funders of the process.

Commodity groups, catchment management groups and land and water management planning groups, as well as, State extension agencies, are also likely to be primary and important users.

It is important that the process also be able to meet the needs of the individual water users providing the data. This could be achieved if the process employed enables more detailed and comprehensive benchmarking information (dealing with more issues of farm management) to be produced for irrigators by industry and commodity groups at a local level. The more general information required at a national level by the funding stakeholders can be distilled and aggregated from the detailed data.

Criteria for Determining Survey Parameters

Survey parameters should be:

- Be adequate to meet the reporting needs of primary stakeholders.
- Be applicable at the national level and able to be differentiated regionally by industry.
- Lead to more informed and better decision making.
- Satisfy sampling statistical and consistency methodologies.
- Be relevant at a farm level.

The approach requires national co-ordination with a national standard core data set and data collection occurring at the regional level. Regional supplementary questions and analysis enable local ownership and highest value output for primary stakeholders.

Complementing Activities of Primary Stakeholders

The process should link and build on other similar surveys. There should be a core standard national data set, which can be added to by regional organisations.

A Long Term Commitment to the Approach

A long-term commitment is required if the benefits of benchmarking are to be achieved. This requires that the purpose, objectives, and outputs (and questions) must be agreed with key stakeholders (funders and primary users) before the process commences. This approach will ensure the usefulness of information reported and, it is hoped, long term ownership and commitment of these stakeholders to provide data and funds. The aim to provide practical results should be emphasised.

Appropriate Sharing of Costs

Agreed cost sharing is required between primary users of the information on the basis of the benefits to be derived from the survey and their ability to pay. Consideration should be given to short-term payments for the data providers. To ensure a robust and credible Benchmarking project thrives in the longer-term government support either direct or indirect will be required.

Evolutionary Implementation Arrangements

The first surveys should be limited in extent and scope in order to confirm the approach and costs and to establish robust systems. Subsequent surveys would build on these arrangements and experience.

4.0 Conceptual Framework for On-Farm Benchmarking

4.1 Alternative approaches

There are four alternative approaches for an on-farm benchmarking project. These are:

- Collect data direct from farms via a national survey.
- Collect data via ABS or BRS.
- Collect data via irrigation water providers (or a designated state agency in areas without an irrigation water provider).
- Collect data via commodity groups.

The first two alternative approaches are not recommended, as they would not engender data provider ownership in the process and provide limited scope to target questions to regional needs. Accordingly data quality would diminish as the perceived benefit to the irrigator diminishes.

Further, a national survey to collect data direct from irrigators would require a large number of resources and would be therefore very expensive.

Although use of the ABS or BRS to conduct the survey would have the advantage of consistency in approach, timing and full national coverage, the Workshop expressed concerns about the acceptability of this approach to water users and hence the accuracy of collected information. These concerns centre around the fear that government would misuse the data.

4.2 Preferred Conceptual Framework

Irrigation water providers and industry commodity groups are currently undertaking a large number of surveys. The preferred methodology (framework) for the national on-farm benchmarking process is therefore to build on these surveys and thus minimise the additional costs and organisational needs. This approach also means that the data collection can be more targeted, avoid duplication and more comprehensive with both local and national needs being met through the one data set.

A core set of national data could be developed to which regional or commodity specific data could be added by involved industry groups. The survey would then be implemented and analysed regionally by an agreed lead organisation with joint sponsorship of the industries involved.

The Irrigation Supply Authority may be the key organisation in regions where they exist because they have a region wide focus, regularly deal with irrigators, are familiar with agricultural industries in the region, and have significant financial and professional resources. They are also often experienced in conducting surveys of their water users.

In other areas (e.g. river diverters, groundwater diverters) a designated organisation would need to be identified as the managing agency. This could be the state agency who works across industries and has a regional presence (and already conduct many of the surveys) and strong professional resources or it could be a commodity group particularly where water use in an area is substantially monocultural. Commodity groups often also have experience in conducting surveys and have the confidence of the irrigators.

Where there is a strong presence of both an industry commodity group and an irrigation water supply authority, it may be desirable to continue with both surveys but using the same protocols. This approach has merit in that the quality of the data will be better in different areas for each organisation. When the data is aggregated at a national level the best possible data set will have been established.

