Australian Government
Australian Research Council

EI 2018 ENGAGEMENT AND IMPACT

Engagement and Impact 2018

The University of Western Australia

UWA14 (SS) - Impact

Overview

Title

(Title of the impact study)

INFFER - applying economics in environmental management

Unit of Assessment

14 - Economics

Additional FoR codes

(Identify up to two additional two-digit FoRs that relate to the overall content of the impact study.)

Socio-Economic Objective (SEO) Codes

(Choose from the list of two-digit SEO codes that are relevant to the impact study.)

91 - Economic Framework
96 - Environment

Australian and New Zealand Standard Industrial Classification (ANZSIC) Codes

(Choose from the list of two-digit ANZSIC codes that are relevant to the impact study.)

72 - Administrative Services
75 - Public Administration
89 - Heritage Activities

Keywords

(List up to 10 keywords related to the impact described in Part A.)

Environmental economics

decision making

prioritisation

project evaluation

land management

water

bushfire mitigation

framework

policy

Sensitivities

Commercially sensitive

No

Culturally sensitive

No

Sensitivities description

(Please describe any sensitivities in relation to the impact study that need to be considered, including any particular instructions for ARC staff or assessors, or for the impact study to be made publicly available after EI 2018.)

Aboriginal and Torres Strait Islander research flag

(Is this impact study associated with Aboriginal and Torres Strait Islander content?
NOTE - institutions may identify impact studies where the impact, associated research and/or approach to impact relates to Aboriginal and Torres Strait Islander peoples, nations, communities, language, place, culture and knowledges and/or is undertaken with Aboriginal and Torres Strait Islander peoples, nations, and/or communities.)

No

Science and Research Priorities

(Does this impact study fall within one or more of the Science and Research Priorities?)

Yes

Science and Research Priority	Practical Research Challenge
Soil and water	New and integrated national observing systems, technologies and modelling frameworks across the soil-atmosphere-water-marine systems.
Soil and water	Minimising damage to, and developing solutions for restoration and remediation of, soil, fresh and potable water, urban catchments and marine systems.
Environmental change	Resilient urban, rural and regional infrastructure.
Environmental change	Options for responding and adapting to the impacts of environmental change on biological systems, urban and rural communities and industry.

Impact

Summary of the impact

(Briefly describe the specific impact in simple, clear English. This will enable the general community to understand the impact of the research.)

The Investment Framework for Environmental Resources (INFFER) is a set of tools and frameworks that has redirected investments worth tens of millions of dollars by methodically demonstrating the value for money, or lack of it, in environmental project options. Since 2011, 20 of Australia's 56 regional environmental management bodies have undertaken training in INFFER and are now using it to develop, evaluate and prioritise environmental projects. INFFER helps managers assess and rank environmental and natural resource projects and provides a framework for economic thinking in the decision processes. Impacts have been seen in greater environmental benefits through better design and prioritisation of environmental projects in publicly funded programs.

Beneficiaries

(List up to 10 beneficiaries related to the impact study)

The Australian Government's Department of Agriculture and Water Resources

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The Victorian Government's Department of Environment, Land, Water and Planning

Natural Decisions Pty Ltd

North Central Catchment Management Authority (Victoria)

Burnett Mary Regional Group (Queensland)

Rangelands Natural Resource Management (Western Australia)

Terrain Natural Resource Management (Queensland)

Ministry for the Environment and catchment management organisations for the Waikato River (New Zealand)

•Alberta Agriculture and Forestry (Canada)

Countries in which the impact occurred

(Search the list of countries and add as many as relate to the location of the impact)

Australia
New Zealand
Canada

Details of the impact

(Provide a narrative that clearly outlines the research impact. The narrative should explain the relationship between the associated research and the impact. It should also identify the contribution the research has made beyond academia, including:
- who or what has benefitted from the results of the research (this should identify relevant research end-users, or beneficiaries from industry, the community, government, wider public etc.)
- the nature or type of impact and how the research made a social, economic, cultural, and/or environmental impact
- the extent of the impact (with specific references to appropriate evidence, such as cost-benefit-analysis, quantity of those affected, reported benefits etc.)
- the dates and time period in which the impact occurred.

NOTE - the narrative must describe only impact that has occurred within the reference period, and must not make aspirational claims.)

