

Looking Ahead

Future options for the NDSP

Prepared for the NDSP

Martin van Bueren (Centre for International Economics)

Richard Price (National Dryland Salinity Program)

*Centre for International Economics
Canberra & Sydney*

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Introduction

Since 1993 the National Dryland Salinity Program (NDSP) has been advancing the knowledge and skills base required to address dryland salinity. The second phase of the program commenced in 1998 and is due to finish in July 2003. Over its nine year history the program has played an important role in funding research and development (R&D), coordinating national extension efforts and putting salinity on the policy agenda as major environmental issue.

With the close of the NDSP phase II imminent, and with new levels of commitment focussed upon addressing dryland salinity widely apparent, it is timely to ask the question, 'where to from here?'

This discussion paper seeks to generate dialogue about future potential roles and directions for the NDSP. Much has changed in the policy, institutional and knowledge environment over the last five years. Arguably, the support needs for salinity management are now quite different to those that existed when NDSP II was initiated.

Key questions for deliberation are:

- ♣ Is there still a role for a national dryland salinity R&D program or has it reached its logical conclusion?
- ♣ If there is still an ongoing role for a national program, what form and function should it adopt?
- ♣ Should the focus of R&D be shifted to different research areas?
- ♣ Would it be sensible for the NDSP to broaden its remit to other natural resource management (NRM) issues?

The NDSP Board cordially invites you to join in these deliberations and we encourage you to make a written submission responding to the issues raised in this discussion paper. Question boxes have been incorporated into the paper to help you structure your submission. Please send your submissions by mail, fax, or email to the Centre for International Economics:

Postal address: Martin van Bueren
Centre for International Economics
GPO Box 2203
Canberra ACT 2601

Fax: 02 6247 7484
Email: mvbueren@thecie.com.au

NDSP background

In 1992, there was no nationally coordinated dryland salinity research effort. Moreover, there was no national strategy for dealing with dryland salinity; few state-wide strategies existed; experts argued about the size and cost of the emerging problem; catchment management was in its infancy; and Landcare and production interests were inadequately integrated.

The role for research in this institutional environment was seen as crucial, but was poorly directed and coordinated. There was no framework or set of priorities to assist research funding agencies, such as the Murray Darling Basin Commission (MDBC) and Land & Water Australia — then known as LWRRDC — to invest rationally in dryland salinity R&D. Cooperative Research Centres were not engaged in the field of dryland salinity.

While there was no shortage of research effort, some of it very good, much of it was poorly conceived, lacked rigour, misdirected, duplicated efforts undertaken elsewhere, or undertaken in isolation from other essential pieces of the puzzle or from those expected to implement the results.

Phase I

In July 1993 the NDSP was initiated to overcome these knowledge and organisational deficiencies. A number of organisations banded together to fund and manage the program. The consortium included:

- ♣ Land & Water Australia;
- ♣ Murray-Darling Basin Commission (MDBC);
- ♣ the former Commonwealth Department of Primary Industries and Energy (now AFFA) through the National Landcare Program; and
- ♣ the State Governments of Western Australia, Queensland, New South Wales, South Australia and Victoria.

The budget for Phase I of the program was approximately \$5 million over five years. Phase I was significant for both its overt accomplishments and its less tangible influences. It made an initial appraisal of the extent and cost of dryland salinity in Australia, improved research methods, and effectively engaged communities in catchment management planning. Its partnership approach to funding and orchestrating collaborative research improved the efficiencies with which R&D was carried out and delivered.

Less overt accomplishments included the generation of more strategic and informed debate, the breakdown of disciplinary and institutional barriers and getting salinity recognised as a core business issue by industry.

Phase II

In 1998, a second phase of the program evolved incorporating a broader range of issues and partners, including the Grains R&D Corporation, Rural Industries R&D Corporation, Meat & Livestock Australia, CSIRO and the State of Tasmania. This broadening of the consortium membership reflected a growing awareness of the wide-ranging impacts of salinity and the diversity of approaches that would be needed to address the problem in a comprehensive fashion.

