ILWS-SEGRA MURRAY DARLING BASIN FORUM 2019
Identified Action Pathways

Building on the collaborative work from 2013 to the present, the purpose of ILWS-SEGRA 2019 MDB Forum held at Barooga NSW on 19 August 2019 was to: *identify and document pathways to optimise biophysical and socio-economic opportunities arising from changing environmental conditions in the Basin*. Forty three people participated in the Forum and the list of attendees is at **Annex A**.

Presentations and five 'round robin tables' were held on the following topics and wide ranging comments and suggestions were 'captured' in terms of key issues, how and when should they be addressed, and the actions needed. The pathways identified to address the issues are as follows.

Integrated management of catchments, riverine and wetland systems

- Acknowledge the importance of integrated catchment management (ICM) as a regional biophysical and socio-ecological process to holistically accommodate: the implications of the global energy paradigm in moving to a carbon reduced economy; the human dimensions of the impacts of climate induced changes on lifestyles and livelihoods; and holistically managing the water resources of the Basin 'for people' not just primary industries.
- Initiate a process to review all water management arrangements such as flow management regimes aimed at protecting and enhancing the environmental health of riverine systems in the Basin (including the management of salinity, irrigation runoff and nutrient concentrations) as well as water storage and distribution infrastructure, including identifying alternative water resources as part of the biophysical and socio-economic assessment processes.
- Provide a clear delineation of MDBA-State roles and responsibilities for managing environmental change including the impacts of changing climatic conditions and extreme weather events and where and why overlaps (institutional, drivers of change, impacts) occur. This should be communicated to Basin communities and beyond.

Ecosystem services

- Communicate to stakeholders that ecosystems services are: *goods and services produced by ecosystems of benefit to individuals and communities* and can be broadly categorised as supporting services, provisioning services, regulating services and cultural services.
- Apply the frameworks for assessing ~~of~~ ecosystem services that encompass: categorising and documenting key ecosystems and natural assets in the Basin, including their extent and spatial distribution; identifying ecosystem functions and ecosystem services; connecting ecosystems with human well-being; and valuing ecosystem services in monetary and other ways.
- Advance ecosystem services as a management tool in the MDB by:
    - Proactive engagement and collaboration with Federal and State agencies, LGAs Indigenous communities, primary industry and community stakeholders
    - Clear articulation of key management objectives and formulation of plans of action
    - Agreeing and resourcing a rigorous research agenda and collaborative involvement of research institutions, industry and communities of interest
    - Clarifying the pathways of responsibility for recording and quantifying who does what and the costs and benefits accruing from utilising ecosystem services in land and water resources management and including them in governmental accounts
    - Fostering regular media reporting on indices of successes

Reducing fish kills in the MDB

- Ensure that actions aimed at reducing fish kills in the MDB are integrated into riverine and wetland management programs. Collaborative initiatives could include involvement of:
    - Fishing and community service clubs
    - Landholders who may control refuges
    - Government agencies to ensure policies and regulations are covered
    - LGAs as facilitators
- Pursue the potential that exists for crowd sourcing funding for planning, operations and purchasing of mitigation technologies.

Secure and safe domestic water

- Mobilise regional and local community based collaborations, under a national brand along the lines of *Secure and Safe Water Australia* to support the sustainable provision of adequate safe domestic water from private supplies (surface, ground water, rainwater tanks) for remote towns and settlements, farming and pastoral properties and isolated commercial enterprises such as tourist infrastructure, caravan/camping parks and service stations. Rainwater tanks in regional towns are also private supplies and the quality of the water needs to be monitored.
- Catalyse regional and local leadership as a positive step towards meaningful collaboration with governmental bodies (state and local), industry based organisations and NGOs, service groups and religious bodies. Community based organisations could take leadership roles in collaborations by:
    - assisting in raising awareness of potential health risks from poor quality supplies
    - supporting water quality screening
    - promoting simple cost effective measures to reduce health risks
    - community education and disseminating information

Embedding sustainability in climate-friendly hospitals and health care facilities

- Embed sustainability in local health and aged care policy, infrastructure and operations as a front line response to changing climatic conditions.
- Undertake a regional evaluation of the level of adoption of sustainability principles and practice in health and aged care facilities with purposes of:
    - reducing the consumption of electricity and water
    - minimising the generation of waste materials (solid, liquid)
    - engaging staff at all levels as champions of sustainable workplaces and lifestyles
- Build partnerships between local hospitals and aged care providers to facilitate strengthening of their roles in addressing the effects of:
    - extreme weather events (eg heatwaves, dust from storms and smoke from bushfires) on vulnerable age groups (small children and aged)
    - health impacts of poor quality domestic water supplies
- Foster continuing meaningful awareness raising and education for staff and patients on the effects of climate change and the need for sustainable adaptive responses.
- Optimise health and aged care facilities as 'hubs' for demonstrating best practice in applying sustainability principles and practice at home and in the workplace.
- Communicate and celebrate the success of sustainably initiatives with local and regional communities.

REPORT OF THE ILWS-SEGRA MURRAY DARLING BASIN FORUM 2019

1. Background

Since 2013, the ILWS-SEGRA Collaboration has actively addressed a range of challenges to sustaining social and economic development in the MDB. These include:

- Impediments to implementing the Basin Plan from the 'bottom up'
- Sustaining small towns and settlements
- Ensuring secure and safe domestic water
- Utilising renewable energy for recycling waste water for primary production

Engagement activities have encompassed workshops at SEGRA 2015, meetings and forums at regional towns and settlements, and presentations and Q&A at community information events. Product from these activities has been collated and disseminated. A summary of the backgrounding activities over the past six years is at **Annex B**.