5.0 Analysis of various activities required within the conceptual framework.

5.1 Feasibility of preferred option

The Workshop as a whole was optimistic that there was merit in, and it was feasible to, undertake a national benchmarking approach. However, it was agreed that feasibility depends on obtaining:

- Adequate funding
- A national “champion” being found for the project
- A project co-ordinator being appointed to manage the process.
- Landholder and industry group commitment to the concept and detail of the process

The extent to which the project goals are met heavily depends upon the degree of rigour and support for, the development of a standard framework for data collection storage and analysis, as well as, a process being developed to provide feedback to farmers.

To improve the chances of success it will be essential that at least the first two surveys be conducted on a face to face basis using local data collectors who can empathise with the land owners (data providers). The second face to face collection of data is needed to ensure the questions and level of detail required are understood by the data provider. Including some form of payment for the landowners time would also further enhance the chances of getting reasonable data.

5.2 Pilot Scheme

It is essential that the proposed questions and protocols be tested on a small group initially. It was proposed that a one-year pilot study be undertaken to gauge feasibility. This pilot would be conducted by, for example, choosing a region or an industry group within the region. If the pilot is successful the process could be extended to other regions and industries to become a comprehensive national survey.

This pilot would include data being collected a by commodity group and a regional water delivery organisation. Face to face interviews would be conducted with the regional water provider data collectors interviewing different populations to the commodity group data collectors. Reports for the pilot scheme would be by commodity group, water business and regionally.

5.3 Management of the pilot scheme

To provide the pilot scheme with appropriate strategic direction a project steering committee would be formed comprising representatives from the following key industry organisations.

- LWRRDC
- Industry group representatives [e.g. Grapes, dairy, rice, cotton , cropping]
- ANCID
- IAA
- AFFA
- State Agencies.

5.4 Frequency

To avoid irrigator “survey fatigue” and provide a greater chance of quality data being collected the Workshop generally agreed that the process should not be repeated annually but possibly every 3-5 years. Seasonal variability and climatic differences would need to be taken into account when determining the frequency of the data collection.

5.5 Information requirements for the Benchmarking Report

Types of Data

The most important factor in data collection is to ensure that there is a standard framework developed for the data collection. That is, the questions and their meaning are common and clearly understood and standard definitions and farm selection protocols are provided.

Data to be collected must be easily obtained and relevant to the questions which need to be answered by at least the key stakeholders. The workshop identified the types of data that should be collected to include the following. The following coarse index has been used to scale the importance of the questions: - **E** = Essential and **D** = Desirable.

Industry overview

What's grown (crop and area)	E
Industries supported by irrigation produce	E
Level of production/output (t/ha)	E
Irrigation water quantity (and source) - entitlement (ML)	E
- use (ML last season)	E
How much water was used for each crop (ML for last season)	E
Total area of the farm (ha)	E
Irrigation water quality (EC)	D

Farm water systems operations

Application methods/system	E
Pan evaporation for the irrigation season (mm)	E
Rainfall for the irrigation season (mm)	E
Water use efficiency (E_t /ML applied) and (t/ML)	E
Recycling/water harvesting (what, from where, quantity, quality)	E
Rainfall during irrigation season (average, and during year of survey)	E
Existence of a whole farm plan	E
Components of a whole farm plan	D
Scheduling method(s)	D
Level of automation of application system	D
Conveyance systems and efficiency	D
Level of automation of conveyance system	D
System pressure (m)	D
Crop rotation (type, timing)	D

Environmental issues

Drainage (type)	E
Subsurface drainage (type)	E
Area laser graded (ha)	E
Fertiliser management (application rates, systems and protocols)	E
Salinity management and monitoring (soil and water)	E

Tailwater management	E
Rainfall runoff management	E
Groundwater level below ground	E
Groundwater quality	E
Nature Conservation (remnant vegetation, tree planting, wetland management)	D
Tillage practices	D
Sediment management	D
Soil management (compaction, acidification, nutrients)	D
Drainage (quality, volume, monitoring)	D
Herbicide and pesticide management	D
Soil salinity	D

Business Management

Use of irrigation advisory services (extension, consultants)	E
Turnover of farm ownership and management	E
Age of structure of application system	E
Labour used (FTE)	E
Time since application system was renovated	D
Age of supply system	D

5.6 Data Storage and Retrieval

Data must be stored in a central location and in a manner in which it can be easily retrieved. Access must however be agreed at the outset of the project and confidentiality of data must be of paramount consideration. Arrangements must also allow for storage of, or access, to data at commodity and water supply authority level to enable the production of local reports.

