Economic evaluation of investments in natural assets under community-based environmental governance:

Developing and testing a method

Working Paper 3 from the project 'Improving economic accountability when using decentralised, collaborative approaches to environmental decisions'

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INFORMATION ON THIS PROJECT

Further information on, and documents from, the project *Improving Economic Accountability when using Decentralised, Collaborative Approaches to Environmental Decisions* is available from http://www.ruralfutures.une.edu.au/staff/3.php?nav=Program%20Leaders&staff=Dr%20Graham%20Marshall

EXECUTIVE SUMMARY

This project

The current project 'Improving economic accountability when using decentralised, collaborative approaches to environmental decisions' has sought to develop a method of evaluating and prioritising investments in natural resource management (NRM) that:

(i) is consistent with the 'economic way of thinking';

(ii) is within the capacity of collaborative community-based organisations (specifically regional NRM organisations) to apply proficiently;

(iii) can accommodate value systems decided collaboratively in community-based processes; and

(iv) can account for the consequences of NRM investments for community and other socio-economic capacities needed for feasible investments into the future.

The method trialled

The method developed for evaluating and prioritising 'asset-focussed' investments (focussed directly on achieving outcomes for specific natural resource assets) is documented in section 2 of this paper. The foundation of this method is the Investment Framework for Environmental Resources (INFFER) developed by a multi-disciplinary team in recent years.

A weakness was identified in this framework in respect of criterion (iv) above. INFFER does account methodically in developing a project for a specific natural asset, and also in evaluating the project developed, for the capacities upon which the project's feasibility in meeting its goal/s depends. However, it does not account for the expected effects of implementing that project on the community and other socio-economic capacities available for other asset-focussed investments to subsequently draw upon. These 'capacity spillover' effects influence the feasibilities of these other investments (assuming fixed budgets) in realising their respective goals. Given that these effects can vary considerably between projects, not accounting for them in an evaluation process means that projects generating positive effects of this kind are not 'rewarded' in the evaluation process; nor are projects generating negative effects of this kind 'punished'.

In order to overcome this weakness, a supplementary form to the Project Assessment Form (PAF) applied in Step 3 of the INFFER process was developed to be used in tandem with the PAF. This tandem process, referred to in this document as the 'supplemented PAF method', was the method for evaluating asset-focussed investment options trialled with the three participating Catchment Management Authorities (CMAs) – the Border Rivers – Gwydir, Namoi and Northern Rivers CMAs (all in New South Wales).

A main purpose of the PAF is to collect the data needed to calculate a Benefit: Cost Index (BCI) for a project which can be used as a quantitative basis for ranking its 'economic worth' against alternative investment opportunities. The PAF supplement is designed to collect the additional data needed to calculate a modified version of the BCI (referred to herein as the Modified BCI or MBCI) that accounts for the capacity spillover effects of the project being evaluated on other areas of investment by the same CMA. The MBCI accounts for these capacity spillover effects in terms of their combined impact on the cost of implementing the other areas of investment at a given level of feasibility.

Where the capacity spillovers are 'beneficial' overall, this is accounted for as a saving in the total cost of the other areas of investment achieving a given set of outcomes. This cost saving is deducted from the direct cost of the project being evaluated (which includes the costs of maintaining the project's intended outcomes beyond its own life) to obtain the net impact on the CMA's investment costs of implementing the project. Where the capacity spillovers are 'adverse' overall, in contrast, this is accounted for as an increase in the total cost of the other areas of investment achieving a given set of outcomes. This extra cost is added to the direct cost of the project being evaluated to obtain the net impact on the CMA's investment costs of implementing the project.

The BCI is calculated by dividing a project's estimated benefits by its own direct cost. Estimating the benefits involves assigning a score for the relative value of the asset on which the project is focused and then calculating, using various parameter values estimated in the process of completing the PAF, the expected proportionate impact of the project on that relative value. In contrast, the MBCI is calculated by dividing a project's estimated benefits by the project's net impact on the CMA's investment costs.

The trials

The supplemented PAF method was trialled on three assets selected by the Border Rivers – Gwydir CMA, two assets selected by the Namoi CMA, and three assets selected by the Northern Rivers CMA. The trial process commenced with a two-day training session on INFFER and the PAF run in Armidale for the three CMAs. The CMAs then proceeded to select the specific natural assets to focus on and to complete PAFs for each of these assets.

The INFFER team and the present author provided feedback on drafts of the various PAFs as they progressed. Once the full set of eight PAFs was nearing completion, the present author ran a half-day training session for each CMA on the PAF supplement and the reasoning behind it. The present author provided feedback on drafts of the various PAF supplements as they progressed. Ultimately, PAFs for seven of the eight assets were completed to the stage that all parameter values required to calculate a BCI had been assigned. PAF supplements for all eight assets were completed to the stage that the additional parameter values needed to calculate an MBCI for each asset could be calculated. However, an MBCI could not be calculated for the one asset for which the PAF had not been completed fully.

The trial process ran from August 2009, when the INFFER training session was held, until February 2010. The process took longer than scheduled (completion was scheduled for November 2009) for a number of reasons. The primary reason was that the method trialled is appreciably more time-consuming and challenging than the investment evaluation processes the staff involved had become accustomed to. Although the 'help-desk' support provided during the course of the trials seemed to be well appreciated, the fact that it generally led to an iterative process of revising the forms meant that the trials tended to lose momentum as they proceeded and as other pressing work commitments for the participating staff appeared on their horizons. Since the trials were an 'add-on' activity for the CMAs, it was often difficult for the staff involved to maintain their focus on this activity when demands on their time of 'core' CMA activities arose. The challenge of maintaining momentum in applying the method trialled would likely be much reduced were the method to be embedded as a core activity of the CMAs.

Accounting for capacity spillovers from projects by using the Modified BCI, rather than the BCI, to rank projects changed the ranking of projects for one of the three CMAs. Given the small number of projects (two or three) being compared for each CMA, it would not have been unexpected if projects rankings were unaffected.

The trials were reviewed at workshops convened in each of the three regions. A questionnaire was also distributed to CMA staff participating in the trials and to other CMA staff and Board members to obtain quantitative feedback on the criteria the CMAs considered important in choosing an evaluation method and on how they rated the performance of the PAF and supplemented PAF methods against these criteria.

Findings from reviewing the trials of the PAF

Findings from workshop discussions

The perceived *strengths* of the PAF method compared with the CMAs' current approaches include:

- broadening the range of assets and projects considered when evaluating investment opportunities;
- prompting a more rigorous process of thinking about project development;
- an ability to compare all kinds of projects; and
- accounting better for risks to project success.

The perceived *weaknesses* of the PAF method compared with the CMAs' current approaches include:

- requiring considerably more time and effort to apply; and
- impractical to apply to the numbers of projects that CMAs have been investing in.

The perceived *obstacles* to applying the PAF method include:

- organisational inertia;
- obtaining consistency across a CMA in how the PAF is applied to competing investment opportunities; and
- community pressures to spread investment funds broadly rather than target them strategically.

Actions to overcome such obstacles to applying the PAF method include:

- organisation-wide training (i.e., for CMA staff and Board members);
- establishing a protocol for quality assurance in how the method is applied across a CMA;
- a decision by a CMA's General Manager and Board to adopt the method; and
- a return to longer-term (e.g., 3-year or 5-year) funding cycles which would allow CMAs more time for strategically planning investments.

Each of the three CMAs could see themselves applying the PAF method to at least some of their investment decisions. Participants at the review workshop with Border Rivers – Gwydir CMA could envisage applying it for investment priority setting under government funding programs (e.g., the NSW Catchment Action program) where CMA flexibility is not unduly limited by pre-determined program priorities. Participants at the review workshop with Namoi CMA could see the PAF method being used to rank projects under consideration within its annual investment cycle (particularly those that would be targeted at the Catchment Action program). They saw it of value also to their CMA in prompting a greater focus on the feasibility of projects when they are being developed. Participants at the review workshop with Northern Rivers CMA also saw the PAF method as useful in strengthening the feasibility of the projects it puts forward for funding. They saw it also of value as a guide to how funds allocated annually to each of their CMA's two major programs should be allocated between particular projects.

Findings from questionnaire data

Of the 20 criteria listed in the questionnaire as relevant to CMAs in choosing a method to evaluate asset-focussed investments, the three ranked on average as of *greatest* importance across the three CMAs were:

- 1st ‘strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes’;
- 2nd ‘strengthens your CMA's confidence that the prioritised investments represent ‘value for money’’; and
- 3rd ‘is practical to apply given the skills and time available to CMA staff’.

The high rankings for these three criteria are highly consistent with the emphases of INFFER generally and its PAF method in particular.

The three criteria ranked on average as of *least* importance across the three CMAs were:

- 18th ‘recognises the benefits from investing in innovative investment options rather than just 'tried and true' options’;
- 19th ‘avoids subjective judgments’; and
- 20th ‘identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals’.

The lowest importance ranking for the three CMAs combined of the criterion ‘identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals’ runs against the strong emphasis placed on this criterion in developing the PAF method.

The three criteria that the PAF method performed *best* against on average across the three CMAs, compared with their current evaluation practices, were:

- 1st ‘provides a quantitative basis for ranking investment options across different asset classes’;
- 2nd ‘makes transparent all the judgements and assumptions that need to be made’; and

3rd ‘provides a quantitative basis for ranking investment options’.

Each of these criteria was emphasised strongly in developing the PAF method.

The three criteria that the PAF method performed *worst* against on average across the three CMAs, compared with the CMAs’ current evaluation practices, were:

18th ‘is consistent with the philosophy of integrated catchment management’;

19th ‘avoids subjective judgments’; and

20th ‘is practical to apply given the skills and time available to CMA staff’.

The criterion ‘is practical to apply given the skills and time available to CMA staff’ was the only one against which the performance of the PAF method was rated lower on average by the three CMAs than their current practices. As observed above, this criterion was ranked across the three CMAs the third most important criterion for choosing an evaluation method. Despite close attention to this criterion in developing the PAF method, it is evident that the CMAs are not convinced enough has been done in this direction.

Of the ten questionnaire respondents who participated in trialling the PAF method, three rated this experience as highly worthwhile, six as moderately worthwhile, and one as slightly worthwhile.

Findings from reviewing trials of the PAF *supplement*

Findings from workshop discussions

The perceived *strengths* of the PAF supplement method compared with the CMAs’ current approaches include:

- raising awareness of the capacity spillover effects of projects;
- accounting for capacity spillovers quantitatively rather than intuitively; and
- revealing the difference that accounting for a project’s capacity spillovers makes to its (M)BCI and to its ranking vis-à-vis other projects.

The perceived *weaknesses* of the PAF supplement method compared with the CMAs’ current approaches include:

- lack of information and evidence on which to predict the kinds of capacity spillovers that may occur and what their strengths might be;
- the method’s need for predictions of CMA investment budgets ten years ahead, and for predictions of how budgets will be apportioned between different areas of investment, is difficult to satisfy in the current environment where funding is short-term and CMAs have limited autonomy in how funds are to be used.

The perceived *obstacles* to applying the PAF supplement method include:

- CMA staff are often not familiar with thinking about capacity spillovers from projects; and

- difficulty of articulating what capacity spillovers might be expected from a particular project rather than from a CMA's investments more generally.

Opportunities that were identified for addressing perceived weaknesses in the PAF supplement method and perceived obstacles to its application include:

- ensuring that the process of completing the PAF supplement is a collective effort, since group discussion on the basis of shared knowledge and experience tends to be invaluable for anticipating capacity spillovers and gauging their likely strength;

- including in the manual for the PAF supplement form a standard list of capacity spillovers that users of the form could use as a basis for identifying those relevant to their particular context;

- providing greater guidance in the manual for the PAF supplement on the multiplier values relevant for measuring the strength of particular kinds of capacity spillover;

- CMAs recording in a dedicated database the capacity spillovers identified for different projects, and the multiplier values assigned to them, so such an accumulating database can be used as a guide for setting multiplier values for subsequent projects;

- adding to existing CMA monitoring and evaluation processes to collect the kinds of data required to increase confidence in the identification of capacity spillovers and in quantifying their effects; and

- using sensitivity testing as a means of dealing with uncertainties regarding the values of multipliers, future investment budgets and future apportionments of those budgets.

Each of the three CMAs could see themselves applying the PAF supplement method to at least some of their investment decisions. Participants at the review workshop with Border Rivers – Gwydir CMA could envisage applying this method were its use simplified by standardising to some extent the identification of capacity spillovers and estimation of the strength of their effects. Participants at the review workshop with Namoi CMA could see their CMA applying the method, although they wanted to undertake further testing of the method to better appreciate its sensitivity to the multiplier values assigned to capacity spillovers. Participants at the review workshop with Northern Rivers CMA could see their CMA applying the method as a way of helping them to better justify investment priority-setting decisions to their community stakeholders.

Findings from questionnaire data

The performance of the supplemented PAF method compared with the CMAs' current practice was rated by respondents against eight of the full set of 20 criteria. Hence, the perceived performance of the PAF and PAF supplement methods can be compared against these eight criteria. The performance of the supplemented PAF method was perceived on average across the three CMAs as *superior* to the standard PAF method against the following six of these criteria (although the superiority against the 1st and 3rd of the criteria listed below was negligible):

- 'strengthens your CMA's confidence that the prioritised investments represent 'value for money'';

- ‘is practical to apply given the skills and time available to CMA staff’;
- ‘helps justify investment decisions to your CMA’s regional community’;
- ‘is consistent with the philosophy of integrated catchment management’;
- ‘accounts for the effects of investment options on the community and other capacities needed for your CMA’s ongoing investments’; and
- ‘avoids subjective judgments’.

The superiority of the supplemented PAF method compared with the standard PAF method was greatest in absolute terms against the criterion ‘accounts for the effects of investment options on the community and other capacities needed for your CMA’s ongoing investments’. This is encouraging given that the supplementation of the PAF method was designed explicitly to improve its performance against this criterion. Nevertheless, the influence of this superiority on motivating adoption by the CMAs of the supplemented PAF method may be limited given that this criterion was ranked across the three CMAs only 16th in importance out of 20 criteria for choosing a method to evaluate asset-focussed investments.

The performance of the supplemented PAF method was perceived on average across the three CMAs as *inferior* to the standard PAF method against the following two of the eight criteria:

- ‘makes transparent all the judgements and assumptions that need to be made’; and
- ‘helps justify investment proposals to government investors’.

As was true for the PAF method, the criterion ‘is practical to apply given the skills and time available to CMA staff’ was the only one against which the perceived performance of the supplemented PAF method was rated lower on average by the three CMAs than that of their current practices. This criterion was ranked across these CMAs the third most important criterion for choosing an evaluation method, however, so poor perceived performance against this criterion remains a significant hurdle to be straddled in gaining adoption of the supplemented PAF method.

Of the nine respondents from the three CMAs who participated directly in trialling the PAF supplement, two rated the experience as highly worthwhile, five as moderately worthwhile, and two as slightly worthwhile. The ten respondents who participated in trialling the PAF tended to find completing this form a more worthwhile experience (three ratings of highly worthwhile, six of moderately worthwhile and one of slightly worthwhile) than that of completing the PAF supplement (although the difference was not large).

Closing comments

Methods of evaluating and prioritising investment decisions are ‘value articulating institutions’. An economic choice between them should therefore be guided by what economists refer to as the comparative institutions approach. This approach recognises the real-world constraints on implementing institutional alternatives such that few alternatives are implemented as ideally intended. Accordingly, it compares the alternatives as they would actually be implemented. Among these real-world constraints are the preferences that intended users apply when assessing the value to them of the alternatives. All else equal, we can expect a given alternative’s quality of implementation to be higher the closer its attributes match the preferences of intended users.

Representatives from the three participating CMAs indicated their preferences for attributes of a method for evaluating investments when, in responding to the review questionnaire mentioned above, they rated the relative importance of various criteria for choosing such a method. They also rated the performance of the standard and supplemented PAF methods, compared with their CMAs' current evaluation practices, against these criteria. Analysis of the questionnaire data indicates that the emphasis of these methods on an economic way of thinking is well-matched with these users' preferences given the high importance rating they gave on average to the criterion, 'Strengthens your CMAs confidence that prioritised investments represent 'value for money''. Moreover, both the standard and supplemented PAF methods were rated on average as performing better against this criterion than the CMAs' current evaluation practices. Indeed, both these methods were rated on average as performing better against all but one of the listed criteria than current practice. However, the criterion against which these methods were rated on average as performing worse than current practice – 'Is practical to apply given the skills and time available to CMA staff' – was rated on average the third most important out of the 20 listed. Moreover, performance of these methods against this criterion was rated on average as *substantially* worse than current practice.

It seems therefore that the three participating CMAs face formidable obstacles in proceeding to adopt the supplemented PAF method (or the standard PAF method for that matter) due to their perceptions that the method is less practical to apply than their current practices given the available skills of their staff and the time they have available for evaluating investments. The degree to which these obstacles actually impede adoption of the method can be lessened by finding ways to develop the requisite skills and free up staff time. As participants in the review workshops emphasised, progress in this direction may be rapid were the leadership of the CMAs to commit to applying the method, especially if external support were provided (e.g., for training staff and providing quality assurance). Any such obstacles could also be mitigated by strengthening CMAs' incentives to adopt evaluation methods likely to increase the value of benefits obtained from their investments. Such incentives could be strengthened significantly by investing governments prioritising more systematically the investment funding bids they receive according to each bid's rigor in demonstrating its cost-effectiveness. A move in this direction by investing governments would increase markedly the rewards that CMAs and other regional NRM organisations perceive from evaluating their investment proposals more rigorously.

Even so, adopting the supplemented PAF method all at once may be too much to ask of most regional NRM organisations. The INFFER team has reported how it remains under pressure from such organisations to further simplify the standard PAF method. Hence, it seems advisable to work with them in gaining confidence with this method and embedding it in their cultures before expecting them to build on that method using the PAF supplement. Although discussions during the review workshops highlighted the value that CMA staff saw from the PAF supplement's accounting for capacity spillovers, they also highlighted their lack of confidence in identifying such spillovers and estimating the parameter values needed to quantify their economic impacts. Building this confidence through learning-by-doing is probably a task that would best wait until regional NRM organisations have gained confidence and proficiency in the standard PAF process.

In the meantime, further research would help redress the lack of knowledge in this area that lessens the confidence with which regional NRM organisations currently can account for capacity spillovers from projects they propose to undertake. This research could involve a series of case studies of how asset-focused investments by such organisations in the past generated capacity spillovers that affected the feasibility of subsequent investments. It should be noted in any case that each of the three participating CMAs found the process of completing the PAF supplement form to be valuable for considering the capacity spillover effects of their proposed projects even where the information relied upon to complete the form was of low quality.

Finally, we can expect regional NRM organisations to be motivated to account for capacity spillovers when evaluating asset-focussed investment projects only to the extent they feel confident that the investments those spillovers are expected to impact upon will actually occur (and indeed that governments will continue to fund these organisations so they remain able to undertake such investments). The shift in recent years by Australian governments to shorter-term NRM funding commitments and to leaving regional NRM organisations less discretion in how funds are to be invested tends to work against this confidence. Indeed, uncertainty of such organisations regarding their own persistence, their future investment budgets and governments' future investment priorities lessens their motivation to pursue any kind of strategy of building community and socio-economic capacities that have value beyond the short term.

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1. INTRODUCTION

The project 'Improving economic accountability when using decentralised, collaborative approaches to environmental decisions' has sought to develop and trial a method of evaluating and prioritising investments in natural resource management (NRM) that:

(i) is consistent with an 'economic way of thinking';

(ii) is within the capacity of collaborative community-based organisations (specifically regional NRM organisations) to apply proficiently;

(iii) can accommodate value systems decided collaboratively in community-based processes; and

(iv) can account for the consequences of NRM investments for community and other socio-economic capacities needed for investments into the future.

Economic and other methods of evaluating and prioritising decision alternatives are 'value articulating institutions' (Jacobs 1997). Such institutions define the rules to be followed in the process of evaluation, which Vatn (2005 pp. 301-302) identified as concerned with:

- participation – who participates, on what premises (position or role), and by which method (e.g., responding to a survey, attending a meeting, written submission);
- what counts as data, and what form it should take (e.g., prices, weights, arguments); and
- the kind of data handling procedures to be used (how data is produced, weighted and aggregated).

Choosing a method to use in evaluating environmental investment decisions is thus a choice between alternative institutions. The consensus in neoclassical welfare economics is that institutional choices are evaluated most appropriately using a comparative institutions approach 'in which the relevant choice is between alternative real institutional arrangements' (Demsetz 1969 p. 1). It follows that no single institutional arrangement is universally optimal, but rather that the optimal arrangement in any given context depends on the specifics of that context.

Thus the process of choosing a method to trial began with a scoping study (reported as Marshall (2008)) to understand the decision-making contexts of the three New South Wales (NSW) Catchment Management Authorities (CMAs) participating in the project (i.e., Border Rivers – Gwydir, Namoi and Northern Rivers CMAs)[1]. This included obtaining an understanding of the procedures currently followed by these CMAs in setting their investment priorities each financial year given the funding opportunities available to them.

The process of choosing an evaluation method continued with a review of the international literature on methods of evaluating and prioritising NRM investments (reported as Marshall, McNeill and Reeve (2009)). The aim of the review was to identify a method with good prospects of fulfilling the four conditions stated above. This review covered methods falling into the three categories of benefit-cost analysis, multi-criteria analysis and deliberative methods.

[1] 'Catchment Management Authority' is the name given in NSW and Victoria to regional NRM organisations.

Based on these steps, I recommended to this project's Steering Committee, at its meeting on 4th June 2009, that the method to be trialled in evaluating 'asset-focused' investment options (i.e., options focused directly on protecting or enhancing the condition of natural resource assets[2]) build on a foundation recently established by way of the Investment Framework for Environmental Resources (INFFER). The reasons for this recommendation, as presented at that meeting, are documented in Marshall (2010). It was noted, however, that INFFER in its current form does not fulfil the fourth of the conditions stated above; i.e., it does not account for the consequences of NRM investments for social capacities needed for investments into the future. I explained at the meeting my intention was to supplement the INFFER method in order for this condition to be satisfied.

The purpose of this working paper is to explain and justify the supplemented INFFER method that was trialled with the three CMAs, provide details of the trials, and to review the performance of the method in these trials. The paper is organised in nine further sections. The method trialled is explained in section 2. The process of trialling the method is documented in section 3. The results of trialling the method on eight natural assets across the three participating CMAs are summarised in section 4. The process of reviewing the trials is discussed in section 5. Findings from the reviews of the trials for the Border Rivers – Gwydir, Namoi and Northern Rivers CMAs are discussed in sections 6, 7 and 8, respectively. The findings across the three CMAs are considered in section 9. A summary of the working paper is presented in section 10 together with conclusions.

[2] In contrast to 'capacity-focused' investment options, the direct focus of which is on building the capacities needed for feasible asset-focused investments.

2. THE METHOD TRIALLED

2.1 INFFER

2.1.1 Overview

INFFER is presented as 'squarely focused on achieving NRM outcomes cost-effectively' and as a means of 'compar[ing] cost effectiveness across different asset types and different project sizes' (Pannell et al. 2009 p. 2). A particular motivation was to keep the framework's application as simple as possible. Pannell et al. (ibid. p. 3) remarked that 'ease of use was particularly important …, as reinforced by the observation that, internationally, there is low usage of many decision tools intended to support decisions about environmental investment'.

INFFER is an asset-based framework which its project team describes as follows:

> … Each project assessed is built around a particular asset or set of assets. The output from the INFFER process for an asset is an assessment of a particular project related to the asset(s), rather than an assessment of the assets per se (Anon. 2009).

