Rivers of Data: Socio-economic MER frameworks for environmental watering

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Key Points

- The Natural Resource Management sector must seize the opportunity to deepen recognition of social and recreational values by proactively developing methods for monitoring and evaluating community sentiment toward the shared outcomes of environmental watering actions.
- Quantitative and qualitative data at the local scale fosters important dialogue on community values tied to the landscape.
- Capture, storage, analysis and reporting of long-term visitation and visitor experience data will provide a foundation of evidence to further refine environmental watering and support management decisions.
- This innovative socio-economic framework applied in the Victorian Mallee recognises the shift toward consideration of social values under water management in the Murray-Darling Basin.

Abstract

Socio-economic monitoring evaluation and reporting (MER) frameworks have a vital role in assessing the outcomes of environmental water management programs. Focusing on the expansion of the Mallee Catchment Management Authority's environmental watering program under the Victorian Murray Floodplain Restoration Project, this case study details a method to monitor social, recreational and economic outcomes from meeting the essential water needs of rivers, wetlands, and floodplains. Aligned with the imperative of Basin Plan, this program emphasises the timeliness of wider implementation of socio-economic MER frameworks.

There is a strong need to capture data within the local landscape, both quantitative and qualitative, incorporate perspectives from a diverse range of respondents, and establish baseline data for assessing changes. This initiative provides a unique opportunity to further the conversation on how social values can be better recognised on a broader scale.

The significance of this study lies in context of recent legislation, which mandates the recognition of recreational values in water management. MER frameworks hold potential to offer a deeper understanding of community values and beliefs and support evidence-based analysis of the outcomes from the environmental watering program. In the Mallee region, this story is tied to the landscape and its people who so strongly care for it.

Acknowledging the evolving nature of this program, this study presents an exciting and innovative step toward documenting the community's story. Ensuring the capture of long-term visitation and visitor experience data, MER frameworks lay the foundation for evidence-based decision-making for the environmental watering program.

Keywords

Environmental watering, recreation, monitoring, community values, social licence.

Introduction

Meeting essential water needs of rivers, creeks, wetlands and floodplains is vital for environmental sustainability, and the flow-on outcomes for social and recreational values. While environmental watering considers a range of elements during planning including the ecological objectives, social and economic outcomes and cultural values, this paper is focused on the monitoring of social, recreational and economic outcomes for environmental watering.

The Monitoring, Evaluation and Reporting (MER) Framework aims to improve the capacity of the Victorian Natural Resource Management (NRM) sector to communicate the outcomes of programs and policy (DSE, 2012). Within this framework, socio-economic MER frameworks stand as robust tools, providing the means to comprehensively assess flow-on outcomes of environmental watering programs. Continual monitoring and reporting supports the delivery of anticipated benefits and allow for decision-makers to adapt their approach to environmental water delivery.

Since the establishment of *Basin Plan 2012* (Cth), the approach for how local communities and stakeholders are considered has evolved. Initially, community input toward the environmental watering program was largely anecdotal and channelled through regional catchment strategies and seasonal watering proposals. Legislative amendments, including the *Water and Catchment Legislation Amendment Act 2019* (Vic), now underscore a shifting paradigm.

There is growing acknowledgement of the recreational values inherent in our waterways which is being formalised through data-driven approaches – a testament to the evolving landscape of the NRM sector under Basin Plan.

Catchment Management Authorities (CMAs) have taken strides to establish social licence for the environmental watering program and recognise a range of stakeholder input through the adaptive management process. This adaptive management process centres on iterative learning and feedback to change management strategies (Webb et al., 2017) and is embedded within Mallee CMA's operations. Social licence is not devoid of existing legal and regulatory responsibilities (Morrison, 2014). The CMA has an essential role in fostering stakeholder participation and promoting community awareness for integrated management of land and water resources.

At its heart, the NRM sector plays a critical role in fostering social licence which in turn can provide a sense of legitimacy to the environmental watering program (O'Donnel et al., 2019). This paper explores the development of a socio-economic MER framework for Mallee CMA to support the Victorian Murray Floodplain Restoration Project (VMFRP). Similar frameworks serve as a tool to effectively communicate project and program outcomes.