5.7 Constraints on Benchmarking

The following possible constraints on benchmarking were identified at the Workshop:

- Potential negative reaction from irrigators because of the time involved in filling out another survey. “Survey fatigue” has developed because of the number of surveys farmers are being asked to complete on a voluntary basis.
- Some representatives at the workshop were concerned that there would be a perception by irrigators that the survey would result in increased interference and regulation of government in the industry resulting in increased costs and restrictions on land use. This would discourage participation and the reliability of the survey.
- Availability of adequate funding which may include funds to meet some of the costs involved in landowners completing the data sets. Payment to landowners and regional collection groups may be necessary if they perceive that there is little benefit to them. This may only be a short-term need until such time as the credibility of the process is established.
- Availability of an agreed national coordinating organisation and project champion.

5.8 Costs

As detailed in Section 2 of this Report, the cost of the survey can vary significantly. This variation in cost depends amongst other things on the;

- level of contact,
- extent of the questionnaire,
- process in storage system used,
- level of followup and support to the landowners in their recording processes,
- level of audit to check data validity and accuracy,
- size of the population surveyed,
- inclusion of payment to landowners for their time is included,
- inclusion of costs associated with the current surveys which would be subsumed or integrated into this project are included,
- extent to which overheads are costed to the project,
- degree of analysis and reporting. (including whether reports would be by region, water delivery organisation, state and commodity group as well as at a national level or just some of these),
- quality of the report published.

Until the methodology and processes are finalised a detailed costing cannot be provided. There are at least 33,000 irrigation farms in Australia. Because of the national variability in the measures to be benchmarked a significant proportion of farms will need to be surveyed. If only 20% of these farms are surveyed (a figure believed to be the absolute minimum that would be required) about 7,000 farms would be surveyed around Australia. This is only an average of about about 70 farms per irrigation region. The cost of each farm would be around \$100-\$300 (based on costs of surveys already carried out by commodity groups and regional authorities). The cost would be approximately \$0.5M-\$1.5M per survey report with some of this cost already being incurred by the commodity groups and regional water authorities in carrying out current surveys. As at least the initial surveys will require face to face contact (in regions which do not already have a regular survey), it is proposed that for the purpose of decision making an estimated cost of approximately \$1.0M per survey be used for the first two national surveys. The pilot scheme, because it will cover a smaller area and probably incorporate some existing surveys, should be significantly less than this.

5.9 Funding

Experience gained for the ANCID Benchmarking Report for the Irrigation Suppliers around Australia indicates that “seed” money is required to ensure that at least initially the organisations supplying the data are not charged for the final report or analysed information. In fact it is believed that greater levels of participation would occur if the data providers were paid for the 1-2 days required to collate and report on the data for that study. It is expected that data collection for the on-farm reports should be limited to taking 1.0-1.5 hours.

In commencing a benchmarking exercise such as on-farm benchmarking seed money is required until the organisations supplying data (landowners, commodity groups and irrigation supply organisations) and ultimately receiving and benefiting from the survey realise these benefits do exist. Some ongoing funding may also be appropriate because of the public good aspect of the reports and data.

These benchmarking initiatives are being driven through the COAG Water Reform process. It would therefore seem appropriate that funding at least initially be provide either through AFFA, LWRDC or another Government initiative.

5.10 Future Direction

It is recommended that the following steps be taken to progress the introduction of a national on-farm benchmarking project.

1. *NPIRD Board briefing*

This report should be presented to NPIRD and LWRDC Boards for their consideration and if agreed, adoption of the recommendations.

2. *Discussions with key industry groups etc*

Discussions should be held with key industry groups (e.g. rice, dairy, cropping cotton, sugar and grapes) representing irrigators as well as ANCID and its water authority members, IAA, AFFA, MDBC and natural resource management agencies (including State) to gauge the support for the proposed concept and decide who should be the lead agency / champion and initial funders for the project. A steering committee should then be established to take the project through the next steps.