A justification for INFFER's asset-based approach was:

> Even in large government programs for the environment and natural resource management, the available funding is small relative to the problems it is intended to address. Spreading the available public resources thinly across many areas will result in little or no effective protection of any of the threatened assets. Experience shows that basing decisions around key assets helps to improve the cost effectiveness of investment (Anon. 2009).

INFFER is intended only for 'asset-focused' projects with a clear focus on protecting or enhancing specific natural resource assets. Asset-focused investments often include activities intended to address specific gaps in the community and other capacities needed to achieve the goals set for those assets. The difference between asset-focused and 'capacity-focused' investments is that the latter are not directly focused on filling gaps in the capacities needed to achieve *particular* natural resource outcomes. Rather, capacity-focused investments are concerned with developing and/or maintaining a 'common pool' of capacities expected to be of value in pursuing a range of natural resource outcomes, typically defined only in general terms, into the future.

Development of a process for applying INFFER recognised 'the constraints of time and resources available for analysis of priorities, such that it was not realistic or efficient to conduct detailed assessments for every possible investment opportunity' (Pannell et al. 2009a p. 3). Hence, the process begins with simplified assessment of a long list of environmental assets, and grows more detailed as the list becomes narrowed to the most attractive options. The steps in the process include:

a. Elicit a 'long list' of natural resource assets considered good prospects for investment. These assets must be particular, spatially explicit assets. This list may be compiled from community and expert input. There may be more than 100 assets on this list.

b. Use simple criteria to condense the 'long list' to a 'long short list'. Such a list compiled by regional NRM bodies might comprise 20 or so assets.

c. Narrow this list by applying a Pre-Assessment Checklist to each asset on the 'long short list'. This checklist consists of five questions designed to determine whether it

is likely to be worthwhile developing a project using the INFFER Project Assessment Form.

d. Apply the Project Assessment Form (PAF) to each asset not culled in the previous step. The PAF is a means of both developing a feasible project for the targeted asset and then undertaking economic evaluation of that project. The economic evaluation occurs on the basis of a Benefit: Cost Index (BCI) calculated from parameter values inserted in the PAF.

e. Select a 'short list' of projects for funding based on their BCIs and other pertinent factors. The short list for a regional NRM body might comprise 5 to 10 assets, depending on funding availability.

f. Develop project proposals or plans based on the completed Project Assessment Forms (ibid.).

Further information on each of these steps, and INFFFR generally, is available from www.inffer.org

Nineteen of Australia's 56 regional NRM bodies had used or trialled INFFER as of January 2010. Of these 19 bodies across four states, two have chosen to adopt the full INFFER process, with the remainder trialling it on a limited number of natural resource assets (Pannell et al. 2009a).

2.1.2 The Benefit: Cost Index

The BCI for a project is calculated as follows:

$$BCI = \frac{V \times W \times F \times A \times B \times P \times G \times DF_B(L) \times 20}{C + PV(M)} \qquad (1)$$

where

V = value of the asset in good condition (score out of 100, or non-market valuation)

W = multiplier for proportionate impact of works on asset value)

F = probability that the project will not fail due to problems with technical feasibility)

A = multiplier for adoption of changed management by private landholders (proportion of adoption level needed to achieve project goal)

B = probability that the project will not fail due to private landholders adopting practices adverse to achieving the project goal

P = multiplier for socio-political risk (probability that socio-political factors will not derail the project, that required changes will occur in other institutions)

G = probability that essential funding subsequent to this project will be forthcoming

DF_B = discount factor function for benefits (proportion), which depends on L

L = time lag until the majority of anticipated benefits from the project occur (years)

C = short-term cost of project ($ million in total over 3-5 year life of project)

PV = present value function to convert future costs to equivalent present-day values

M = annual cost of maintaining outcomes from the project after its completion ($ million per year).

The numerator of equation (1) measures the net benefits from a project as discounted for how slowly they are expected to arise. In scoring the value of the asset (V), the project assessor is advised to value the asset as if it were in good condition. The PAF manual (Pannell et al. 2009b) recommends that the scoring system set out in Table 2 of the manual, which is calibrated so that an asset of very high national significance has a score of 100, be used as a guide in choosing a V score for a particular asset. According to this scoring system, an asset of local significance (e.g., a locally valued wetland or creek) might be assigned a score somewhere between 0.1 to 2. The fact that natural asset of all kinds are valued against this common scale means that the BCIs for projects targeting different kinds of assets (e.g., biodiversity and soil health) are comparable. Although this non-monetary method of valuing assets means that the BCI for a project does not provide a guide to whether its benefits exceed its costs, the BCIs for different projects do provide a means of ranking them consistently with economic logic.

The denominator of the equation measures the expected costs of the project and maintaining its benefits after it is completed. The time frame of the project (3-5 years) is judged to be short enough that the error from not calculating the present value of the upfront cost of the project (C) will be minor.

The proposed procedure for allocating a fixed budget between competing projects on the basis of their BCIs involves ranking the projects in descending BCI order and continuing to fund projects down the list while the cumulative cost remains within the total available budget (Anon. 2008). However, the BCI 'provides information that can assist decision makers, but given the inevitable limitations of data, and the likely relevance of other considerations that have not been captured in the assessment, the resulting ranking of options should be treated as a guide, rather than as 'the answer'' (ibid. p. 7).

2.2 Supplementing INFFER to account for 'capacity spillovers' from projects

2.2.1 Rationale

One of this project's four criteria for choosing an economic method of NRM investment evaluation was that the method should account for how investments affect the capacities needed for the feasibility of other such investments into the future. INFFER does account for capacity-building activities required within a project to achieve its goals, and implicitly for existing community and other capacities when assessing the feasibility of the project. However, it is not designed to account for the consequences of a current project (whether from specified capacity-building activities or other aspects of a project) on the feasibility of subsequent projects (as would be accounted when evaluating those projects by the values assigned to the parameters A, B, P and G in equation (1)). These consequences may be for community capacities (e.g., capacity of landholders to adopt practices likely to be promoted to them in subsequent projects), for capacities of the regional body itself (e.g., for the ability of its staff to work effectively with landholders), or they may be for the capacities of other parties whose cooperation could be required (e.g., for the other parties establishing the knowledge and trust needed to motivate them to adopt the changes needed for success in subsequent projects).

Australian governments recognise that making progress against environmental policy goals is often a long-term endeavour (Curtis et al. 2008). They also generally acknowledge the crucial importance of making success feasible by strengthening and sustaining the community and other social capacities needed to make affordable the transaction (including political) costs that often threaten to stifle momentum in this domain. Nevertheless, under-investment in the social capacities needed for longer-term NRM success can be expected until the implications of investment decisions in this

domain for ongoing community and other capacities are accounted for systematically when evaluating these decisions.

2.2.2 Accounting for capacity spillovers when evaluating projects: the general approach adopted

The main weakness of INFFER as a method for economic evaluation consistent with the collaborative vision for environmental management lies in its inability to account for the effects of current environmental investments on the socio-economic capacities available to successfully implement other collaborative investments into the future. In this paper these socio-economic effects are referred to as 'capacity spillovers'. A capacity spillover occurs when implementing a current project affects the socio-economic capacities available for, and thus the feasibility of, implementing other investments. Various types of socio-economic capacity may be affected, including financial capacities, personal or human capacities (e.g., awareness, knowledge and skills), and social capacities (e.g., community ownership, inter-organisational trust). To the extent that capacity spillovers differ between projects, or in alternative project design options for a particular natural asset, a method of economic evaluation unable to account for such differences will provide an inaccurate basis for prioritising options according to their cost-effectiveness.

The process of developing a method to account for capacity spillovers in a modified BCI progressed through progressively simpler variants of a similar approach. This progression was informed by awareness that many users of INFFER's Project Assessment Form (PAF) had found it overly long and cumbersome (Marsh et al. 2010; Pannell et al. 2009), so that any supplement added to this form would not be greeted favourably by users unless it were simplified as far as possible without sacrificing essential rigour. The variants considered are discussed in section 5.1 of Marshall (2010).

Capacity spillovers from a 'current project' (the project currently being evaluated) to other investments affect the feasibility of those other investments achieving their respective goals. 'Positive' capacity spillovers from a project for another investment mean that a more ambitious goal can be set for that investment without rendering it infeasible. On the other hand, 'negative' capacity spillovers from a project for another investment mean that the goal for that investment needs to be made less ambitious for it to remain feasible.

The most direct approach to accounting for these effects would involve assessment of how the benefits of the affected other investments would change as a result of influencing their feasibility. However, this approach would require the assessor to complete a PAF not only for the current project but also for each of the affected investments. The method ultimately recommended to the participating CMAs for the purpose of a trial was judged to be simplified as far as it could be while maintaining sufficient rigour.

Rather than focusing on how capacity spillovers from a current project affect the benefits from other investments (with investment costs held constant), it focuses on how they affect the costs of these investments (with the benefits of those investments held constant). Due to this refocusing, it is no longer necessary to complete a PAF for each of the affected investments. It is necessary only to estimate the total costs of each of these investments. The effect of capacity spillovers from the current project on the level of benefits that could feasibly be achieved with affected investment *j*'s original budget would be estimated by the multiplier *Rj*. The approach was based on the following logic:

- the more that capacity spillovers from a project strengthen the feasibility of another investment, the less will costs need to be incurred in achieving a given level of investments benefits; and

- the more that capacity spillovers from a project weaken the feasibility of another investment, the greater will be the need for costs to be incurred in achieving a given level of investment benefits.

More specifically, the effect of capacity spillovers on the costs incurred in a particular affected investment was assumed inversely proportional to the effect of those spillovers on the level of benefits that could feasibly be achieved from that investment. For illustrative purposes, suppose that:

- the total cost of feasibly achieving the goal of affected investment *j* in the absence of capacity spillovers is Qj = \$1.0 million; and

- capacity spillovers from the current project would change the feasibility of that investment by the multiplier $Rj = 0.98$.

Given these parameters and the preceding assumption, it follows that the cost of feasibly achieving the goal of that affected investment is increased to Qj/Rj = \$1.0 million ÷ 0.98 = \$1.020 million as a result of the capacity spillovers. The effect of these spillovers on the total cost of that investment is thus calculated as $\Delta Qj = Qj/Rj - Qj$ = \$1.020 - \$1.0 = \$0.02 (million). The sum of the ΔQj values for the various affected investments ($\Sigma\Delta Qj$) would be calculated to obtain the total effect of capacity spillovers from the current project on the costs incurred in other investments achieving their goals. This value for $\Sigma\Delta Qj$ (converted to a present value) would be included in the denominator of the BCI for the current project as an additive term. The costs of this project would thus be increased to the extent that $\Sigma\Delta Qj$ is positive, and decreased to the extent that $\Sigma\Delta Qj$ is negative[3]. This approach involves significant simplification by way of assuming constant returns to scale in the relationship between the costs of an investment and the level of benefits it is feasible to achieve in that investment.

The outlines of this 'cost-reduction' approach was submitted to the INFFER team for feedback regarding its (i) consistency with the INFFER method, and (ii) likelihood of being applied proficiently by regional NRM bodies (given the INFFER team's prior experiences in working with such bodies). David Pannell responded favourably in respect of (i), although he was concerned initially that the consequences of capacity spillovers from a current project on its net benefits would be accounted for in the denominator of the modified BCI equation rather than in the numerator as is conventional in benefit-cost analysis. In respect of (ii), he observed that regional NRM bodies were already baulking at the demands of completing the existing PAF, and that the additional demands of accounting for capacity spillovers in the way proposed might well not be acceptable to them.

2.2.3 Details of the approach adopted

Accordingly, the cost-reduction approach was further simplified as far as was possible without forfeiting its essential rigour. A supplementary form to the PAF (hereafter 'PAF supplement') was developed (with an accompanying instruction manual) to capture from project assessors the

[3] It is possible for the costs of the current project to be calculated as negative when 'positive' capacity spillovers from the project are sufficiently strong that the total cost savings accruing to affected investments exceed the costs of the project itself (as measured by the denominator of equation (1)). In such a case, presuming the benefits of the project (as measured by the numerator of equation (1)) are positive, the BCI for the current project will be calculated as negative. Rather than signifying that the project lacks economic merit, the negative BCI value in such a case means that benefits are being achieved for 'less than nothing' and consequently that the project should be ranked higher than projects with positive BCIs.

information required to apply this approach. A copy of the PAF supplement can be found in Appendix A. The approach trialled with the participating CMAs involved the following steps:

1. *Predict Q, the average annual budget[4] the investing organisation (the relevant CMA in the case of the trials) will have available over the subsequent ten years[5] for asset-focused investments j = 1, …, n other than the current project*.

2. *Predict how Q will be apportioned, on average over the subsequent ten years[6], between areas of asset-focused investment other than the current project.*

   'Area of investment' does not refer here to a geographic area, but rather to a general focus of investment; for instance, to all asset-focused investments aligned with a particular management target in a CAP. This step, together with step 1, enables calculation of the average annual budget over the subsequent ten years that the relevant CMA is expected to invest in each defined area of investment (i.e., the *Qj* values referred to in section 5.1 of Marshall (2010)). The proportion of *Q* accounted for by the average annual budget of area of investment *j* is given by $Pj = Qj \div Q$.

3. *Identify the various capacity spillovers from the current project for each of the other areas of investment identified in step 2*.

   Two classes of capacity spillovers are distinguished for the purposes of this step[7]:

   (a) Capacity spillovers affecting the adoptability by private citizens (including landholders) of on-ground works and actions targeted in the other areas of asset-focused investment. In assessing the feasibility of a current project, the PAF distinguishes between two types of adoptability by private citizens: (i) adoptability of beneficial practices (i.e., that contribute to achieving the project's goal); and (ii) adoptability of adverse practices (i.e., that work against achieving the project's goal). Class (a) capacity spillovers relate to *both* these classes of adoptability, although the

[4] An estimate of the average annual budget over the subsequent ten years was requested, rather than for estimates of budgets for each year over that period, for reasons of simplification. Although this simplification clearly involves losses of accuracy compared with the more demanding alternative (which would enable calculation of the average present-value budget over that period), this disadvantage was judged to be outweighed by the advantage of reducing the risk of CMAs losing their commitment to proceed.

[5] The choice here of a ten-year horizon represents a compromise between a more realistic longer-term horizon (given that the effects of capacity spillovers may be long-lasting) and the practical difficulties of predicting funding levels for CMAs beyond three or so years ahead.

[6] The choice of a ten-year horizon represents a compromise between a more realistic longer-term horizon (given that the effects of capacity spillovers will often be long-lasting) and the practical difficulties of predicting not only CMA funding, but also apportionment of that funding, beyond the short-term. Uncertainties regarding apportionment arise partly from the discretion available to CMA Boards in allocating funds between areas of investment but also (recognising that this discretion has been reduced under the Caring for our Country program) from the likelihood of government and other investors changing their investment priorities periodically (and perhaps also entire investment programs).

[7] The two classes cover three of the four aspects of investment socio-economic feasibility accounted for in the PAF when evaluating a current project (aspects relating to BCI parameters *A*, *B* and *P*), except that they relate here to the feasibility not of the current project but of other areas of asset-focused investment. The aspect not covered relates to BCI parameter *G*, which measures the probability that funding needed to maintain outcomes of the current project will be forthcoming. (In the context of accounting for capacity spillover effects, the focus would instead be on effects in terms of the probability that funding needed to maintain outcomes of the other areas of asset-focused investment will be forthcoming.) This aspect was accounted for in an early version of the PAF supplement, but trials of this version with participating CMAs highlighted that the task of predicting consequences for the likelihood of obtaining future funding for other areas of asset-focused investment was not one that project assessors felt able to complete with any confidence.

focus here is on consequences for adoption in other areas of investment (rather than for adoption in the current project)[8].

(b) Capacity spillovers affecting the socio-political risks faced in pursuing the goals of other areas of asset-focused investment. The PAF defines socio-political risk as arising from (i) non-cooperation by other organisations responsible for natural resource management; and (ii) social, administrative or political constraints. Here we are concerned with socio-political risks faced not by the current project but by other areas of investment.

For each of these two classes of capacity spillover in turn, project assessors could identify from zero to multiple capacity spillovers from the current project for each area of investment. They were encouraged to consider possibilities of both positive and negative capacity spillovers for another area of investment (where 'positive' refers to spillovers contributing to the goal of another area of investment, and 'negative' refers to spillovers working against the goal of another area of investment). They were encouraged also to consider capacity spillovers in terms of one or more of physical, financial, personal/human and social capacities.

Figure 1 presents an excerpt from the PAF supplement of the table into which project assessors are asked to insert details of the capacity spillovers from the current project relating to each other area of asset-focused investment. The excerpt is from the table concerned with effects on the private adoptability of on-ground practices targeted in the other areas of investment. The table concerned with effects on socio-political risks faced by the other areas of investment is similar. The project assessor is asked to list each of the other areas of investment in the leftmost column of the table[9], and to list the relevant capacity spillovers for each area of investment in the corresponding rows of the middle column.

4. *Assign a multiplier to each capacity spillover indicating the direction and strength of its effect on the relevant aspect of socio-economic feasibility of the relevant other area of investment*.

Although considerable evidence exists of the importance of capacities of various kinds for gaining cooperation from individuals (e.g., landholders in terms of adopting conservation practices promoted to them) and others (e.g., organisations in terms of monitoring and enforcing the rules of NRM programs) in pursuing NRM objectives, this evidence is generally not specific nor context-relevant enough to provide a basis for estimating in the form of a multiplier the strengths of a each different capacity spillover effect. The multiplier value options presented in Figure 2 (for capacity spillovers relating to private adoptability) and Figure 3 (for capacity spillovers relating to socio- political risk) were judged to provide a reasonable range for project assessors to choose from[10]. Given the uncertainty that will commonly exist regarding the values of these multipliers, sensitivity testing of these values in respect of the value of the (Modified) BCI value for each competing current project and for their ranking according to this criterion is recommended.

[8] There were two reasons for grouping together in this step these two types of private adoptability in assessing capacity spillover effects. The first was that this allowed the length of the PAF supplement to be reduced. The second was that capacity spillovers in terms of 'type (ii)' adoptability are relatively uncommon, and they also tend to be difficult for CMA staff to understand. (The INFFER team has reported that the process in the PAF of identifying instance of adverse private adoption is often misunderstood by project assessors).

[9] The full table allows up to eight different other areas of investment to be listed.

[10] The instruction manual for the PAF supplement explains that project assessors can set multiplier values outside this range. Justification for choices of multiplier values is required in all cases.

Figure 1: Excerpt from the PAF supplement where capacity spillovers relating to private adoptability of on-ground practices are recorded

Area of investment	**Effects of current project on the adoptability of on-ground practices targeted by other areas of investment**	**Multiplier**
		[ma11]
		[ma12]
		[ma13]
		[ma21]
		[ma22]
		[ma23]

Figure 2: Multiplier value options for capacity spillovers relating to private adoptability of on-ground practices targeted in other areas of investment

Small increase (decrease) in adoption of beneficial (adverse) practices	1.01	Small decrease (increase) in adoption of beneficial (adverse) practices	0.99
Moderate increase (decrease) in adoption of beneficial (adverse) practices	1.03	Moderate decrease (increase) in adoption of beneficial (adverse) practices	0.97
Larger increase (decrease) in adoption of beneficial (adverse) practices	1.05	Larger decrease (increase) in adoption of beneficial (adverse) practices	0.95

Figure 3: Multiplier value options for capacity spillovers relating to socio-political risks faced by other areas of investment

Small increase in risk	0.99	Small decrease in risk	1.01
Moderate increase in risk	0.97	Moderate decrease in risk	1.03
Larger increase in risk	0.95	Larger decrease in risk	1.05

The instruction manual for the PAF supplement developed to account for capacity spillovers explains that the multiplier value chosen for a particular area of investment should reflect the strength of the capacity spillover effect across all projects comprising that area of investment. If the effect is rated as strong for one project within an area of investment but insignificant for all other projects comprising that area of investment, then the strength of the effect across the area of investment as a whole should be weighed up accordingly.

5. *Calculate a multiplier measuring the aggregate effect of capacity spillovers from the current project on the feasibility of the combination of other areas of asset-focused investment.*

This multiplier, represented by the parameter *R*, is calculated in the spreadsheet developed for deriving a (Modified) BCI value for any current project. This involves:

(i) Calculating for aspect of socio-economic feasibility *i* (where *i* = 1 refers to the private-adoptability aspect, and *i* = 2 refers to the socio-political-risk aspect) the total multiplier for each area of investment *j*. If three capacity spillovers are identified in respect of feasibility aspect *i* for area of investment *j* and the corresponding multipliers are estimated to be 1.03, 1.01 and 1.01, for instance, the total multiplier for area of investment *j* is given by

Rij = 1.03 x 1.01 x 1.01 = 1.051.

(ii) Calculating a multiplier measuring the aggregate effect of capacity spillovers from the current project on feasibility aspect *i* in respect of the combination of other areas of investment. This involves calculating the weighted average of the *Rij* values for feasibility aspect *i*, which involves in turn multiplying each *Rij* value in respect of this aspect by its corresponding *Pj* value (as defined in step 2) and summing the resulting products. Suppose five other areas of asset-focused investment have been identified, their *Rij* values for feasibility aspect *i* are 1.051, 0.985, 1.0, 1.0 and 1.0[11], and their respective *Pj* values are 0.3, 0.1, 0.3, 0.2 and 0.1. The aggregate multiplier for feasibility aspect *i* is then calculated as

Ri = (1.051 x 0.3) = (0.985 x 0.1) + (1.0 x 0.3) + (1.0 x 0.2) + (1.0 x 0.1) = 1.014.

(iii) Calculating *R* as the product of the *Ri* values derived for *i* = 1 and *i* = 2. If these values are 1.014 and 0.988, for instance, *R* = 1.014 x 0.988 = 1.002.

6. *Calculate a (Modified) BCI value for the current project.*

The modified BCI (MBCI) is calculated in the spreadsheet developed for this purpose. It is calculated using equation (2) which is embedded in the spreadsheet[12].

$$MBCI = \frac{V \times W \times F \times A \times B \times P \times G \times DF_B(L) \times 20}{C + PV(M) + PV(Q)/R - PV(Q)} \qquad (2)$$

where *V*, *W*, *F*, *A*, *B*, *P*, *G*, DF_B, *L*, *C*, *PV* and *M* are defined as for equation (1), *Q* is calculated as described in step 1, *R* is calculated as described in step 5, and *PV* is a present value function[13].

7. *Identify qualitatively any capacity spillovers effects on asset-focused investments by other organisations.*

[11] An *Rij* value of unity for feasibility aspect *i* and area of investment *j* signifies that this area of investment is not an affected area of investment in respect of this feasibility aspect.

[12] The BCI used in the standard INFFER process is also calculated in this spreadsheet, enabling assessment of the degree to which the BCIs and MBCIs differ for various current projects, and of the sensitivity of project rankings to these differences.

[13] Consistent with the BCI used in the standard INFFER process, the present value function in this formula assumes an annual discount rate of 5 per cent

Steps 1-6 are concerned with capacity spillover effects of the current project on other areas of investment expected to be implemented by the project assessor's own organisation. Their scope is bounded in this way since in most cases it is likely to be difficult enough for project assessors to provide the kinds of quantitative responses required by the PAF supplement for investments by their own organisations, let alone for investments by other organisations they will normally have much less knowledge of. Step 7 provides an opportunity to identify in words any capacity spillover effects from the current project that are anticipated to be visited upon investments by other organisations. This qualitative information can be included in the Project Assessment Report for that project alongside its MBCI, and thus can be accounted for in the subsequent process of prioritising that project in relation to alternatives.

