



Making best practice common practice

*Submission to the Inquiry into the impact of the Murray-Darling Basin Plan in
Regional Australia*



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What might be?

Tom woke to the news on Radio National. He made his way to the kitchen to make tea for himself and his wife Jane, who was still in bed, grabbing a few more minutes sleep. As he went he flicked switches, turning on lights and computer screen, his window onto the farm. He picked up a pile of papers from the printer.

As he made the tea he looked through the reports that had downloaded over night. He scanned through them; the satellite image telling him how much water his crops had used; the report from the Smart Meter telling him how much water was applied through each part of his irrigation systems; the exception report indicating that one of his automatic bay gates had not operated correctly and been bypassed; the computer screen showed him the soil moisture status of several different parts of the farm; the plant water use for the last few days was also shown; an alarm advised that the pivot had just started to apply water to the tomato crop on the block beside the dairy pastures; pressure, flow and application rates were all according to specifications.

The tea made and the first checks done he planned his work for the day. His main task was getting ready for the visit from Penny, the new district irrigation agronomist, who would be auditing the border check system on his dairy pastures. He hoped that the new software she was going to show him would help make him more efficient.

He thought back to 2010 and shook his head in amazement with the realisation that in less than five years he had doubled his yields and profitability using half the water he used to. Why hadn't he started sooner?

Introduction

The release of the Murray Darling Guide to future water allocations in the Murray Darling Basin has led to widespread predictions of the collapse of the irrigation industry, with the loss of thousands of jobs and millions of dollars of production. These claims were met with scarcely less believable comments of reassurance. Unfortunately all such responses will only secure a rerun of the claim and counter claim campaign that "informed" the antagonism which passed for debate on the mining tax.

Most Australian know that we cannot afford such a rerun of partisan ideas, most Australians and Murray Darling Basin dwellers know that there has to be change. The recently released Basin Pulse report (Basin Pulse, 2010) makes clear that a majority of Basin dwellers believe there should be changes to water allocations to enable ecosystems to survive.

The ecological, environmental and economic future of the country and the Basin demand strong leadership and sound policy to achieve what our previous experience tells us is possible.

The release of the report and the subsequent headlines can act as the catalyst to transform our irrigation industry into a shining example of world's best practice, matching consumptive, productive use with the sustainable yield from the Basin catchments.

Rather than generating headlines that describe the issue in win-lose terms, that describe a battle between the environment and the irrigation sector we should acknowledge that productive industries that consume water cannot survive if the catchments in which they exist do not survive. Our challenge is to take the gains that have already been made by irrigators and link them with better use of technology, with building human capacity to cement Australia's role as the world leader in irrigation practice.

The key question is; can a 40% reduction in resource use be offset by increased productivity so that output remains the same or even improves? Statistics from the irrigation industry suggest that an



average 40% improvement in productivity (water use efficiency) is achievable using currently available technology.

All of the technologies described as operating on Tom's farm exist today, many of them Australian inventions, developed for Australian conditions and used by a small minority of irrigators. The latest statistics collected by the ABS indicate that 80% of all irrigation scheduling decisions are made on the basis of the irrigation manager's knowledge without the use of any of the many tools which exist to inform this decision. Similarly techniques and technologies for improving irrigation efficiency, across all types of irrigation systems from gravity fed border check and furrow systems to centre pivot and micro irrigation systems, have been adopted by fewer than a quarter of the potential users.

If current best practice became common practice the water allocation issues in the Murray Darling would be of much less significance and may even be solved.

It is also important to acknowledge that "technology" includes skills and knowledge as well as tools. The future of the irrigation industries in the MDB depends on the capability of our managers, just as much as on the tools they deploy to manage their systems.

This submission describes a way to make best practice common practice and to transform our irrigation industry into the world leader. As a by product it will encourage the development of an irrigation science sector with the capacity to export its tools and techniques to the rest of the world, which needs this expertise to address the critical question of global food production.

Who am I?

