

INVESTING IN DAMS – THE IMPORTANCE OF GETTING WATER INFRASTRUCTURE ECONOMICS RIGHT

Understanding the full costs and benefits of new dams is crucial to inform investments that deliver the best outcomes for Australia

It is critical to understand what constitutes economically sound investment in dams. The forthcoming white papers on Developing Northern Australia and Agriculture Competitiveness are both expected to raise the prospect of new dams. The recent Infrastructure Australia Infrastructure Audit also found that further water storages may be necessary to secure water supply in the face of increasing climate variability and population growth. Against this backdrop, it is important for governments' consideration of new dams to be underpinned by robust economic analysis to ensure returns are commensurate with the level of investment.

New dams could help enable economic development. Secure water supplies are a cornerstone of agricultural and economic development. In principle, when matched by downstream demand, the right size dam constructed in the right location can support investor confidence, higher value agriculture and increased productivity, as well as industry and regional development.

But the costs of investing in inappropriate dams are high. Investing in the wrong dam in the wrong area can create an ongoing liability for customers and governments, and prevent scarce capital from being allocated to more productive investments. Dams are long-lived capital-intensive assets, and once constructed, necessitate the ongoing recovery of capital, operating and maintenance costs – including the costs of meeting dam safety regulations. Current tight economic conditions mean it is more important than ever for any investments in new dams to be affordable over their lifecycle and deliver value for money.

The proper use of economic analysis, insights and advice will help realise the opportunities presented by current interest in new dams.



Image provided by Icon Water 2015

Basic economic tools are essential to guide improved investment decisions.

Economic cost benefit analysis (CBA) is the Australian Government's preferred economic tool to assess and compare the costs and benefits of infrastructure options. A key advantage of CBA is that different options can be compared using a common metric, money. By comparing the full set of project benefits to the costs, all in today's dollars, it is possible to determine whether a dam project enhances overall welfare. High quality economic appraisal can identify which projects are most worthy of investment and avoid misallocating investment resources to expensive 'white elephants'.

CBA for water infrastructure requires a bespoke methodology. Economists typically focus on quantifying benefits and comparing these to cost estimates developed by engineers. The economic benefits of new dams result from increased supply reliability underpinning mining, agriculture and other economic activities, as well as urban development. Economic valuation techniques can be used to derive a market value for water if there are similar systems with water markets in place. Otherwise, the economic value of water in various uses can be estimated using production based techniques.

Other factors that influence the quantification of benefits include:

- The definition of the base case. For example, it is important to recognise the loss in dryland agricultural production when land is moved into irrigated agricultural production.
- Aggregate demand for water in a catchment. For example, in the past, poor quality appraisals have incorrectly assumed major increases in production of certain commodities without considering impacts on commodity prices.

Dams can also provide ancillary benefits such as flood protection and recreation.

There will be a range of other site specific social and environmental impacts that could and should be quantified where applicable (e.g. recreational impacts, impacts on greenhouse gas emissions, land acquisition and resettlement costs, and flood impacts). Using the latest economic valuation techniques can help to estimate these types of benefits, which have historically been overlooked.

Dams alter flow regimes and inundate land, with resulting environmental impacts. The extent of these impacts varies depending on the size of the dam, its management and its location. Environmental impacts will be the subject of significant environmental planning and

approvals processes, which will typically result in management or mitigation measures. CBA should consider the costs and benefits of these measures. Where residual environmental impacts remain, these can be assessed qualitatively (in non-monetary terms) or by using non-market valuation approaches.

CBA for dams requires explicit approaches to dealing with uncertainty.

Many of the benefits of dam projects are subject to risk and uncertainty. So too are the cost estimates. For instance, every dam involves on-site construction and unique geotechnical, hydrological and locational challenges. Therefore, sophisticated analysis of risk and uncertainty is useful for CBAs of dam projects. Aither has significant experience in undertaking complex probabilistic analysis to take uncertainty into account, while still presenting results in an intuitive manner.

Sound economics can influence sound decision making. Overall, getting investment decisions right can deliver outcomes that represent the most appropriate use of public funds, have strong stakeholder support, and generate long-lasting benefits to the community. In the context of new dams, the proper use of economic analysis, insights and advice will help realise these opportunities.

Aither's team include experts in economic appraisal of dams and water infrastructure investments. The quality of economic CBA can determine the success or failure of new dam funding submissions. Aither's recent experience in economic CBA for water infrastructure (which stretches from Tasmania to Cape York) means we are well placed to provide practical advice underpinned by sound economic principles.



Rod Coulton
Senior Consultant
0412 164 895
rod.coulton@aither.com.au



Jane Branson
Principal
0478 072 430
jane.branson@aither.com.au



Chris Olszak
Director
0425 707 170
chris.olszak@aither.com.au