Enjoying the flow

Rivers, floodplains, and wetlands serve as a hub for a range of different types of water and natured-based recreation. These experiences aren't just limited to locals, they offer tourists a tapestry of experiences woven into the fabric of these important ecosystems. Recreational opportunities are a pillar of these ecosystems that provide enjoyment, support health and wellbeing, and foster social interaction and community cohesion. Environmental watering plays a large role in contributing to a range of water-based and riverside recreation, a fact which is widely understood (VEWH, 2018; MDBA 2017).

Key attributes of waterways that support nature-based recreation are the proportion and abundance of native fish species, the array of native waterbirds, healthy native vegetation along riverbanks, and the area of river suitable and safe for recreation (Bennett et al., 2008). These attributes are some of the primary benefit streams of the environmental watering program.

The 20th anniversary of The Living Murray (TLM) program was celebrated in 2024. The ecological monitoring established for the TLM icon site was developed to observe, track and adapt the program with respect to the

changing environmental condition. This pioneer program serves as a template for the VMFRP to develop a similar, strong and comprehensive dataset for the social, socio-economic and community values and outcomes of environmental watering.

With the absence of an extensive long-term visitor monitoring program in Northern Victoria, previous studies have had to rely on a number of expert judgements and conservative estimates. A study estimated the recreational value generated from environmental watering in Northern Victoria to be in the range of $1.4 million and $3.9 million, increasing to between $2.8 million and $8 million by 2030 (NCEconomics, 2020).

These market value estimates can help show the true economic value of these ecosystems and support any cost-benefit analysis for programs. However, these dollar values do not reveal the drivers or need for particular systems and sites, and to help plan and manage intervention. They do not offer insights into local circumstances that are tied to these unique landscapes.

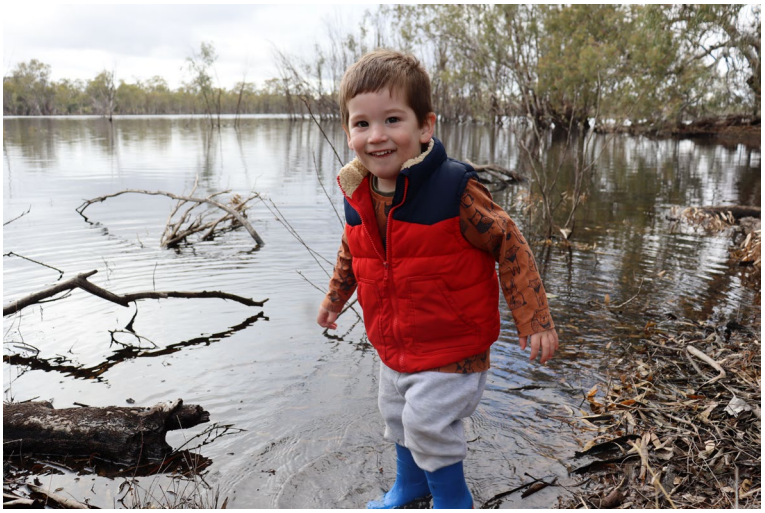

Figure 1. The Hattah Lakes are a much-loved part of the Victorian Mallee community

What we want is to be able to understand the ways in which different people use and value specific waterways where environmental water contributes to maintaining or improving waterway health. In this expansive landscape, nothing is small, and nothing is cheap. But even within resource constrained environments, a fit-for-purpose approach to inform decision-making can have meaningful outcomes (Mussehl et al., 2023).

The Mallee heartland

In the Victorian Mallee, the science underpinning environmental water management cannot be divorced from the iconic landscape and its people. In this part of the world, what drives people's love of this region is exactly what motivates them to care for it – the thriving birdlife and cacophony of frogs in a wetland recently refilled; the towering river red gums and gnarled black box on the floodplains; the immense beauty of the big Mallee skies; the humbling power of the Murray River during times of high flows.

