



# EERHPOLICYBRIEF

*“Yes we can ...”* : Improving the funding cost efficiency for natural resource management

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*By focusing on outcomes rather than inputs, funding cost efficiency for resource management and water quality can be significantly improved.*

Governments regularly provide incentives and support to stimulate better environmental outcomes from private land management. But how can funding be sensibly allocated when there is a wide variety of initiatives and projects to support?

Much government funding is allocated through bodies such as Catchment Management Authorities or Natural Resource Management (NRM) groups, which then allocate the money to landholders. On-farm projects that will have wider environmental benefits for the community, such as improving biodiversity conservation or water quality, receive much of the funding.

Proposals from landholders need to be assessed in a way that identifies preferred projects for funding. The reality is, public funds are often allocated with little knowledge of project outcomes.

In economic terms, public funding is best allocated when selected projects deliver the greatest public benefits relative to the costs involved. But because there is a lack of value estimates for many environmental improvements, net values are difficult to evaluate in a cost efficiency analysis.

Where value estimates are not available, the next best option is to select projects based on cost-effectiveness by identifying projects that meet objectives at least cost. Cost effectiveness is measured by each project cost compared with environmental improvements.

### **Natural resource management funding**

Funding is rarely allocated for environmental programs based on cost efficiency or cost effectiveness (and there is rarely enough detail reported in programs to allow assessment of either). Instead, fixed grants are often allocated. These grants select key actions (inputs) and often maximise participation across landholders. Funding at the regional level focuses on meeting short-term objectives and achieving political outcomes.

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It is difficult for public officers to allocate environmental funds because of information asymmetries. Often governments have limited knowledge of the trade-offs between farm management and environmental outcomes. Farmers tend to have limited knowledge of the environmental benefits of changing management practices. This results in significant variations in the cost effectiveness of farm management proposals.

Poor selection processes means the most cost-effective proposals are not always selected. Allocating funding between regional groups can also be difficult as local politics and parochial interests mean each group claims large shares of funding.

## Quantifying environmental benefits

Many mechanisms for allocating environmental funding have focused on simply identifying landholder actions and management inputs. Although these are easy to assess, they involve a leap of faith that the project will result in benefits.

Case study 1: A program to improve water quality from cane farms, Burdekin region, north Queensland

*Two methods to assess projects for funding were compared. The first involved a scorecard approach, typical of fixed grant programs, to assess farm management practices. The second used a metric to predict changes in pollutants reaching the Great Barrier Reef. While the scorecard assessed what landholders were doing, it didn't predict what the changes in emissions might have been. The metric was focused on assessing the change in pollutants that were affecting water quality, and was more than twice as successful at identifying environmental improvements from landholder proposals compared to the scorecard approach.*

Environmental funding should at least be prioritised by the **change in outputs**. For water quality proposals, this might be the change in on-farm pollutants, or change in emissions that reach the nearest stream. It is even better to predict the **change in environmental outcomes** such as the improvement in riparian health or fish stocks as a result of lower pollution.

A focus on environmental outcomes means predicting the consequences of management actions. The many information gaps are a key challenge. For example, assessing water quality proposals involves predicting:

- change in emissions on-farm
- the rate at which pollutants are transported to streams
- the environmental improvements generated by reduced pollutants.

Evaluating proposals in terms of predicted environmental benefits will help identify science research priorities.

## Selecting the most cost-effective proposals

Funding proposals need to be evaluated by comparing investment costs against the environmental benefits. The costs of making farm-level changes vary between landholders and the amount of improvement needed. At a state level, the costs of making environmental improvements vary across regions, across industries, and across pollutant types. It is important to consider how the cost effectiveness of different proposals can vary when selecting which projects to fund.



Case Study 2: Water quality tender, Burdekin region.

*The potential variation in cost-effectiveness between landholders was demonstrated in eighty-four proposals from the grazing and sugarcane industries to improve water quality.*

*The 10 most highly ranked projects would have cost \$180,574. These projects were modelled to capture 47,510 kilograms of nitrogen (\$1.70 per kilogram), 51.6 kilograms of pesticide (\$1,579 per kilogram), and 29.8 tons of sediment (\$117.4 per ton).*

*The 10 lowest ranked projects would have cost \$495,808. These projects were modelled to capture 870 kilograms of nitrogen (\$290.78 per kilogram), no pesticides and 18 tons of sediment (\$13,480 per ton).*

*If policy makers had selected the 10 worst proposals, they would have only achieved a fraction of the environmental benefits that other farmers were prepared to achieve. Similar activities can generate very different outcomes across farms because of varying soil, climate, geographic, and management conditions.*

In summary, the efficiency of funding programs to improve environmental conditions can be improved by:

1. Basing funding to catchments, regions and industries on the relative environmental outcomes, and avoiding scoring mechanisms such as multi-criteria analysis (these confound the objectives and are open to bias or manipulation)
2. Basing funding to farmers on the relative environmental outcomes, they will achieve
3. Being sensitive to varying outcomes between farmers, and minimising the use of mixed grants.

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The Environmental Economics Research Hub brings together leading economic and social scientists to look at new and improved ways of valuing environmental assets and determining the benefits and costs of different actions. This work extends across terrestrial and marine biospheres. The overarching focus of the research hub is to develop economic models and tools, especially for policy makers. It employs leading edge economic principles and practices to address key environmental policy issues such as the design of marine reserves, development of incentives and tools for improving water efficiency, policies for promoting environmental stewardship, multi-species and ecosystem management for biodiversity, and adapting to climate change.

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