Funding for public environmental programs is very small relative to the number and scale of environmental problems. To deliver the most valuable environmental outcomes requires careful targeting of funds to the projects most likely to deliver a successful outcome, but identifying these projects is challenging. It requires decision makers to integrate economic, biological, physical, social and policy information in a decision-making framework. In practice, few programs succeed in this difficult task. As a consequence, environmental programs are often criticised for being unclear about their objectives, poor project prioritisation, using inappropriate policy mechanisms, and being unable to demonstrate environmental benefits.

INFFER is a set of tools and frameworks developed by researchers led by UWA Professor David Pannell which provides environmental managers and policy makers with the means to select and design projects that deliver the most valuable environmental outcomes with the funds available. Since 2011, 20 of Australia's 56 regional environmental management bodies have undertaken training in INFFER and are now using it to develop, evaluate and prioritise environmental projects. Government agencies in three states have also been trained in using the framework. For some, INFFER has become central to the way they do business. In the North Central Catchment Management Authority (Victoria) INFFER has been deeply embedded in the organisation, influencing all decision processes and the culture of the organisation.

Use of INFFER has helped organisations to improve their quality of environmental decision making to deliver better outcomes for the community. INFFER has redirected environmental investments worth tens of millions of dollars by demonstrating the value for money, or lack of it, of the available project options. A study by Pannell and Gibson (2016) estimated that use of an economically rigorous tool like INFFER to guide prioritisation would increase the value of environmental benefits by 50 to 100% relative to existing commonly used decision processes.

"For our organisation, using INFFER was like switching the lights on. It's superior to anything else I've seen, and it's had a profound impact on our organisation and the way we think about investing in the environment." (Damian Wells, former CEO of North Central Catchment Management Authority).

"INFFER has become an integral component of the process for developing a new Regional Catchment Strategy. The valuable consultation that has resulted with the regional community and key partners has provided us with a new look at our regional assets and how they should be valued." (Hannah Brook, Glenelg Hopkins CMA).

"INFFER was selected as the process to develop a new operational plan within Coliban Water, which was included as part of Coliban Water's 2018 Pricing Submission (PS18) to the economic regulator in Victoria, the Essential Services Commission. The acceptance of the operational plan by the business established for the first time an investment program in Natural Resource Management and illustrates the effectiveness of INFFER in being able to adapt, and meet multiple agency and stakeholder goals and aspirations." (Barry Floyd, Coliban Water).

"In the Wet Tropics, Burnett Mary, and Burdekin Natural Resource Management regions of Queensland, INFFER was selected as the most suitable tool for prioritising management options for maximising the water quality and economic benefits of investments in protection of the Great Barrier Reef." (Jane Waterhouse, C2O Consulting).

In New Zealand, INFFER has been used by The Waikato River Authority and has led a collaborative process with a number of New Zealand organisations to assess various options to reduce water pollution in the Waikato River. This work is guiding the expenditure of NZ$300 million over the coming 10 years.

There has also been uptake of INFFER in Canada with training programs delivered by the Pannell and others from the INFFER team in Alberta and Manitoba. The Land Stewardship Centre in Edmonton has used INFFER in the delivery of a study on water pollution in Alberta, funded by the Alberta Provincial Government.

"There has been a significant and growing interest in INFFER across the three Western Canadian Prairie provinces, driven by its rigour, its sound economic principles, and the eloquence of the theoretical foundation. From a policy perspective, having all the environmental policy tool options on the table in the same analysis has been ground-breaking." (Jim Stalwick, Saskatchewan Ministry of Agriculture).

The value and impact of INFFER has been recognised in other sectors. The Bushfire CRC and the Australasian Fire and Emergency Service Authorities Council (AFAC) funded the adaptation of INFFER to the area impacted by bushfires, which was applied to assess strategic fire mitigation options in Western Australia, South Australia, New South Wales, Victoria and New Zealand. This is the first time Australian fire agencies have integrated economic, technical and social information to analyse their strategies. These analyses are changing the thinking about the options available for fire mitigation in Australia's fire agencies. "The INFFER work has assisted the Department for Environment & Water (SA) (DEW) to attempt to quantify the costs of our bushfire mitigation activities, consider what we are mitigating & how and better understand what benefits/costs we are 'generating'. The results will be used in Bushfire Risk Planning to better understand what risk reduction can be achieved with existing/proposed budgets and policies. The findings and the approach used (INFFER) can also use to add cost/benefit information to policy development. Developing the tools to conduct and the understanding of cost/benefit analysis is increasingly important to DEW as this information is now required for all Cabinet Submissions." (Mike Wouters, Department of Environment and Water)