3. *Develop a Detailed Implementation Paper*

Based on the findings of this report a detailed discussion paper should be prepared. This discussion paper should include a detailed review of current approaches (including any international approaches) and deals with the issues of:

- Purpose and practical use of information.
- Data Collection approach and proposed national data set.
- Proposed standards and definitions.
- Quality assurance issues including survey population size.
- Selection of the 1-year pilot region including the proposed commodity group and commodity group region.
- Size of the survey population and the method of selecting the farms to be surveyed.
- Method of analysis and for normalising seasonal variability and unusual circumstances.
- Data confidentiality and ways of minimising the possibility of the data being misused or miss quoted.
- Marketing and communication issues including a strategy with which to proceed in this area.
- Detailed costing and proposed cost share for large-scale project and the pilot project.
- The likely level of commitment from possible funding organisations.
- Implementation issues including timing.

4. *Hold Workshop to Critically Analyse Proposal*

A workshop involving potential pilot area representatives and funding organisations should be held. The workshop would decide future directions (including whether to proceed), develop a draft standard framework and national question set and other details of the process.

5. *Meeting of Key Stakeholders*

In the event of a decision to proceed, meetings between funding organisations and regional stakeholders should be held to determine:

- Supplementary questions
- Form (mail, telephone, farm visit) of the survey
- Size and selection of the survey population
- Analysis approach (who, computer/scanner based)
- Detailed costing
- Lead agency and approach
- Cost sharing

6. *Undertake Survey and report*

The agreed lead agency is to co-ordinate the survey, data collection, analysis and produce the national level report based on the pilot population.

7. *Review Process and Findings*

The process and findings set out in the reports on the pilot study should then be reviewed by the steering committee and recommendations on the future of on-farm benchmarking should be provided to the NPIRD Board for its consideration.

8. *Revise and Expand Scope*

If the NPIRD Board is satisfied that the pilot study is a success, the lead agency should broaden the framework to include all irrigation industries and include the development of an implementation and communication strategy to undertake a national data collection and reporting.

5.11 Timeframe

It is envisaged that a realistic timeframe in which to complete the recommended actions is as shown in Table 3.

Table 3: Project Implementation Timetable

TASK	ELAPSED TIME (weeks)	INDICATIVE DATE
Brief NPIRD Board	4	Jan. 2001
Discussions with key industry groups	12	March 2001
Develop a detailed implementation paper	24	Sept. 2001
Hold a workshop to critically analyse the proposal	4	Oct. 2001
Meeting of key stakeholders	8	Dec. 2001
Set up national protocols and undertake pilot survey and report	36	Sept. 2002
Review process and findings	12	Nov. 2002
Revise and expand scope and undertake national survey	26	June 2003

6.0 Conclusions

- (i) After reviewing the sample of on-farm surveys already being carried out and heeding the views of those industry representatives who attended the Workshop, it is concluded that national on-farm benchmarking is both feasible and desirable provided there is sufficient government or R & D corporation funding and, industry and landowner ownership and co-operation.
- (ii) Taking into consideration the views of the Workshop attendees and the feeling that “survey fatigue” amongst irrigators has developed as a result of the large number of surveys they are currently completing, an annual benchmarking project would not be feasible. It is therefore concluded that a 3-5 year cycle would be feasible.
- (iii) National on-farm benchmarking would provide the necessary tool to measure the on-going performance of the on-farm section of the irrigation industry, a tool that is not currently available.
- (iv) Regional and commodity groups are already carrying out many on-farm surveys. These existing surveys should form the foundation of a national approach and industry or regional bodies should be the data collection bodies because:-
 - Use of local/industry bodies will engender more confidence from the irrigators and will enable collection of local level data and the preparation of a local level report of use to individual irrigators.
 - Use of existing survey processes should reduce costs.
 - Use of existing surveys processes should reduce the number of surveys irrigators are asked to complete and therefore avoid “survey fatigue” and improve the quality of the data collected.

