

## **Working with economic evaluation; dream or nightmare?**

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### **Introduction**

Much has been written about economic analysis of projects as a discipline, particularly benefit-cost analysis. Similarly, non-economic evaluation has a rich documented history with established schema, philosophies, language and methods. However, there is a dearth of information on how these two approaches can work together.

The authors of this paper are both experienced evaluators but novices in economic evaluation, and have been working on economic evaluation of an agricultural practice change project in DPI over the past twelve months. The paper presents an account of the journey to date and lesson learnt along the way.

The Round Table discussion format will be used to;

1. Present lessons gained whilst working on the economic evaluation
2. Share perspectives on where both types of evaluation can work together, and the role that evaluators not trained in economics can play

### **Context for this work**

This paper draws on experience gained whilst undertaking an economic evaluation of a project called Feeding Pastures for Profit (FPFP), delivered as a part of the Department of Primary Industries Victoria (DPIV) Dairy Program.

The FPFP program provides dairy farmers with decision guidelines and support to optimize their pasture and feeding management. The guidelines are studied and practiced during two theory days followed by four on-farm group days to provided support in applying the principles and tools over twelve months. A one to one follow up visit is also provided if required.

The FPFP evaluation was conducted in response to an emerging need for greater use of economic analysis within the DPIV Dairy Program. In 2007 Dairy Australia (DA), a co-investor in the DPIV Dairy Program, embarked on a schedule of both targeted (BDA Group, 2007) and random (BDA Group, 2008) ex-post benefit-cost evaluations of projects across the portfolio of R&D programs, designed to contribute to a broader suite of studies across the Rural Industry Research and Development Corporations (eg CRRDCC, 2008). During this time, both Dairy Australia and DPI were also seeking greater use of ex-ante benefit-cost analysis in program proposals to help inform investment portfolio decisions.

Whilst a number of factors pointed to the need for economic evaluation of FPFP, economic thinking was not routine in the dairy program and some of the data required for a benefit-cost analysis was not being collected or even considered. In response, the dairy management team decided on a strategy to embed economic thinking and analysis into future programs, using a three pronged approach;

- (i) commissioning the development of a simple and transparent benefit-cost methodological framework as a set of guidelines, agreeable to DPI and DA, and suitable for both ex-ante and ex-post assessment of extension work, utilizing a reference group drawn from DA and DPI economists, the Dairy Program Evaluation Manager and a DPI evaluation specialist
- (ii) initial application of the framework to existing data for the FPPF by the Dairy Program Evaluation Manager as part of studying an economic evaluation subject at Melbourne University
- (iii) building on the initial analysis, with refinement of the process, feedback and subsequent data collection, to conduct and write up a preliminary benefit-cost analysis (BCA) for FPPF by an independent economist contractor, in conjunction with the Dairy Program Evaluation Manager.

### **The benefit-cost methodology**

Benefit-cost analysis (BCA), also called cost-benefit analysis, is a method of economic evaluation for projects, programs or policies that measures benefits and costs as far as possible in money units (Finance, 2006). The analysis can be undertaken prior to a project (ex-ante) to assess 'what could be without change, versus what could be with change' or after the project has been completed (ex-post) to assess 'what was, versus what could have been' (B Malcolm, pers. comm., 2009).

Cost-effectiveness analysis, in contrast, is where the benefits are quantified in non-monetary units (Yates, 2009) and can therefore be regarded as an intermediate step in cost-benefit analysis, along the pathway from listing, to quantifying, and valuing benefits, and is used to compare the performance of programs which contribute to the same quantifiable outcome (eg Boymal, Rogers, Brumby and Wilder, 2007). Not surprisingly, there are situations where benefits can be listed but not quantified or valued as explained by Chudleigh, Simpson, and Schofield (2007) in their methodology, and noted by the Council of Rural Research and Development Corporation Chairs CRRDCC (2008) in their study of 68 economic evaluations across 15 rural research and development corporations.

In developing the DPI Benefit-Cost Analysis Guidelines for Evaluators (Habgood, 2009) for the FPPF evaluation, the BCA methodologies published by Department of Finance and Administration (Finance, 2006), Land and Water Australia (Chudleigh, Simpson and Schofield, 2007), and the Council of Rural Research and Development Corporation Chairs (CRRDCC, 2007) were synthesised and simplified into five broad steps;

1. Describing the project intervention
2. Identifying, quantifying and valuing the project benefits in the 'with' and 'without' intervention (counterfactual) scenarios
3. Creating a stream of net benefits over time based on adoption curves and individual benefits
4. Identifying, quantifying and valuing the project costs and creating a stream of costs over time based on costing data and delivery schedules
5. Computing and interpreting the economic analysis, including sensitivities and assumptions

The first step of describing the project intervention is seldom mentioned in economic evaluation methodologies, but was included in the guidelines to provide a basis from

which to explain costs in relation to project activities, audience and reach, and to explain the linkage of behaviour changes to benefits, in other words the program logic.