I have worked in the irrigation industry for over 20 years as researcher, consultant, trainer, expert witness and business manager. I prepared the business case for the establishment of the Cooperative Research Centre for Irrigation Futures with Professor Wayne Meyer of the University of Adelaide. I helped prepare a number of industry best practice guidelines. I am currently Chair of Irrigation Australia's Professional Development Committee, Chair of the Expert Panel for the Smart Approved Water Mark Scheme and have, for the past 10 years, been Australia's delegate on the International Standards Committee's subcommittee for standards for irrigation equipment (ISO TC23 SC18).

A complete cv is included as an appendix to this submission.

Since my consulting activities are focussed on the use and adoption of irrigation technologies I could benefit if greater public resources were allocated to irrigation research, training and capacity building generally. This is my statement of a potential conflict of interest and a clarification of my position in the industry.

Proposal

This submission proposes that a national water use efficiency initiative be developed with the stated goal of doubling production using half the water. The initiative should have the following characteristics:

- The initiative should be nationally consistent in its technical approach and principles to allow monitoring and benchmarking but sufficiently flexible to enable regional differences in program application.



Making best practice common practice

- There should be explicit acknowledgement of the environmental, social and economic context of the initiative which must be considered in its planning
- The program must include R&D, training, planning, implementation and monitoring to a time table with periodic reviews of planned goals.
- The initiative must recognise the commercial goals of the irrigator as well as the wider social, environmental and regional development goals of government and communities.
- Implementation must be driven locally within the national framework to ensure local ownership and direction, supported by appropriate expertise.
- The initiative must be integrated with existing and previous programs. For example there should be collaboration and integration between;
 - extension and adoption
 - research and development
 - financial incentives
 - education and training
 - other relevant agencies and staff, e.g. catchment management authorities (CMA) and hydro geologists
- Industry, which specifically includes the commercial sector of contractors and resellers, consultants, as well as irrigators and commodity groups, must be closely involved. Involvement in development and implementation by industry will result in extra capacity in the private sector which can be maintained after government programs conclude.
- The water use efficiency program should be integrated with other programs so that water planning becomes an integrated part of farm planning, not a separate goal.
- Incentives to adopt better practices should be diverse, based on good science and associated with complementary training programs.
- There should be clearly enunciated government support for the program. Support should be demonstrated through funding and commitment to the goals of the program. Support for staff engaged to work with the program must be consistent and persistent. Retention of staff and, as a result, increasing intellectual capacity and corporate memory, are key human resource issues for agencies involved in water use efficiency programs.
- A communication program should be developed with the initiative to reflect the different stages of the initiative. It should be clear to all groups and individuals with an interest in the outcome of the initiative;
 - What needs to be done, by whom and when and the administrative arrangements for this
 - There should a clear guide to the community processes and the industry groups involved in its implementation
 - There should be an industry communication strategy as well as a communication strategy aimed at irrigators.
- A strong education program for support staff, the industry as well as for irrigation managers is critical to success.

This initiative should be supported by the adoption of national guidelines for the design, installation and operation of irrigation systems. Our irrigation should comprise the most efficient systems, built from quality components to exacting specifications and managed and operated by skilled, well trained people. An example of such a “Code of Practice” has been prepared previously (Murray Darling Basin Commission, 2001). The Code of Practice for Urban Irrigation is another model that could be used (Cape, 2006)



Historical context

This proposal is based on the report of a workshop (Irrigation Association of Australia, 2003) held in 2003 in Dubbo. At the workshop staff from Water Use Efficiency Incentive Schemes from all States in Australia gathered to share their experiences and to design a best practice incentive scheme to improve water use efficiency. This blue print was available at the time the Howard Government introduced the first Water Initiative; its recommendations were largely ignored. It is symptomatic of the fragmentation and duplication that has persisted in irrigation research, training, extension and adoption for over 25 years.

In the 1980's there was a National Irrigation Research Fund (NIRF), this was succeeded in the 90's by the National Program for Irrigation Research and Development (NPIRD) which then mutated into the National Program for Sustainable Irrigation (NPSI), which still exists. These programs were run by Land and Water Australia. At the same time commodity R & D Corporations in Horticulture, Grains, Rice, Cotton and Sugar were all making their own investment in irrigation R & D. As well State Governments had their own programs and for most of this time the Murray Darling Basin Commission ran an irrigation research program.