Deliberations at the *Rural and Remote Regions Research Agenda* and the *Murray-Darling Round Table* at ***SEGRA 2015*** focused the urgency for:

- *Promoting and actioning a collaborative client focused and needs driven research, engagement, and communications agenda that is based on sustainable relationships between customers, investors and providers to support the implementation of the 'Basin Plan' from the 'bottom up'*

Building on this and subsequent work, ILWS-SEGRA convened a 'Forum Planning Workshop' at the Graham Centre at Wagga Campus in April 2019 and drew on the experience and learnings of participants to scope an action agenda to address challenges such as:-

- Dimensioning the implications of environmental change (physical, biological, social, economic and cultural) in the Basin.
- Utilising the knowledge and value systems of 'Traditional Owners' to enhance environmental management practices and the attainment of sustainability goals: interfacing traditional and safe water approaches to reduce human and environmental health risks and achieve biodiversity outcomes.
- Managing the 'Basin System' holistically: maximising collaborative governance to deliver integrated catchment and water cycle management and harness the socio-economic benefits of ecosystem services.
- Capitalising on the economic potential of production and conservation landscapes, local and regional creative and entrepreneurial forces, and innovative commercial enterprise: the economy of the Basin is much more than water and irrigation.

Moving forward on the collaborative work from 2013 to the present, the purpose of ILWS-SEGRA 2019 MDB Forum held on 19 August 2019 was to: *identify and document pathways to optimise biophysical and socio-economic opportunities arising from changing environmental conditions in the Basin*.

2. Morning Program for the Forum

2.1 Perspectives on current actions

To initiate the morning session, perspectives were provided by representatives of governmental, non-governmental bodies on current actions that are addressing the following challenges.

Independent assessment of social and economic conditions in the Basin

Panel member, Cr Andrew Kassebaum provided an overview of the role and proposed activities of the Independent Expert Panel convened by MDBA at the request of the Minister for Water Resources that is assessing social and economic conditions impacting communities across the Murray–Darling Basin, due to provide an interim report in December 2019 and a final report in April 2020. The panel is well resourced to undertake genuine engagement with communities across the Basin. Andrew stated that *'this project will answer questions the communities want answered'*.

Communities and stakeholders have different needs and should be engaged differently. Recognising this, the panel will devote resources to this task to enable all stakeholders the opportunity to engage. The project will be evidenced-based and participatory, with the scope of the work and the analytical approach co-designed with community representatives wherever practicable.

Andrew urged ~~that~~ institutions, organisations and individuals to make submissions and participate in the independent assessment process.

Connecting catchments and communities

Jessica Maher, Communications and Engagement Officer and James Marshall, Policy Officer provided a snap shot of the MDA 'connecting catchments and communities' forums that were launched in February 2019. The inter-regional events are aimed at enhancing water literacy and exchanging information between councils and communities across the Basin.

The first event held in Renmark in February *Menindee to The Mouth* explored the role and management of both the Menindee Lakes, and the Coorong and Lower Lakes explored the role and management of both the Menindee Lakes, and the Coorong and Lower Lakes. Experts and the relevant authorities looked at operational and ecological management strategies and the interconnectedness of Basin regions. Other topics for the series include:

- Albury to Adelaide - exploring topics of inflows and urban water use, planning, flood management etc.
- Balonne to Broken Hill – exploring topics of irrigation in the Northern Basin, Barwon-Darling water sharing plan etc
- Moira to Mildura – exploring issues of constraints, management of the Barmah choke, impact of expanding the irrigation footprint to permanent plantings below The Choke, total capacity and supply obligations etc.
- Naran Lake to Nyngan – Managing the Macquarie Marshes – exploring the relationship between the irrigation, the SDLs and ephemeral wetlands of the interior.

The series is targeted to councils and communities Barwon-Darling and South Australian Regions and provide an opportunity for knowledge building and information exchange with government departments and agencies, and with each other.

Climate risks and adaptive response

Comments on climate change and related activities of the MDBA were provided by Rebecca Thornberry, Assistant Director MDBA and Roger Knight, Regional Engagement Officer.

Attention was drawn to the MDBA Discussion Paper *Climate Change and the Murray-Darling Basin Plan* released in February 2019. The paper sets the scene for discussions and action in reporting that: *The climate of the Murray–Darling Basin is changing. Average temperatures are increasing, droughts are occurring more often and the volume of inflows into the Murray–Darling Basin have decreased over the last 20 years*.

As a working document the Discussion Paper notes that we need to understand:

- whether current policies can be improved to assist the environment, communities and irrigators to adapt to a future with potentially even less water than planned in 2012
- what climate change is likely to mean for the hydrology of our rivers, the way we operate them, the effect on water quality and water-dependent ecosystems and how water markets and trade will operate in the future

MDBA has established regional offices to:

- build presence in regional areas and develop relationships with stakeholders
- help provide the Authority with local knowledge and the capability to build partnerships
- support research, evidence and analytical capacity
- contribute to policy and decision making

Roger reported that Regional Engagement Officers (REOs) work part-time in their regions through hosting arrangements in place with five organisations. And that the MDBA are working towards having seven officers across the Basin. Regional LGAs and communities were encouraged to work with the REOs to:

- gain a better understanding of the Basin Plan and its implementation
- talk about experiences and concerns
- proactively engage in change management processes in the Basin
- collaboratively strengthen stakeholder relationships between industry, government, business and community groups

Gavin Helgeland, Director Economic Development at Balranald Shire Council (BSC), provided an on-the-ground example of actions being taken to sources funding for climate change adaptation initiatives, build collaborative partnerships, and mobilise institutional assistance. Gaining funding from the NSW Government *Increasing Resilience to Climate Change* program was the case example. Gavin explained how BSC:

- Engaged with the NSW Department of Planning, Industry and Environment (DPIE) to ensure that funding applications were in tune with government policy and guidelines.
- Fostered regional partnerships with and through the Far West Joint Organisation (FWJO).
- Initiated collaboration with the Institute for Land Water and Society, Charles Sturt University and SEGRA to ensure that there was strong professional and practitioner underpinning of project activities.