While the need for a coordinated approach remained, NDSP II broadened its horizons to encompass; catchment processes, industry, engineering, policy, local government, environmental and regional dimensions of salinity. The budget was expanded to \$11 million over five years (inclusive of partner contributions) and took on new emphases:

<i>Phase I emphasis</i>		<i>Phase II emphasis</i>
Three themes	⇒	Seven themes
Agency issue	⇒	Shared issue (with industry)
Technical drive	⇒	Policy drive
Developing understanding	⇒	Developing solutions
Improving methods	⇒	Improving applications
Catchment engagement	⇒	Broad-scale engagement

Achievements to date

A detailed evaluation of the program's outcomes is currently underway. While the results of this assessment have not been finalised, it is apparent that NDSP II has made some significant achievements. The program has funded approximately 40 projects across seven themes. Work has included the development of:

- ♣ a catchment classification system for characterising the responsiveness of different catchments to recharge control treatments;
- ♣ auditing methods for assessing the extent and impacts of dryland salinity (under the National Land & Water Resources Audit);
- ♣ information packages to assist local governments understand and address salinity;
- ♣ decision support tools for the agricultural industry including a deep drainage calculator and a tool for designing environmentally sound engineering works;

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- ♣ dryland salinity management training modules for the meat and cropping industries;
 - ♣ an improved understanding about the ecology of saline environments and the impact of salinity on remnant vegetation and aquatic biodiversity; and
 - ♣ options for the productive use of saline land.

The program has also contributed to putting salinity on the political agenda and helped to motivate the formation of initiatives such as the National Action Plan for Salinity and Water Quality and state salinity strategies.

Key assets of the NDSP

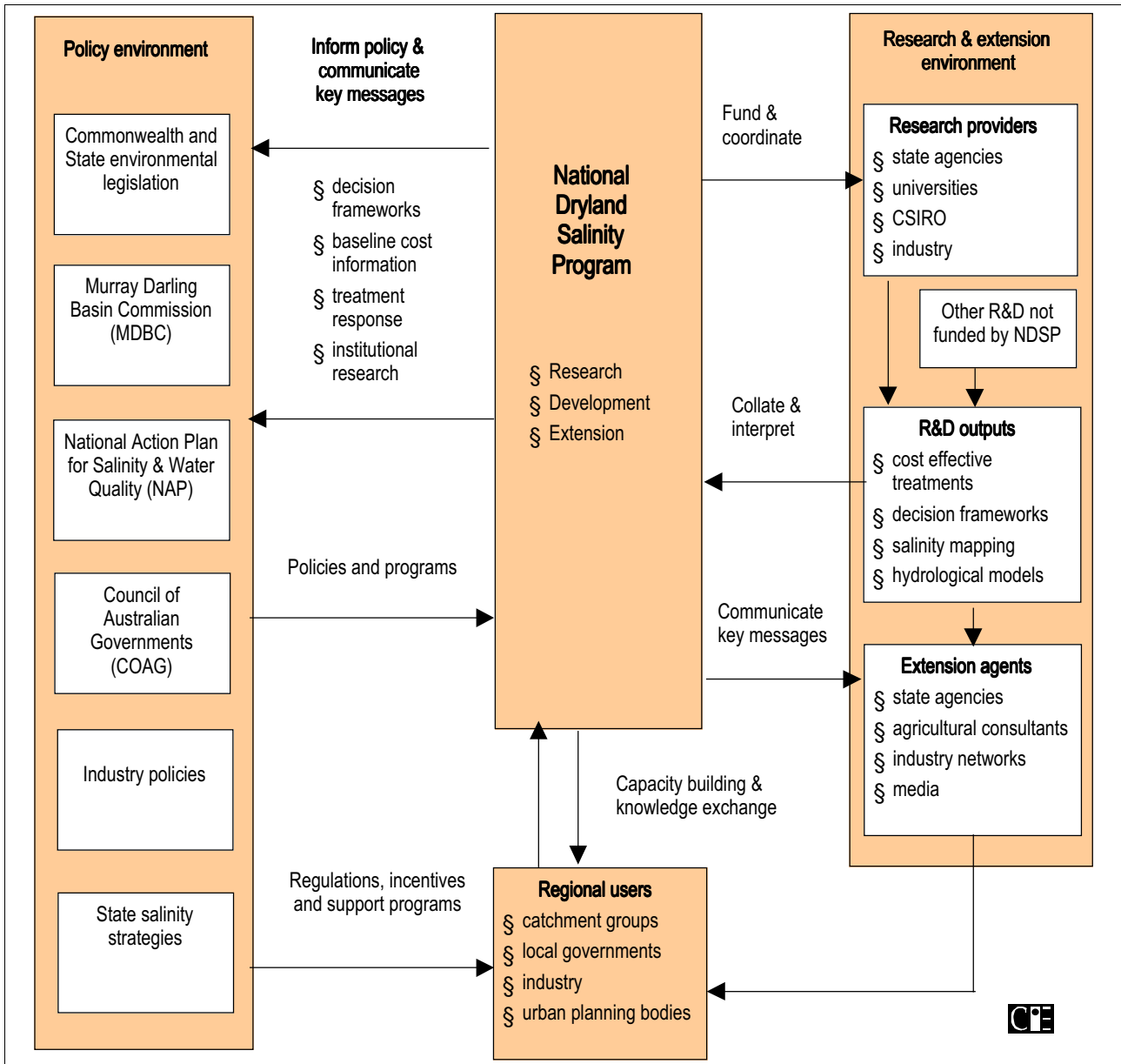
In deliberating the future of the NDSP it is important to recognise that the program has a number of potentially valuable assets, some of which are unique to the NDSP. These include:

- ♣ discretionary R&D funding which is not tied to a particular jurisdiction or industry sector;
- ♣ an ability to create a critical mass of resources to be deployed on priority cooperative activities;
- ♣ an established national communication network with connections to industry and other stakeholders;
- ♣ multilateral arrangements with the States and Territories at relatively low transaction costs;
- ♣ an ability to hold funds through the facilities of Land & Water Australia; and
- ♣ an established brand and website.

Where does the NDSP fit in the wider context?

The endpoint goal of the NDSP is to support and facilitate on-ground change to address salinity. Over the last nine years it has worked towards this endpoint by researching potential treatments, informing the design of support programs and economic incentives, and enhancing community capacity to change. In itself, land use change is not the only criteria against which to measure the success of the NDSP. Equally valuable has been its contribution to helping resource managers make salinity management decisions in a principled and defensible way — which may, or may not, involve large-scale land use change.

1 NDSP roles and its operating environment



One of the program's important functions is to inform public policy by providing baseline information, decision frameworks and advancing alternative institutional arrangements for dealing with salinity. It must also respond to State and Commonwealth policy developments and act strategically by providing support to programs that complement its objectives. The NDSP's job is difficult because it operates in an environment where there are sometimes conflicting objectives between public and private interests.

The NDSP's role is augmented and complemented by a range of other NRM programs, policies and R&D initiatives (chart 1). Thus the overall impact of the

NDSP must be examined in the context of its total operating environment — and the constraints/synergies presented by this environment.

The changing policy, institutional and knowledge environment

A great deal of change has taken place in the policy and institutional environment since the establishment of NDSP II four years ago. Furthermore, new knowledge has come to the fore about the economic, scientific and social dimensions of salinity. In deliberating what future opportunities lie ahead for the NDSP, it is valuable to reflect on these changes.

Increased awareness

Recent surveys show that awareness of salinity across Australia has never been higher within both urban and rural populations. Catchment management programs now exist in all states and the Landcare ethic has permeated into mainstream rural institutions. Salinity risk mapping and related activities notably the National Land and Water Resources Audit (NLWRA) report on dryland salinity and the MDBC's Salinity Audit have heightened awareness among policy makers and the wider community about the potential extent of the problem. There is also a heightened recognition that dryland salinity is a major contributor to water salinity in the Murray Darling Basin and that rising river salinity is not solely caused by poor irrigation practices.

New knowledge

The NDSP has improved our understanding of the hydrological processes responsible for dryland salinity, including spatial and temporal aspects of the problem. This has allowed a better appraisal of the current and future economic, environmental and social impacts. Key findings emerging from the NLWRA's National Salinity Audit and other NDSP projects are:

- ♣ salinity is estimated to impose significant costs across a wide range of sectors and the 'off-farm' costs could exceed agricultural losses;
- ♣ catchment characterisation has provided an understanding of the likely responsiveness of different catchment 'types' to recharge control treatments;
- ♣ the degree of intervention required to prevent land salinisation is generally much higher than previously envisaged;
- ♣ in many cases cost-effective preventative treatments are still not available — mainly because ground water systems are less responsive than previously thought; and

- ♣ case studies have demonstrated that no one hydrological model fits all situations. Similarly, treatments and management options need to be tailored for specific catchments and targeted to regions where the benefits exceed the costs.

These findings have a number of far-reaching implications for the future direction of salinity management and research.