Researchers and extension staff on the ground were frequently looking for funding from several sources at once and many changed careers to follow the money trail to job security as funding was received for shorter and shorter time periods. The result has been a dilution of the human capital involved in this critical area and a loss of expertise.

Another consequence has been the shift away from locally based programs with excellent connections to local industry to centrally imposed programs, managed by people with little experience and knowledge of the conditions on the ground.

There was some coordination, between researchers at least, during the life of the Cooperative Research Centre for Irrigation Futures (CRC IF) from 2003 to 2010. The CRC IF bid for another term was unsuccessful.

Throughout this period the commercial sector, represented by the developers and sellers of technology was largely ignored as a component of the irrigation sector by publicly funded bodies, even though research has indicated that this sector is a critical source of information for irrigators.

The lessons of history

The recent history of irrigation R&D provides a model of how neglecting soft infrastructure causes it to crumble as fast as any road or bridge that is not maintained. Competition between funding bodies for the right to claim the latest advance as "theirs" has frequently meant the re-badging of the same technology a number of times.

The links and supports for local community have disappeared because extension staff and other key links with the operators of the ground have retired or left to pursue more secure careers. The commercial sector has been largely ignored and evidence tells us that the sellers of technology are a key source of information for irrigators.

Irrigation efficiency programs were not integrated with other farm planning and local environmental management initiatives.

The result is a fractured industry with a variety of individuals and organisations claiming to be the "Voice". There is little technical support remaining in the public sector and the private sector has found it difficult to train and employ the skilled people it requires to support irrigators. The result is that irrigators receive an inadequate service to cope with the complex and difficult management decisions they must make in regard to irrigation water, let alone the wider whole farm decisions.



Implementing the Initiative

The initiative should be implemented on a catchment by catchment (or sub basin) basis. The following steps could be implemented, using the successful Queensland Rural Water Use Initiative (Coutts, 2004) as a guide.

1. Establish an industry based group in each basin who will become the key partner for the development of the initiative in that location and appoint supporting technical staff to implement the program
2. Begin a benchmarking process in each region that identifies current performance and the opportunities for improvement
3. Identify from the benchmarking process research needs and knowledge gaps and plan a research, investigation and training program to address these needs
4. Use the initial benchmarking results to establish a baseline against which progress can be measured and which can be used to determine how to meet the yield constraints as determined by the Sustainable Yields program
5. With the industry groups develop strategies for bringing water use in line with the sustainable yields over a specific timeline.
6. Implement the strategies developed in each catchment.

It is critical that the lessons from previous such initiatives are learned. For example funds should be paid directly to industry groups for distribution in each catchment without interference from existing State jurisdictions. In the past some States have used Federal initiatives as an opportunity to access funds to pay for their own departmental activities. As an example much of the Productivity Placements training resources to support irrigation training were paid to State Departments of Further Education which allocated funds to TAFE Institutes remote from irrigators!

What still could be

A national effort to deploy the technology we have available to the irrigation industry could improve our productivity, reduce our water use and stimulate our regions. With a research, training and extension effort we can develop new technologies that will keep this momentum going, as well it will help build an export industry which can take Australian technology to the world.



Works Cited

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Cape, J. (2006). *Urban Irrigation Best Management Practices*. Sydney: Irrigation Association of Australia Ltd.

Coutts, D. J. (2004). *Evaluation of the Rural Water Use Efficiency Adoption Program*. Brisbane: Queensland Department of Natural Resources and Mines.

Irrigation Association of Australia. (2003). *Water Use Efficiency Incentive Schemes*. Dubbo: Irrigation Association of Australia.

Murray Darling Basin Commission. (2001). *Australian Code of Practice for On Farm Irrigation*. Canberra: MDBC, IAA and NSW Agriculture.



Appendix 1 Curriculum vitae

Jeremy Cape

Director,

CapeAbility Consultants Pty Ltd

Jeremy Cape has a wealth of experience in the irrigation industry in Australia and internationally. His career has been characterised by foresight and being ahead of the pack, as evidenced by the number of significant industry “firsts” he has participated in and led. The CRC for Irrigation Futures, the National Irrigation Science Network, and the Australian Irrigation Technology Centre are organisations he helped to build from the ground up. He initiated, coordinated the development of, and then, wrote Australia’s first irrigation code. He conducted the first large scale market research project to ask irrigators what they thought about the technology they were using.