8. *Rank the various current projects under consideration on the basis of their MBCIs, sensitivity testing of their MBCIs, and other information recorded in their respective Project Assessment Reports.*

3. TRIALLING THE SUPPLEMENTED INFFER METHOD

3.1 Preparatory steps

In this section the process of trialling the supplemented INFFER method, as detailed above, is discussed. The process began by informing the INFFER team of our intention to trial an approach that used the method they had developed as a foundation to work from. The INFFER team subsequently offered to provide (a) a two-day training workshop in Armidale with a purpose of familiarising the participating CMAs with the INFFER method, and (b) help-desk support to the CMAs during the process of completing PAFs for the assets they chose to target. The INFFER team observed it would be feasible only to focus on step 3 of their approach (completing PAFs for the assets selected) for 2-3 assets per CMA given the time available for completing the trials.

Meetings with each of the three CMAs were then held at which we proposed the idea of trialling with them a method of investment evaluation that built on the INFFER approach. An outline of that approach was provided, as was the offer from the INFFER team to provide training and help-desk support and also the proposal from us to extend their approach to account for capacity spillovers. Each of the CMAs agreed in-principle to attend the training session and to decide after the training whether they would proceed to trials as proposed.

The two-day training workshop was held over 10-11 August 2009. It was attended by three staff (including at least one senior officer) from each of the participating CMAs. The logic underlying the INFFER approach, and the process of applying this approach, was explained to participants step by step. Participants from each CMA chose a particular natural resource asset from their region to focus on in a 'quick and dirty' experience of completing a PAF. Participants were each provided with a complete set of the training materials developed to assist users in applying the INFFER process.

Each of the CMAs were asked soon after the training workshop whether they were willing to proceed to trial the INFFER approach on 2-3 assets chosen by themselves, and also to trial the proposed extension of this approach designed to account for capacity spillovers. It was explained that our aim was to complete these trials by early November 2009 (i.e., within three months). The first phase of the trial process would involve completing a PAF for each selected asset, and the second phase would involve completing a PAF supplement that was in the process of being developed to account for capacity spillovers from the project defined for each asset.

The CMAs each responded positively to this question, although some reservations were expressed. A common concern involved the demands of the approach on CMA staff time. Another common concern was the challenge to the prevailing CMA culture that a wholesale move to using the INFFER process for investment prioritisation would entail. Another related to the subjectivity involved in setting values for some of the parameters.

3.2 Trialling INFFER's PAF

Meetings were held with each of the Regional Working Groups (comprising representatives from the participating CMAs) soon after the training workshop to decide on the assets that the trials would target, decide on who in the relevant CMA would be responsible for completing the PAF for each selected asset (usually drawing on expertise of colleagues), and to commence the process of completing PAFs for these assets.

The meeting for the Northern Rivers region was held in Coffs Harbour over 26-27 August 2009, attended by the three CMA staff from this region who had attended the INFFER training. One of

these staff was at Program Manager level (2nd highest tier) and the other two were at Catchment Coordinator level (3rd highest tier). The two Catchment Coordinators had previously emailed their respective theme teams (terrestrial and aquatic) for suggestions regarding specific environmental assets in their region for which trials could be undertaken using the PAF. Of the list of 10 or so assets thus identified, the three staff at the meeting decided to focus on assets matching the priorities of the Caring for our Country (CFoC) Business Plan, so that their time devoted to the trials would better position them to submit quality funding bids to that program. However, they decided also to continue with an asset for which they had commenced completing a PAF during the INFFER training. With the assets identified as fitting CfoC priorities, these were subjected to a rapid run-through of the INFFER Step 2 process ('Filtering significant assets prior to detailed assessment'). Two assets emerged from this process (on the basis that they were highly significant, subject to a high level of threat and 'passed' the five questions in the pre-assessment checklist). The resulting three assets were:

(i) water quality in a designated catchment (this was the asset for which a PAF had been commenced at the INFFER training);

(ii) biodiversity of a particular landscape; and

(iii) a particular complex of wetlands in a floodplain[14].

Each of the three individuals present agreed to take the lead in completing a PAF for one of the assets, drawing in the expertise of others as needed. The reasoning in this region for allocating high-level staff to completing the PAF was that CMAs too often trained their staff in new frameworks and tools that subsequently didn't get used much. They felt it was better that a few senior staff of their CMA learn for themselves about the value of the method being trialled rather than risk wasting the time of other staff.

The meeting for the Namoi region was held on 11 September 2009 in Armidale, attended by two of the three CMA staff from this region who had attended the INFFER training. These two staff were at the Senior Project Officer and Project Officer levels respectively (i.e., lower than the Catchment Coordinator level). The third (non-attending) staff member was at the Program Manager level. The two attending staff had decided prior to the meeting on two assets they focus their trials on. They decided to select one asset that their CMA had already developed a project for, since this would provide a benchmark against which the method to be trialled could be compared, and another asset that may be a target for future investment. The first asset was a population of an endangered riparian fauna species, and the second asset was a nature corridor. Each of the two individuals present agreed to take the lead in completing a PAF for one of the assets, drawing on the expertise of others as needed.

The meeting for the Border Rivers – Gwydir region was held on 23 September 2009 in Inverell, attended by two of the three staff who had attended the INFFER training plus three additional staff who would be involved in the trials. The non-attending staff member was at the Program Manager level. The two staff who attended the INFFER training were at the Catchment Officer level (equivalent to the Project Officer level). One of these was the CMA's Planning Officer. The three additional staff were at the level of Project Officer or Senior Project Officer. The CMA had designated the Planning Officer as the coordinator of the trials, who had in turn chosen three of the Project Officers/Senior Project Officers present at the meeting to be responsible for leading

[14] Assets are defined in this report only in general terms since some of the participating CMAs may have been reluctant otherwise to permit the evaluation results to be reported. The assets evaluated were of course defined much more precisely than this for the purposes of undertaking the trials.

completion of a PAF for one asset each. These three staff members had each chosen an asset to focus a trial on. The three assets were:

(i) a vegetation community focused on one part of their region;

(ii) a vegetation community extending across their region; and

(iii) particular Ramsar-listed wetlands.

A phone hook-up with members of the INFFER team occurred towards the end of each of these meetings to discuss issues that had arisen, obtain advice on how the assets chosen might be defined more tightly to better facilitate the PAF process, and obtain guidance on what would be an appropriate SMART goal for each asset. In each case the INFFER team recommended that drafts of section 1 of the PAF (detailing the asset and its significance), and also of the SMART goal, be written and submitted to them for further feedback. This recommendation was taken up in each case.

Subsequently, these CMA staff submitted a number of further drafts of their work on the PAF for further feedback (from the INFFER team and myself). The process of completing PAFs for these assets generally took substantially longer than the scheduled three months. In most cases, help-desk feedback from the INFFER team and myself on early PAF drafts identified a need for the drafts to be substantially revised in terms of defining the asset and a related 'SMART' goal and strengthening internal consistency between information provided throughout the form. Pressures of CMA staff members' other commitments meant that responses to this help-desk feedback were often delayed considerably. A second meeting with the Northern Rivers CMA team was held in Coffs Harbour on 22 October 2009 to progress completion of those three PAFs. A teleconference involving the Border Rivers – Gwydir CMA team, the INFFER team and myself was held on 28 October 2009 to address issues that had arisen in completing those three PAFs. All but one of the eight PAFs that were commenced across the three CMAs have now been completed satisfactorily.

3.3 Trialling the PAF supplement

The process of completing the PAFs was sufficiently advanced for two of the CMAs that they were in a position to commence the subsequent process of completing PAF supplements before 2009 had ended. A half-day meeting with the Border Rivers – Gwydir CMA was held in Inverell on 14 December. All but one of the CMA staff attending the 23 September 2009 meeting were present at this meeting. The person not present, who had led the completion of the PAF for one of that CMA's assets, was on extended leave. The Planning Officer, who was coordinating that CMAs involvement in the trials, agreed to complete the PAF supplement for that asset. At my suggestion, an additional staff member with a broad overview of the CMA's activities had been invited to the meeting to assist with identifying capacity spillovers from the projects developed for the three assets. This suggestion was made because the Project Officers leading completion of the PAFs may not necessarily have had a broad enough overview of their CMA's activities to identify how capacity spillovers might flow from the project they had developed to the CMA's other areas of investment.

A similar meeting with the Namoi CMA was held in Armidale on 16 December. The meeting was attended by both the staff members who had led completion of the PAFs for that CMA (and who had attended the meeting on 11 September), and also by the Program Manager who had attended the INFFER training. At my suggestion the CMA's Strategic Planning Officer also attended this meeting, again to ensure a broad enough overview of the CMA's activities was available to help identify capacity spillovers from the projects developed for the three assets.

A further similar meeting with the Northern Rivers CMA was held in Coffs Harbour on 14 January 2010. The meeting was attended by all three staff members who had led completion of the PAFs for that CMA (and who had attended the meeting on 26-27 August 2009). The member of this team at Program Manager level was confident he could bring to the table a broad enough view of that CMA's activities to help identify any capacity spillovers that might flow from the projects that had been developed in the PAF trial to the CMA's other areas of investment.

At each of these meetings the logic of the method developed to account for capacity spillovers was explained, and participants were taken through the PAF supplement form that had been developed to capture the data needed to apply this method. Feedback from this process contributed significantly to refining the form to make it more user friendly and remove possible sources of confusion. In each case, a start was made in completing the forms for each asset. Participants were provided also with an instruction manual that had been developed to assist them complete the PAF supplement.

Each CMA had been asked before its respective meeting to compile whatever data it would need to complete section S.1 of the form concerned with steps 1 and 2 of the method outlined in section 2.2.3 (i.e., predicting (a) the CMA's average annual budget for asset-focussed investments (other than the current project) over the next 10 years, and (b) how that budget would be apportioned on average over those 10 years. Each CMA commented on the difficulty of making such predictions with any confidence given the uncertainties they faced regarding future government funding programs and the priorities of these programs, and indeed about the longevity of the CMAs themselves. A common view among the three CMAs, however, was that their current funding levels, and apportionments between investment areas, provided their best basis for predictions. Hence, they started from their current funding levels and apportionments in making these predictions, in some cases modifying these current figures somewhat to reflect expectations of some changes in future funding levels and priorities. Some disquiet about the use of these predictions in the method was expressed. In response it was argued that the method would facilitate sensitivity testing for alternative predictions since the calculator for the Modified Benefit: Cost Index, into which the predictions would be transferred from the PAF supplement, would be in the form of a spreadsheet.

It was interesting to observe at the meetings the efforts by CMA participants to identify the capacity spillovers from their respective projects to their organisation's other areas of investment. Although all participants acknowledged the prevalence and importance of capacity spillovers, some found it more difficult than others to articulate any particular spillovers from their own project. The opportunity provided by the meeting format to 'bounce ideas around' on what capacity spillovers might be expected from one project for each other area of investment, and on what the strength of those spillovers might be, was valuable for those who found the process challenging.

The participants undertook the read the instruction manual subsequent to their respective meetings and then complete their respective PAF supplements more rigorously than had been possible during the meeting. I undertook to provide help-desk support to the officers in completing these forms, including by providing feedback on their drafts. At least one round of feedback was provided on the PAF supplement forms for all eight assets evaluated across the three CMAs. All eight of these forms were completed satisfactorily.

4. SUMMARY OF TRIAL RESULTS

The results of trialling the method on the assets chosen by the three CMAs are summarised in Table 1. The three CMAs, and the eight assets on which they trialled the PAF and PAF supplement forms, are listed in the left-hand column. The 'project benefit score' entries in the second column of the table were calculated in accordance with the numerator of the BCI formula (equivalent to the numerator of the MBCI formula). The 'project cost' entries in the third column were calculated in accordance with the denominator of the BCI formula. The BCI entries in the fourth column were calculated using the BCI formula. It can be seen that the BCI for a given project is equal to the corresponding benefit score divided by the corresponding project cost.

The fifth column presents the *PV(Q)* value for each project; i.e., the present value of the estimated annual budget the CMA will have available over the ensuing ten years for asset-focussed investments other than the project under current consideration. These values range from $16.6 million to $26.8 million.

The value of the *R* parameter for each project – a multiplier measuring the combined effect of capacity spillovers from the current project on the feasibility of the CMA's other areas of asset-focussed investment – is presented in the sixth column. Note that the values of *R* for six of the eight projects exceed 1. This signifies that the effect of the capacity spillovers identified from each of these projects is to increase the overall feasibility of the same CMA's other areas of investment. The largest value of *R* calculated is 1.043 for the project evaluated by the Northern Rivers CMA that targeted the asset 'a complex of wetlands in a floodplain'. This value means that implementing this project is expected to increase the overall feasibility of that CMA's other areas of asset-focussed investment by 4.3 per cent.

For one of the eight projects (targeting the asset 'biodiversity of a particular landscape') the estimated value of *R* is 1.000. In this case no capacity spillovers were expected to flow from the project, so that the overall feasibility of other areas of asset-focussed investment would be unaffected by implementing the project. For another of the projects (targeting the asset 'a vegetation community focused on one part of this CMA's region'), *R* is estimated at 0.974. This value means that implementing this project is expected to reduce the overall feasibility of the relevant CMA's other area of asset-focused investment to 97.4 per cent of what it would otherwise have been.

The seventh column presents for each project the additional cost expected to be incurred in the CMA's other area of asset-focussed investment as a result of capacity spillovers arising from the project. This additional cost is given by $PV(Q)/R - PV(Q)$ in the denominator of equation (2). For instance, the relevant parameter values for the project targeting the asset 'a complex of wetlands in a floodplain' are *PV(Q)* = $26.8 million and *R* = 1.043. In this case, therefore, $PV(Q)/R - PV(Q) = 26.8/1.043 - 26.8 = 25.7 - 26.8 = -1.1$ (or -1.11 if the *Q* value had not be rounded to on e decimal place). Hence; the project's capacity spillovers in this case are estimated to generate a cost saving of $1.1l million for the relevant CMA's other areas of asset-focussed investment.

The eighth column ('project cost after capacity spillovers accounted for') presents for each project the net cost of the project after the effects of its capacity spillovers on the costs of other areas of investment are accounted for. The values in this column are obtained as the sum of the 'project cost' (column 3) and 'added cost from capacity spillovers' (column 7). For the project targeting the asset 'a complex of wetlands in a floodplain', for instance, the value in the eighth column is given by adding its 'project cost' of $0.79 million to its 'added cost from capacity spillovers' of -$1.11 million, resulting in a 'project cost after capacity spillovers accounted for' of 0.79 – 1.11 = -$0.33 million.

Table 1: BCI and MBCI results for the projects on which trials were run

CMA and assets for which projects were developed	**Project benefit score**	**Project cost** **$m**	**Benefit: Cost Index**	***PV(Q)*$^{\alpha}$** **$m**	***R*$^{\beta}$**	**Added cost from capacity spillovers** **$m**	**Project cost after capacity spillovers accounted for** **$m**	**Modified Benefit: Cost Index**
Border Rivers – Gwydir CMA								
A vegetation community focused on one part of this CMA's region	3.2	2.49	**1.3**	25.7	0.974	0.69	3.18	**1.0**
A vegetation community extending across this CMA's region	13.2	1.51	**8.8**	26.1	1.006	-0.14	1.37	**9.7**
Ramsar-listed wetlands.	7.7	0.64	**12.0**	26.6	1.029	-0.75	-0.10	**-74.5**
Namoi CMA								
Population of an endangered riparian fauna species	4.6	1.57	**2.9**	16.6	1.028	-0.46	1.11	**4.1**
A nature corridor	0.7	0.58	**1.1**	16.9	1.034	-0.56	0.02	**27.5**
Northern Rivers CMA								
Water quality in a designated catchment	49.9	2.54	**19.7**	25.5	1.036	-0.88	1.66	**30.0**
A complex of wetlands in a floodplain	18.8	0.79	**23.9**	26.8	1.043	-1.11	-0.33	**-57.6**
Biodiversity of a particular landscape	Not available$^{\gamma}$	Not available$^{\gamma}$	Not available$^{\gamma}$	23.1	1.000	0.00	Not available$^{\gamma}$	Not available$^{\gamma}$

α *PV(Q)* is the present value (PV) of the estimated annual budget the CMA will have available over the subsequent 10 years for asset-focussed investments other than the current project (*Q*).
β *R* is a multiplier measuring the aggregate effect of capacity spillovers from the current project on the feasibility of the CMA's other areas of asset-focussed investment.
γ The PAF for this asset was not completed to the stage where parameter values needed to calculate these measures could be obtained.

The preceding case is one of two (the other being the project for the asset 'Ramsar listed wetlands) where the value of 'added cost from capacity spillovers' is negative and greater than 'project cost'; i.e., where the cost-savings for other areas of asset-focussed investment due to the project's capacity spillovers exceed the cost of the project itself. The net impact of implementing the projects in these cases is not to add to the costs of the relevant CMAs but rather to reduce their total costs in achieving the outcomes they seek across their asset-focussed investments.

The Modified Benefit: Cost Index (MBCI) for each project, calculated in accordance with equation (2), is presented in the rightmost column of the table. It can be seen that the Modified Benefit: Cost Index for a given project is equal to the corresponding 'benefit score' (column 2) divided by the corresponding 'project cost after capacity spillovers accounted for' (column 8). Note that the MBCI values for the two projects with a negative 'project cost after capacity spillovers accounted for' are also negative. This means these projects are highly attractive since positive benefits from the projects are being achieved for a net investment of 'less than nothing'. Such projects should be ranked higher than all projects with positive MBCIs.

Project rankings by the BCI and the MBCI can be compared in Table 2. Although the BCI and MBCI values differ for each of the projects evaluated by the Border Rivers – Gwydir and Northern Rivers CMAs, it can be seen that accounting for capacity spillovers in the MBCI does not change the project rankings for these CMAs.

Table 2: Comparison of project rankings by the BCI and the MBCI

CMA and assets for which projects were developed	Benefit: Cost Index	Rank by Benefit: Cost Index	Modified Benefit: Cost Index	Rank by Modified Benefit: Cost Index
Border Rivers – Gwydir CMA				
A vegetation community focused on one part of this CMA's region	1.3	3rd	1.0	3rd
A vegetation community extending across this CMA's region	8.8	2nd	9.7	2nd
Ramsar-listed wetlands.	12.0	1st	-74.5	1st
Namoi CMA				
Population of an endangered riparian fauna species	2.9	1st	4.1	2nd
A nature corridor	1.1	2nd	27.5	1st
Northern Rivers CMA				
Water quality in a designated catchment	19.7	2nd	30.0	2nd
A complex of wetlands in a floodplain	23.9	1st	-57.6	1st
Biodiversity of a particular landscape	Not available	Not available	Not available	Not available

In contrast, accounting for capacity spillovers by using the MBCI instead of the BCI does reverse the rankings of the two projects evaluated by the Namoi CMA. We see from Table 1 that both of these projects are expected to generate beneficial capacity spillovers for that CMA's other area of

asset-focussed investment (*R* values for both projects exceed 1), and thus to generate a negative 'added cost from capacity spillovers'. In the case of the project ranked 2nd by the BCI (targeting 'a nature corridor'), this negative added cost (-$0.56 million) is very nearly as large in absolute terms at the cost of the project ($0.58 million). The 'project cost after capacity spillovers accounted for' for this project is thus reduced to close to zero (to $0.02 million), thus resulting in a MBCI value much higher than the BCI value. In the case of the project ranked 1st by the BCI (targeting 'population of an endangered riparian fauna species'), the negative added cost (-$0.46 million) is less than one-third the size in absolute terms as the cost of the project ($1.57 million). The 'project cost after capacity spillovers accounted for' for this project is therefore reduced, compared with the project cost, much less in proportionate terms than is the case for the other project. Hence, the MBCI for this project is increased proportionately much less than is the case for the other project. The outcome is that the MBCI for this project is less than that of the other project, despite its BCI having been higher.

5. REVIEWING THE TRIALS

A workshop was held in each of the three regions to review the methods that had been trialled for economic evaluation of asset-focused investments. The Regional Working Group for each region was asked to invite not only the people who participated directly in the trials but also others (e.g., CMA board members, other CMA stakeholders, other CMA staff) who may be interested in learning from the experience gained in the trials and/or who may be in a position to provide feedback.

The workshop for the Northern Rivers region was held in Coffs Harbour on 18 March 2010, and was attended by the three CMA staff who had participated directly in the trials and also by the Chairperson of the CMA Board. The workshop for the Namoi region was held in Tamworth on 24 March 2010 and was attended by two of the three CMA staff who had participated directly in the trials (the third rendered an apology due to illness on the day) and one member of the CMA board. The workshop for the Border Rivers – Gwydir region was held in Inverell on 13 April 2010 and was attended by three of the five CMA staff who had participated directly in the trials and also by five other CMA staff (including the Acting General Manager and an Acting Program Manager).

Each workshop ran from three to four hours. For the benefit of those who had not participated directly in the trials, each workshop commenced with a presentation on the INFFER method and of the supplementary method developed to account for the effects of capacity spillovers arising from a particular project. This presentation stimulated considerable discussion in each case which provided significant 'informal' feedback on the trials process. The subsequent 'formal' review part of each workshop was semi-structured in the sense that participants were asked to respond verbally to a series of pre-defined questions.

The set of questions asked regarding the trials of INFFER's PAF process was as follows:

P1: What are the strengths of the INFFER method compared with your CMA's current practice?

P2: What are its weaknesses compared with current practice?

P3: Can you see the INFFER method, or elements of it, being applied by your CMA?

P4: What are the obstacles to your CMA applying the INFFER method?

P5: What could be done to alleviate these obstacles?

P6: With practice, how self-sufficient could your CMA become in applying the INFFER method?

Each workshop included a teleconference (for around 45 minutes) with two members of the INFFER team. These were timed as far as possible to coincide with the discussion surrounding the foregoing six questions. After discussions had concluded the INFFER team was invited to comment on any of the points made. Participants also queried the INFFER team on any other issues that came to mind.

The set of questions asked regarding the trials of the supplementary method designed to account for capacity spillover effects from a project was as follows:

C1: Is it important to account for capacity spillovers from projects when prioritising them?

C2: Does your CMA currently account for them?

C3: Is the PAF supplement useful in accounting for capacity spillovers from projects when evaluating them?

C4: What difficulties did you encounter in completing the PAF supplement?

C5: What might be done to alleviate these obstacles?

C6: Can you see the PAF supplement method, or elements of it, being applied by your CMA?

C7: If so, how self-sufficient could your CMA become in applying the PAF supplement?

Towards the conclusion of each workshop a short questionnaire was distributed to each participant. A copy of the questionnaire can be found in Appendix B. The questionnaire includes three tables – A, B and C – of items requiring responses plus four further questions.

Table A lists 20 criteria identified as relevant to CMAs in choosing a method for evaluating asset-focused investments. For each criterion, respondents were asked to rate what they perceived to be its importance to their CMA in choosing such a method. This involved marking one box on a seven-point scale of importance from 'very low' to 'very high'. Space was left at the bottom of the table for respondents to add further criteria which they considered important.

Table B lists the same set of criteria. Respondents are asked to rate the performance of INFFER's PAF method against each of these criteria relative to their CMA's current practice. This rating is on a seven-point scale of relative performance from 'much worse' (-3) to 'much better' (+3) including a scale midpoint of 'about same' (= 0).

Table C lists eight of the full set of criteria. This subset was chosen to rate the performance of the 'supplemented PAF' method for evaluating investments relative to their CMA's current practice. (This supplemented PAF method entails completion of the PAF *plus* completion of the PAF supplement form that was developed to account for capacity spillover effects.) Again, this rating is on a seven-point scale of relative performance from 'much worse' (-3) to 'much better' (+3) including a scale midpoint of 'about same' (= 0).

Those directly involved in the trials were asked to respond to all items and questions in the questionnaire. Workshop participants who had not been involved in the trials were asked only to respond to the items in Table A (which require no experience with the PAF or PAF supplement).