2.2 Practitioner presentations and Q&A

Practitioner presentations and a Q&A session focused on the topic *Opportunities for Collaborative Actions.* The presentations were as follows.

- Professor Max Finlayson*, Integrated management of catchments, riverine and wetland systems*
- Adjunct Professor David James, *Ecosystem services*
- Dr Lee Baumgartner, *Reducing fish kills in the MDB*
- Adjunct Professor Peter Waterman, *Secure and safe domestic water*
- Dr Teresa Lewis, *Embedding sustainability: climate-friendly hospitals and health care facilities as a case example*

Also, short presentations were made by members of a delegation from Pakistan. The group were visiting Australia as part of a set of scoping activities funded by the Australian Centre for International Agricultural Research for a proposed long-term 'research for development' project that ILWS is leading. The project proposes to focus on building adaptive capacity of communities living in salinity affected landscapes of the southern Indus Basin, and the visitors will have lead roles in the project should it secure ACIAR funding. The group were visiting Australia to learn from communities and organisations that have adaptively managed and responded to salinity issues in landscapes here. The Murray Darling Basin Forum provided an excellent opportunity for them to hear about MDB issues more broadly, and to engage with local MDB experts and organisations.

Power point material from presenters is at **Annex C**.

3. Afternoon Program: observations from the 'round robin tables' ----towards action pathways

Five 'round robin tables' were held in the afternoon corresponding to the morning presentations and Q&A session. Material 'captured' on butcher's paper from this session follows.

3.1 Integrated management of catchments, riverine and wetland systems

Some of the issues

- A 'whole of nation' framework/approach is needed for regional, water for agricultural and urban development.
- People and community should be put first when considering integrated management of catchments, riverine and wetland systems, remembering that it is people-centric because people are affected and equity and not disadvantage should be the outcome.
- There is a need to take politics out of the integrated management process by being aware of short term political visions and the effects of 'political' electoral cycles.
- Mechanisms are needed for the reallocation of water to new agricultural enterprises from older irrigation districts.
- Appropriate land use planning is needed to accommodate the domestic water needs of urban development
- A sound appreciation of the distribution of monetary and social capital across towns, settlements, and enterprises across the Basin is need to assess the impacts of inequity.

How and when should they be addressed?

- Optimise the human capital available in regional towns and settlements and seek better use of NGOs, service and industry groups and their networks for community education.
- As a part of community education, tell people what the Basin Plan is really about in terms of (for example) long term goals and objectives and how the water allocation process works.
- These are long standing area of issues that need immediate attention.

Action pathway

- Acknowledge the importance of integrated catchment management (ICM) as a regional biophysical and socio-ecological process to holistically accommodate: the implications of the global energy paradigm in moving to a carbon reduced economy; the human dimensions of the impacts of climate induced changes on lifestyles and livelihoods; and holistically managing the water resources of the Basin 'for people' not just primary industries.
- Initiate a process to review all water management arrangements in terms of water storage and distribution infrastructure including identifying alternative water resources as part of the biophysical and socio-economic assessment processes (eg the desalination and treatment of low salt concentration water and irrigation runoff).
- Provide a clear delineation of MDBA-State roles and responsibilities for managing environmental change including the impacts of changing climatic conditions and extreme weather events and where and why overlaps occur. This should be communicated to Basin communities and beyond.

3.2 Ecosystem services

Some of the issues

- Poor understanding that 'ecosystem services' cover the wide range of goods and services produced by ecosystems that are of benefit to individuals and communities and can be categorised as:
    - Supporting services
    - Provisioning services
    - Regulating services
    - Cultural services

- Common questions arising with respect to utilising ecosystems services include:
    - How do we prioritise ecosystems?
    - What/who can we expect to influence?
    - What are good decision making frameworks?
    - How do we measure the success of interventions?

How and when should they be addressed?

- Basically a triage approach. In this context, it is worth checking with Commonwealth Environmental Water Holder (CEWH) to see how they prioritise. On another front, the MDBA is working with the Department of Environment on applications including SEEA.
- Influencing requires long-term thinking and focusing through a social lens. An understanding of ecosystems and their services could help attract people to the regions and influence decision makers to build critical infrastructure and enhance amenity values.
- Incorporating indigenous values and market power is a major challenge.