Science doesn't care how you feel, but we must…

History has shown us that without demonstrating respect for why people love and value the Mallee landscape, you cannot earn the social licence required to implement water management planning and actions.

Monitoring community (the key users) satisfaction with the outcomes of environmental watering has been a key driver behind the development of the VMFRP Socio-Economic Monitoring, Evaluation and Reporting (MER) Plan (Sequana Partners, 2021). This plan provides a framework for the capture of data to help confirm

the attainment of anticipated benefits and inform adaptive management, while also developing an implementation method with a degree of rigour and structure that encourages confidence in the findings.

The development of this MER plan is an important milestone in the history of environmental watering in the Victorian Mallee. It recognises that community values for our wetlands and floodplains must be a constant consideration in the way environmental watering is planned and managed.

The My Victorian Waterways survey (DELWP, 2022) identified residents of the Mallee catchment actively seek experiences such as relaxation (81%) and exercise / fun (61%) when visiting waterways. Recreational activities primarily undertaken by Mallee residents are enjoying the scenery (24%), exercise (22%), passing through (17%) and picnics / barbeques (13%).

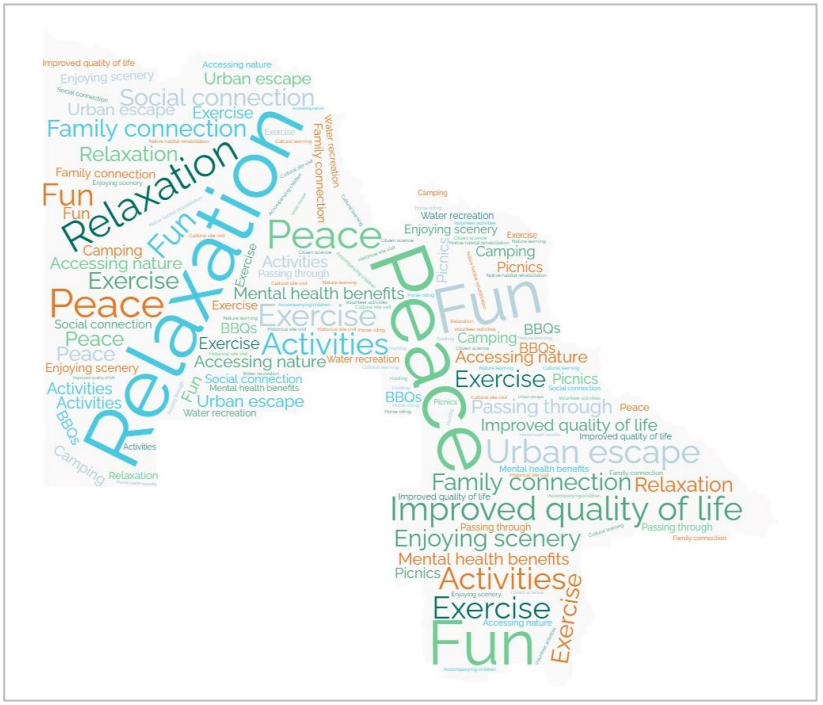

Figure 2. Recreational activities and experiences sought by residents of the Mallee catchment (adapted from DELWP, 2022)

Having benchmark data allows waterway managers to track how satisfied key users are with social outcomes such as amenity to see how the environmental watering influences these management outcomes. Through time, this type of outcome reporting could also allow the influence of externalities to be better understood and improve scenario planning.

Project scope

Sequana was engaged by the Mallee CMA to finalise the VMFRP socio-economic MER, develop the implementation method, and deliver a database solution for the ongoing monitoring and reporting of data. The initial engagement explored the breadth and range of socio-economic indicators in the context of the Mallee region and its ties to environmental water.

Subsequent implementation planning brought the theoretical metrics into practice through survey questions and data collection templates to set the ongoing mechanisms for data collection. Integrated data storage and reporting was established to facilitate the ongoing reporting and strategic communication requirements of the program.