Completed questionnaires were received from all workshop participants, except for one participant in the workshop for Border Rivers – Gwydir Region. In addition, each of the participating CMAs was requested to distribute the questionnaire to CMA Board members unable to attend the relevant workshop. These Board members were asked to respond only to the Table A items. The Board members of the Border Rivers – Gwydir CMA chose to complete a single questionnaire jointly. Aside from the one Namoi CMA Board member who attended the review workshop for that region, four other Board members returned questionnaires. Aside from the one Northern Rivers CMA Board member (i.e., the Chairperson) who attended the review workshop for that region, no other Board member returned a questionnaire.

6. REVIEW FINDINGS: BORDER RIVERS – GWYDIR REGION

6.1 Trials of the PAF

6.1.1 Workshop discussions

Comments from workshop participants in relation to each of the pre-defined questions for this phase of the trials are presented below.

P1: What are the strengths of the INFFER method compared with your CMA's current practice?		
Comment code	Who? (S=staff; B=Board)	Comment
BP1_1	S2	It makes you think more. It makes you think more about what you're actually trying to protect, what the asset is, like whether it's the vegetation community or the soils underneath it. And it looks more effectively at the sorts of information that you use to support your decision, whether you've got the appropriate information for that asset and how relevant your information is.
BP1_2	S1	I think it's quite a good process. It provides more transparency compared with what we've previously done. And it's a good upfront way of defining an asset and thinking about the feasibility of trying to protect it given your funding regulation and so on. It's a good justification tool for why you're funding a particular asset.
BP1_3	S3	It was very constructive to be able to send drafts of our PAF to the INFFER team for feedback as we proceeded. It was good having someone giving independent input into a project that I thought was a really good project, who could identify big holes in your project that you might not notice because you're passionate about it.
BP1_4	S3	It doesn't require you to start with a fixed budget. It allows you to be more hypothetical. So it's a bit outside the box compared with what we normally do.
BP1_5	S6	It's good that it captures the spin-offs from your project to other assets.
BP1_6	S9	We've spent 5 years tying to fill in the gaps in our knowledge, to be able to make more informed decisions, and that stuff is just starting to come through now. So this INFFER approach could be really timely for us.
BP1_7	S1	It's good because it makes you sit down and look at all the information gaps.

P2: What are its weaknesses compared with current practice?		
Comment code	Who? (S=staff; B=Board)	Comment
BP2_1	S2	It's not exactly a weakness of it, but if we were to submit these to the NRC we'd have to convince them that we had used their Standard for Quality NRM. You'd have to incorporate that in your process somehow. *INFFER team response: We've had this issue in a few states, in making the wording of our tool compatible with the local process. It's not a problem that can't be solved without goodwill. The actual content of the tool is very compatible with the Standard, it's just making it work within the system.*
BP2_1	S2	Subjectivity is a bit of a weakness. But that may have been our fault in that we didn't go through Step 2, the filtering process, to confirm that the asset we'd selected would work for

		the PAF process. And if we'd had more input from other staff we may have got different answers.
BP2_3	S1	There were originally some concerns about the PAF not capturing a project's spinoffs in building capacities of value for other projects. But I guess that's been sort of addressed by the PAF supplement dealing with the capacity spillovers.
BP2_4	S2	We didn't apply the PAF to any cultural heritage assets, because we were told that might be difficult. But given CMAs are supposed to look at them, we're not sure how we would use the INFFER process for them.
BP2_5	S2	My issue with using INFFER for the CAP review is the time consuming nature of it. I can see its applicability for a CAP review, but it'd be pretty time consuming, so you would need assistance. So doing it would be more of a challenge. *INFFER team response 1: INFFER does take additional time, so for it to be worth doing you would need institutional support, and you would need to feel that the better decision making, the better-designed projects that come out of this, are sufficient to outweigh that extra input of resources, and/or the institutions further up – NRC, DECCW – have to support the process sufficiently strongly to be worth putting that effort in. The selection criteria in the CfoC business plan are remarkably consistent with the criteria in INFFER, but where it breaks down is that I don't think DAFF apply those criteria very well when choosing what to fund. I think in the last round of funding that the groups that did use INFFER did not get much advantage out of that, because the DAFF process was so poor. But we're still working on them, trying to support them to improve their processes.* *INFFER team response 2: I've seen enormous resources consumed by the catchment planning processes in Victoria. So I'm not sure I agree that using INFFER for that process makes it more time consuming and resource intensive. What it does is make it more focussed and structured, which ultimately saves time and money.*

P3: Can you see the INFFER method, or elements of it, being applied by your CMA? How?		
Comment code	Who? (S=staff; B=Board)	Comment
BP3_1	S1	Definitely it could be applied. It's harder to apply with Caring for our Country, since priorities are already designated, although it could have a role similar to writing a project plan for those ones. But where's there's funding flexibility, it's useful there for deciding what to invest in.
BP3_2	S2	I think it's a better process than what we've been using for splitting up our funding between themes. The process we've used in the past is probably more subjective than INFFER. It would give more credibility about how you split the funds up at that initial stage. You mightn't do a full INFFER on a theme but you could look at some of the steps in INFFER in deciding how to split the money up. At the moment there's a rationale for doing that, but it's not really based on much.
BP3_3	S2	For Caring for our Country, and how you might fund different areas, you could use it as a tool. You could use it to split the money between the priority subcatchments, or look at where the money will be more effective. We'll see what comes out of the current trials of INFFER in the CAP review process. If the information that comes out of the trials directs us to use it, then I suppose we'll use it then.

BP3_4	S6 & S2	S6: For the CAP review it would help getting community feedback on specific issues. We've had feedback from some subcatchments that we're not paying attention to their issues. S2: Yes, in the Central West the community did say how pleased they were to be involved in the initial stages of their CAP review process. *INFFER team response: One of the outcomes of the process is a long list of assets that include all the ones that came up out of the community workshops, and its understood by everyone that you'll only be able to fund a small minority of those, but at least they're all recognised, they feel that their input has been honoured, that the list is publicly available, they can see their own 'pet asset' on the list. That process really seems to have helped a lot.*

P4: What are the obstacles to your CMA applying the INFFER method?		
Comment code	Who? (S=staff; B=Board)	Comment
BP4_1	S2	Just making sure we've got the right people around the table, including people from other agencies and other organisations. The main obstacle is the time constraint, but it does get a lot easier once you get used to using the method. And getting the information you need to apply it, but that's faced in applying any method.
BP4_2	S7	Just general inertia in our organisation. I've been trying to get systems consistent across our organisation for a while now, and we've just gotten a bit of that now in our project management plans, and I'd really be loathe to turn around now and say there's something new coming along, because people would kill me.
BP4_3	S6	There's the obstacle of most people in the organisation not having had experience with it to know its advantages, like Sally and Sara have had. *INFFER team response: That's an issue we have in every region we work with. Geoff and April do a fantastic job with training and support, and we have an accredited training program, but it's a long slow process. Sometimes it involves some pretty difficult cultural change. You strike attitudes that are deeply ingrained about the best way to do things.*

P5: What could be done to alleviate these obstacles?		
Comment code	Who? (S=staff; B=Board)	Comment
BP5_1	S2	It's about getting the right people in the room and locking the door, having the people there with the information you need and having the costs information there. It's detailed like a project management plan, so you've got to be thinking upfront about all the information you'll need to complete the form.
BP5_2	S2	We need to keep gathering information as we can afford it.
BP5_3	S6 & S2	There'd need to be INFFER training not only for staff but for board members, landcare groups, etc, so that got an appreciation of how the process works for ranking, so that when you feed the results back to the community there's no misunderstanding that could be a negative. We'd need to carefully structure our public meetings so that we know what we're talking about. *INFFER team response: One thing that CW CMA did was send their project officer down to a meeting in North Central CMA, so he had a good sense of what was likely to happen, how the meeting could be facilitated etc. Another thing we've tried to do is 'buddy up' new CMAs with experienced CMAs and create support networks that way.*

P6: With practice, how self-sufficient could your CMA become in applying the INFFER method?		
Comment code	Who? (S=staff; B=Board)	Comment
BP6_1	S1	I think once you'd been through the process a couple of times you'd become pretty self-sufficient, but the challenge would be to get that self-sufficiency across all staff. And to get consistency across the CMA so you can be confident about your rankings of projects.
BP6_2	S3	It would be good to have some outside QA, even if you sent a random of selection of projects back out for QA, to make sure you're not getting off-track. *INFFER team response: Even once a CMA is fairly self-sufficient, for its process to have credibility in the wider system there'd really need to be some outside system of QA. That's something to discuss with the NRC and DECCW.*

6.1.2 Questionnaire data

Eight Border Rivers – Gwydir CMA staff responded to the questionnaire. The Board of the CMA also provided joint responses to the criteria listed in Table A of the questionnaire. The responses from the Board were accounted for only in calculating average responses for the CMA to the criteria listed in Table A. The importance rating given by the Board to a criterion was weighted equally with each staff response in calculating an average CMA rating for that item.

Ratings of the importance of different criteria in choosing a method for evaluating investments

The responses of the eight staff in respect of the 20 criteria listed in Table A are presented in Table C1 (see Appendix C). Recall that a score of 1 for a criterion denotes a rating of very low importance and a score of 7 denotes a rating of very high importance.

Summary statistics for responses by the eight staff and the CMA as a whole (including joint responses from the Board) are presented in Table 3. The criteria are listed in the table in descending order of mean score for all respondents. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of importance of that criterion. Hence, the full set of respondents differed least in their ratings for the criterion 'Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive' and differed most about their ratings for the criterion 'Accounts for the technical risks that investment options may face'.

Rankings of the various criteria according to their respective mean ratings of importance by all respondents are shown in Table 4. Hence, the three criteria ranked on average *highest* in importance by all respondents were:

1st 'strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes';

2nd 'is based on sound biophysical science'; and

Table 3: Summary statistics for the importance of various criteria in choosing an evaluation method: Border Rivers – Gwydir CMA

Criteria: The method …	Respondent category			
	All (n = 9)		Staff (n = 8)	
	Mean score for criterion importance	Std. Dev.	Mean score for criterion importance	Std. Dev.
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	6.22	1.09	6.13	1.13
Is based on sound biophysical science	6.11	1.05	6.13	1.13
Is practical to apply given the skills and time available to CMA staff	6.00	1.50	6.00	1.60
Makes transparent all the judgements and assumptions that need to be made	5.89	1.17	5.88	1.25
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5.78	1.56	5.63	1.60
Helps justify investment decisions to your CMA's regional community	5.67	1.58	5.63	1.69
Can incorporate local knowledge and values	5.56	1.01	5.50	1.07
Provides a quantitative basis for ranking investment options	5.33	1.22	5.50	1.20
Helps justify investment proposals to government investors	5.33	1.32	5.25	1.39
Avoids subjective judgments	5.22	1.64	5.25	1.75
Provides a quantitative basis for ranking investment options across different asset classes	5.22	1.09	5.38	1.06
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	5.22	1.20	5.00	1.07
Is based on sound economics	5.00	1.58	5.13	1.64
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	5.00	1.32	4.88	1.36
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	5.00	1.32	5.00	1.41
Accounts for the social, bureaucratic and political risks that investment options may face	5.00	1.50	4.88	1.55
Accounts for the technical risks that investment options may face	4.89	1.83	4.88	1.96
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	4.78	0.97	4.75	1.04
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	4.67	1.22	4.63	1.30
Is consistent with the philosophy of integrated catchment management	4.44	1.24	4.50	1.31

Table 4: Criteria ranked by mean importance scores: Border Rivers – Gwydir CMA

The method … Criteria:	Mean criterion importance score across all respondents (n = 9)	Rank by mean criterion importance score
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	6.22	1
Is based on sound biophysical science	6.11	2
Is practical to apply given the skills and time available to CMA staff	6.00	3
Makes transparent all the judgements and assumptions that need to be made	5.89	4
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5.78	5
Helps justify investment decisions to your CMA's regional community	5.67	6
Can incorporate local knowledge and values	5.56	7
Provides a quantitative basis for ranking investment options	5.33	8
Helps justify investment proposals to government investors	5.33	8
Avoids subjective judgments	5.22	10
Provides a quantitative basis for ranking investment options across different asset classes	5.22	10
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	5.22	10
Is based on sound economics	5.00	13
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	5.00	13
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	5.00	13
Accounts for the social, bureaucratic and political risks that investment options may face	5.00	13
Accounts for the technical risks that investment options may face	4.89	17
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	4.78	18
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	4.67	19
Is consistent with the philosophy of integrated catchment management	4.44	20

3rd ‘is practical to apply given the skills and time available to CMA staff’.

The three criteria ranked on average *lowest* in importance by all respondents were:

18th ‘recognises the benefits from investing in important issues that nonetheless may be controversial or divisive’;

19th ‘recognises the benefits from investing in innovative investment options rather than just ‘tried and true’ options’; and

20th ‘is consistent with the philosophy of integrated catchment management’.

The criterion ‘strengthens your CMA’s confidence that the prioritised investments represent ‘value for money’’ was ranked on average 5th in importance, while the criterion ‘is based on sound economics’ was ranked on average 13th in importance.

Aside from the criteria pre-specified in Table A, respondent S7 suggested three further criteria were relevant to their CMA in choosing an evaluation method. The first of these was ‘accounts for cumulative benefits in an area’. This criterion was rated by this respondent equal sixth in importance with four of the pre-specified criteria and one other criterion he had nominated). It was rated by this respondent more important than 12 other criteria.

The second of these was ‘accounts for multi-themed benefits of investments’. This criterion was rated by this respondent equal sixth in importance with four of the pre-specified criteria and one other nominated criterion). It was rated by this respondent more important than 12 other criteria.

The third of the additional criteria identified by respondent S7 was ‘links to an MER program’. This criterion was rated by this respondent equal first in importance alongside four of the pre-specified criteria.

Ratings of the performance of INFFER’s PAF method relative to the CMA’s current practice

The responses of the four Border Rivers – Gwydir CMA staff who participated directly in trialling the PAF method in respect of the 20 criteria listed in Table B are presented in Table C2 (Appendix C). Recall that a score of -3 for a criterion denotes a rating of very low performance of the PAF method relative to current practice, +3 denotes a rating a very high performance of the PAF method relative to current practice, and a score of 0 denotes a rating that the performance of the PAF is ‘about same’ as that of the CMA’s current practice..

Summary statistics are presented in Table 5. The criteria are listed in the table in descending order of mean score for all respondents. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of performance of the PAF method against that criterion relative to that of the CMA’s current practice. Hence, the respondents differed least about their ratings for the criteria ‘is consistent with the philosophy of integrated catchment management’ and ‘is practical to apply given the skills and time available to CMA staff’. They differed most about their rating for ‘avoids subjective judgements’.

Table 5: Summary statistics for performance of the standard PAF method against the various criteria: Border Rivers – Gwydir CMA

Criteria: The method …	Mean PAF performance score	Rank by mean PAF performance score	Std dev. of PAF performance score
Provides a quantitative basis for ranking investment options	1.75	1	0.96
Provides a quantitative basis for ranking investment options across different asset classes	1.75	1	0.96
Helps justify investment proposals to government investors	1.50	3	1.29
Makes transparent all the judgements and assumptions that need to be made	1.25	4	1.26
Helps justify investment decisions to your CMA's regional community	1.25	4	1.71
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1.25	4	1.26
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	1.00	7	1.41
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	1.00	7	0.82
Can incorporate local knowledge and values	0.75	9	1.50
Is based on sound biophysical science	0.75	9	1.50
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	0.75	9	1.50
Is based on sound economics	0.75	9	1.71
Accounts for the technical risks that investment options may face	0.75	9	1.50
Accounts for the social, bureaucratic and political risks that investment options may face	0.75	9	1.71
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	0.50	15	1.73
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	0.50	15	1.73
Is consistent with the philosophy of integrated catchment management	0.25	17	0.50
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	0.25	17	0.96
Avoids subjective judgments	-0.25	19	2.22
Is practical to apply given the skills and time available to CMA staff	-1.25	20	0.50

Table 5 reveals that the three criteria that the PAF method scored on average *highest* against were:

Equal 1st	'provides a quantitative basis for ranking investment options';
Equal 1st	'provides a quantitative basis for ranking investment options across different asset classes'; and
3rd	'helps justify investment proposals to government investors'.

The four criteria that the PAF method scored on average *lowest* against were:

17th	'is consistent with the philosophy of integrated catchment management';
17th	'recognises the benefits from investing in important issues that nonetheless may be controversial or divisive;
19th	'avoids subjective judgments'; and
20th	'is practical to apply given the skills and time available to CMA staff'.

The mean scores against all but two of the criteria are positive, signifying that respondents on average rated the performance of the PAF method against 18 of the 20 criteria as superior to current practice. Respondents on average rated the performance of this method against the criteria 'avoids subjective judgments' and 'is practical to apply given the skills and time available to CMA staff' as inferior to current practice'.

In Table 6 the criteria are ranked in descending order of their mean importance scores, as in Table 4, with the mean score for the PAF method's relative performance against each criterion also presented. We can see from this table that the criterion 'avoids subjective judgments' was ranked equal 10th in importance for this CMA based on its mean importance score. The criterion 'is practical to apply given the skills and time available to CMA staff' was ranked 3rd in importance for this CMA. Hence, the fact that respondents on average rated the performance of the PAF method against this criterion as (substantially) inferior to current practice signals a real hurdle that needs to be addressed if this CMA is to adopt this method.

The two criteria against which the PAF method was perceived on average to perform equally best (compared with current practice) – 'provides a quantitative basis for ranking investment options' and 'provides a quantitative basis for ranking investment options across different asset classes' – were ranked 8th and 10th in importance for this CMA based on mean criterion importance scores.

Rating how worthwhile was the experience of trialling the standard PAF method

The four respondents participating directly in the trials of the PAF method were asked 'How worthwhile for you was the experience of completing INFFER's PAF?". Of these respondents, one answered that their experience had been highly worthwhile, two answered it had been moderately worthwhile, and one answered it had been slightly worthwhile (the remaining unutilised option was 'not at all worthwhile'). Respondent S2 elaborated that 'Completing the PAF provided an opportunity to consider how and why we invest in certain areas and the impact it has across themes'.

Table 6: Criteria ranked by mean performance of the PAF method against each: Border Rivers – Gwydir CMA

Criteria: The method …	Ranking by mean criterion importance score	Mean PAF performance score (n = 4)
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	1	0.75
Is based on sound biophysical science	2	0.75
Is practical to apply given the skills and time available to CMA staff	3	-1.25
Makes transparent all the judgements and assumptions that need to be made	4	1.25
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5	1.25
Helps justify investment decisions to your CMA's regional community	6	1.25
Can incorporate local knowledge and values	7	0.75
Provides a quantitative basis for ranking investment options	8	1.75
Helps justify investment proposals to government investors	8	1.50
Avoids subjective judgments	10	-0.25
Provides a quantitative basis for ranking investment options across different asset classes	10	1.75
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	10	1.00
Is based on sound economics	13	0.75
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	13	1.00
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	13	0.50
Accounts for the social, bureaucratic and political risks that investment options may face	13	0.75
Accounts for the technical risks that investment options may face	17	0.75
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	18	0.25
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	19	0.50
Is consistent with the philosophy of integrated catchment management	20	0.25

6.2 Trials of the PAF supplement

6.2.1 Workshop discussions

Comments from workshop participants in relation to each of the pre-defined questions for this phase of the trials are presented below.

C1: Is it important to account for capacity spillovers from projects when prioritising them?		
Comment code	Who? (S=staff; B=Board)	Comment
BC1_1	S1	I think it's important to take them into account.
BC1_2	S6	It's good to be able to look at the BCI for each project with and without the capacity spillovers accounted for, so you can see what difference the spillovers make.
BC1_3	S2 & S6	We don't really think about the capacity spillovers when we set up a project, about the impact we'll have on other areas of the catchment. It's never been measured and ranked like this. It's always been a subjective thing.

C2: Does your CMA currently account for them? How?		
Comment code	Who? (S=staff; B=Board)	Comment
BC2_1	S2 & S6	Not very well. Just subjectively.
BC2_1	S5 & S6	The project management plans mention related projects. But those are projects that are already funded. It doesn't look at how a project may affect future projects. A lot of it depends on the experience of the people involved. Someone who has been there 10 years will be in a much better position to identify those kinds of spillovers, and account for them just intuitively when developing and choosing between projects.

C3: Is the PAF supplement useful in accounting for capacity spillovers from projects when evaluating them?		
Comment code	Who? (S=staff; B=Board)	Comment
BC3_1	S2	Yes, but we don't have a lot of information to base our responses on.
BC3_2	S1	Yes.
BC3_3	S6	It's a useful tool but you need to be aware of the errors, and use sensitivity testing accordingly.

C4: What difficulties did you encounter in completing the PAF supplement?		
Comment code	Who? (S=staff; B=Board)	Comment
BC4_1	S1	One thing I'm concerned about is that you're looking at capacity spillovers against the other asset projects that are listed, of which potentially some may not go ahead. So what you're assuming may not happen. You can only go on the information that you have now.

BC4_2	S1	To an extent we're making assumptions. At present we don't have a lot of evidence to support why we've identified particular spillovers, or rated how strong they will be.
BC4_3	S1	Identifying the capacity spillovers. I got plenty of comments [from feedback on draft PAF supplement forms] like "Is that really a capacity spillover from your project". You've got to really think whether that is really a spillover from this particular project or is it a spillover from something else happening in the area. Like there's a number of things I had in mind that affected negatively the capacities to implement various other investments, but they were really to do with their negative perceptions of government agencies. They weren't really negative capacity spillover effects of the project. There were a lot of things I was thinking about that really weren't direct effects of my project, but rather from something else.

C5: What might be done to alleviate these obstacles?		
Comment code	Who? (S=staff; B=Board)	Comment
BC5_1	S6	You could draw up a standard list of capacity spillovers that people could draw from when completing the PAF supplement, but they'd need to provide a justification before listing each particular one.
BC5_2	S7 & S2	Is there any kind of way that you could standardise the general effects of different kinds of projects? I know that'd be rough as guts, but if you're doing on-ground works of this type, then they generally have a capacity spillover of a certain type of X per cent, or something like that. I think you'd have to do something like that if you were to use this approach on a CMA basis. You'd need some kind of standardised process. Yeah, because we run very similar sorts of projects.

C6: Can you see the PAF supplement method, or elements of it, being applied by your CMA?		
Comment code	Who? (S=staff; B=Board)	Comment
BC6_1	S7	Yeah, I ready if there were a ready-reckoner for different kinds of projects it would get used all the time. It'd be a rougher way of doing it.
BC6_2	S2	We could use it but, yeah, I think we'd need to standardise it.

C7: If so, how self-sufficient could your CMA become in applying the PAF supplement?		
Comment code	Who? (S=staff; B=Board)	Comment
		Participants referred to their comments under Question P6 (section 6.1.1) as relevant here.

6.2.2 Questionnaire data

The responses of the three staff who participated directly in trialling the supplementary PAF in respect of the 8 criteria listed in Table C are presented in Table C3 (Appendix C). Respondent S3 who participated directly in trialling the PAF method was on leave during the PAF supplement trials and so was not in a position to complete Table C of the survey form.

Recall that a score of -3 for a criterion denotes a rating of very low performance of the 'supplemented PAF method' relative to current practice, +3 denotes a rating a very high performance of the supplemented PAF method relative to current practice, and a score of 0 denotes a rating that the performance of the supplemented PAF method is 'about same' as that of the CMA's current practice..