He is an experienced project manager as well as having made a major contribution as a researcher with particular skills in irrigation technology, its adoption, use and development. A philosophy of transparency, collaboration and sharing characterises the projects he has managed. This stems from a strong belief that sharing information openly and honestly is the best way to encourage technology adoption.

QUALIFICATIONS

- ↳ Bachelor of Agricultural Science (B.Ag.Sc)
Adelaide University
- ↳ Masters of Business Management (M.B.M)
Adelaide University
- ↳ Certificate IV in Assessment and Work Place training

AFFILIATIONS

- ↳ National Director
Irrigation Association of Australia (IAA) 1992-2000

EXPERIENCE

IRRIGATION INDUSTRY

- ↳ **Director, CapeAbility Consultants Pty Ltd** – CapeAbility provides research, training and project management services to its clients, particularly in the area of water management. As well as undertaking consulting assignments CapeAbility distributes irrigation management software and also a range of devices developed and designed by the company to help improve water use. Current clients include the Irrigation Association of Australia, Water Services Association of Australia, Nursery and Garden Industry Association as well as local government and private clients.
- ↳ **Chair, Expert Panel Smart Water Mark Approved** – The Smart Water Mark Approved initiative is a joint venture between the Irrigation Association of Australia, the Water Services Association of Australia, Australian Water Association and the Nursery and Garden Industry Association. The initiative aims to reduce the water used outside the home in urban situations. As Chair of the Expert Panel I am responsible for developing the criteria which will be used to judge which products, services and organisations can be described as making a significant contribution water saving.
- ↳ **Executive Officer CRC for Irrigation Futures** – As the executive officer for the CRC Irrigation Futures I was responsible for the coordination and development of the application and initial business plan, developing support



Making best practice common practice

- National Chair IAA 1993-96
 - Member SA regional committee 1990-2003
 - Chair IAL Professional Development Committee 2010 to present
- for and marketing the proposal to industry, preparing the interview team, developing and implementing the communications plan, facilitating the development of the Centre and Commonwealth Agreements, maintaining the financial records and reporting on the financial status of the application and acting as secretary to the interim CRC Board. The CRC for Irrigation Futures is arguably the single most important organisational event in the history of irrigation research in Australia. I believe my foresight, enthusiasm and vision helped the CRC become a reality.
- Coordinator National Irrigation Science Network** – 1999 – 2003 acted as the coordinator of the National Irrigation Science Network, a collaboration between 14 irrigation research agencies, including CSIRO Land and Water, PIRSA, NRE Victoria, NSW Agriculture and Goulbourn Murray Water. My main task was to coordinate and stimulate collaboration in the research activities of the partners, as well as complete specific short term projects.
 - Development of a strategy for optimising the use of the internet in the irrigation industry** – This project reviewed the use of the internet by the irrigation industry, the availability of information on irrigation on the internet and proposed a strategy for optimising the use of the internet. The project is a good example of the collaborative approach that characterises all of the projects undertaken.
 - Development of National Irrigation Code** - This was a three year project funded by the Murray Darling Basin Commission. It comprised a) an investigation of existing codes of practice and standards relating to irrigation equipment, engineering and management practices and individual skill requirements, b) identification of the gaps in the existing codes and c) initiation of the development of new codes and standards. Two editions of the code have been published, one for irrigators and the other for the professional service sector. The code is currently being reviewed as a model for similar documents in other countries as the code represents the first time such a document has been produced.
 - Know the Flow Project** – I acted as project manager for this milestone project which defined the current state of flow measurement in the irrigation in Australia. I coordinated and managed a multidisciplinary team who conducted technical reviews, surveys of current practice and developed a communications plan to deliver the results of the project to the industry. The project featured a series of workshops involving representatives from the water supply authorities, equipment manufacturer's policy and educational institutions. This inclusive approach paved the way for much better industry coordination in this area. Since the completion of the project follow up projects have seen the development of a training course for flow meter installers and a website providing up to date information on the various technical options available for flow measurement.
 - Preparation of a Position Paper to Define Irrigation Research Priorities-** Completed this consultancy in association with Barrett Purcell & Assoc. consulting engineers for the Land and Water Research and Development Corporation to help define the priorities for the National Irrigation Research Program (NPIRD). The consultancy involved an extension consultation



process using surveys and face to face interviews with a range of stakeholders from Government Department representatives to individual irrigators.