Funding environment

Funding for salinity-related R&D and on-ground works has increased substantially over the last few years. In 2001 the CRC for Plant Based Management of Dryland Salinity was established with a seven-year budget of \$107 million. Most state governments are also engaged in salinity research.

Approximately \$1.4 billion of Commonwealth and State funding over a seven year period is earmarked for the National Action Plan for Salinity & Water Quality (NAP). Unlike previous funding arrangements, the program will fund regional bodies to plan and implement salinity and water quality measures. Under this arrangement it is expected that regional bodies will have greater control over salinity funds and greater responsibility for delivering agreed outcomes. This is likely to generate new demands for region-specific R&D. Additionally, the new Natural Heritage Trust will address salinity together with other related issues on a regional basis – again resulting in new demands for region-specific information and R&D.

Legislative and regulatory environment

One of the features of the inter-governmental agreement (IGA) underpinning the NAP is the establishment of standards and catchment-specific targets for salinity and water quality. It is intended that these targets will be used as a basis for measuring progress towards environmental change, thus improving the accountability of public expenditure on catchment management activities. The MDBC salinity strategy has also adopted an outcome-orientated approach, with its specification of 'end of valley' water quality targets. While these targets are not enforceable they do represent a shift toward making regional bodies more accountable for their salinity outcomes and will ultimately require better clarification of property rights. The new emphasis on market based instruments will also demand a clear definition of property rights.

Expansion of R&D providers

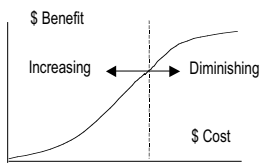
Where once research capacity in salinity was limited, there are now four Cooperative Research Centres (CRCs) dealing with aspects of dryland salinity. In addition, state government agencies responsible for NRM are investing in salinity research, while those R&D Corporations independent of the NDSP are also including salinity issues in their sustainable production research. With these research institutions wielding significant budgets, there is now a certain degree of ‘crowding out’ among research providers.

Into the future

In light of these new developments it is pertinent to ask what are the emerging research issues that will need to be addressed in the future, and whether a national program such as the NDSP is the appropriate vehicle to facilitate that research. Furthermore, are governments and communities now adequately equipped to meet future challenges or is a third phase of the NDSP warranted?

How much salinity R&D is enough?

R&D benefits curve



The returns to R&D are typically related to the amount of effort invested. Once a minimum critical mass is achieved, small additional levels of effort increase the returns steeply. However, at some point the returns to additional investment begin to diminish — as shown in the diagram at the left.

Key questions

- ♣ Can we expect large gains from additional investment in salinity R&D or are the returns flattening off?
- ♣ What are the key R&D gaps where additional investment is likely to yield high returns?

Is there still a need for NDSP?

Even if we are still on the steep part of the R&D benefit curve, is the current NDSP approach the best way to move forward? There are arguments both for and against the continuation of an evolving program:

Arguments for

- ♣ There are still areas of research (knowledge gaps) that require a concerted and coordinated approach. For example:
 - cost effective treatments to secure large scale, long term change in lower rainfall areas have yet to be developed;
 - there is a limited understanding of the interaction between salinity and biodiversity and what can be done to restore ecosystem function;
 - catchment plans and planning processes rarely account for long term variables such as climate change and biodiversity loss;
 - the classification of groundwater flow systems is a major new aid to decision making but there is limited community understanding of it. It requires finetuning to local scales;

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- there are inadequate processes for making decisions on difficult trade-offs and limited information available to support these processes; and
 - communities do not have the tools to help monitor NAP implementation.
- ♣ These research gaps are universal, shared across Australia.
 - ♣ Furthermore, the nation’s pool of expertise remains limited, requiring a process to facilitate shared learning, training and information exchange.

Arguments against

- ♣ There now exists a range of new research institutions and programs directed towards addressing dryland salinity.
- ♣ The major agricultural industries are picking up the baton and embedding salinity research within their own contexts and programs – but it could be argued that this effort is mainly directed to improving the efficiency and sustainability of existing land uses rather than developing new uses for land and water..
- ♣ Australia has moved from a situation of too little coordination to one where too many institutions want to manage the coordination function. Most States now have their own coordinating mechanisms, and these are viewed by some States as adequate to addressing their needs.
- ♣ There are other significant NRM priorities, suggesting that an integrated approach to NRM may be more appropriate.

Key questions

- ♣ Considering these arguments, is there an ongoing role for the NDSP or has it reached its logical conclusion?
- ♣ Are there other arguments — either ‘for’ or ‘against’ — that are missing from the list above?