Summary statistics are presented in Table 7. The criteria are listed in the table in descending order of mean score for all respondents. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of performance of the PAF method against that criterion relative to that of the CMA's current practice. Hence, the respondents differed least in their ratings for the criteria 'is practical to apply given the skills and time available to CMA staff', and least about their ratings for 'avoids subjective judgements' and 'strengthens your CMA's confidence that the prioritised investments represent 'value for money''.

The mean scores for the performance of the supplemented PAF method are positive against all of the eight criteria except 'is practical to apply given the skills and time available to CMA staff'. In other words, the supplemented PAF method was perceived on average by respondents from the Border Rivers – Gwydir CMA as superior to the CMA's current practice against seven of the eight criteria.

The criterion against which on average the supplemented PAF method performed best compared with current practice was 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments'. Nevertheless, this criterion was ranked only (equal) 13th of the full set 20 criteria in terms of its perceived importance to this CMA for choosing an evaluation method.

Table 8 allows comparison of the mean performance score of the PAF method against each of the eight criteria with the mean performance score of the supplemented PAF method. The criteria are listed in the table in descending order of their mean importance score (based on the ordering in Table 4 of the full set of 20 criteria). The performance of the supplemented PAF method is perceived on average as superior to the standard PAF method against six of the eight criteria – the two exceptions being 'strengthens your CMA's confidence that the prioritised investments represent 'value for money'' and 'helps justify investment proposals to government investors'.

The mean performance score of 2.00 for the supplemented PAF method against the criterion 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments' compares with the mean performance score of 1.00 for the standard PAF method against the same criterion. However, the relevance of the former method's superiority against this criterion for the CMA's choice of an evaluation method may have limited influence on its choice of method given its perception of this criterion as being of relatively low importance.

Rating how worthwhile was the experience of trialling the PAF supplement

The three respondents participating directly in the trials of the PAF supplement were asked 'How worthwhile for you was the experience of completing the supplementary form to the PAF?". Of these respondents, one answered that their experience had been highly worthwhile, and two answered it had been moderately worthwhile (the remaining unutilised options were 'slightly worthwhile' and 'not at all worthwhile').

Table 7: Mean performance of the supplemented PAF method against the different criteria: Border Rivers – Gwydir CMA

Criteria: The method …	Mean performance score for supplemented PAF method (n = 3)	Std dev.	Rank by mean performance score
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	2.00	1.00	1
Makes transparent all the judgements and assumptions that need to be made	1.67	1.15	2
Helps justify investment decisions to your CMA's regional community	1.33	1.53	3
Avoids subjective judgments	1.00	2.00	4
Helps justify investment proposals to government investors	1.00	1.00	4
Is consistent with the philosophy of integrated catchment management	1.00	1.00	4
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1.00	2.00	4
Is practical to apply given the skills and time available to CMA staff	-0.67	0.58	8

Table 8: Comparing performance of the standard PAF method and the supplemented PAF method against eight criteria: Border Rivers – Gwydir CMA

Criteria: The method …	Mean importance score (n = 9)	Mean performance score for standard PAF method (n=4)	Mean performance score for supplemented method (n=3)
Is practical to apply given the skills and time available to CMA staff	6.00	-1.25	-0.67
Makes transparent all the judgements and assumptions that need to be made	5.89	1.25	1.67
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5.78	1.25	1.00
Helps justify investment decisions to your CMA's regional community	5.67	1.25	1.33
Helps justify investment proposals to government investors	5.33	1.50	1.00
Avoids subjective judgments	5.22	-0.25	1.00
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	5.00	1.00	2.00
Is consistent with the philosophy of integrated catchment management	4.44	0.25	1.00

Recall that respect of the equivalent question for the standard PAF form (answered by four respondents rather than the three that answered the question regarding the PAF supplement) that one respondent answered that their experience completing this form had been highly worthwhile, two answered that the experience had been moderately worthwhile, and one answered that the experience had been slightly worthwhile. Overall, therefore, the experience of completing the PAF supplement was found to be a similarly worthwhile experience as that of completing the standard PAF form. Respondent S2 commented in respect of their experience in completing the PAF supplement that ‘Considering and trying to quantify the impact of the decisions was good’.

7. REVIEW FINDINGS: NAMOI REGION

7.1 Trials of the PAF

7.1.1 Workshop discussions

Comments from workshop participants in relation to each of the pre-defined questions for this phase of the trials are presented below.

P1: What are the strengths of the INFFER method compared with your CMA's current practice?		
Comment code	Who? (S=staff; B=Board)	Comment
NP1_1	S1	We look at investor priorities and say, OK, we can do something there, and we write a project to that. For one of the projects we evaluated, for example, we had the study, we had the spatial prioritisation, it was a nice easy thing to do with Catchment Action NSW money, so we just went ahead and did it. But we don't go and say, well, here's all the possible projects that we could do, and then actually assess them against each other. So we look at investors' priorities and we just write a project to that with the money we've got. And with those projects afterwards we don't actually compare their benefits between them. So, 'Did the project get a higher BCI than, say, a grasslands project?". Or we don't look at a project and say, "Even though we've written a project for that, it's getting a low BCI, so should we be thinking about a different type of project, or one that's got more feasibility?" With our brigalow project, for instance, we did find we had strong barriers to adoption. So where I think INFFER can help out is, when we do the new CAP which is meant to have spatial priorities we could then run an INFFER process over the top of that. So we have all these spatial priorities in all these themes within the CAP and we know what we want to do over the next 10 years, so let's do an INFFER process on a 10 year scale and say let's rank all those projects that came out of that spatial prioritisation. And when it comes to our annual investment plans we can rank them all, then run them by the Board and say this is what we want to do in the annual investment plan. They can put other equity and political filters across that as well. That's where I think our gap is, in our processes at the moment, and where INFFER could possibly help out.
NP1_2	S3	The INFFER process is good in making you look at what's been done before in the area you intend to focus on. We've run into problems before because we didn't look at that kind of information.
NP1_3	S3	Certainly there's a lot of steps in it that we would do already, but there's obviously steps we don't already do. It would make you think about each step in each program in a similar way and tease out a bit more information that possibly doesn't get looked at as hard, like some of the adoption factors and things like that. As a step by step process that compares programs in a similar way, that's something that could be beneficial.

P2: What are its weaknesses compared with current practice?		
Comment code	Who? (S=staff; B=Board)	Comment
NP2_1	S1	Weaknesses may be with overarching general type stuff, where low risk projects with returns in the short term may not necessarily be outcomes that the organisation actually wants. They may be easier to do and they're sound investments, but we really might want to go over here instead. But I recognise that the INFFER team advocates it as only a guide, and the Board or executive can come in and put other filters across that information. *INFFER team response: The PAF process does favour projects that are less risky and that yield outcomes sooner rather than later, all else equal. This accords with economic logic. But if a CMA does want to focus some portion of its budget on higher-risk or longer-returning projects, then the PAF process could be used to rank alternative projects within these*

		categories.
NP2_2	S1	The method also assumes there is a plethora of projects to assess. When we get investor priorities and other constraints, there's not always a hundred projects to put through the coarse filter and finally get 10. We might be starting with 10, then try to run them through INFFER.
NP2_3	B1	My understanding is that a program or theme may contain lots of projects. Is it possible to have the INFFER process overlay at a macro level, so you're talking about riparian projects as a whole rather than a project that is a 5 km stretch of river bank? If that's not possible, then it becomes a question of numbers, of how many micro projects you need to assess. You don't want to run through the PAF process 500 or 700 times. *INFFER team response: Of those 700 projects, many will be quite small and you wouldn't justify doing a comprehensive assessment process on hundreds of very small projects. You'd want to have some sort of scale threshold for when it's worthwhile.*
NP2_4	S3	There's a Caring for our Country goal relating to soil carbon that involves working with so many farmers. We have to pick a number of farmers to target within our catchment. Our program is to design 90 contracts. I don't see how the PAF process relates to that kind of program. That makes identifying the asset hard. The asset is soil carbon. *INFFER team response: Yes, that is hard because it's a very poorly defined outcome. It's defined in terms of activity or involvements rather than in term of environmental outcomes. So the PAF won't be a comfortable fit for developing a project for a target like that. But you could look at what environmental outcomes you're trying to achieve by working with that number of farmers, focusing on specific assets of the kind relevant to the target.*
NP2_5	S3	It is time consuming, that's one weakness of it. *INFFER team response: We're very conscious that it's time consuming, and we've tried to keep it down to the simplest minimum set of information that is essential, and to make sure that the way the questions are asked are relatively simple as well. But all the information that's asked about now is quite crucial. Our process is certainly more time consuming than some other processes, but that probably reflects that those processes don't consider all the relevant information.*
NP2_6	S1	With other CMAs, they may have substantial limitations regarding their data on assets and other things, which I'd reckon would increase the subjectiveness of the assessment.
NP2_7	S3	One of its weaknesses is that makes you make a stab at things that you mightn't feel comfortable with. Which is a strength I suppose, but it can also be a weakness. Sometimes quantifying things all the time mightn't be useful. You might be relatively good at it but you might be wrong in the first place.

P3: Can you see the INFFER method, or elements of it, being applied by your CMA? How?

Comment code	Who? (S=staff; B=Board)	Comment
NP3_1	B1	I think it's been very useful and we should continue stepping forward if we can.
NP3_2	B1	A role may be in modifying our monitoring and evaluation processes so that we're picking up extra feedback to strengthen the database for answering the questions in the PAF. For example, monitoring and reporting the capacity spillovers from our projects. But I think it's been very useful and we should continue stepping forward if we can.
NP3_3	S1	It would be a help for ranking projects within our annual investment cycle. We just write projects to the priorities without comparing whether we should go with this one or the other. So if we had 20 projects coming into an annual investment plans, and we could only fund five, the method would give us BCIs and other information we could use as a guide to decide which ones to fund. And that's relevant for funding from NSW Catchment Action, because there's no spatial prioritisation in that, and we've got some freedom in how to invest our funds across the different themes.
NP3_4	S1	It would help in thinking about the feasibility aspect of a particular project, like how hard or easy it will be to engage landholders with the delivery mechanisms we intend to use. It might tell us early that it's not going to run well and we need to think about another strategy to get the kind of outcome we want. So I can see how we could use it in the organisation.

P4: What are the obstacles to your CMA applying the INFFER method?		
Comment code	Who? (S=staff; B=Board)	Comment
NP4_1	S1	There are some obstacles with how some people view it within the organisations, in getting them to accept it for what it's worth.
NP4_2	S1	In the short term, time is an obstacle. By the time we do our CAP review, we'll already be in the next financial year. I would think that logically we'd do the CAP review, then with the spatial priorities in the CAP you'd possibly run an INFFER process over that during the middle of the next financial year, to take the CAP forward for those next 5 or 9 years.
NP4_3	S1	Deciding on values for the parameters in the PAF is intuitive sometimes, just backed up by experience. So if you had staff that were new onto the scene, you'd question whether they could really make those judgements.

P5: What could be done to alleviate these obstacles?		
Comment code	Who? (S=staff; B=Board)	Comment
NP5_1	S1	Perhaps some sort of protocol is needed on how you use the method, about how it gets reviewed, about what consultation should be required, so you start to filter out some of the subjectivity in it, and so that you do get consistency from year to year.
NP5_2	S1	[related to comment NP4_3] That's what could be part of the protocol, that you'd need say 5 years under your belt in an area before your intuition would be accepted in that process. Or that you ensure there's others with the experience to be consulted in the process.
NP5_3	S1	With the mindset problems, I guess you've just got to sell it to people, but at the end of the day it's up to the General Manager to tell the staff how to do the analysis. Which I think is not a big obstacle in this case.
NP5_4	S3 & S1	Go back to 5 year funding cycles, I suppose. Because that would automatically give you more time to do your planning. And that'd be more congruent with the change processes you need to run, where you run extension processes first, and training, and then you go into on-ground works and monitoring. That's at least 3 years to design a decent project and run that, so you're not rushing around and sending money to low-priority areas. We could all sit down and do a tremendous INFFER analysis, but we'd still be stuck with one-year funding cycles and we'd still be rushing stuff then. Or we'd start picking the very easy short-term stuff, so we're missing the critical 3 or 5 year projects.

P6: With practice, how self-sufficient could your CMA become in applying the INFFER method?		
Comment code	Who? (S=staff; B=Board)	Comment
NP6_1	S3	I'd want to do another one or two and run them through the INFFER team so I was confident I'd got it down pat, at least. Because we've depended on you and the INFFER team a lot in doing the PAFs we did, so to turn around now and do some new ones ourselves would be risky.
NP6_2	S1	I would think we'd need a service where we could ask questions as we went through the forms, and that would review our PAFs. In this CMA, we do have staff who are skilled and experienced who could fill in the form. Other CMAs with high staff turnover, they'd probably need a fair bit of support to get up to a certain level.

7.1.2 Questionnaire data

Three staff of the Namoi CMA who had participated directly in the trials responded to the questionnaire. Five members of the CMA Board also responded to the questionnaire (including one who had attended the review workshop for this CMA on 24 March 2010).

Ratings of the importance of different criteria in choosing a method for evaluating investments

The responses of the three staff and five Board members in respect of the 20 criteria listed in Table A are presented in Table C4 (see Appendix C). Recall that a score of 1 for a criterion denotes a rating of very low importance and a score of 7 denotes a rating of very high importance.

Summary statistics for responses by the three staff, five Board members, and the full group of eight respondents are presented in Table 9. The criteria are listed in the table in descending order of mean score for all respondents. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of importance of that criterion. Hence, the full set of eight respondents differed least in their ratings for the criterion 'accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment'. They differed most in their ratings for the criterion 'identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals'.

Rankings of the various criteria according to their respective mean ratings of importance by all respondents are shown in Table 10. The criteria are listed in this table in descending order of their mean score for the full set of eight respondents. The three criteria ranked on average *highest* in importance for choosing an evaluation method by the *full set of respondents* were:

1st 'strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes';

2nd 'can incorporate local knowledge and values'; and

3rd 'strengthens your CMA's confidence that the prioritised investments represent 'value for money''.

The two criteria ranked on average highest (equal 1st) in importance by the *staff respondents* were 'strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes' and 'makes transparent all the judgements and assumptions that need to be made'.

The three criteria ranked on average highest (equal 1st) in importance by the Board respondents were 'strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes', 'can incorporate local knowledge and values' and 'strengthens your CMA's confidence that the prioritised investments represent value for money'.

Hence, the staff and Board respondents, as groups, both ranked the criterion 'strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes' as most important for choosing a method to evaluate investments in natural assets. Both groups also ranked the criterion 'can incorporate local knowledge and values' as highly important (the ranking for the staff group was equal 3rd).

There seems indeed to be reasonable correspondence between the importance ratings of this CMA's staff and Board members - the mean criterion-importance scores for the group of staff respondents and the group of Board respondents are moderately positively correlated with one another

Table 9: Summary statistics for the importance of various criteria in choosing an evaluation method: Namoi CMA

Criteria: The method …	Respondent category					
	All (n = 8)		Staff (n = 3)		Board (n = 5)	
	Mean criterion importance score	Std. Dev.	Mean criterion importance score	Std. Dev.	Mean criterion importance score	Std. Dev.
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	6.13	1.5	6.33	1.2	6.00	1.7
Can incorporate local knowledge and values	6.00	0.8	6.00	1.0	6.00	0.7
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5.88	1.4	5.67	2.3	6.00	0.7
Makes transparent all the judgements and assumptions that need to be made	5.75	1.0	6.33	1.2	5.40	0.9
Is based on sound biophysical science	5.63	1.5	6.00	1.7	5.40	1.5
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	5.63	0.7	6.00	1.0	5.40	0.5
Helps justify investment proposals to government investors	5.50	0.9	6.00	1.0	5.20	0.8
Helps justify investment decisions to your CMA's regional community	5.50	0.9	6.00	1.0	5.20	0.8
Is practical to apply given the skills and time available to CMA staff	5.38	1.4	5.00	2.0	5.60	1.1
Is consistent with the philosophy of integrated catchment management	5.38	1.3	5.00	1.7	5.60	1.1
Is based on sound economics	5.38	1.1	5.67	1.5	5.20	0.8
Accounts for the technical risks that investment options may face	5.38	0.9	5.33	1.2	5.40	0.9
Provides a quantitative basis for ranking investment options	5.25	0.9	5.67	0.6	5.00	1.0
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	5.13	1.4	4.33	2.1	5.60	0.5
Accounts for the social, bureaucratic and political risks that investment options may face	5.13	1.2	5.00	2.0	5.20	0.8
Provides a quantitative basis for ranking investment options across different asset classes	4.88	0.8	5.00	1.0	4.80	0.8
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	4.75	1.0	4.67	1.5	4.80	0.8
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	4.63	1.5	4.67	2.3	4.60	1.1
Avoids subjective judgments	4.50	0.9	4.33	1.2	4.60	0.9
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	4.13	1.7	4.00	1.7	4.20	1.9

Table 10: Criteria ranked by mean importance scores: Namoi CMA

Criteria: The method …	Rank by mean importance score for respondent category		
	All (n = 8)	Staff (n = 3)	Board (n = 5)
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	1	1	1
Can incorporate local knowledge and values	2	3	1
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	3	8	1
Makes transparent all the judgements and assumptions that need to be made	4	1	7
Is based on sound biophysical science	5	3	7
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	5	3	7
Helps justify investment proposals to government investors	7	3	11
Helps justify investment decisions to your CMA's regional community	7	3	11
Is practical to apply given the skills and time available to CMA staff	9	12	4
Is consistent with the philosophy of integrated catchment management	9	12	4
Is based on sound economics	9	8	11
Accounts for the technical risks that investment options may face	9	11	7
Provides a quantitative basis for ranking investment options	13	8	15
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	14	18	4
Accounts for the social, bureaucratic and political risks that investment options may face	14	12	11
Provides a quantitative basis for ranking investment options across different asset classes	16	12	16
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	17	16	16
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	18	16	18
Avoids subjective judgments	19	18	18
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	20	20	20

(Spearman's rank-order correlation coefficient = 0.51, significant at the 0.05 level). Some noteworthy differences are:

- the criterion 'strengthens your CMA's confidence that the prioritised investments represent value for money' was ranked equal 1st for the group of Board respondents but 8th by the group of staff;
- 'recognises the benefits from investing in innovative investment options rather than just 'tried and true' options' was ranked equal 4th by Board respondents but 18th by staff respondents;
- 'is practical to apply given the skills and time available to CMA staff' was ranked 4th by Board respondents but 12th by staff respondents;
- 'helps justify investment proposals to government investors' and 'helps justify investment decisions to your CMA's regional community' were ranked equal 3rd by staff respondents but equal 11th by Board respondents.

Other noteworthy observations from the table are:

- 'is based on sound economics' was ranked equal 9th for all respondents (8th for staff respondents and 11th for Board respondents);
- 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments' was ranked only 17th in importance by all respondents (16th for both staff and Board respondents);
- 'provides a quantitative basis for ranking investment options' was ranked 13th by all respondents (8th for staff and 15th for Board respondents); and
- 'provides a quantitative basis for ranking investment options across different asset classes' was ranked 16th in importance by all respondents (12th for staff and 16th for Board respondents).

Aside from the twenty criteria pre-specified in Table A, three of the respondents who completed this table suggested additional criteria relevant to their CMA in choosing an evaluation method. These were:

- 'ensures assessment steps are comprehensive' (respondent B1, who ranked this criterion equal seventh in importance with thirteen other criteria, ahead of two other criteria);
- 'aligns with the core values of the CAP' (respondent B2, who ranked this criterion equal first in importance with two of the pre-specified criteria and one other nominated criterion;
- 'provides identified outcomes/tangible results that the community values' (respondent B2, who ranked this criterion equal fifth in importance with eleven pre-specified criteria, ahead of seven other criteria);

- ‘provides a qualitative analysis of what happens if don’t invest’ (respondent B2, who ranked this criterion equal first in importance with two of the pre-specified criteria and one other nominated criterion);

- ‘the investment provides a logical path to an outcome. (Similar to second point [see the next criterion listed], however may make the path more explicit and therefore the next point becomes more valuable’ (respondent B5, who ranked this criterion equal fifth in importance with nine of the pre-specified criteria, after two of the pre-specified criteria and two other nominated criteria);

- ‘the investment can be effectively and efficiently monitored/evaluated over time’ (respondent B5, who ranked this criterion equal first in importance, with two of the pre-specified criteria and one other nominated criterion); and

- ‘the investment/s provide a sense of ‘proportion to the problem’. Investing in some activities may never change the outcome due to the magnitude of the investment needed. Should these investments be undertaken at all?’ (respondent B5, who ranked this criterion equal first in importance with two of the pre-specified criteria and one other nominated criterion).

Ratings of the performance of INFFER’s PAF method relative to the CMA’s current practice

Summary statistics are presented in Table 11. The criteria are listed in the table in descending order of mean score for all staff respondents participating directly in trialling the PAF method. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of performance of the PAF method against that criterion relative to that of the CMA’s current practice. Hence, the respondents differed least (in fact not at all) in their ratings for the criteria ‘can incorporate local knowledge and values’, ‘helps justify investment decisions to your CMA's regional community’ and ‘strengthens your CMA's confidence that the prioritised investments represent 'value for money’’. They differed most in their ratings for ‘recognises the benefits from investing in innovative investment options rather than just 'tried and true' options’ and ‘identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals’.

Hence, the five criteria that the PAF method scored on average *highest* against were:

1st	‘provides a quantitative basis for ranking investment options across different asset classes’;
Equal 2nd	‘makes transparent all the judgements and assumptions that need to be made’;
Equal 2nd	‘provides a quantitative basis for ranking investment options’;
Equal 2nd	‘strengthens your CMA’s confidence that investments will achieve their intended biophysical outcomes’; and
Equal 2nd	‘helps justify investment proposals to government investors’.

Table 11: Summary statistics for performance of the standard PAF method against the various criteria: Namoi CMA

Criteria: The method …	Mean PAF performance score	Rank by mean PAF performance score	Std dev. of PAF performance score
Provides a quantitative basis for ranking investment options across different asset classes	1.33	1	0.58
Makes transparent all the judgements and assumptions that need to be made	1.00	2	0.00
Provides a quantitative basis for ranking investment options	1.00	2	1.00
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	1.00	2	1.00
Helps justify investment proposals to government investors	1.00	2	1.00
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	0.67	6	0.58
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	0.33	7	0.58
Is based on sound economics	0.33	7	0.58
Accounts for the social, bureaucratic and political risks that investment options may face	0.33	7	0.58
Can incorporate local knowledge and values	0.00	10	0.00
Helps justify investment decisions to your CMA's regional community	0.00	10	0.00
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	0.00	10	0.00
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	0.00	10	1.00
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	0.00	10	2.00
Is based on sound biophysical science	-0.33	15	0.58
Is consistent with the philosophy of integrated catchment management	-0.33	15	1.53
Accounts for the technical risks that investment options may face	-0.33	15	0.58
Avoids subjective judgments	-0.67	18	1.15
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	-1.00	19	1.00
Is practical to apply given the skills and time available to CMA staff	-1.67	20	0.58

The mean scores against these five criteria are positive – as are the mean scores against the four further criteria ‘accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments’, ‘accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment’, ‘is based on sound economics’ and ‘accounts for the social, bureaucratic and political risks that investment options may face’. On average, therefore, the three respondents from Namoi CMA rated the performance of the PAF method against these nine criteria as superior to their current practice.

The three criteria that the PAF method scored on average *lowest* against were:

18th	‘avoids subjective judgments’;
19th	‘recognises the benefits from investing in innovative investment options rather than just ‘tried and true’ options’; and
20th	‘is practical to apply given the skills and time available to CMA staff’.

The mean scores against these three criteria are negative – as are the mean scores against the three further criteria ‘is based on sound biophysical science’, ‘is consistent with the philosophy of integrated catchment management’ and ‘accounts for the technical risks that investment options may face’. On average, therefore, the three respondents from Namoi CMA rated the performance of the PAF method against these six criteria as inferior to their current practice.