- ↳ **Development of a Value Selection Methodology for Choosing Soil Moisture Monitors** - As project manager I worked to develop a simple method for choosing between alternative soil moisture sensors. This two year LWRRDC funded project was completed in January 1997.
- ↳ **Evaluation of Automatic Equipment for Border Check Irrigation** - In association Goulburn Murray Water, NSW Agriculture and Vic Ag the AITC has been developing a standard test procedure for evaluating automatic bay gates for border check irrigation. The project involved developing an industry standard in association with irrigators and manufacturers, using surveys and discussion groups.
- ↳ **National Survey of Irrigators** – I initiated and managed the first national survey of irrigators to research their attitudes to irrigation equipment and technology. The project surveyed over 3000 irrigators in all mainland states. As project manager I was involved in survey design, managing the conduct of the survey and in the writing and preparation of the final report. The project was funded by the National Irrigation Research Fund, and three major equipment manufacturers.
- ↳ **Position Paper on Technology Adoption** - In 1993 was commissioned by LWRRDC to prepare a position paper on technology adoption in irrigation with a view to developing a strategy for LWRRDC to improve the adoption of research results. The consultancy was completed in partnership with Prof S Chamala from University of Queensland and Dr G Syme from CSIRO, Water Resources, WA.
- ↳ **Position Paper on Standards and Codes** – While at the AITC I managed a project to prepare a comprehensive listing of the standards and codes existing in the irrigation. The final report recommended how standards and codes could be used to encourage the adoption of better management practices. Again this project represented the first time such a list had been prepared anywhere in the world and it has subsequently been published on a number of international websites.
- ↳ **Irrigation Equipment Test and Evaluation** - As manager of the Australian Irrigation Technology Centre (AITC) have been involved in establishing the AITC as the only independent equipment testing facility in Australia. As well as managing the AITC I have been involved in the operation of the test and evaluation procedures thus helping to establish the AITC as a unique source of technical data for the irrigation industry. During its life the AITC conducted over 200 equipment tests on equipment ranging from pumps, valves, pipes and fittings to a wide range of emitters, drippers and sprinklers. The test results are still sought by the industry nearly five years after the closure of the AITC.
- ↳ **Irrigation Research Workshops and Seminars** - Since the inception of the



AITC the consultant has been involved in a number of national workshops which have looked at the issues effecting particular aspects of irrigation management in Australia. These have included, Integration of Off Farm and On Farm rehabilitation, Technology Adoption in Irrigation, Infrastructure Management Issues and Research Priority Setting Workshops. As a facilitator and a presenter I have been involved with all the irrigated industries in rural and urban irrigation from sugar, cotton and horticulture to golf and turf.

- b **Chair Irrigation Association of Australia Ltd** – As well as serving as a director on the national board of the IAA from 1991 to 2002 I was elected Chair from 1993 to 1996. During the unprecedented 3 year term I helped to initiate a number of important projects with the major contribution being in the development of the professional activities of the association. I am still involved in teaching the Certified Landscape Irrigation Auditor course throughout Australia and was part of the original team that began the metrication of the US certification material for use in Australia. During my time on the board I worked hard to improve the professionalism of the association and the board helping to initiate, update and implement key strategic plans.

PROFESSIONAL EXPERIENCE

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| 1999-present | Director CapeAbility Consultants Pty Ltd |
| 1990-1999 | Manager Australian Irrigation Technology Centre |
| 1985-89 | General Manager Elders Rural Information Service |
| 1984 | Manager Elders Livestock Development |
| 1977-84 | Consultant and Director of McGowan International SA Pty Ltd |
| 1975-77 | Adelaide University |
| 1971-74 | Shepherd, shearer and farm worker in the South Island of New Zealand |
| 1969-71 | Canterbury University, Christchurch New Zealand |