Potential future roles and directions

If we accept that there is an ongoing role for a national salinity program, what functions should the program perform and what future directions should it take? One alternative is that it continues to fund and coordinate salinity R&D and extension, albeit with a modified focus to accommodate changing needs and opportunities. Several different future directions associated with this option are outlined below.

A second alternative could see the program discontinue its role as a funder of R&D and instead concentrate its efforts on synthesising knowledge from various sources and disseminating it to specific target audiences. Again, there are a number of potential future directions that this role could take.

Funder and coordinator role

This role mirrors the NDSP's current function — that is, the setting of R&D priorities, funding projects, promoting collaborative research, and coordinating extension activities. There are both pros and cons to maintaining a national program that funds and coordinates salinity research and extension.

Pros

- ♣ With a budget to directly fund projects it is possible for the NDSP to influence the direction of R&D;
- ♣ the existence of a core R&D budget also provides a mechanism for drawing together a diverse group of research providers and funding partners, the latter of which seek to gain leverage on their own investments; and
- ♣ the coordination function of the NDSP serves to reduce duplication of research effort and improve information exchange.

Cons

- ♣ Crowding-out is evident in the current climate. That is, many institutions want to manage the coordination function;
- ♣ the finding that salinity processes are location-specific may obviate the need for a national, generic approach; and
- ♣ an NDSP coordinating role may be less effective if research is also pursued separately through state salinity strategies and the NAP.

Future directions in salinity R&D and extension

If the NDSP was to retain its role as a funder and coordinator of R&D and extension, what future directions should it take? Some possible opportunities are outlined below.

Future directions — funder & coordinator

1. Capacity building and regional support

- The current NDSP has concentrated on developing generic principles for managing dryland salinity, abstracting itself from specific catchments or regions. With the advent of the NAP, there is likely to be a strong demand for research products tailored for specific regions. Thus, one function for a new national program could be to foster greater participation of community groups in the development of particular tools and practices that can support the NAP process at a local level.

2. Expanded industry collaboration

- A new program could develop a research portfolio that supports the needs of a wider range of commercial interests that are beginning to show an interest in dryland salinity, including the financial sector, water technology, mining and commercial farming sectors.

3. Biodiversity and environmental research

- To date, most salinity related R&D has focussed on agricultural catchment processes with limited assessment of the impacts of salinity on biodiversity and the environment in general. Nor has there been a concerted effort to develop remedial measures to rebuild damaged landscapes. Therefore, a new program could turn its attention to this aspect of salinity.

4. Assessment and monitoring methods

- Under the NAP it will be essential for communities to assess the effectiveness of their actions and to manage salinity adaptively. With this in mind, a new program might focus around National Land & Water Resources Audit II activities, coordinating the implementation of a national salinity monitoring framework. The main research issue for monitoring is to develop a common set of methodologies that can be applied at the catchment scale to inform the assessment of treatments.

5. Quality assurance

- As funder of R&D, the NDSP to date has been able to promote consistent approaches to salinity research. It has undertaken this role through developing and promoting common conceptual and practical frameworks for undertaking investigations and assessments, and generating debate among scientists and experts about the best ways forward in dealing with dryland salinity. A new program, in whatever guise, could formalise this past intangible role into more concrete activities.

6. Integrated NRM

- There is some debate as to whether it is still appropriate to view salinity as stand-alone issue. One view is that an integrated approach to funding, coordinating and prioritising NRM R&D could be better than taking a single-track approach. Thus, a new program could take the form of a cross-disciplinary national body comprising NRM experts to steer R&D directions in salinity and other forms of NRM.

Key questions

- ♣ Is the role of funder and coordinator still as relevant today as it was when the NDSP was first conceived?
- ♣ If so, is the current mix of NDSP investment in basic research, developmental research, capacity building and communication appropriate?
- ♣ Is there a need for the NDSP to change its direction and, if so, what direction should it take, and could it attract the right partners?
- ♣ Is there a need to strengthen the quality and appropriateness of dryland salinity R&D?
- ♣ Is dryland salinity still a relevant focal point for a national R&D and extension program?
- ♣ Should it be the objective of a national program to fund and coordinate regional-level R&D to address specific catchment issues or should this be left to state agencies?
- ♣ Would a national approach help fill a gap in the supply of regional support?