As part of the process of listing, quantifying and valuing project benefits (step two), published BCA methodologies typically contrast the 'with' intervention scenario to the 'without' intervention scenario also referred to the 'counterfactual' (see Cummings, 2006) or 'program effect' (Rossi, Lipsey and Freeman, 1993). Malcolm (pers. Comm., 2009), emphasises that such scenario comparisons need to recognise changes that may occur in the absence of the project intervention, and not just consider the status quo as the counterfactual. The concept of the counterfactual is illustrated below in Figure 1, highlighting how project interventions may speed up the rate of practice change, and/or lead to benefits not captured without the intervention.

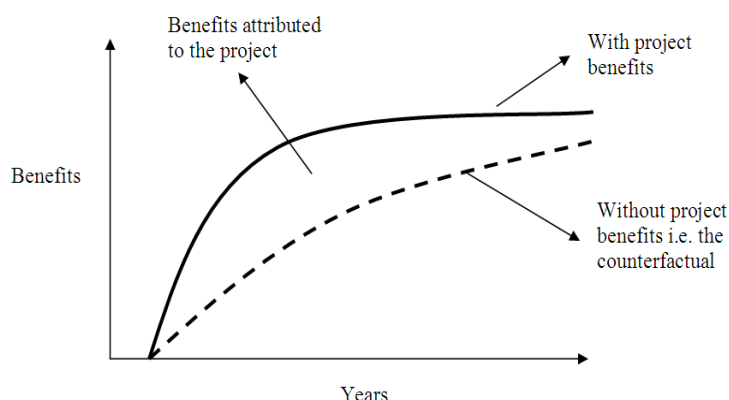


Figure 1: The Counterfactual Illustrated (from Habgood, 2009)

In step three, a stream of net benefits (the difference between the 'with' scenario and 'without') over time is produced based on adoption curves and individual benefits, along with a stream of costs based on costing data and delivery schedules in step four. In step five the value of each stream is discounted to its equivalent Present Value in today's dollars and Benefit-Cost Ratios calculated using the ratio of present values of benefits to costs (Finance, 2006).

### Application of the methodology and lesson arising

Application of the methodology to the evaluation of FFP is shown below (Figure 2), starting with the first step of describing the intervention, then working through the benefits (left hand side of the diagram) and costs (right hand side) culminating in streams of net benefits and costs with their Present Values used to compute the Benefit Cost Ration (BCR).

The task of describing the intervention commenced with examination of the program logic. The logic showed how changes in on-farm practice in the program should lead to benefits of increased pasture growth and milk production and/or less supplementary feeding, or increased fodder conservation, thus providing starting point to identify, quantify and value project benefits. Details of the program delivery model provided a basis for project costs.

*Lesson 1: a program logic is an extremely useful tool to signal benefits, and as a starting point to understand delivery costs*



*Lesson 4: credible evidence of behaviour change will provide a strong foundation to identify, quantify and value benefits*

The next step in the process was to develop a stream of benefits over time, for the 'with' intervention scenario and for the counterfactual, taking into account the magnitude of benefit, the timing, duration, and adoption rates.

*Lesson 5: deriving a counterfactual is critical in estimating economic net-benefit of a program, and should also be considered when assessing the non-economic impact of programs*

On the costs side, costing data and delivery schedules are required, and were readily available in our analysis.

Reflecting on the process overall, it seems that people with different skill sets can play a different role at each stage of the BCA process. For example evaluators working with program staff were well placed to help clarify the intervention, its delivery, and identify behaviour changes and resulting benefits, depicted by the pale coloured boxes in Figure 2. Quantifying and valuing the biophysical changes, shown in the dark-coloured boxes, utilized the expertise of a farm consultant. The dark coloured ovals identify the key roles for an economist in generating streams of benefits and costs, and computing the economic analysis.

*Lesson 6: people with different skill sets can play a different role at each stage of the BCA process, however it not clear cut who should lead the evaluation overall and produce the final report*

Our final lesson mirrors that reported by Herman *et.al* (2009) that economic evaluations would have taken less time and been more accurate if they had been included in the initial plans for the project.

*Lesson 7: that data collection should be planned to fit with the requirements of an economic evaluation for accuracy and time-effectiveness*

## **Summary**

This evaluation, including testing of the guidelines for economic evaluation, and working with economists and program staff, was a journey of learning from a very low knowledge base to a situation where we are now much clearer on;

- the process for economic evaluation
- how both economic and non-economic evaluation can work together and the role that evaluators not trained in economics can play

We have identified seven key lessons to share with other evaluators, and hope that they may help others to more effectively participate in economic evaluation.

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