- Measuring the success of interventions is way of testing decision making frameworks and processes. This can be initiated by sending informative messages to communities and asking relative targeted groups about the successes of programs.
- Building on success is essential and there are example such as:
    - Natural capital on farms that is of considerable interest to banks
    - Promoting broader ecosystem effects thought LGA and NGO land management initiatives
    - Providing incentives by way of concessions with Local Government rates
    - Green labelling of local produce
    - Application of SEEA concepts
    - Carbon credits including fostering 'carbon neutrality' in the beef industry

Action pathway

- Communicate to stakeholders that ecosystems services are: *goods and services produced by ecosystems of benefit to individuals and communities* and they can be categorised as supporting services, provisioning services, regulating services and cultural services.
- Apply the frameworks for assessing of ecosystem services that broadly encompass: connecting ecosystems with human well-being; ecosystem functions and ecosystem services; and values of ecosystem services in monetary and other ways.
- Advance ecosystem services as a management tool in the MDB by:
    - Proactive engagement and collaboration with Indigenous communities, primary industry and community stakeholders
    - Collaboration with Federal and State agencies and LGAs
    - Clear articulation of key management objectives and formulation of plans of action
    - Agreeing and resourcing a rigorous research agenda and collaborative involvement of research institutions, industry and communities of interest
    - Clarifying the pathways of responsibility for recording and quantifying who does what and the costs and benefits accruing from utilising ecosystem services in land and water resources management in the MDB
    - Including ecosystem services in governmental accounts
    - Fostering regular media reporting on indices of successes

3.3 Reducing fish kills in the MDB

Some of the issues

- Finfish and non-finfish can be adversely affected by drought, floods and pumping for irrigation. There have been large fish kills in the past (eg 2011) but these did not receive as much media attention as the Menindee events in early 2019.
- The physio-chemical and hydrological conditions that contribute to kills are well known and have been documented. Stratification, blue-green algae and black water during high flow all contribute to these events.
- Management requires an understanding of the constraints relating to the survival of native fish vs the eradication of carp.
- There is an urgent need to raise the profile of fish issues in the MDB and to find innovative ways of addressing the challenge of fish kills.

How and when should they be addressed?

- Management techniques are needed for low and high flow conditions. For low flows approaches include aerators, fish rescues, bubbles, and dedicated refuges. Operational plans for high flows need to include escape paths and refuges.
- Post catastrophic event recovery needs to encompass trans-location of fish stocks, strategies for re-stocking, e-water inputs, hatcheries, oxygen blocks and compensation measures.
- Operational plans (including native fish strategies) should:
    - ensure buy-in from all stakeholders
    - be flexible
    - accurately embed long-term forecasting

<u>Action pathway</u>

- Ensure that actions aimed at reducing fish kills in the MDB are integrated into riverine and wetland management programs. Collaborative initiatives integrated into riverine and wetland management programs could include:
    - Fishing and community service clubs
    - Landholders who may control refuges
    - Government agencies to ensure policies and regulations are covered
    - LGAs as facilitators
- Pursue the potential that exists for crowd sourcing funding for planning, operations and purchasing of mitigation technologies.

3.4 Secure and safe domestic water

Some of the issues

- Australia wide, farming and pastoral properties are expected to meet their own household requirements and ensure that the water being used is not a health risk. And this is done in the absence of any statutory requirements in the MDB.
- Guidelines on using non-scheme supplies are issued by state health authorities are available on-line. Knowledge and utilisation of these is limited to properties with web access.
- Safe water supplies are those of a quality that will not harm people through either consumption or contact. To be safe, concentrations of contaminants must be at t levels that preclude people becoming ill or physically harmed. Harmful contaminants include:
    - disease-causing microbes such as bacteria, viruses and protozoans
    - cancer-causing chemicals such as many pesticides, organic solvents, petroleum products, chlorinated by products of the disinfection process, and some metals and metalloids
    - nitrates and nutrients, endocrine-disrupting compounds, strong acids, strong bases, radionuclides, and any other acutely toxic substances
- Organisational inflexibility, historical animosity over the ownership of the nation's water resources and rigid cultural mindset within some areas of government, particularly the traditional health and water resources portfolios, has resulted in:
    - poor articulation of the implications of poor water quality as a constraint to regional development
    - ineffective advocacy of the pathways to resolving water quality issues
    - continuing risk to human health and economic production from insecure and poor quality water supplies

- Attention has been given to the quantity and quality of water available for irrigated agriculture, horticulture and stock raising. However, many would argue that the needs of domestic users of private supplies in the MDB have been somewhat neglected.

How and when should they be addressed?

- With respect to the MDB, critical human water needs are defined in subsection 86A (2) of the Water Act 2007 and Chapter 11 of the *Basin Plan* and cover all uses of surface and ground water for domestic purposes.
- Essential first steps towards understanding how this statutory requirement is being met at the property scale include:
    - raising awareness of potential health risks
    - water quality screening
    - providing information on remedial actions to reduce the impacts of poor quality domestic water supplies
- To this end, the MDBA and the MDA support the Secure Safe Domestic Water (SSDW) initiative and are keen to see it rolled out in the MDB.
- A more cohesive approach to addressing the issue of secure safe water could be through community based and supported collaborative actions aimed at:
    - integrated management of surface and ground water resources at catchment scales
    - reducing potential health risks from all sources used for domestic and recreational purposes
    - ensuring that poor water quality is not an impediment to local and regional lifestyles and livelihoods

Action pathway

- Mobilise regional and local community based collaborations, under a national brand along the lines of *Secure and Safe Water Australia* to support the sustainable provision of adequate safe domestic water from private supplies (surface, ground water, rainwater tanks) for remote towns and settlements, farming and pastoral properties and isolated commercial enterprises such as tourist infrastructure, caravan/camping parks and service stations. Rainwater tanks in regional towns are also private supplies and the quality of the water needs to be monitored.
- Catalyse regional and local leadership as a positive step towards meaningful collaboration with governmental bodies (state and local), industry based organisations and NGOs, service groups and religious bodies. Community based organisations could take leadership roles in collaborations by:
    - assisting in raising awareness of potential health risks from poor quality supplies
    - supporting water quality screening
    - promoting simple cost effective measures to reduce health risks
    - community education and disseminating information

3.5 Embedding sustainability: climate-friendly hospitals and health care facilities as a case example

Some of the issues

- Australia is just at the start of the journey in ensuring that hospital sand aged care facilities are climate friendly.