- (v) As the quality of the data provided by irrigators will be directly related to the perceived value of the benchmarking process to the individual irrigator, it is essential that the process enables useful information for landowners to be produced as well as more general national information required by funding stakeholders. To this end, the input and support of peak bodies representing irrigators (such as the Grape and Winegrowers Council, Ricegrowers Co-operative etc.) should be sought.
- (vi) It is essential that a national standard format for data collection and consistent survey / population selection protocols be established. This would include a standard set of core questions, to which local questions can be added of relevance to particular commodity groups or regions.
- (vii) A workshop be held with peak industry groups to test the feasibility of the proposed approach. If the approach is endorsed by that group and a sponsor can be found, a pilot study should be undertaken with a commodity group and water supply authority via a selected region to test the feasibility of the process ahead of extending the process to a national scale.
- (viii) Funding is required to establish and prove the credibility of the project to the key stakeholders. This funding which could be up to \$1.0M per survey should initially include some payment to the data providers to cover their time in participating in the survey.
- (ix) A strong communication strategy is essential for the success of the project.

7.0 Recommendations

It is recommended that:

- A national on-farm benchmarking project should be undertaken on a 3-5 year cycle rather than an annual basis.
- The conceptual framework for this benchmarking project should be to build on the surveys already undertaken by rural water providers and commodity groups at a regional level.
- Discussions are held with key industry groups to gauge support and decide on a lead agency/champion for the project, to establish a steering committee and agree on details of the process.
- Funding should include the cost of data provision, data collection, data storage, data analysis reporting and communication.
- A pilot study should be undertaken in one region by an irrigation water authority and a commodity group to test the feasibility of the process ahead of implementing a national project.
- If the pilot study is gauged to be a success the project be implemented on a national scale.

ATTACHMENT 1

Attachment 1: Attendees at the Workshop in Melbourne on the 4 August 2000.

The workshop was organised by Hydro Environmental, held at the Centra Hotel at Tullamarine Airport in Melbourne and facilitated by Jeremy Cape.

Name	Association
Karen Alexander	Hydro Environmental
Peter Alexander	Hydro Environmental
Allan Nicholls	ABS
Brett Tucker	LWRRDC
Clive Lyle	Hydro Environmental
Chris Norman	DNRE Tatura
Daniel Armstrong	DNRE Tatura
Derek Poulton	G-MWater
Geoff McLeod	MIL Deniliquin
Helen Dugdale	CRDC Narrabri
Ian Loh	WA – Water Resources
Jeremy Cape	Capeability
Jim Purcell	AQUATECH
Leigh Sparrow	HRDC - Tas
Lindsay Jones	Hydro Environmental
Mark Hickey	NSW Agriculture
Mark Skews	DEHAA - Loxton
Nick Austin	NSW Ag Dubbo
Nick Schofield	LWRRDC
Peter Sutherland	DNR Q
Ralph Schulze	CRDC Narrabri
Rob Rendell	Rendell- McGuchian
Sigrid Tijs	Murrumbidgee Irrigation
Steven Raine	USQ - Toowoomba

ATTACHMENT 2**Attachment 2: Summary of a sample of Current Surveys - August 2000**

Name of Survey/Industry	Survey type/Why carried out	Detail of Survey	By whom	When done	To be repeated
1. Goulburn Murray Water Irrigation Census	Irrigation culture survey/Trends in irrigation development	Irrigation culture survey-data collected in Goulburn-Murray water Region on irrigation farm cultures (area only), environmental developments, groundwater pumping and drain diversions. Cost \$106,300 for 12,000 returns from a mail survey.	Goulburn-Murray Water and DNRE	March/April 1997	Four yearly. Next due Sept 2000
2. Shepparton Irrigation Region Land and water Management Plan Annual Reporting	Report on progress of implementation of Land and Water Salinity Management Plan	Data collected in Shepparton Irrigation Region on Implementation Performance Indicators including: whole farm plans, groundwater pumps, surface drainage, reuse systems, tree establishment, wetland/remnant vegetation protection.	Goulburn-Murray Water and DNRE		Annually
3. Horticultural Environmental Audit	Overall assessment of environmental issues in horticulture	Survey of horticultural growers across Australia on source of water, water quality rating, use of scheduling, type of on-farm water storage	Consultant for HRDC	1999	Not planned