Knowledge broker role

The role of ‘knowledge broker’ involves the collation and delivery of salinity information to support the needs of existing programs, such as NAP. Under this role, the NDSP would be a clearing house for information rather than a funder of R&D. Expert opinion could be brought to bear on research findings and key messages packaged into a format that is useful for practical application. One of the main functions of ‘knowledge broker’ is to identify useful information and effectively communicate this information to end-users. There are both pros and cons associated with this option.

Pros

- ♣ As a knowledge broker the program could concentrate its efforts on bridging the gap between generic models/principles and the demand for catchment-specific information. For instance, there is a need for technical support to facilitate the implementation of market based instruments and other NAP initiatives;
- ♣ this option would build on the current communications network established by the NDSP, which has been one of the more effective components of the existing program; and
- ♣ a national effort to broker information to research providers would help to minimise the duplication of research effort and advance the exchange of ideas.

Cons

- ♣ Without a budget to fund R&D, the program would be relatively powerless to steer the direction of R&D and to bring researchers and competing ideas and concepts to the debating table; and

- ♣ lack of a R&D budget could make it potentially difficult to gain effective access to industry networks and state agencies; and
- ♣ there could be high transaction costs for a national program that has to interact and provide specific information at a catchment level.

Future directions as a knowledge broker

If the NDSP was to modify its role to only undertake communication and knowledge brokering, how could it best contribute to the goal of improving salinity management? Some possible opportunities are outlined below.

Future directions — knowledge broker

1. Priority setting and informing public policy

- A new program could focus on informing public investment decisions in managing salinity at a national and regional level. It would aim to safeguard against poor investments being made under the NAP. Its function would be to assemble information from various sources and feed this information into a salinity investment framework. Such frameworks are beginning to be developed by State governments. Analysis of information in this way would highlight the trade-offs inherent in alternative resource use options. Coordination of monitoring and assessment protocols across Australia would be an integral part of this function.

2. Supporting regional communities

- The program could focus on providing the private sector with information about salinity risks and the relative cost-effectiveness of different treatment options in different catchments.

3. Technical steering body

- There may be scope for the national program to relinquish its role as a R&D funding body yet continue to undertake the current functions of the NDSP Operations Committee, which provides technical advice on salinity management principles and performs a quality assurance role.

4. Supporting emerging industry programs

- The current NDSP communications network could be built on to improve its effective delivery to emerging industry programs — for example, the meat, grains and wool industry initiatives for addressing salinity.

Key questions

- ♣ Is the current NDSP an effective knowledge broker?
- ♣ Would the demise of the NDSP leave a big gap in the provision of salinity information?
- ♣ Who are the main users of salinity information — current and prospective?
- ♣ Can the NDSP partnership model effectively deliver to the catchment level?
- ♣ If the NDSP were to limit its role to brokering knowledge, what future direction should it take in terms of engaging with stakeholders?

Other roles and directions

The NDSP does not have to do more of the same; indeed it is incumbent on the program investors to ensure that, if a new program is warranted, that it evolves in a direction demanded by those dealing with dryland salinity. For this reason, the program may take on a broader natural resource management flavour, it could emphasise only one or a combination of those options discussed above, or it could take some totally different direction, depending on the demands.

Key question

- ♣ Are there any other potential roles and directions not canvassed in this discussion paper that you think should be considered?

Call for submissions

The NDSP Board invites you to make a written submission addressing the issues raised in this paper or on any other matter pertinent to the Board's deliberations about the future of the program.

Please mail, fax, or email your submission to the Centre for International Economics at the address below. To aid our interpretation of your feedback we ask you to state the organisation you are affiliated with. Your comments will be treated in strictest confidence.

Closing date for submissions is 14 October 2002.

Postal address: Dr Martin van Bueren
Centre for International Economics
GPO Box 2203
Canberra ACT 2601

Fax: 02 6247 7484

Email: mvbueren@thecie.com.au

Further information

Further information about the NDSP can be sought from the NDSP website (www.ndsp.gov.au) or from any one of the NDSP communication coordinators:

National	Kim Mitchell	kim@curriecom.com.au
Victoria	Jo Curkpatrick	jo@spancom.com.au
South Australia	Bruce Munday	bcmunday@senet.com.au
Western Australia	Georgina Wilson	gwilson@agric.wa.gov.au
New South Wales	Lisa Gray	lgray@dlwc.nsw.gov.au
Queensland	Mark Warnick	Mark.Warnick@dnr.qld.gov.au