- Understanding the pit face dimensions of what sustainability really means in terms of facility management and staff performance is at the core of the wasteful use of energy and water resources and the excessive generation of liquid and solid waste materials from patient care.
- Institutions may promote themselves as being 'green credentialed' but this does not translate down to the practices of staff at all levels. This reflects that policies have not been linked to practice and a lack of professional training in what sustainability means in the performance of your job (ie service focus).
- Across regional Australia the provision of hospital infrastructure and services are changing quite rapidly. For example, larger regional hospitals are becoming more specialised in terms of service delivery and small hospitals are experiencing down grading of services. A hub and satellite approach to facilities is emerging Australia wide.
- Often hospital services audits do not take into account the sustainability dimension and the implications of changing climatic conditions (especially prolonged heat waves) on infrastructure, energy and water consumption and the wellbeing of patients. That is, are they meeting societal expectations and if not: what should communities and concerned citizens do about it?

How and when should they be addressed?

- Appreciating and understanding he health care dimensions of changing climatic conditions and lifting the sustainability performance of facilities, infrastructure and staff is a matter of some urgency
- Communities need to be engaged and take control of the performance of vital health and aged care infrastructure and resources. There must be a clear focus on retaining services whilst at the same time reducing unsustainable practices in terms of water and energy consumption and generation of waste materials.
- Professional development programs for hospitals and care facility staff must include sustainability practices and the challenges arising for environmental changes including greater climatic variability and extreme weather events.

<u>Action pathway</u>

- Embed sustainability in local health and aged care policy, infrastructure and operations as a front line response to changing climatic conditions.
- Undertake a regional evaluation of the level of adoption of sustainability principles and practice in health and aged care facilities with purposes of:
    - reducing the consumption of electricity and water
    - minimising the generation of waste materials (solid, liquid)
    - engaging staff at all levels as champions of sustainable workplaces and lifestyles
- Build partnerships between local hospitals and aged care providers to facilitate strengthening of their roles in addressing the effects of:
    - extreme weather events (eg heatwaves, dust from storms and smoke from bushfires) on vulnerable age groups (small children and aged)
    - health impacts of poor quality domestic water supplies
- Foster continuing meaningful awareness raising and education for staff and patients on the effects of climate change and the need for sustainable adaptive responses.
- Optimise health and aged care facilities as 'hubs' for demonstrating best practice in applying sustainability principles and practice at home and in the workplace.
- Communicate and celebrate the success of sustainably initiatives with local and regional communities.

4. Reflections on the Basin Plan Context

For some of the Forum participants the Basin Plan was the elephant in the room. And there was a demonstrated need for greater understanding of the Plan and its processes.

Implementation of the Basin Plan involves the formulation and implementation of thirty three 'Water Resource Plans' by State Governments, subject to accreditation by MDBA. These plans are in effect integrated catchment management plans, implemented as second-tier actions under the Basin Plan, although their focus is on water rather than land-water relationships. Among other things, they are required to address the challenges of assessing climate risk and adapting to climate change. MDBA have reported that six of these plans have been completed and accredited, and work has been accelerated on the rest.

Forum participants recognised that there are of course broader policy issues such as:

- the coordination of sustainable land management and water resource management
- appropriate structural adjustment programs designed to ameliorate adverse impacts of changes in water availability and use on regional communities
- region-specific strategies aimed at coping with the effects of climate change at local and regional scales

Quite of few of the actions recommended more generally in the comments captured through the 'Round Robin Tables' process' above might be perceived as competitive with MDBA strategies and implementation procedures. Thus, there is the risk of suggesting actions that may duplicate or manage better what the MDBA is already undertaking. This was not the intent.

What is being emphasised is the need for local and regional bodies to interact more closely with MDBA – in collaboration with State Governments – to inject regional perspectives into plans, strategies and actions of MDBA in better managing water resources throughout the Basin.

5. Pulling it together

The purpose of the forum was to: *identify and document pathways to optimise biophysical and socio-economic opportunities arising from changing environmental conditions in the Basin* and Professor Max Finlayson focused this by asking:

- What environment conditions are changing and what are the implications for people in the Basin?
- What are the opportunities (biophysical and socio-economic) that these changes offer?
- What and where are the information sources (Traditional indigenous, local communities, business enterprises, governmental and non-organisations, research and educational bodies) to assess changing conditions?
- What further knowledge is needed to address the dynamics of biophysical and socio-ecological change?
- What collaborative processes are in place to collect, collate, assess or analyse and make use of the information for management, including restoring and renewing the biophysical and socio-economic conditions in the MDB?
- What are the priorities, how are these determined and who will deliver them?

Some of these questions were echoed in the morning presentations and discussions throughout the day. And some answers are reflected in the inputs collected through the 'round robin tables' as summarised in the notes 3.1 to 3.5 above.

Collectively, we have a fairly broad knowledge of the dimensions and implications of the five areas of environmental change covered by the Forum, and we can identify a range of opportunities that they offer. The presentations and the product of the 'Round Robin Tables' demonstrate that there is a lot of 'action' occurring across the Basin to deal with specific areas of environmental concern. But as documented above, more is needed.

Also, we know broadly what spatial and time series information is available and where key information sources to assess changing conditions are held and by whom. For some areas of issue, we know what further knowledge is needed to address the dynamics of biophysical and socio-ecological change. But we also know that much of the material is fragmented, there is patchy meta-data, and access can be difficult because data sets are held in different institutions and within different jurisdictions.

One observation drawn from synthesising the action pathways outlined above is the need for collaborative processes to collect, collate, assess or analyse and apply the information for the integrated assessment and management of the environmental resources, and the optimal utilisation of the social capital of the Basin communities.