Associated research

(Briefly describe the research that led to the impact presented for the UoA. The research must meet the definition of research in Section 1.9 of the EI 2018 Submission Guidelines. The description should include details of:
- what was researched
- when the research occurred
- who conducted the research and what is the association with the institution)

Research undertaken at UWA into the management of soil salinity in rural areas, including the integration of economic, social, biological and physical aspects, was the starting point for investigations that led to the development of INFFER. It evolved from similar multidisciplinary research into the management of a broad suite of environmental issues. From these research efforts, and from close engagement with environmental agencies, it was recognised that there was enormous potential to deliver much greater environmental benefits from the resources available through improved analysis and decision-making. From this point, the research diversified to encompass topics needed to meet INFER's potential. Research was conducted into the existing practices, perceptions and capacity levels of environmental managers; the performance of existing environmental policies and programs and reasons for performance deficiencies; and the pilot testing of various new tools developed for environmental managers.
The research on salinity commenced in 2005 and the various strands of research have continued since then in parallel with translation, engagement and communication activities. The research has been led by Professor David Pannell at UWA, initially within the CRC for Plant Based Management of Dryland Salinity (Salinity CRC), then within the Future Farm Industries CRC (FFI CRC), and as part of his ARC Federation Fellowship. There have been 8 key participants at UWA and around the country.

FoR of associated research

(Up to three two-digit FoRs that best describe the associated research)

05 - Environmental Sciences
14 - Economics

References (up to 10 references, 350 characters per reference)

(This section should include a list of up to 10 of the most relevant research outputs associated with the impact)

Pannell, D.J. (2008). Public benefits, private benefits, and policy intervention for land-use change for environmental benefits, Land Economics 84(2), 225-240.

Roberts, A. and Pannell, D. (2009) Piloting a systematic framework for public investment in regional natural resource management: dryland salinity in Australia, Land Use Policy 26(4), 1001-1010.

Pannell, D.J. and Roberts, A.M. (2009). Conducting and delivering integrated research to influence land-use policy: salinity policy in Australia, Environmental Science and Policy 12(8), 1088-1099.

Alexander, J. Roberts, A.M. and Pannell, D.J. (2010). Victorian Catchment Management approaches to salinity: learning from the National Action Plan experience, Australasian Journal of Environmental Management 17(1), 45-52.

Pannell, D.J., Roberts, A.M., Park, G., Alexander, J., Curatolo, A. and Marsh, S. (2012). Integrated assessment of public investment in land-use change to protect environmental assets in Australia, Land Use Policy 29(2), 377-387.

Roberts, A.M. Pannell, D.J. Doole, G. and Vigiak, O. (2012). Agricultural land management strategies to reduce phosphorus loads in the Gippsland Lakes, Australia, Agricultural Systems 106(1), 11-22.

Pannell, D.J., Roberts, A.M., Park, G. and Alexander, J. (2013). Improving environmental decisions: a transaction costs story, Ecological Economics 88, 244-252.

Pannell, D.J., Roberts, A.M., Park, G. and Alexander, J. (2013). Designing a practical and rigorous framework for comprehensive evaluation and prioritisation of environmental projects, Wildlife Research 40(2), 126-133.

Park, G., Roberts, A., Alexander, J., McNamara, L. and Pannell, D. (2013). The quality of resource condition targets in regional natural resource management in Australia, Australasian Journal of Environmental Management 20(4), 285-301.

Pannell, D.J. and Gibson, F.L. (2016). The environmental cost of using poor decision metrics to prioritise environmental projects, Conservation Biology 30(2), 382-391.

Additional impact indicator information

Additional impact indicator information

(Provide information about any indicators not captured above that are relevant to the impact study, for example return on investment, jobs created, improvements in quality of life years (QALYs). Additional indicators should be quantitative in nature and include:
- name of indicator (100 characters)
- data for indicator (200 characters)
- brief description of indicator and how it is calculated (300 characters).)