In Table 12 the criteria are ranked in descending order of their mean importance scores, as in Table 10, with the mean score for the PAF method’s relative performance against each criterion also presented. We can see from this table that the criterion ‘is practical to apply given the skills and time available to CMA staff’ was ranked equal 9th in importance for this CMA. Hence, the fact that respondents on average rated the performance of the PAF method against this criterion as (substantially) inferior to current practice signals a hurdle that needs to be addressed if this CMA is to adopt this method (although less of a hurdle than in the Border Rivers – Gwydir case where this criterion was ranked 3rd in importance).

Rating how worthwhile was the experience of trialling the standard PAF method

The three Namoi CMA respondents participating directly in the trials of the PAF method were asked ‘How worthwhile for you was the experience of completing INFFER’s PAF?”. Of these respondents, one answered that their experience had been highly worthwhile and two answered it had been moderately worthwhile (the remaining unutilised options were ‘slightly worthwhile’ and ‘not at all worthwhile’). Respondent S1 commented: ‘Good, I learnt quite a bit from the process. I think it can be a useful tool as long as the limitations are understood and it is not followed blindly’. Respondent S3 commented: ‘It highlighted some areas that we don’t look at as closely under our current system’.

Table 12: Mean performance of the standard PAF method against the different criteria (ranked by their mean importance scores): Namoi CMA

The method … **Criteria:**	**Ranking by mean criterion importance score**	**Mean PAF performance score (n = 3)**
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	1	1.00
Can incorporate local knowledge and values	2	0.00
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	3	0.00
Makes transparent all the judgements and assumptions that need to be made	4	1.00
Is based on sound biophysical science	5	-0.33
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	5	0.33
Helps justify investment proposals to government investors	7	1.00
Helps justify investment decisions to your CMA's regional community	7	0.00
Is practical to apply given the skills and time available to CMA staff	9	-1.67
Is consistent with the philosophy of integrated catchment management	9	-0.33
Is based on sound economics	9	0.33
Accounts for the technical risks that investment options may face	9	-0.33
Provides a quantitative basis for ranking investment options	13	1.00
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	14	-1.00
Accounts for the social, bureaucratic and political risks that investment options may face	14	0.33
Provides a quantitative basis for ranking investment options across different asset classes	16	1.33
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	17	0.67
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	18	0.00
Avoids subjective judgments	19	-0.67
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	20	0.00

7.2 Trials of the PAF supplement

7.2.1 Workshop discussions

Comments from workshop participants in relation to each of the pre-defined questions for this phase of the trials are presented below.

C1: Is it important to account for capacity spillovers from projects when prioritising them?		
Comment code	Who? (S=staff; B=Board)	Comment
NC1_1	S3, S1 & B1	Yeah, for sure. Those spillovers are certainly there, so being able to account for them properly would be good.

C2: Does your CMA currently account for them? How?		
Comment code	Who? (S=staff; B=Board)	Comment
NC2_1	S1	Our CMA doesn't account for those capacity spillovers currently. I guess we know that they happen, but that's about it.
NC2_2	S3	We look at what's happened in the relevant areas, we think about them to some extent, but we don't quantify them.

C3: Is the PAF supplement useful in accounting for capacity spillovers from projects when evaluating them?		
Comment code	Who? (S=staff; B=Board)	Comment
NC3_1	S1	It's definitely helpful in getting you to think about the capacity spillover effects from a project. It's something in the background that we do, bringing intuition to it. But it does get you thinking about if we do a project like this, how much extra benefits might we get. Doing the PAF supplement really makes you think about what are the extras that this project is going to deliver.

C4: What difficulties did you encounter in completing the PAF supplement?		
Comment code	Who? (S=staff; B=Board)	Comment
NC4_1	S1	Just the guessing, or relying on our own experience to put the numbers in, the subjectivity of it, but it's hard to get some of that data.
NC4_2	S3	It depends on who is being asked to fill it in. The PAF supplement asks for global budgets and other things that I don't deal with. Someone who can do the PAF alright mightn't be able to do the PAF supplement, because they lack the wider knowledge that is needed – although they can ask of course.
NC4_3	S1 & S3	[after seeing how accounting for capacity spillovers from the projects affects their respective BCI and thus their rankings] I have to admit I am surprised by how much the capacity spillovers turn those projects around. I'd expected it might change the ranking between two fairly close projects, but it's really had a big effect on these two projects that weren't really

		close. I'm surprised too. It shows we really need to be careful about what we do put into that PAF supplement. Perhaps it just needs some sensitivity modelling to see what's happening, to see how small these measures can be and still turn things around.
NC4_4	S3	I think that even getting this result here [the reversal of rankings of the two projects when capacity spillovers are accounted for] was a good result in its own right. That big a difference makes you think about what's the process again, and what really is counting, and why.

C5: What might be done to alleviate these obstacles?		
Comment code	Who? (S=staff; B=Board)	Comment
NC5_1	S1	First and foremost, the CMA would need to commit to it. So you'd need some directive from the GM saying 'This is what we're doing', and then you'd need to make time to do it properly. So everyone would need to feel committed. Otherwise, if you try to do it in the background amongst other things it becomes a rush job and the value of it at the end of the day is questionable.
NC5_2	S1 &S3	[relates to comment NC4_2] We might need cross-organisational teams for doing that [providing the breadth of knowledge needed to complete the PAF supplement]. And that means the other people would need to be knowledgeable about the process, because you couldn't just walk up to them and say "Give me this information?" They'd say, "why?'

C6: Can you see the PAF supplement method, or elements of it, being applied by your CMA?		
Comment code	Who? (S=staff; B=Board)	Comment
NC6_2	S1	I think so, but we'd like to have it tested a bit to verify it before we take it on. The thinking it creates about the capacity spillover effects is all good.
NC6_1	B1	A role may be in modifying our monitoring and evaluation processes so that we're picking up extra feedback to strengthen the database for answering the questions in the PAF and PAF supplement. For example, monitoring and reporting the capacity spillovers from our projects.

C7: If so, how self-sufficient could your CMA become in applying the PAF supplement?		
Comment code	Who? (S=staff; B=Board)	Comment
NC7_1	S1	I think we'd be right. There's limiting data, but we'd rely on the expertise and experience we've got. That increases the subjectivity of it, that's all.

7.2.2 Questionnaire data

The responses of the three Namoi CMA staff who participated directly in trialling the supplementary PAF in respect of the 8 criteria listed in Table C are presented in Table C6 (Appendix C). Recall that a score of -3 for a criterion denotes a rating of very low performance of the 'supplemented PAF method' relative to current practice, +3 denotes a rating a very high performance of the supplemented PAF method relative to current practice, and a score of 0 denotes

a rating that the performance of the supplemented PAF method is 'about same' as that of the CMA's current practice..

Summary statistics are presented in Table 13. The criteria are listed in the table in descending order of mean score for the three respondents. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of performance of the PAF method against that criterion relative to that of the CMA's current practice. Hence, the respondents differed least in their ratings in respect of the criteria ranked 1st-4th and most in respect of the criteria ranked 7th and 8th.

The mean scores for the performance of the supplemented PAF method are positive against all of the eight criteria except 'avoids subjective judgments' (for which the mean score is zero) and 'is practical to apply given the skills and time available to CMA staff' (for which the mean score is negative). In other words, the supplemented PAF method was perceived on average by respondents from the Namoi CMA as superior to the CMA's current practice against six of the eight criteria.

The criterion against which on average the supplemented PAF method performed best compared with current practice was 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments'. Nevertheless, we see from Table 10 that this criterion was ranked only 17th of the full set of 20 criteria in terms of its perceived importance on average to all respondents from this CMA for choosing an evaluation method.

Table 14 allows comparison of the mean performance score of the PAF method against each of the eight criteria with the mean performance score of the supplemented PAF method. The criteria are listed in the table in descending order of their mean importance score (based on the ordering in Table 10 of the full set of 20 criteria). The performance of the supplemented PAF method is perceived on average as superior to the standard PAF method against five of the eight criteria – the three exceptions being 'makes transparent all the judgements and assumptions that need to be made', 'helps justify investment proposals to government investors' and 'helps justify investment decisions to your CMA's regional community'.

The mean performance score of 1.67 for the supplemented PAF method against the criterion 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments' compares with the mean performance score of 0.67 for the standard PAF method against the same criterion. However, the relevance of the former method's superiority against this criterion for the CMA's choice of an evaluation method may have limited influence on its choice of method given its perception of this criterion as being of relatively low importance for its choice of evaluation method.

Rating how worthwhile was the experience of trialling the PAF supplement

The three respondents participating directly in the trials of the PAF supplement were asked 'How worthwhile for you was the experience of completing the supplementary form to the PAF?". Of these respondents, two answered that their experience had been moderately worthwhile, and one answered it had been slightly worthwhile (the remaining unutilised options were 'highly worthwhile' and 'not at all worthwhile'). Recall that respect of the equivalent question for the standard PAF form that one respondent answered that their experience completing this form had been highly worthwhile, and two answered that the experience had been moderately worthwhile. Overall, therefore, the three respondents found the experience of completing the PAF supplement a less worthwhile experience than completing the standard PAF form.

Table 13: Mean performance of the supplemented PAF method against eight criteria: Namoi CMA

Criteria: The method …	Mean performance score for supplemented PAF method (n = 3)	Std dev.	Rank by mean performance score
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	1.67	0.58	1
Makes transparent all the judgements and assumptions that need to be made	0.67	0.58	2
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	0.67	0.58	2
Helps justify investment proposals to government investors	0.33	0.58	4
Is consistent with the philosophy of integrated catchment management	0.33	0.58	4
Helps justify investment decisions to your CMA's regional community	0.33	0.58	4
Avoids subjective judgments	0.00	1.00	7
Is practical to apply given the skills and time available to CMA staff	-1.00	1.00	8

Table 14: Comparing performance of the standard PAF method and the supplemented PAF method against eight criteria: Namoi CMA

Criteria: The method …	Mean importance score (n = 8)	Mean performance score for standard PAF method (n = 3)	Mean performance score for supplemented PAF method (n = 3)
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5.88	0.00	0.67
Makes transparent all the judgements and assumptions that need to be made	5.75	1.00	0.67
Helps justify investment proposals to government investors	5.50	1.00	0.33
Helps justify investment decisions to your CMA's regional community	5.50	0.00	0.33
Is practical to apply given the skills and time available to CMA staff	5.38	-1.67	-1.00
Is consistent with the philosophy of integrated catchment management	5.38	-0.33	0.33
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	4.75	0.67	1.67
Avoids subjective judgments	4.50	-0.67	0.00

Respondent S1 commented in respect of their experience in completing the PAF supplement: ‘Starts you thinking about how much flow on your projects have, but I think the quantifications at the end of the BCI have too much impact and may cause a perverse result. I will run some sensitivity analysis to explore this comment more’. Respondent S3 commented: ‘I found it difficult putting figures on the amount of spill over and until it is verified (or tested) I am not sure how much confidence I would put in the results’.

8. REVIEW FINDINGS: NORTHERN RIVERS REGION

8.1 Trials of the PAF

8.1.1 Workshop discussions

Comments from workshop participants in relation to each of the pre-defined questions for this phase of the trials are presented below.

P1: What are the strengths of the INFFER method compared with your CMA's current practice?		
Comment code	Who? (S=staff; B=Board)	Comment
NRP1_1	S1	INFFER is significantly different from our current approach. To develop a project now, we flow down from what the target is, the length of time involved in the target. That tells us what activities we should do. So it's not a single asset identification process as this is. And our process doesn't cover cost, including maintenance costs. And our process doesn't look at the risks, say, of not getting the local government input you need.
NRP1_2	S3	What's really good is that it forces us early in the process to nail down what the asset is and other levels of detail to ensure focus of project remains accurate and logical.
NRP1_3	S1	Getting all the parts of defining and costing a project consistent with each other is one of the method's benefits.
NRP1_4	S1	INFFER does make you have a SMART goal. It does make you test your assumptions and methodology all the way through. You do need to decide where you're going to work.
NRP1_5	S3	The need to define a SMART goal is a strength – to varying degrees we already do that, but the PAF tightens that up to ensure that is done.
NRP1_6	S2	INFFER requires you to decide where you're going to work. We currently tend to be very broad brush. We advertise for projects within a targeted area, and we get responses from the community. It doesn't matter to us which bit of river we fix first, as long as we begin somewhere.
NRP1_7	S2	INFFER has the advantage of being able to compare large and small projects. Our method ends up with large projects always out-competing the smaller ones.
NRP1_8	S2	The ability of INFFER to compare assets across different asset classes is also a strength.
NRP1_9	S2	When you're pushed for time, and INFFER is asking you all these questions, it's hard. But the benefit is that it documents all this stuff.
NRP1_10	S3	Consistency checks through form help to maintain the internal logic, so the project is on solid ground.
NRP1_11	S3	The process improves the 'sleep at night' factor in ensuring the project is well thought out.
NRP1_12	S2	The project development templates we've got now are designed around the NRC Standard. And no-one understands how they apply, that's just being honest about it. You go through the Standard and you go "Yeah, yeah, that's important" but … The elements of the Standard are there in the PAF, but the PAF does it in a way that makes you consider it.

P2: What are its weaknesses compared with current practice?		
Comment code	Who? (S=staff; B=Board)	Comment
NRP2_1	S1	Resourcing and time factor are the main weaknesses.
NRP2_2	S1	We are driven by the NRC standards, so its probably a weakness of INFFER that we can't easily identify how it interweaves with that Standard. It's there, I know, but in terms of us responding to NRC Audits it would help if that were made clearer.

NRP2_3	S3	It's time consuming, so we'd reserve it for larger strategic projects rather than smaller scale projects. We'd need more resources to apply it to our investment strategy.

P3: Can you see the INFFER method, or elements of it, being applied by your CMA? How?		
Comment code	Who? (S=staff; B=Board)	Comment
NRP3_1	S2	In developing investments, we see that some of the questions in the PAF are very valuable. If someone came up with a project idea, we would ask 'make sure you cover these things in developing that project'.
NRP3_2	S1	We've got two programs. Each has a program plan which they adapt every 12 months. So it would be useful there for their program reviews in identifying the asset within their programs to be targeted. The PAF does ask some very good questions and we can certainly use a lot of that.
NRP3_3	S3	Certainly elements of form could be incorporated in what we're doing now, although much of it is already there. Section 3 that deals with choice of delivery mechanisms was really useful, and could be included in our processes. Other questions could be included as a reality check in our current project development. It's human nature sometimes to convince yourself of something, so the reality check would be good.
NRP3_4	S3	It could be used for major projects – would need to be worth $500K or more to justify using the PAF in full.

P4: What are the obstacles to your CMA applying the INFFER method?		
Comment code	Who? (S=staff; B=Board)	Comment
NRP4_1	S1	It's the continued use factor. If we were as expert as Geoff and April [from the INFFER team] we'd have no trouble at all. But in reality there'd be a continuing requirement to understand, keep things moving, and have all of our staff on the same train.
NRP4_2	S1	Our difficulty is that we've got hundred's of assets in this region. Identifying the few to target using high significance and high threat as the criteria would be challenging.
NRP4_3	S1	At the moment we're at the mercy of our own community who have an expectation that we'll fix everything for them. We'd have difficulty concentrating our resources in a few areas, given our community up here. And community reactions to the asset identification and 'culling' process would be an issue – the "what about me" thing, if they happened to be left off the list.
NRP4_5	S1	These [comments NRP1_1, NRP4_2 & NRP4_3] aren't weaknesses of the process. I think it's very thorough. It's about us getting our heads around it and becoming more comfortable.
NRP4_6	B1	My board would say that "community" is our greatest asset, ie, interests, motivation, professionalism to do NRM. It's not clear how INFFER would integrate that. Our business model differs from other CMAs because we want to protect that. *INFFER team response: We believe INFFER integrates information about community capacity and socio-economics in a way that provides a stronger case for why you would invest larger amounts of money in NRM in assets that the community really values and wants to work on. I reckon INFFER deals with community capacity much better and more seriously than anything else I've seen. It doesn't give lip-service to community.*
NRP4_7	B1	I imagine the biggest obstacle would be to get consistency across people and areas. *INFFER team response: For it to work in a CMA, you really need one person, a "super user" within the organisation to provide help and critique. But you'll have someone in your organisation who'd be very suited to doing that, to provide the internal quality assurance. That will be hard the first time around, but over time it will be easier as it becomes part of the routine.*
NRP4_8	S2	It took us a while to get our heads around the CAP. A few years down the track our programs seem to be delivering on those targets. Applying INFFER is about moving from what you've got established to something new. We'd have to get rid of some of the existing processes to

		bring something in new. You don't want to do INFFER extra, because you have trouble doing everything now. *INFFER team response: Our view is that we'll never be able to make a case for really significant investment in NRM without stronger business models. The amount of money that a region gets, and its flexibility in spending it, is very limited really. You can say then that INFFER hasn't much point, but ultimately we need to get better business models in place to get serious funding.*
NRP4_9	S3	We currently do stuff around the NRC standards, and we need to find alternatives or better understand what the NRC standards mean. At the moment its difficult for staff to grasp those standards conceptually. There are elements in the INFFER that might help in that respect, but some of the language in the PAF would need to be better aligned with the Standard.
NRP4_10	S3	Time management is the problem, given the time demands of applying the PAF. We're currently putting a number of new systems in place, like for monitoring and evaluation. We're in a transitionary stage, and some of those things will take a while to bed down before we can free up the time needed to spend on applying the INFFER method.

P5: What could be done to alleviate these obstacles?		
Comment code	Who? (S=staff; B=Board)	Comment
NRP5_1	S1	More resources.
NRP5_2	S1	It's also about developing the will within the CMA staff, the board, getting everyone on the same train, deciding this is where we're going, this is what we're going to use, and this is how we're going to do it, and then bite the bullet and do it. They're the decisions that we face now. Once you've made the decision, the obstacles are not insurmountable, but there's that big one to get over in the first instance.

P6: With practice, how self-sufficient could your CMA become in applying the INFFER method?		
Comment code	Who? (S=staff; B=Board)	Comment
NRP6_1	S1	Nailing the asset goal was the really hard part, which involved a lot of toing and froing with Graham and also Geoff and April [from the INFFER team]. There were a lot of iterations in doing the form to get it right, all consistent. But having done it once, it'd be easier to do next time.
NRP6_2	S3	Unless we were doing it quite regularly so we got in the swing of it, and my feedback today suggests we wouldn't be [doing it regularly], we'd always be looking for at least some intellectual input from those more familiar with the process.
NRP6_3	S1	We'd have to import the skills, or get a "super user". We could develop skills internally, but we don't have a super user at the moment. I wouldn't be confident that I was doing it right with other assets, even after having been though this trial. So you need to import someone, or get someone trained as a super user.
NRP6_4	B1	It's the newness of it. Once you got used to it, that would go away.

8.1.2 Questionnaire data

Three staff of the Northern Rivers CMA who had participated directly in the trials responded to the questionnaire. One member of the CMA Board, who attended the review workshop for this CMA on 18th March 2010, also completed Table A of the questionnaire.

Ratings of the importance of different criteria in choosing a method for evaluating investments

The responses of the three staff and one Board member in respect of the 20 criteria listed in Table A are presented in Table C7 (see Appendix C). Recall that a score of 1 for a criterion denotes a rating of very low importance and a score of 7 denotes a rating of very high importance.

Summary statistics for responses by the three staff, one Board member, and the full set of four respondents are presented in Table 15. The criteria are listed in the table in descending order of mean score for all respondents. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of importance of that criterion. Hence, the full set of four respondents differed least (in fact not at all) in their ratings for the criterion 'strengthens your CMA's confidence that the prioritised investments represent 'value for money'' and differed most in their ratings for the criterion 'avoids subjective judgments'.

Rankings of the various criteria according to their respective mean ratings of importance by all respondents are shown in Table 16. The criteria are listed in this table in descending order of their mean score for the full set of four respondents. The three criteria ranked on average *highest* in importance for choosing an evaluation method by the *full set of respondents* were:

Equal 1st	'provides a quantitative basis for ranking investment options';
Equal 1st	'provides a quantitative basis for ranking investment options across different asset classes';
Equal 1st	'strengthens your CMA's confidence that the prioritised investments represent 'value for money''

The two criteria ranked on average highest in importance by the *staff respondents* were 'strengthens your CMA's confidence that the prioritised investments represent 'value for money' (ranked 1st), 'provides a quantitative basis for ranking investment options' (equal 2nd) and 'provides a quantitative basis for ranking investment options across different asset classes' (equal 2nd).

The ten criteria ranked on average highest (equal 1st) in importance by the *Board* respondent were 'provides a quantitative basis for ranking investment options', 'provides a quantitative basis for ranking investment options across different asset classes', 'is practical to apply given the skills and time available to CMA staff', 'helps justify investment proposals to government investors', 'can incorporate local knowledge and values', 'strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes', 'helps justify investment decisions to your CMA's regional community', 'makes transparent all the judgements and assumptions that need to be made', 'is consistent with the philosophy of integrated catchment management', and 'is based on sound biophysical science'.

Hence, the staff as a group and the Board respondent both ranked the criteria 'provides a quantitative basis for ranking investment options' and 'provides a quantitative basis for ranking investment options across different asset classes' either 1st or 2nd in importance for choosing a method to evaluate investments in natural assets. Both also ranked the criteria 'is practical to apply given the skills and time available to CMA staff' and 'helps justify investment proposals to government investors' as highly important (both ranked equal 4th by the staff group and equal 1st by the Board respondent).

Table 15: Summary statistics for the importance of various criteria in choosing an evaluation method: Northern Rivers CMA

Criteria: The method …	Respondent category					
	All (n = 4)		Staff (n = 3)		Board (n = 1)	
	Mean criterion importance score	Std. Dev.	Mean criterion importance score	Std. Dev.	Mean criterion importance score	Std. Dev.
Provides a quantitative basis for ranking investment options	6.00	1.20	5.67	1.20	7.00	n.a.
Provides a quantitative basis for ranking investment options across different asset classes	6.00	0.80	5.67	0.60	7.00	n.a.
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	6.00	0.00	6.00	0.00	6.00	n.a.
Is practical to apply given the skills and time available to CMA staff	5.75	1.90	5.33	2.10	7.00	n.a.
Helps justify investment proposals to government investors	5.75	1.30	5.33	1.20	7.00	n.a.
Can incorporate local knowledge and values	5.50	1.30	5.00	1.00	7.00	n.a.
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	5.50	1.30	5.00	1.00	7.00	n.a.
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	5.50	1.00	5.33	1.20	6.00	n.a.
Helps justify investment decisions to your CMA's regional community	5.50	1.30	5.00	1.00	7.00	n.a.
Accounts for the technical risks that investment options may face	5.50	1.00	5.33	1.20	6.00	n.a.
Makes transparent all the judgements and assumptions that need to be made	5.25	1.70	4.67	1.50	7.00	n.a.
Is consistent with the philosophy of integrated catchment management	5.25	2.10	4.67	2.10	7.00	n.a.
Accounts for the social, bureaucratic and political risks that investment options may face	5.25	1.50	5.00	1.70	6.00	n.a.
Is based on sound biophysical science	5.00	1.80	4.33	1.50	7.00	n.a.
Is based on sound economics	5.00	2.00	4.67	2.30	6.00	n.a.
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	5.00	1.40	4.67	1.50	6.00	n.a.
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	5.00	1.40	4.67	1.50	6.00	n.a.
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	5.00	1.40	5.00	1.70	5.00	n.a.
Avoids subjective judgments	4.50	2.40	4.00	2.60	6.00	n.a.
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	4.50	1.30	4.00	1.00	6.00	n.a.