This information should be publically accessible and be in forms that can be applied to targeted areas of priority action such as:

- Integrated management of catchments, riverine and wetland systems
- Reducing fish kills in the MDB
- Secure and safe domestic water
- Ecosystem services
- Embedding sustainability for climate-friendly hospitals and health care facilities

The presentations highlighted the diversity of activity underway in the Basin to address these areas and other areas of issue. However, from questions raised by Forum participants in their deliberations and group discussions it was apparent that (to quote one attendee) 'the left hand did not know what the right hand was doing'.

People were aware of their roles but not well informed on the bigger picture. For example, there is a lot of information on departmental, institutional and non-governmental websites but it appears that this is not being networked.

The calls for awareness raising, community education and better communications are indicative of a need for a networking or knowledge hub (or hubs) to help in the information tracking and dissemination process. In short, help to provide the big picture.

This does not need a new mechanism but rather the enhancement of the capabilities of a Basin wide organisation that best represents the interests of communities of space and interest. And the Murray Darling Association (MDA), as the organisation that brings together the LGAs within or dependent on water from the Basin, could well fit this role.

Further steps

From the material summarised as the product of the 'round robin' session and foregoing comments, it is evident that priorities are still to be determined along with who will deliver them. And this is an identified task for a future meeting or forum or related collaborative activity. Specifically, there needs to be agreement on:

- How do we build on strength and the experiences to date?
- 'Harvesting low hanging fruit'-------what are the key initiatives to deliver value for money?

- Optimal ways of mobilising the skills and capabilities of:

    - regional Indigenous communities
    - research institutions
    - industries
    - local stakeholders

- Sourcing funds and professional support
- Timelines for agreed actions

For example, this could be actioned through a *Research Collaboration Planning Meeting* with the purposes of:

- Building on history of ILWS-MDA engagement, the MDA Strategic Plan 2019 2022 and the MDA 'connecting catchments and communities' forums to identify potential research areas, partners' and funding for collaborative research and community engagement activities.
- Linking output from ILWS-SEGRA MDB Forum to future collaborative engagement activities.
- Framing a *Research Collaboration Discussion Paper* to guide future research and community engagement collaboration in the MDB.

And would entail discussion and documentation of:

- potential institutional participants, research partners and funding sources
- possibilities for further integrated activities across research themes such as environmental water and Rural and Regional Communities
- opportunities for integrated activities in Biodiversity Conservation with respect to riverine and wetland systems
- framework and timetable for information synthesis and the preparation of the *Research Collaboration Discussion Paper* and agenda and timelines for actions

Appropriate funding would need to be sourced to undertake this activity.

Annex A

Attendees

Mrs	Karen	Abberfield	Industry Development Officer	Moira Shire Council
	Altaf	Ali Siyal		ILWS-CSU
Assoc Prof	Catherine	Allan	Environmental Sociology and Planning	ILWS-CSU
	Irfan	Baig		ILWS-CSU
Dr	Lee	Baumgartner	Rivers and Wetlands	Charles Sturt University
Dr	Rui	Bi	Senior Lecturer	Charles Sturt University
Mr	Ashley	Bland	Managing Director	Constructive Energy
Cr	Kevin	Bourke	Councillor	Moira Shire Council
Cr	John	Bruce	Councillor	Berrigan Shire Council
	Barb	Cowey	Regional Coordinator Riverland and Murraylands	Primary Industries and Regions SA
Cr	Ed	Cox	Councillor	Moira Shire Council
Professor	Max	Finlayson	Director	ILWS-CSU
Mr	Mark	Forbes	Chief Executive Officer	Far West Joint Organisation
Mrs	Edwina	Hayes	Director Regional Development and CEO	RDA Murray
	Iftikhar	Hussain		ILWS-CSU
ms	Rowena	Jackson	Business Advisor	BEC Advice South & West NSW
Dr	David	James	Adjunct Researcher Professor	ILWS-CSU
Cr	Andrew	Kassebaum	Area Councillor	Berri Barmera Council
Mr	Roger	Knight	Regional Engagement Officer	Murray-Darling Basin Authority
	Bakhshal	Lashari		ILWS-CSU
Mr	Austin	Ley	Manager - Economic Development	Moira Shire Council

Dr	Zhenquan	Li	Senior Lecturer	ILWS-CSU
Ms	Jessica	Maher	Communications and Engagement Officer	Murray Darling Association
Mr	Frank	Malcolm	Investment Development Officer	Moira Shire Council
Cr	Peter	Mansfield	Councillor	Moira Shire Council
Mr	James	Marshall	Policy Officer	Murray Darling Association
	Fozia	Memon		ILWS-CSU
Dr	Michael	Mitchell	Social Researcher	ILWS-CSU
Mr	Matt	Nelson	Regional Director - Hume	Regional Development Victoria
Ms	Nina	O'Brien	Committee Member	RDA Murray
	Latif	Qureshi		ILWS-CSU
Mr.	Andrew	Robertson	Elected Member	Victor Harbor City Council
Mrs	Sue	Rudd	Member	Basin Community Committee
Ms	Rebecca	Thornberry	Assistant Director	Murray-Darling Basin Authority
	Tanveer	ul Haq		ILWS-CSU
Mr	Michael	Vanderzee	PhD Researcher	ILWS-CSU
Dr	Wesley	Ward	Adjunct Research Fellow	ILWS-CSU
Adjunct Professor	Peter	Waterman	Pracademic	ILWS-CSU
Mr	Gavin	Helgeland	Economic Development	Balranald Shire Council
Dr	Teresa	Lewis	Director	Sustainability Systems Management