Name of Survey/Industry	Survey type/Why carried out	Detail of Survey	By whom	When done	To be repeated
4. Queensland Fruit & Veg Growers Survey	Water Use Efficiency-current practices	Data collected from 10% of growers (300 farms) which covered 40% of production.	Consultant for DNR	1999	2003
5. Benchmarking and Monitoring Irrigated Horticulture	Water use efficiency/develop a tool for improving irrigation management	Survey of WUE in citrus, winegrapes and potato industries in Riverland (SA) and the Sunraysia in NSW and Vic	PIRSA for MDBC	1996/97 to 1997/98	Not in same form, developing a self managed version to be available annually.
6. Benchmarking to Improve Irrigation management in South Australia	Water use efficiency	Survey of winegrapes, potatoes, dairy, small seeds growers in the Sth. Australian South-East Region	PIRSA	1999/2000 and 2000/01	As above
7. Vegetables Best practice Processing Tomatoes, Melons, Onions Carrots.	Water use efficiency	Survey of processing tomato growers in Sth. NSW and Nth Vic	DNRE Tatura	1998/99 Season	Smaller sample March 2001

Name of Survey/Industry	Survey type/Why carried out	Detail of Survey	By whom	When done	To be repeated
8. Land and water Resource use in the Australian Dairy Industry	Determine current practices and attitudes within the dairy industry to land and water use issues	1800 dairy farmers surveyed across 8 dairy regions on irrigation water use, area irrigated, re-use systems etc,	DRDC	April/May 2000	Not known
9. Irrigated Dairy in Nth Vic and Sthn NSW	WUE	Survey of 180 farms to determine irrigation layout and practices and re-use systems	DNRE Kyabram	1996	See Survey no.11
10. Monitoring WUE on 20 dairy farms in Nth vic and Sthn NSW	Monitor changes in water use efficiency	Survey of 20 farms to on irrigation layout and practices and re-use systems to monitor changes in WUE	DNRE Kyabram	1998,1999,2000	Annual
11. Changes in dairy farm WUE on the Goulburn and Murray (Vic) in recent seasons	Determine the impact of low irrigation allocations on water use efficiency	Changes in WUE on 100 of the farms surveyed in survey no.9	DNRE Kyabram	July 2000	Possibly
12. Cotton Industry Benchmarking Survey-Irrigation Section	Part of benchmarking major issues and management systems for whole cotton industry.	10% of cotton growers in each cotton growing district were surveyed to determine WUE, ML pumped, type of irrigation system, rainfall etc.	CRDC	1996	2000

Name of Survey/Industry	Survey type/Why carried out	Detail of Survey	By whom	When done	To be repeated
13. Ricecheck	Improve sustainability productivity and food safety	Productivity, environmental and quality assurance data collected from rice industry farmers	NSW Agriculture	Since 1986	Annual
14. Cropcheck (Irrigated crops in the Murrumbidgee area)\	As above	Productivity, environmental, and quality assurance data collected from wheat and canola farmers	NSW Agriculture	2000	Annual
15. WUE Improvement scheme	Increase awareness about WUE and improve WUE through education and extension	Survey of 100 large farms in the MIA &D and 150 horticultural farms in the MIA&D	Murrumbidgee Irrigation and MIA Council of Horticultural Associations for horticulture	1997/98, 1998/99, 1999/2000	Annual
16. Rice Environmental Monitoring Program	To identify breaches of the rice environmental policy	Rice areas and water usage information was collected for all rice growers in the MIA&D area	Murrumbidgee Irrigation	Annual	Annual

Name of Survey/Industry	Survey type/Why carried out	Detail of Survey	By whom	When done	To be repeated
17. Water Quality Monitoring Murrumbidgee IA & Districts	Environmental performance monitoring	Water quality parameters of supply and drainage were collected in the Murrumbidgee Irrigation Area & Districts	Murrumbidgee Irrigation	Started 1994 and collected monthly	Monthly
18. LWMP Farm Survey-Murrumbidgee	Benchmarking and target setting for LWMP	Determining On Farm Best Management Practices in the Murrumbidgee Irrigation Area & Districts	Murrumbidgee Irrigation Area & Districts	2000	5 yearly
19. Soil Salinity survey-Murrumbidgee	Monitor changes in soil salinity	Field sampling carried out in the Murrumbidgee & Coleambally Irrigation Areas & Districts	Former Dept. of Water Resources and Murrumbidgee Irrigation	1991,1994, 1998	3 yearly
20. Water Use Efficiency Benchmarks, monitoring and education-NSW	To assess current levels of efficiency, barriers to improvement and document changes as a result of water reforms	Data collected from NSW irrigators (across regions and industries) including farm level water allocation and use, rainfall, losses and system type and performance	NSW Agriculture	Ongoing	Annual for next 3 years