Table 16: Criteria ranked by mean importance scores: Northern Rivers CMA

Criteria:	Rank by mean score for respondent category		
The method …	**All (n = 4)**	**Staff (n = 3)**	**Board (n = 1)**
Provides a quantitative basis for ranking investment options	1	2	1
Provides a quantitative basis for ranking investment options across different asset classes	1	2	1
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1	1	11
Is practical to apply given the skills and time available to CMA staff	4	4	1
Helps justify investment proposals to government investors	4	4	1
Can incorporate local knowledge and values	6	8	1
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	6	8	1
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	6	4	11
Helps justify investment decisions to your CMA's regional community	6	8	1
Accounts for the technical risks that investment options may face	6	4	11
Makes transparent all the judgements and assumptions that need to be made	11	13	1
Is consistent with the philosophy of integrated catchment management	11	13	1
Accounts for the social, bureaucratic and political risks that investment options may face	11	8	11
Is based on sound biophysical science	14	18	1
Is based on sound economics	14	13	11
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	14	13	11
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	14	13	11
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	14	8	20
Avoids subjective judgments	19	19	11
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	19	19	11

Overall, however, there was limited correspondence between the importance ratings of the group of staff respondents from this CMA and the sole Board respondent - the mean criterion-importance scores for the group of staff respondents and the Board respondent are only slightly positively correlated with one another (Spearman's rank-order correlation coefficient = 0.18, not significant at the 0.10 level). Some noteworthy differences are:

- the criterion 'is based on sound biophysical science' was ranked equal 1st in importance by the Board respondent but 18th by the group of staff respondents;

- 'recognises the benefits from investing in important issues that nonetheless may be controversial or divisive' was ranked 20th (i.e., last) by the Board respondent but 8th by the group of staff respondents;

Other noteworthy observations from the table are:

- the criterion 'is based on sound economics' was ranked equal 14h in importance for all respondents (equal 13th for staff respondents and equal 11th for the Board respondent); and

- 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments' was ranked 14th in importance by all respondents (13th by staff and 11th by the Board respondent).

Ratings of the performance of INFFER's PAF method relative to the CMA's current practice

The responses of the three Northern Rivers CMA staff who participated directly in trialling the PAF method in respect of the 20 criteria listed in Table B are presented in Table C8 (Appendix C). Recall that a score of -3 for a criterion denotes a rating of very low performance of the PAF method relative to current practice, +3 denotes a rating a very high performance of the PAF method relative to current practice, and a score of 0 denotes a rating that the performance of the PAF is 'about same' as that of the CMA's current practice.

Summary statistics are presented in Table 17. The criteria are listed in the table in descending order of mean performance score for all respondents. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of performance of the PAF method against that criterion relative to that of the CMA's current practice. Hence, the respondents differed least (in fact not at all) in their ratings for the criteria 'is based on sound biophysical science'. They differed most in their ratings for 'provides a quantitative basis for ranking investment options'.

Table 17 reveals that the eight criteria that the PAF method scored on average *highest* against were:

1st	'makes transparent all the judgements and assumptions that need to be made';
2nd	'strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes';
Equal 3rd	'provides a quantitative basis for ranking investment options';
Equal 3rd	'provides a quantitative basis for ranking investment options across different asset classes';

Table 17: Summary statistics for performance of the standard PAF method against the various criteria: Northern Rivers CMA

Criteria: The method …	Mean PAF performance score	Rank by mean PAF performance score	Std dev. of PAF performance score
Makes transparent all the judgements and assumptions that need to be made	2.00	1	1.00
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	1.67	2	0.58
Provides a quantitative basis for ranking investment options	1.33	3	1.53
Provides a quantitative basis for ranking investment options across different asset classes	1.33	3	1.15
Helps justify investment proposals to government investors	1.33	3	0.58
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	1.33	3	0.58
Helps justify investment decisions to your CMA's regional community	1.33	3	0.58
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1.33	3	0.58
Is based on sound biophysical science	1.00	9	0.00
Avoids subjective judgments	1.00	9	1.00
Is based on sound economics	1.00	9	1.00
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	1.00	9	1.00
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	1.00	9	1.00
Accounts for the technical risks that investment options may face	0.67	14	0.58
Is consistent with the philosophy of integrated catchment management	0.33	15	0.58
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	0.33	15	0.58
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	0.33	15	0.58
Accounts for the social, bureaucratic and political risks that investment options may face	0.33	15	0.58
Can incorporate local knowledge and values	0.00	19	1.00
Is practical to apply given the skills and time available to CMA staff	-2.00	20	1.00

Equal 3rd	‘helps justify investment proposals to government investors’;
Equal 3rd	‘accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment’;
Equal 3rd	‘helps justify investment decisions to your CMA’s regional community’; and
Equal 3rd	‘strengthens your CMA's confidence that the prioritised investments represent ‘value for money’’.

The two criteria that the PAF method scored on average *lowest* against were:

19th	‘can incorporate local knowledge and values’; and
20th	‘is practical to apply given the skills and time available to CMA staff’.

The mean scores against all but two of the criteria are positive, signifying that respondents on average rated the performance of the PAF method against 18 of the 20 criteria as superior to current practice. Respondents on average rated the performance of this method against the criteria ‘can incorporate local knowledge and values’ as equal to current practice. Against the criteria ‘is practical to apply given the skills and time available to CMA staff’ they rated the performance of the PAF method as (substantially) inferior to current practice.

In Table 18 the criteria are ranked in descending order of their mean importance scores, as in Table 16, with the mean score for the PAF method’s relative performance against each criterion also presented. We can see from this table that the criterion ‘is practical to apply given the skills and time available to CMA staff’ was ranked equal 3rd in importance for this CMA. Hence, the fact that respondents on average rated the performance of the PAF method against this criterion as (substantially) inferior to current practice signals a real hurdle that needs to be addressed if this CMA is to adopt this method. The criterion against which the PAF method was perceived on average to perform best (compared with current practice) – ‘makes transparent all the judgements and assumptions that need to be made’ – was ranked equal 11th based on mean criterion importance scores for this CMA.

Aside from the 20 criteria pre-specified in Table A, respondent S3 from this CMA suggested that one further criterion was relevant to their CMA in choosing an evaluation method. This was ‘additionality – ensures outcomes invested in are over and above what would happen in the usual course of events. This criterion was ranked by this respondent equal first in importance with five of the pre-specified criteria.

Rating how worthwhile was the experience of trialling the standard PAF method

The three Northern Rivers CMA respondents participating directly in the trials of the PAF method were asked ‘How worthwhile for you was the experience of completing INFFER’s PAF?”. Of these respondents, one answered that their experience had been highly worthwhile and two answered it had been moderately worthwhile (the remaining unutilised options were ‘slightly worthwhile’ and ‘not at all worthwhile’).

Respondent S1 commented: ‘Although it was time consuming and we have probably given some negative feedback, the exercise was very worthwhile in terms of our learning, our options for the future of investment and being able to communicate with future investors on this method’.

Table 18: Mean performance of the standard PAF method against the various criteria (listed in descending order of perceived importance): Northern Rivers CMA

The method … Criteria:	Ranking by mean criterion importance score	Mean PAF performance score (n = 3)
Provides a quantitative basis for ranking investment options	1	1.33
Provides a quantitative basis for ranking investment options across different asset classes	1	1.33
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1	1.33
Is practical to apply given the skills and time available to CMA staff	4	-2.00
Helps justify investment proposals to government investors	4	1.33
Can incorporate local knowledge and values	6	0.00
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	6	1.67
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	6	1.33
Helps justify investment decisions to your CMA's regional community	6	1.33
Accounts for the technical risks that investment options may face	6	0.67
Makes transparent all the judgements and assumptions that need to be made	11	2.00
Is consistent with the philosophy of integrated catchment management	11	0.33
Accounts for the social, bureaucratic and political risks that investment options may face	11	0.33
Is based on sound biophysical science	14	1.00
Is based on sound economics	14	1.00
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	14	0.33
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	14	0.33
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	14	1.00
Avoids subjective judgments	19	1.00
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	19	1.00

Respondent S2 commented: 'There were some very good project planning and review questions contained in the PAF'. Respondent S3 commented: 'I liked the checks and balances with some questions rechecking the logic, and the section dealing with mechanisms appropriate to the problem (i.e., regulatory versus incentives, etc). Highly valuable in that there are some good elements for us to include, but not so great in terms of the time it takes. Could only justify for large projects'.

8.2 Trials of the PAF supplement

8.2.1 Workshop discussions

Comments from workshop participants in relation to each of the pre-defined questions for this phase of the trials are presented below.

C1: Is it important to account for capacity spillovers from projects when prioritising them?		
Comment code	Who? (S=staff; B=Board)	Comment
NRC1_1	S2	Yes, conceptually it's important. You've got to invest in something that makes the job easier for the next project.

C2: Does your CMA currently account for them? How?		
Comment code	Who? (S=staff; B=Board)	Comment
NRC2_1	B1 & S2	Our whole model is based on those capacity spillover effects. We haven't put numbers on them, but we do think about them. For instance, we deliberately work with the low-hanging fruit first, because that makes it easier to move on to other people. That's why we have a staged process of river planning. The first plans we do with landholders put them in a position to do other plans. But with our river reach approach there's also the 'looking over the fence' benefit, because activities are focused in particular areas rather than spread randomly across a wide landscape. It's easier to get new people onboard once you've already demonstrated what would happen.

C3: Is the PAF supplement useful in accounting for capacity spillovers from projects when evaluating them?		
Comment code	Who? (S=staff; B=Board)	Comment
NRC3_1	S1	It was interesting to think about who we are affecting, who else is going to get the benefit, who is at risk. It adds another dimension to your project. Instead of just whacking a few lumps of timber in the river to fix it, it makes you think that if you do that then who else is affected.
NRC3_2	S2	The more you think about those effects, the more ideas you'd get about filling out the form. It definitely makes you think about the capacity legacies you might get from a project, and plan for projects that have those spillover effects.
NRC3_3	S2	Whether the dollar value of the capacity spillovers is what's important I'm not sure. I suppose it does help you gauge which project is better than another, and that is important. But whether that dollar value that you're saving is actually correct, there's lots of questions about that. The form uses quite coarse distinctions in the strength of capacity spillovers – 1 %, 3% and 5% - whether that actually makes any sense I'm not sure. My question is whether it's

		worth measuring in dollars, rather than just rating the value of the capacity spillovers as low, medium or high. It's whether there's enough rigour to measure them in dollars.
NRC3_4	S3	Completing the PAF supplement form certainly raised my awareness of capacity spillover effects and the kind of thinking that is need to account for them..

C4: What difficulties did you encounter in completing the PAF supplement?		
Comment code	Who? (S=staff; B=Board)	Comment
NRC4_1	S1	I found it to be, because it was new, not an easy process.
NRC4_1	S1	Having to put figures on these capacity spillover effects wasn't easy.
NRC4_2	S2	I think it just takes time. Eventually they [capacity spillovers] come to you. You fill out the form, read it a couple of times, and then you realise there's something else you hadn't considered before. It's just we haven't done it before, we haven't valued these things.

C5: What might be done to alleviate these obstacles?		
Comment code	Who? (S=staff; B=Board)	Comment
NRC5_1	S1	It hasn't been done before. What can we do to alleviate the obstacles? It's building our confidence in our own predictions, in benchmarking.

C6: Can you see the PAF supplement method, or elements of it, being applied by your CMA?		
Comment code	Who? (S=staff; B=Board)	Comment
NRC6_1	B1	If you're going to do the first part, you'd be silly not to do the second part. It makes it a better outcome to take the capacity spillover effects into account.
NRC6_2	S1	Yes, we'd be silly not to. It'd get a better overall product for us. We have a very scrutinising community, so the more evidence and transparency we can show to them the better.

C7: If so, how self-sufficient could your CMA become in applying the PAF supplement?		
Comment code	Who? (S=staff; B=Board)	Comment
NRC7_1	S1	The same answer as before [see comments NRP6_3 and NRP6_4]. Once you're established and into it and you've got a hierarchy or structure that are going it, whether that's the "super user" model or whatever, we would be reasonably self-sufficient, but it's getting to that point.

8.2.2 Questionnaire data

The responses of the three Northern Rivers CMA staff who participated directly in trialling the supplementary PAF in respect of the 8 criteria listed in Table C are presented in Table C9 (Appendix C). Recall that a score of -3 for a criterion denotes a rating of very low performance of

the ‘supplemented PAF method’ relative to current practice, +3 denotes a rating a very high performance of the supplemented PAF method relative to current practice, and a score of 0 denotes a rating that the performance of the supplemented PAF method is ‘about same’ as that of the CMA’s current practice..

Summary statistics are presented in Table 19. The criteria are listed in the table in descending order of the mean score for the three respondents. The standard deviation for a particular criterion indicates the degree of consensus between respondents on the level of performance of the PAF method against that criterion relative to that of the CMA’s current practice. Hence, the respondents differed least in their ratings in respect of the criteria ‘helps justify investment decisions to your CMA’s regional community’ and ‘strengthens your CMA’s confidence that the prioritised investments represent ‘value for money’ and most in respect of the criterion ‘makes transparent all the judgments and assumptions that need to be made’.

The mean scores for the performance of the supplemented PAF method are positive against all of the eight criteria except ‘is practical to apply given the skills and time available to CMA staff’ (for which the mean score is -2.0). In other words, the supplemented PAF method was perceived on average by respondents from the Northern Rivers CMA as superior to the CMA’s current practice against seven of the eight criteria.

The criterion against which on average the supplemented PAF method performed best compared with current practice was ‘makes transparent all the judgments and assumptions that need to be made’. We see from Table 16 that this criterion was ranked equal 11th of the full set of 20 criteria in terms of its perceived importance on average to all respondents from this CMA for choosing an evaluation method.

Table 20 allows comparison of the mean performance score of the PAF method against each of the eight criteria with the mean performance score of the supplemented PAF method. The criteria are listed in the table in descending order of their mean importance score (based on the ordering in Table 16 of the full set of 20 criteria). The performance of the supplemented PAF method was perceived on average as superior to the standard PAF method against one of the criteria – ‘accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments’. The performance of the supplemented PAF method was perceived on average as inferior against four of the eight criteria – ‘strengthens your CMA's confidence that the prioritised investments represent ‘value for money’’, ‘helps justify investment decisions to your CMA's regional community’, ‘makes transparent all the judgements and assumptions that need to be made’ and ‘avoids subjective judgments’. The two methods were perceived on average as performing equally well against the three criteria ‘helps justify investment proposals to government investors’, ‘is practical to apply given the skills and time available to CMA staff’ and ‘is consistent with the philosophy of integrated catchment management’.

The relevance of the PAF supplement method’s superiority against the criterion ‘accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments’ may have limited influence on this CMA’s choice of method given that this criterion was ranked on average by respondents from this CMA as only equal 14th (out of 20) in importance for choosing a method.

Rating how worthwhile was the experience of trialling the PAF supplement

The three respondents participating directly in the trials of the PAF supplement were asked ‘How worthwhile for you was the experience of completing the supplementary form to the PAF?”. Of these respondents, one answered that their experience had been highly worthwhile and two that it

Table 19: Mean performance of the supplemented PAF method (compared with current practice) against the various criteria: Northern Rivers CMA

Criteria: The method …	Mean performance score for supplemented PAF (n = 3)	Std dev.	Rank by mean performance score
Makes transparent all the judgements and assumptions that need to be made	1.67	1.15	1
Helps justify investment proposals to government investors	1.33	0.58	2
Helps justify investment decisions to your CMA's regional community	1.00	0.00	3
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1.00	0.00	3
Avoids subjective judgments	0.67	1.15	5
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	0.67	0.58	5
Is consistent with the philosophy of integrated catchment management	0.33	0.58	7
Is practical to apply given the skills and time available to CMA staff	-2.00	1.00	8

Table 20: Comparing performance of the standard PAF method and the supplemented PAF method against eight criteria: Northern Rivers CMA

Criteria: The method …	Mean importance score (n = 4)	Mean performance score for standard PAF method (n = 3)	Mean performance score for supplemented PAF method (n = 3)
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	6.00	1.33	1.00
Helps justify investment proposals to government investors	5.75	1.33	1.33
Is practical to apply given the skills and time available to CMA staff	5.75	-2.00	-2.00
Helps justify investment decisions to your CMA's regional community	5.50	1.33	1.00
Makes transparent all the judgements and assumptions that need to be made	5.25	2.00	1.67
Is consistent with the philosophy of integrated catchment management	5.25	0.33	0.33
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	5.00	0.33	0.67
Avoids subjective judgments	4.50	1.00	0.67

had been moderately worthwhile (the remaining unutilised options were ‘slightly worthwhile’ and ‘not at all worthwhile’). Recall that respect of the equivalent question for the standard PAF form that one respondent answered that their experience completing this form had been highly worthwhile, and two answered that the experience had been moderately worthwhile. Overall, therefore, the three respondents found the experience of completing the PAF supplement a less worthwhile experience than completing the standard PAF form.

Respondent S1 commented in respect of their experience in completing the PAF supplement: ‘The supplement is very useful for NRCMA as we place a very high emphasis on community’. Respondent S2 commented: ‘It made me realise the value of spill-over effects, but am still a bit sketchy on how they are being measured by this method’ Respondent S3 commented: ‘Less valuable [than the standard PAF process], but it’s a difficult concept to address. I think it is a difficult issue to address in this way (i.e., quantify), better I think to raise the issues and ensure people consider in structured way (a series of questions), but leave as qualitative. That’s my gut feel’.

9. COMPARING AND SUMMARISING FINDINGS FROM QUESTIONNAIRE DATA ACROSS THE THREE REGIONS

9.1 Trials of the PAF

9.1.1 Ratings of the importance of different criteria in choosing a method for evaluating investments

Table 21 brings together the average scores from the three CMAs in respect of their respondents' perceptions of the importance of different criteria for choosing a method to evaluate investments in natural assets. It presents also the average scores across the three CMAs, calculated as the average of the three CMAs' average scores[15]. The criteria are listed in the table in descending order of average criterion score across the three CMAs. Table 22 presents the information in Table 21 in the form of ranks of criterion importance for each CMA and the three CMAs combined.

We see from Table 22 that the three criteria ranked on average as of *greatest* importance across the three CMAs are:

- 1st ‘strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes';
- 2nd ‘strengthens your CMA's confidence that the prioritised investments represent ‘value for money'’; and
- 3rd ‘is practical to apply given the skills and time available to CMA staff'.

The high rankings for the first two of these criteria would be encouraging for the INFFER team given the focus in their method of achieving biophysical outcomes and value for money. The fact that the criterion ‘strengthens your CMA's confidence that the prioritised investments represent ‘value for money'’ was ranked by the three CMAs combined considerably higher than the criterion ‘is based on sound economics' (ranked equal 13th across the three CMAs) indicates perception that that sound economics is not needed for assessing value for money and/or the simplifications of the PAF method from sound economics (i.e., from the conventional approach to benefit-cost analysis) do not detract significantly from its ability to assess value for money. The third highest ranking for the criterion ‘is practical to apply given the skills and time available to CMA staff' also coincides with the focus of the INFFER team, although, as we have seen in sections 6.1.2, 7.1.2 and 8.1.2**,** they have had appreciably less success in achieving perceptions from respondents in the three CMAs that they have delivered on this focus.

The three criteria ranked on average as of *least* importance across the three CMAs are:

- 18th ‘recognises the benefits from investing in innovative investment options rather than just 'tried and true' options';
- 19th ‘avoids subjective judgments'; and
- 20th ‘identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals'.

[15] This is different from calculating average scores across the full set of 21 respondents (nine from Border Rivers – Gwydir CMA, eight from Namoi CMA and four from Northern Rivers CMA). Calculating the average scores in this way would have given greater weight to CMAs with larger numbers of respondents.

Table 21: Mean scores for criterion importance, for each CMA and the three CMAs combined

Criteria: / The method …	Average score for criterion importance by CMA*			Average score for criterion importance across the 3 CMAs (n = 21)
	Border Rivers – Gwydir (n = 9)	Namoi (n= 8)	Northern Rivers (n = 4)	
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	6.22	6.13	5.50	5.95
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5.78	5.88	6.00	5.89
Is practical to apply given the skills and time available to CMA staff	6.00	5.38	5.75	5.71
Can incorporate local knowledge and values	5.56	6.00	5.50	5.69
Makes transparent all the judgements and assumptions that need to be made	5.89	5.75	5.25	5.63
Is based on sound biophysical science	6.11	5.63	5.00	5.58
Helps justify investment decisions to your CMA's regional community	5.67	5.50	5.50	5.56
Provides a quantitative basis for ranking investment options	5.33	5.25	6.00	5.53
Helps justify investment proposals to government investors	5.33	5.50	5.75	5.53
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	5.22	5.63	5.50	5.45
Provides a quantitative basis for ranking investment options across different asset classes	5.22	4.88	6.00	5.37
Accounts for the technical risks that investment options may face	4.89	5.38	5.50	5.26
Is based on sound economics	5.00	5.38	5.00	5.13
Accounts for the social, bureaucratic and political risks that investment options may face	5.00	5.13	5.25	5.13
Is consistent with the philosophy of integrated catchment management	4.44	5.38	5.25	5.02
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	5.00	4.75	5.00	4.92
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	4.78	4.63	5.00	4.80
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	4.67	5.13	4.50	4.77
Avoids subjective judgments	5.22	4.50	4.50	4.74
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	5.00	4.13	5.00	4.71

Table 22: Rankings (in descending order) of mean criterion importance, for each CMA and the three CMAs combined

	Criterion ranking in descending order of mean importance			
	Border Rivers – Gwydir (n = 9)	**Namoi (n = 8)**	**Northern Rivers (n = 4)**	**Combined (n = 21)**
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	1	1	6	1
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5	3	1	2
Is practical to apply given the skills and time available to CMA staff	3	9	4	3
Can incorporate local knowledge and values	7	2	6	4
Makes transparent all the judgements and assumptions that need to be made	4	4	11	5
Is based on sound biophysical science	2	5	14	6
Helps justify investment decisions to your CMA's regional community	6	7	6	7
Provides a quantitative basis for ranking investment options	8	13	1	8
Helps justify investment proposals to government investors	8	7	4	8
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	10	5	6	10
Provides a quantitative basis for ranking investment options across different asset classes	10	16	1	11
Accounts for the technical risks that investment options may face	17	9	6	12
Is based on sound economics	13	9	14	13
Accounts for the social, bureaucratic and political risks that investment options may face	13	14	11	13
Is consistent with the philosophy of integrated catchment management	20	9	11	15
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	13	17	14	16
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	18	18	14	17
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	19	14	19	18
Avoids subjective judgments	10	19	19	19
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	13	20	14	20

The lowest importance ranking for the three CMAs combined of the criterion 'identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals' may be of some concern to the INFFER team given the central focus of their method on satisfying this criterion (particularly through embedding the Public: Private Benefits framework in this method (Pannell et al. 2009)).

The criterion importance rankings of the three CMAs are moderately positively correlated with each other. The Spearman's rank-order coefficient of correlation between the mean importance scores for the Border Rivers – Gwydir and Namoi CMAs is 0.66 (significant at the 0.01 level, 2-tailed). Between the mean importance scores for the Border Rivers – Gwydir and Northern Rivers CMAs it is 0.45, and between the mean importance scores for the Namoi and Northern Rivers CMAs it is also 0.45 (in both cases the coefficients are significant at the 0.05 level, 2-tailed). Some discrepancies across the three CMAs include:

- the Northern Rivers CMA's equal-1st ranking for 'provides a quantitative basis for ranking investment options across asset classes' is markedly higher than the corresponding rankings for Border Rivers – Gwydir and Namoi CMAs (equal 10th and 16th, respectively);

- the Northern Rivers CMA's equal-1st ranking for 'provides a quantitative basis for ranking investment options' is markedly higher (but less so than in the case of the previous criterion) than the corresponding rankings for Border Rivers – Gwydir and Namoi CMAs (equal-8th and 13th, respectively); and

- the Northern Rivers CMA's equal-14th ranking for 'is based on sound biophysical science' is markedly lower than the corresponding rankings for Border Rivers – Gwydir and Namoi CMAs (2nd and equal-5th, respectively).