Annex B

ILWS-SEGRA 2019 MURRAY DARLING BASIN FORUM

19 August 2019

Background Briefing Notes

Maximising the opportunities of the Murray Darling Basin Plan

Australia has struggled with water management for most of the last century. In this context, the one million square kilometre Murray Darling Basin (MDB), which is 14% of the Australian continent, presents possibly the most difficult multifaceted challenge confronting water resources managers in Australia. Specifically, managers in the water sector need to address issues encompassing natural and human ecological factors such as:

- Vast geographic scale and biophysical complexity in terms of topography, landforms, soil assemblages and degraded river, wetland and dryland landscapes
- Diverse range of climatic conditions and seasonal weather patterns affecting water yields
- Wide variety of natural and human impacted ecosystems
- Settlement patterns and demands for potable water
- Existing and land and water use conflicts and uncertainties over water allocation and future land uses in the Basin
- Stressed socio-economic conditions in marginal primary production areas as a result of prolonged drought conditions
- Complicated mix of irrigated agricultural activities across the production landscape in response to committed levels of water allocation
- Political and governmental implications of water trading

Added to this is a layer of governance complexity due to the four Basin States (Queensland, NSW, Victoria and SA) and the Australian Capital Territory having different:

- policy settings for water allocation and pricing
- statutory regimes for land use planning and natural resources management, especially surface and ground water
- levels of priority and commitment to managing natural resources and the environment

Notwithstanding these complexities, management of the water resources across the MDB is possibly unique, demonstrating what amounts to extraordinary collaboration across jurisdictions for the allocation of a valuable but limited resource.

As promulgated, the 2012 *Basin Plan* is about water allocation for irrigators and other users and environmental flows in the main arteries of the catchments, below dams. Currently, the Basin Plan is not about natural and environmental resources management or integrated water resources management or integrated catchment management.

Also, critics argue that there isn't a balance between economic, social and environmental values. Moreover, the current Plan is not holistic and is seen to some detractors as lacking because it neither addresses the dynamics of changing climatic conditions and nor does it provide a vehicle to optimize the utilization of the ecosystems services inherent to the catchments of the Basin.

The Murray Darling Association (MDA), as the organisation representing the interests of Local Government Authorities within or dependent on the waters of the Basin, provides examples of

concerns with the Act and the Basin Plan as they now stand. And the MDA is strident in their call for action on the following issues.

- Simplification of the sector for greater efficiencies and better alignment*: The MDA recommends that a body of work be undertaken to facilitate better alignment between the Commonwealth and the States, and state to state and to provide a level of uniformity or consistency across the water management sector. A key priority of the work should be to minimize duplication and overlap, and to provide greater accountability, and clarity for stakeholders.*
- Water trading: *The MDA recommends that s106 and 86AE of the National Water Act of 2007 are revised to align for consistency and simplicity, and that Act explicitly allows for the proceeds from the trade of water or environmental water holdings held by the Commonwealth Environmental Water Holder to be allowed to be applied to investment in water saving infrastructure*.
- Better balance between social, economic and environmental imperatives: *The MDA recommends that section 21 of the Act be rewritten to provide balanced weighting and flexibility to consider the interrelatedness of social, economic and environmental outcomes for a more sustainable ecology and community.*

Additionally, the MDA advocate that:

- The Commonwealth Environmental Water Holder requires greater flexibility in water trade to facilitate investment in water efficiency infrastructure, and balanced availability of water for food producers
- The current price of temporary water and its trajectory over recent seasons is constraining agriculture and is unsustainable.
- The Commonwealth Water Act 2007 and the Basin Plan 2012 must provide for the balanced weighting of economic, social and environmental impacts in all decisions made under those instruments.
- The MDBA has most effectively lobbied the Australian Government to ensure that
- The commitment to legislate to cap buybacks at 1,500 Gigalitres must be delivered, to provide security for impacted irrigators and to drive water efficiencies in other areas
- The 2750GL of environmental water to be recovered under the plan can be efficiently, effectively and safely delivered, and will achieve the intended outcomes.

Collectively, these concerns illustrate the need for 'bottom up' Information, participation and support for the implementation of the Basin Plan. The MDB experience exemplifies many of the realities, challenges and opportunities for water management elsewhere. A plan now exists, based on a robust history of consultation and societal concerns. Moreover, the 2012 *Basin Plan* is backed by Federal legislation, promising to equitably meet the needs of multiple and diverse stakeholders.

However, there is a risk is that the plan will falter unless there is an effective mechanism to garner buy-in from communities of interest in the Basin. To be successful, it is envisaged that: the correct indicators of success are established; progress can be measured; and timely knowledge is derived from effective community and research networks. As the plan is essentially about 'creating thriving, vibrant regional communities through equitable distribution of limited resources', it has many lessons for water managers elsewhere. Given the magnitude and complexity of ensuring the sustainable management of water resources there is support for the concept that "*you'll never manage it all, but you can empower people to make it work"*.

Delegates participating in the *Rural and Remote Regions Research Agenda* and the *Murray-Darling Round Table* at SEGRA 2015 agreed that maximising the opportunities of the *Basin Plan* requires high levels of knowledge, understanding and collaboration between stakeholders within and outside the Basin. To this end, collaborative arrangements should involve governments, industries and communities in the catchments as well as those that are dependent on water from the MDB. Also, collaborative initiatives should be led by teams familiar with biophysical and socio-economic conditions within and relating to the Basin. One model is the multi-partner Regional Centre of Expertise for the Murray-Darling (RCE-MD) with a focus on capacity building and cooperation. Another example is emerging around the rapidly developing concept of *ecosystem service partnerships* to share and maximise the multiple benefits that can accrue from water reform.