The socio-economic MER is funded under the VMFRP as an approval condition to mitigate potential short-term impacts to businesses and communities, and ensure the project delivers on the anticipated long-term

benefits. The program provides the means to ensure an ongoing emphasis on community values and attention to social, recreational and socio-economic outcomes.

With the first round of data collection occurring in 2024, the VMFRP socio-economic MER is currently being piloted in the Mallee region.

Methodology

This section details the collaborative approach through key stages of the development of the socio-economic MER from setting objectives, implementation planning, to enabling the ongoing monitoring and reporting requirements for the program.

MER Objectives

Metric development aimed to meet a growing interest in understanding the socio-economic outcomes of environmental water management. On the basis of guidance from Mallee CMA and the VMFRP Environmental Management Framework, the overarching objectives identified for the Socio-Economic MER plan were:

- **Adaptive management** of environmental watering actions.
- **Community and stakeholder engagement** on the outcomes and achievement of the program – including both during construction and operation of the VMFRP sites.
- **Benefits realisation** reporting to meet requirements of the VMFRP funding deed

These objectives were developed through a series of collaborative workshops with the VMFRP project partners to define metrics that would form the basis for the monitoring program.

Crafting the right questions

Further work involved a series of facilitated workshops to develop the implementation method and survey templates for socio-economic metrics. Dedicated workshops were held to enable targeted discussion and feedback on the proposed means and methods of data collection.

Key considerations were practical, affordable, and appropriate methods of data collection leveraging project partner experience and knowledge to refine the process. *What was appropriate to ask community? And what would be meaningful to capture?*

Survey questions were developed in line with the 2014 My Victorian Waterways survey, which provides a significant state and catchment-wide social benchmark, to further develop region-specific data for the Mallee catchment.

> ***Visitor experience*** *data can show how strong the relationship is between watering and different recreation activities.*

Environmental watering is expected to enhance the experience visitors derive from visiting a project site by improving ecological outcomes and providing water for recreational and sightseeing purposes. Understanding the level of visitation as well as the motivations and demographics of the visitors themselves is essential in planning and developing appropriate means to facilitate visitor experience.

Key questions include: *How often do you visit this site? Who do you visit with? How long do you stay? What attracted you to this site? What activities did you do? Was the presence of water important?*

> ***Related business activity*** *data can explain whether certain types of recreation or business activity that rely on natural resources responds to specific changes from water in the landscape or enhanced ecological condition.*

In line with objective of VMFRP to grow ecotourism and nature resource business activity within the area, this metric aims to measure the change in business activity, particularly in response to environmental watering events.

Key questions include: *If the environment is healthy, is that of benefit to your business? What changes in your enterprise do you notice when water is present?*

> ***Community sentiment*** *information can help us to appreciate the general opinion / attitude toward environmental water and what strategic communications need to address.*

This metric aims to gain an understanding of the broader community sentiment towards the VMFRP and its objectives through engagement with project staff, advisory groups, and key members of the community. It may also highlight key issues of concern, providing guidance for project operational and communications strategies.

Key questions include: *How would you describe the community perception toward environmental water? Have you heard any 'good' or 'bad' news stories about the presence of water at the site?*

Maintaining the story

In order to collate and protect the data, a database solution was developed to address the long-term capture, storage and reporting of socio-economic data. The engagement built upon the existing work to clearly define the database and ongoing reporting requirements.