Name of Survey/Industry	Survey type/Why carried out	Detail of Survey	By whom	When done	To be repeated
21. Volumetric conversion and Access Conditions for water Licences in NSW	To collect the data to convert irrigation licences from area to volume basis.	Data was collected from about 12,000 licensed irrigators on unregulated river systems in NSW (not including the Barwon - Darling)	Dept. of Land & Water Conservation with assistance from Dept of Agriculture	1999/2000	No
22. Improving Irrigation efficiency in the Lachlan Valley	Part of improving Irrigation efficiency project	WUE , re-use , irrigation type, farming practices, fertiliser and pesticide management data collect from Lachlan Valley Maize Growers from mid Lachlan, including Jemalong Irrigation District	NSW Agriculture Forbes	1998,1999, 2000	annual
23. Rural water Use Efficiency Initiative Benchmarking study- QLD Canegrowers	To provide data to assess the current standard of irrigation practice	Data on water use, source, system, scheduling method, system management and record keeping collected from 10% of all cane farm irrigators in QLD.		June 2000	2001 and 2003 with a lesser study in the interim years
24. Agricultural Census of Aust.-ABS	To provide broad statistical report on agriculture in Aust.	Data collected from all farms on ABS' Business Register with estimated value of agricultural operations of \$5000 or greater- approx 145,000 farms	ABS	1997	2001

Name of Survey/Industry	Survey type/Why carried out	Detail of Survey	By whom	When done	To be repeated
25. Agricultural Commodity survey in Aust.	As above	Data collected from a sample of 35000 farms with an estimated value of agricultural operations \$5000 or greater	ABS	2000/2001	Every year except the Agricultural Census years
26. Benchmarks and BMPS for the stone and pome fruit industry	Improved use of natural resources and productivity	Data collected from 200 stone and pome fruit growers in Goulburn-Murray valleys and 40 growers in monitoring programs	DNRE	1997/98	Repeat of management aspects after 3 years
27. Irrigation Benchmarks for wine, table and dried grapes	As above	Building on data collected from 19 growers in Sunraysia in (1998/99).plus an additional 70 growers in Sunraysia.	NSW Agriculture, DNRE & PIRSA	1999/2000	On-going
28. Benchmarking WUE of Agricultural Industries for Regional Vic. (proposed)	Assist in determination of DNRE investment for WUE	To be determined	DNRE/ Irrigation Supply Authorities	2000	Unknown
29. Sustaining our Natural Resources- Dairying for Tomorrow (Same as 8)	To assess sustainability issues, practices, attitudes and opportunities in the dairy industry.	Data collected from 1826 dairy farmers nationally across the 8 main dairying regions	IRIS Research on behalf industry (ADI,DRDC, NLWRA,ADFF ADPF)	March-May 2000	Unlikely

Name of Survey/Industry	Survey type/Why carried out	Detail of Survey	By whom	When done	To be repeated
30. Irrigation Profiles for NSW River Valleys (various)	To improve basic understanding of water use and efficiency	Data was collected from ABS, ABARE, DLWC's Licence Admin System, & Rivers Management Committees for major river valleys on water use and irrigated agricultural production in NSW at catchment and sub-catchment level	NSW Agriculture	1998-2000	No
31. Murray Irrigation Annual Land holders Survey	To provide data to report on the LWMP implementation	Data is collected on specific land-use management practices including re-use systems, farm plans, and ground water pumps. From a representative sample of approx 10% (320) of land holders	Murray Irrigation Ltd	Annually	Yes
32. Murray Irrigation Rice water use	Assess water use on rice	Data is collected from all rice growers on rice water use. Water use determined by water orders and pump meters and rice areas determined from satellite image.	Murray Irrigation Ltd	Annually	Yes