With these factors in mind, Delegates participating in the at the *Research Agenda* and the *Round Table* proposed that the risks mentioned above be addressed through institutional collaboration around six core components: Adaptive integrated research; Strategic market analysis; Creative engagement; Scenario setting; Outcome measuring instrumentation; Iterative program and project delivery.

As such, the collaboration would provide sound underpinning information, knowledge and practical experience to meet three core needs. Namely to:

- equip and assist governments, business, industry and communities of space and interest to better understand each's position, role and responsibility with respect to implementing the Basin Plan
- heighten awareness and embed industry and community based tools and techniques to address the threats and risks to the implementation of the plan that are predicted to arise from extreme weather events, changing climatic conditions and anthropogenic threats within and beyond the Basin
- initiate the necessary processes and protocols to independently assess the biophysical and socio-economic effects of plan implementation at local and regional catchment scales

As reflected in panellist's contributions to the ***SEGRA 2015*** Hypothetical session, for the MDB there is broad stakeholder agreement of the need to ensure that:

- triple bottom or quadruple bottom line assessment and analysis is reality checked in the context of what impacts and changes in the MDB can be attributed to the water allocation process including environmental flows
- the Basin is managed in an Integrated Water Resources Management (IWRM) framework that embeds Integrated Catchment Management (ICM) and Integrated Water Cycle Management (IWCM) principles
- the common elements of jurisdictionally based water sharing plans, and the essential elements of a National Water Plan are identified and assessed
- ecosystems services inherent in natural and human ecologies of the Basin systems are optimised in commercial and intrinsic terms for the people of the Basin

Many detractors argue that supporting documents for the current *Basin Plan* do not adequately address the implications of changing climatic conditions and associated environmental changes on either the water allocation process or the management of environmental flows or the communities and people who are being impacted. This has been seen by many environmental scientists and representatives of primary industry bodies as a major deficiency.

When examined, the Plan does not take an IWRM approach that utilises ICM tools to maximise yields from irrigated and dry land production and conservation landscapes alike. Also, the plan is virtually silent on the benefits to be gained by optimising the ecosystem services inherent in optimising allocated waters and environmental flows.

In defence, the Murray Darling Basin Authority has responded by saying that these issues will be addressed in the revised plan.

Towards Priority Policy Actions

Key lessons from the water management realities and challenges in general and the *Basin Plan* as a case example are:

- Geographically dimension and understand the biophysical, socio-economic and governance realities and challenges at all scales
- Be inclusive, holistic and integrative from the start
- Ensure statutory flexibility
- Build on strengths of approaches and/or benchmark off analogues

An approach and a framework have been proposed for an *Adaptive Integrated Research, Development and Demonstration (RD&D) Program* to support the implementation of the Basin Plan from 'the bottom up'. Such an approach has relevance in regional Australia in insuring that IWRM that is delivered through ICM processes is a reality**.**

The ***SEGRA 2013*** challenge argued the case for supporting the implementation of the 2012 Basin Plan from the 'the bottom up'. This challenge has been actively pursed over the past two years and a range of actions suggested for collaborative research to underpin the process such as: actively seeking learnings from other multi-jurisdictional basin scale water plans; implementing integrated water resource managements (eg state water sharing plans); constructing futures using visualisation and scenario setting; and back casting to project changes to production and conservation landscapers

Four areas for collaborative projects were identified at ***SEGRA 2015*** through the *Rural and Remote Regions Research Agenda* and the *Murray-Darling Round Table*.

- Community water planning. This would be a multi-agency project and could use a community focused participative approach similar to that used by the NWC for Indigenous communities. Product would include pictorial representation of supply and treatment systems.
- Land use futures for the MDB. This would utilise a systems approach and cover issues such as governance, capital and investment, disruptive technologies and use tools such as (for example) the CSIRO land use change model, big data from TERN and the 'Data Cube'.
- Agriculture, industry and environment---Consumption verses conservation. What is the balance and who for? The approach could include overlay values mapping and net chain analysis. On and off farm adaptation strategies would be imbedded in the approach.
- The Basin in 50 years? Constructing futures using visualisation and scenario setting and back casting to project changes to production and conservation landscapes. This would have a policy maker thrust and encompass trade policy.

Deliberations at the *Rural and Remote Regions Research Agenda* and the *Murray-Darling Round Table* at ***SEGRA 2015*** focused the urgency for:

Promoting and actioning a collaborative client focused and needs driven research, engagement, and communications agenda that is based on sustainable relationships between customers, investors and providers to support the implementation of the 'Basin Plan' from the 'bottom up'

Focusing the 2019 ILWS-SEGRA MDB Forum

Building on the work undertaken since 2013, the ILWS-SEGRA 2019 Murray Darling Basin Forum seeks to draw on the experience and learnings of participants to develop an action agenda to address challenges such as:-

- Dimensioning the implications of environmental change (physical, biological, social, economic and cultural in the Basin.
- Utilising the knowledge and value systems of 'Traditional Owners' to enhance environmental management practices and the attainment of sustainability goals: interfacing traditional and safe water approaches to reduce human and environmental health risks and achieve biodiversity outcomes.
- Managing the 'Basin System' holistically: maximising collaborative governance to deliver integrated catchment and water cycle management and harness the socio-economic benefits of ecosystem services.
- Capitalising on the economic potential of production and conservation landscapes, local and regional creative and entrepreneurial forces, and innovative commercial enterprise: the economy of the Basin is much more than water and irrigation.

Annex C

PPP from presentations