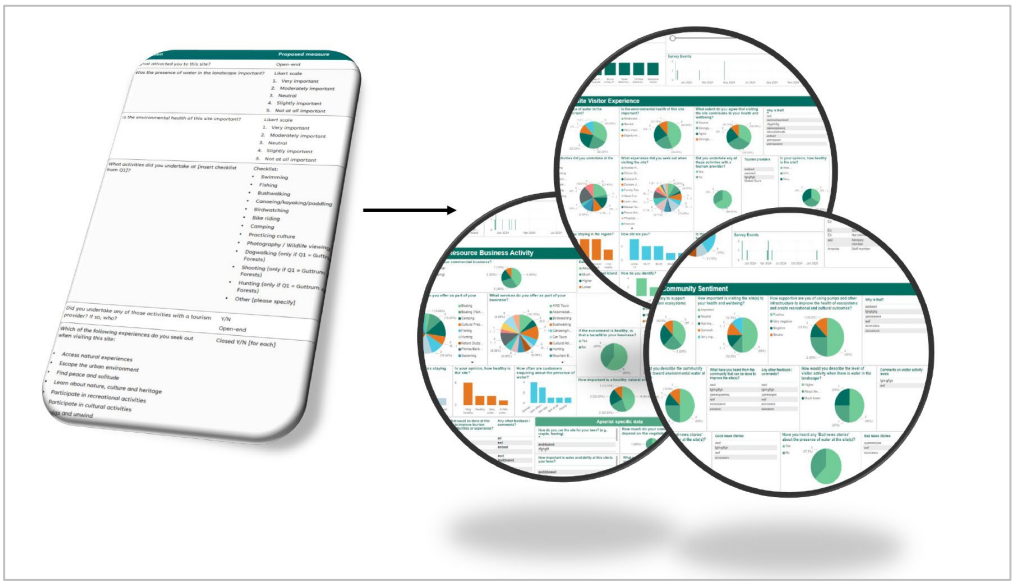

Figure 3. From survey templates to dashboard reporting

The project resulted in a fit-for-purpose database solution with integrated Business Intelligence (BI) reporting templates that enable site specific and time-bound data analysis. By supporting the MER data requirements in a cost-effective manner, the solution provides Mallee CMA with the means to manage its integrated data storage and reporting. Reporting outcomes as positioned to inform future strategic communications and adaptive management practices within the environmental watering program.

Flexible management in real-time

Adaptive management is implicit within the CMA's day-to-day management of environmental watering. It is a defined iterative decision-making process based on continual learning that aims to reduce uncertainty over time. The adaptive management approach is suitable for such a program with fluctuating environmental conditions and uncertainty in management decisions (Williams and Brown, 2014).

By incorporating feedback and learning from past experiences, adaptive management can promote collaboration by involving community and stakeholders in the decision-making process and build resilience into these systems.

A common reason for the failure of adaptive management is the lack of commitment to monitoring and evaluation efforts by management agencies (Schreiber et al., 2004). Monitoring, evaluation and reporting serve as the backbone of adaptive learning, providing the critical feedback loop to management and paving the way for informed changes in future strategies based on new knowledge (Horne et al., 2017) - without it the adaptive management cycle is incomplete.

The long-term payoff of monitoring and evaluation is invaluable, as it ensures the sustainability and success of adaptive management practices over time. The data-driven approach of the socio-economic MER program aims to further support the adaptive management process through active recognition of real-time stakeholder input.

Conclusion

While this program is in its genesis, it forms part of an evolving conversation recognising the need to document this story and improve the environmental watering practice.

Beyond our obligations to a sustainable environment, funding for environmental water management projects is supported by compelling social and economic evidence. Methods such as storytelling and engaging case studies convey the importance of natural resources to the public (Boyd, 2021) and can be better informed by a robust repository of socio-economic data through MER programs.

To achieve lasting community support for the environmental watering program, the NRM sector needs to invest in building trust and reporting outcomes (O'Donnel et al., 2019). NRM agencies must appreciate this opportunity to deepen recognition of social and recreational values associated with our waterways, further driven by formal recognition of these values in the *Water and Catchment Legislation Amendment Act 2019* (Vic).

Due to a lack of longitudinal visitation data available for the Northern Victorian region, previous studies have largely had to rely on expert judgements and conservative assumptions to assess the socio-economic outcomes of the environmental watering program (NCEconomics, 2020). Long-term capture of visitation and visitor experience data may serve to further refine the environmental watering program and guide management strategies.

In pursuit of understanding the outcomes of environmental watering events, collecting information on how people use these sites and landscapes paints a more comprehensive picture of the human dimension. Rather than rely on assumptions, NRM agencies would have the capacity share real and transparent data, statistics, and stories.

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