Table 22 reveals also that:

- the criterion 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments' was ranked quite low (16th) in importance by the three CMAs combined, and by each of Border Rivers – Gwydir, Namoi and Northern Rivers CMAs (equal-13th, 17th and equal-14th, respectively);

- the criterion 'helps justify investment decisions to your CMA's regional community' was ranked by the three CMAs combined and by each CMA similarly in importance to the criterion 'helps justify investment proposals to government investors' (8th and 10th, respectively, for the three CMAs combined).

9.1.2 Performance of INFFER's PAF method relative to CMAs' current practice

Table 23 brings together the average scores from the three CMAs in respect of their respondents' perceptions of the performance of the PAF method compared with their current practice for evaluating investments in natural resource assets. It presents also the average performance scores across the three CMAs, calculated as the average of the three CMAs' average scores[16]. The criteria are listed in the table in descending order of average performance score across the three CMAs

[16] This is different from calculating average scores across the full set of 10 relevant respondents (fours from Border Rivers – Gwydir CMA, three from Namoi CMA and three from Northern Rivers CMA). Calculating the average scores in this way would have given greater weight to CMAs with larger numbers of respondents.

Table 23: Mean performance scores (compared with current practice) for the standard PAF method against the various criteria, for each CMA and the three CMAs combined

The method … Criteria:	Average score for PAF method's relative performance against criteria, by CMA*			Average score for performance against criteria across the 3 CMAs (n = 10)
	Border Rivers – Gwydir (n = 4)	Namoi (n = 3)	Northern Rivers (n = 3)	
Provides a quantitative basis for ranking investment options across different asset classes	1.75	1.33	1.33	1.47
Makes transparent all the judgements and assumptions that need to be made	1.25	1.00	2.00	1.42
Provides a quantitative basis for ranking investment options	1.75	1.00	1.33	1.36
Helps justify investment proposals to government investors	1.50	1.00	1.33	1.28
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	0.75	1.00	1.67	1.14
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	1.00	0.33	1.33	0.89
Helps justify investment decisions to your CMA's regional community	1.25	0.00	1.33	0.86
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1.25	0.00	1.33	0.86
Is based on sound economics	0.75	0.33	1.00	0.69
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	1.00	0.67	0.33	0.67
Is based on sound biophysical science	0.75	-0.33	1.00	0.47
Accounts for the social, bureaucratic and political risks that investment options may face	0.75	0.33	0.33	0.47
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	0.25	0.00	1.00	0.42
Accounts for the technical risks that investment options may face	0.75	-0.33	0.67	0.36
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	0.50	0.00	0.33	0.28
Can incorporate local knowledge and values	0.75	0.00	0.00	0.25
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	0.50	-1.00	1.00	0.17
Is consistent with the philosophy of integrated catchment management	0.25	-0.33	0.33	0.08
Avoids subjective judgments	-0.25	-0.67	1.00	0.03
Is practical to apply given the skills and time available to CMA staff	-1.25	-1.67	-2.00	-1.64

against the criteria. Table 24 presents the information in Table 23 in the form of ranks of performance against criterion for each CMA and the three CMAs combined.

Table 24 reveals that the three criteria that the PAF method performed *best* against on average across the three CMAs, compared with the CMAs' current evaluation practices, were:

1st	'provides a quantitative basis for ranking investment options across different asset classes';
2nd	'makes transparent all the judgements and assumptions that need to be made'; and
3rd	'provides a quantitative basis for ranking investment options'.

Each of these criteria was indeed emphasised strongly in developing the PAF method. The higher performance ranking against 'provides a quantitative basis for ranking investment options across different asset classes' than against 'provides a quantitative basis for ranking investment options' is consistent with the fact that the PAF method differs more from the CMAs' current practice in terms of the first of these (the CMAs already apply environmental benefit indices or other tools to quantitatively rank investment options within asset classes, but they lack quantitative methods for ranking options across asset classes).

The three criteria that the PAF method performed *worst* against on average across the three CMAs, compared with the CMAs' current evaluation practices, were:

18th	'is consistent with the philosophy of integrated catchment management';
19th	'avoids subjective judgments'; and
20th	'is practical to apply given the skills and time available to CMA staff'.

The criterion 'is practical to apply given the skills and time available to CMA staff' was the only one against which the performance of the PAF method was rated lower on average by the three CMAs than their current practices. As observed above, this criterion was strongly emphasised in developing the PAF method. The PAF method's bottom-ranking and inferior performance against this criterion across the three CMAs indicates a need to find ways for the CMAs to perform better against it (e.g., through greater resourcing, training and provision of outside support). The INFFER team is well aware of resistance by some regional NRM bodies to applying INFFER because the process is perceived as:

> … too long and is too cumbersome …The team has made a concerted effort to simplify the process in response to feedback, and have also entertained (briefly) the idea of 'allowing' a simpler INFFER (basically just key questions). … The INFFER team is now inclined to take a hard line on requests to further simplify INFFER. Our view is that it has already been simplified to the point where it does not contain anything that should be considered optional, and in fact represents a basic level of due diligence for the expenditure of millions of dollars of public funds (Marsh et al. 2010 p. 16).

The PAF performance rankings of the three CMAs against the various criteria are moderately to fairly strongly positively correlated with each other. The Spearman's rank-order coefficient of correlation between the mean performance scores for the Border Rivers – Gwydir and Namoi CMAs is 0.77. Between the mean performance scores for the Border Rivers – Gwydir and Northern

Table 24: Rankings (in descending order) of mean performance of the standard PAF method against the various criteria, for each CMA and the three CMAs combined

The method … Criteria:	Criterion ranking in descending order of mean performance			
	Border Rivers – Gwydir (n = 4)	Namoi (n = 3)	Northern Rivers (n = 3)	Combined (n = 10)
Provides a quantitative basis for ranking investment options across different asset classes	1	1	3	1
Makes transparent all the judgements and assumptions that need to be made	4	2	1	2
Provides a quantitative basis for ranking investment options	1	2	3	3
Helps justify investment proposals to government investors	3	2	3	4
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	9	2	2	5
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	7	7	3	6
Helps justify investment decisions to your CMA's regional community	4	10	3	7
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	4	10	3	7
Is based on sound economics	9	7	9	9
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	7	6	15	10
Is based on sound biophysical science	9	15	9	11
Accounts for the social, bureaucratic and political risks that investment options may face	9	7	15	12
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	17	10	9	13
Accounts for the technical risks that investment options may face	9	15	14	14
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	15	10	15	15
Can incorporate local knowledge and values	9	10	19	16
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	15	19	9	17
Is consistent with the philosophy of integrated catchment management	17	15	15	18
Avoids subjective judgments	19	18	9	19
Is practical to apply given the skills and time available to CMA staff	20	20	20	20

Rivers CMAs it is 0.65, and between the mean importance scores for the Namoi and Northern Rivers CMAs it is 0.58. All three correlations are significant at the 0.01 level, 2-tailed. Notable discrepancies across the three CMAs include:

- the Northern Rivers CMA's equal-15th ranking for 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments is markedly lower than the corresponding rankings for Border Rivers – Gwydir and Namoi CMAs (equal-7th and 6th, respectively);

- the Border Rivers - Gwydir CMA's equal-9th ranking for 'strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes' is markedly lower than the corresponding rankings for Namoi and Northern Rivers CMAs (equal-2nd and 2nd, respectively);

- the Northern Rivers CMA's 19th ranking for 'can incorporate local knowledge and values' is markedly lower than the corresponding rankings for Border Rivers – Gwydir and Namoi CMAs (equal-10th and equal-9th, respectively); and

- the Northern Rivers CMA's equal-9th ranking for 'avoids subjective judgments' is markedly higher than the corresponding rankings for Border Rivers – Gwydir and Namoi CMAs (19th and 18th, respectively).

Table 24 reveals also that:

- the relative performance of the PAF method against the criterion 'identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals' was ranked quite low (15th) for the three CMAs combined. This perception from the CMAs runs against the considerable effort invested by the INFFER team in satisfying this criterion;

- the relative performance of the PAF method against the criterion 'is consistent with the philosophy of integrated catchment management' was also ranked lowly (18th) for the three CMAs combined;

- the relative performance of the PAF against the criteria 'strengthens your CMA's confidence that the prioritised investments represent 'value for money'' and 'is based on sound economics' was ranked similarly for the three CMAs combined (equal-7th and 9th, respectively); and

- the criteria 'helps justify investment proposals to government investors' was ranked slightly higher across the three CMAs than 'helps justify investment decisions to your CMA's regional community' (4th and 7th, respectively).

9.1.3 Rating how worthwhile was the experience of trialling the PAF method

All ten respondents from the three CMAs participating directly in the trials of the PAF method were asked 'How worthwhile for you was the experience of completing INFFER's PAF?' The distributions of responses to this question for each CMA and the three CMAs combined are presented in Table 25. We see that six of all 10 respondents across the three CMAs rated the experience as moderately worthwhile, three as highly worthwhile, one as slightly worthwhile, and none as not at all worthwhile. The proportionate distribution across the rating levels was similar across the three CMAs.

Table 25: Ratings from each CMA and overall in response to the question ‘How worthwhile for you was the experience of completing INFFER’s PAF?’

How worthwhile?	Ratings from respondents in each CMA			Total across the three CMAs
	Border Rivers - Gwydir	Namoi	Northern Rivers	
Highly	1	1	1	3
Moderately	2	2	2	6
Slightly	1	0	0	1
Not at all	0	0	0	0
Total	4	3	3	10

9.2 Trials of the PAF supplement

9.2.1 Performance of the supplemented PAF method relative to CMAs' current practice

Table 26 brings together the average scores from the three CMAs in respect of their respondents' perceptions of the performance of the *supplemented* PAF method compared with their current practice for evaluating investments in natural resource assets. It presents also the average performance scores across the three CMAs, calculated as the average of the three CMAs' average scores[17]. The criteria are listed in the table in descending order of average performance score across the three CMAs against the criteria. Table 27 presents the information in Table 26 in the form of ranks of performance against criterion for each CMA and the three CMAs combined.

Table 27 reveals that the five criteria that the supplemented PAF method performed *best* against on average across the three CMAs (i.e., ranked down to equal 3rd), compared with the CMAs' current evaluation practices, were:

1st	'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments';
2nd	'makes transparent all the judgements and assumptions that need to be made';
Equal 3rd	'strengthens your CMA's confidence that the prioritised investments represent 'value for money'';
Equal 3rd	'helps justify investment proposals to government investors'; and
Equal 3rd	'helps justify investment decisions to your CMA's regional community'.

The finding that the supplemented PAF method was rated to perform best on average across the three CMAs against the criterion 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments' – compared with their current evaluation practices – is encouraging given that the supplementation of the standard PAF method was designed explicitly to satisfy this criterion.

The three criteria that the supplemented PAF method performed *worst* against on average across the three CMAs, compared with the CMAs' current evaluation practices, were:

18th	'avoids subjective judgments';
19th	'is consistent with the philosophy of integrated catchment management'; and
20th	'is practical to apply given the skills and time available to CMA staff'.

[17] This is the same in this case as calculating average scores across the full set of nine relevant respondents (three from each of the CMAs), given that the number of respondents is the same for each CMA.

Table 26: Mean performance of the supplemented PAF method against eight criteria, for each CMA and the three CMAs combined

The method … Criteria:	Mean performance score for supplemented PAF method			
	Border Rivers – Gwydir (n = 3)	Namoi (n = 3)	Northern Rivers (n = 3)	Combined (n = 9)
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	2.00	1.67	0.67	1.45
Makes transparent all the judgements and assumptions that need to be made	1.67	0.67	1.67	1.34
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1.00	0.67	1.00	0.89
Helps justify investment proposals to government investors	1.00	0.33	1.33	0.89
Helps justify investment decisions to your CMA's regional community	1.33	0.33	1.00	0.89
Avoids subjective judgments	1.00	0.00	0.67	0.56
Is consistent with the philosophy of integrated catchment management	1.00	0.33	0.33	0.55
Is practical to apply given the skills and time available to CMA staff	-0.67	-1.00	-2.00	-1.22

Table 27: Rankings (in descending order) of mean performance of the supplemented PAF method (relative to current practice) against eight criteria, for each CMA and the three CMAs combined

The method … Criteria:	Criterion ranking in descending order of mean performance			
	Border Rivers – Gwydir (n = 3)	Namoi (n = 3)	Northern Rivers (n = 3)	Combined (n = 9)
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	1	1	5	1
Makes transparent all the judgements and assumptions that need to be made	2	2	1	2
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	4	2	3	3
Helps justify investment proposals to government investors	4	4	2	3
Helps justify investment decisions to your CMA's regional community	3	4	3	3
Avoids subjective judgments	4	7	5	6
Is consistent with the philosophy of integrated catchment management	4	4	7	7
Is practical to apply given the skills and time available to CMA staff	8	8	8	8

9.2.2 Performance of the supplemented PAF method relative to the standard PAF method

Table 28 allows comparison of the mean performance score of the PAF method against each of the eight criteria with the mean performance score of the supplemented PAF method. The criteria are listed in the table in descending order of their mean importance score (based on the ordering in Table 22 of the full set of 20 criteria). The performance of the supplemented PAF method was perceived on average across the three CMAs as *superior* to the standard PAF method against the following six of the eight criteria (although the superiority against the 1st and 3rd of the criteria listed below was negligible):

- 'strengthens your CMA's confidence that the prioritised investments represent 'value for money'';
- 'is practical to apply given the skills and time available to CMA staff';
- 'helps justify investment decisions to your CMA's regional community';
- 'is consistent with the philosophy of integrated catchment management';
- 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments'; and
- 'avoids subjective judgments'.

The superiority of the supplemented PAF method compared with the standard PAF method was greatest in absolute terms against the criterion 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments'. The mean performance scores for these two methods against this criterion were 1.45 and 0.67, respectively. This is again encouraging given that the supplementation to the PAF method was designed explicitly to improve its performance against this criterion. Nevertheless, the influence of this superiority on motivating adoption by the CMAs of the supplemented PAF method may be limited given that this criterion was ranked across the three CMAs only 16th in importance out of 20 criteria for choosing a method to evaluate investments in natural assets (see Table 24).

The second greatest superiority in absolute terms of the supplemented PAF method compared with the standard PAF method was against the criterion 'avoids subjective judgments' (mean performance scores 0.56 and 0.03, respectively), and the third greatest absolute superiority was against the criterion 'is consistent with the philosophy of integrated catchment management' (mean performance scores 0.55 and 0.08, respectively). As is the case against the criterion 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments', however, both these criteria were ranked across the three CMAs as low in importance for choosing an evaluation method. 'Avoids subjective judgments' was ranked 19th in importance out of the 20 criteria, and 'is consistent with the philosophy of integrated catchment management' was ranked 15th in importance. Hence, the marked superiority of the supplemented PAF method compared with the standard PAF method against the three criteria 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments', 'avoids subjective judgments' and 'is consistent with the philosophy of integrated catchment management' may have limited positive influence on the motivations of the CMAs to adopt the supplemented PAF method.

Table 28: Comparing performance of the standard PAF method and the supplemented PAF method against eight criteria, all CMAs combined

The method … Criteria:	Mean criterion importance score (n = 21)	Mean performance score for standard PAF method (n= 10)	Mean performance score for supplemented PAF method (n = 9)
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	5.89	0.86	0.89
Is practical to apply given the skills and time available to CMA staff	5.71	-1.64	-1.22
Makes transparent all the judgements and assumptions that need to be made	5.63	1.42	1.34
Helps justify investment decisions to your CMA's regional community	5.56	0.86	0.89
Helps justify investment proposals to government investors	5.53	1.28	0.89
Is consistent with the philosophy of integrated catchment management	5.02	0.08	0.55
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	4.92	0.67	1.45
Avoids subjective judgments	4.74	0.03	0.56

The superiority of the supplemented PAF method compared with the standard PAF method was fourth greatest in absolute terms against the criterion 'is practical to apply given the skills and time available to CMA staff' (mean performance scores -1.22 and -1.64, respectively). Unlike the other three criteria against which the supplemented PAF method was rated across the three CMAs as markedly superior, this criterion was ranked high in importance (third out of 20) across these CMAs. This particular perceived superiority could therefore be expected to be a significant motivator for the CMAs to adopt the supplemented PAF method, at least compared with the standard PAF method. However, the mean performance score of this method against this criterion remains strongly negative, indicating that the task of motivating adoption of this method remains a formidable one.

The performance of the supplemented PAF method was perceived on average across the three CMAs as *inferior* to the standard PAF method against the following two of the eight criteria:

- 'makes transparent all the judgements and assumptions that need to be made'; and
- 'helps justify investment proposals to government investors'.

These two criteria were ranked across the three CMAs 5th and 8th, respectively, in importance out of the 20 criteria for choosing an evaluation method. Hence, the perceived inferiority on average of the supplemented PAF method against these two criteria, compared with the standard PAF method, may have a significant negative influence on the CMAs' motivations to choose the former over the latter.

9.2.3 Rating how worthwhile was the experience of trialling the supplemented PAF method

All nine respondents from the three CMAs participating directly in the trials of the PAF supplement were asked 'How worthwhile for you was the experience of completing the supplementary form to the PAF?' The distributions of responses to this question for each CMA and the three CMAs combined are presented in Table 29. We see that five of the nine respondents across the three CMAs rated the experience as moderately worthwhile, two as highly worthwhile, two as slightly worthwhile, and none as not at all worthwhile. Overall, the respondents from the Border Rivers – Gwydir CMA found the experience most worthwhile (one rating of highly worthwhile and two of moderately worthwhile). Overall, respondents from the Namoi CMA (two ratings of moderately worthwhile and one of slightly worthwhile) and Northern Rivers CMA (one rating of highly worthwhile, one of moderately worthwhile and one of slightly worthwhile) found the experience similarly worthwhile.

Table 30 allows comparison of respondents' ratings across the three CMAs of how worthwhile were their experiences of completing the standard PAF form and the PAF supplement, respectively. Overall, the respondents found the experience of completing the standard PAF form to be more worthwhile (three ratings of highly worthwhile, six of moderately worthwhile and one of slightly worthwhile) than of completing the PAF supplement (two ratings of highly worthwhile, five of moderately worthwhile and two of slightly worthwhile), although the difference was not large.

Table 29: Ratings from each CMA and overall in response to the question ‘How worthwhile for you was the experience of completing the supplementary form to the PAF?

How worthwhile was the experience of completing the PAF supplement?	No. of ratings from respondents in each CMA			Total
	Border Rivers - Gwydir	Namoi	Northern Rivers	
Highly	1	0	1	2
Moderately	2	2	1	5
Slightly	0	1	1	2
Not at all	0	0	0	0
Total	3	3	3	9

Table 30: Comparison of ratings from the three CMAs overall to the questions about how worthwhile were the experiences of completing the PAF and PAF supplement

How worthwhile was the experience of completing each form?	No. of ratings from the respondents across the three CMAs	
	Standard PAF	PAF supplement
Highly	3	2
Moderately	6	5
Slightly	1	2
Not at all	0	0
Total	10	9

10. SUMMARY AND CONCLUSIONS

10.1 The method trialled

The current project – 'Improving economic accountability when using decentralised, collaborative approaches to environmental decisions' – has sought to develop a method of evaluating and prioritising investments in natural resource management (NRM) that:

(i) is consistent with the 'economic way of thinking';

(ii) is within the capacity of collaborative community-based organisations (specifically regional NRM organisations) to apply proficiently;

(iii) can accommodate value systems decided collaboratively in community-based processes; and

(iv) can account for the consequences of NRM investments for community and other socio-economic capacities needed for feasible investments into the future.

The method developed for evaluating and prioritising 'asset-focussed' investments (focussed directly on achieving outcomes for specific natural resource assets) was documented in section 2 of this working paper. The foundation of this method is the Investment Framework for Environmental Resources (INFFER) developed by a multi-disciplinary team (including an economist as one of the two team leaders) in recent years (Pannell et al. 2009).

A weakness was identified in this framework in respect of criterion (iv) above. INFFER does account methodically in developing a project for a specific natural asset, and also in evaluating the project developed, for the capacities upon which the project's feasibility in meeting its goal/s depends. However, it does not account for the expected effects of implementing that project on the community and other socio-economic capacities available for other asset-focussed investments to subsequently draw upon. These 'capacity spillover' effects influence the feasibilities of these other investments (assuming fixed budgets) in realising their respective goals. Given that these effects can vary considerably between projects, not accounting for them in an evaluation process means that projects generating positive effects of this kind are not 'rewarded' in the evaluation process, and projects generating negative effects of this kind are not 'punished' in the evaluation process.

In order to overcome this weakness, a supplementary form to the Project Assessment Form (PAF) applied in Step 3 of the INFFER process was developed to be used in tandem with the PAF[18]. This tandem process, referred to in this document as the 'supplemented PAF method', was the method for evaluating asset-focussed investment options trialled with the three participating Catchment Management Authorities (CMAs) – the Border Rivers – Gwydir, Namoi and Northern Rivers CMAs (all in NSW).

A main purpose of the PAF is to collect the data needed to calculate a Benefit: Cost Index (BCI) for a project which can be used as a quantitative basis for ranking its 'economic worth' against alternative investment opportunities. The PAF supplement is designed to collect the additional data needed to calculate a modified version of the BCI (referred to herein as the Modified BCI or MBCI) that accounts for the capacity spillover effects of the project being evaluated on other areas of investment by the same CMA. The MBCI accounts for these capacity spillover effects in terms of

[18] See Appendix A for a copy of the PAF supplement form.

their combined impact on the cost of implementing the other areas of investment at a given level of feasibility.

Where the capacity spillovers are 'beneficial' overall, this is accounted for as a saving in the total cost of the other areas of investment achieving a given set of outcomes. This cost saving is deducted from the direct cost of the project being evaluated (which includes the costs of maintaining the project's intended outcomes beyond its own life) to obtain the net impact on the CMA's investment costs of implementing the project. Where the capacity spillovers are 'adverse' overall, in contrast, this is accounted for as an increase in the total cost of the other areas of investment achieving a given set of outcomes. This extra cost is added to the direct cost of the project being evaluated to obtain the net impact on the CMA's investment costs of implementing the project.

The BCI is calculated by dividing a project's estimated benefits by its own direct cost. Estimating the benefits involves assigning a score for the relative value of the asset on which the project is focused and then calculating, using various parameter values estimated in the process of completing the PAF, the expected proportionate impact of the project on that relative value. In contrast, the MBCI is calculated by dividing a project's estimated benefits by the project's net impact on the CMA's investment costs.

10.2 The trials

The supplemented PAF method was trialled on three assets selected by the Border Rivers – Gwydir CMA, two assets selected by the Namoi CMA, and three assets selected by the Northern Rivers CMA. The trial process commenced with a two-day training session on INFFER and the PAF run in Armidale for the three CMAs. The CMAs then proceeded to select the specific natural assets to focus on and to complete PAFs for each of these assets. Resource and time limitations meant it was not possible to identify these assets through Steps 1 and 2 of the INFFER process designed to list and map all significant assets in a region and methodically narrow this list to a set small enough that it becomes affordable to run each of the remaining asset through the PAF process. Rather, each CMA devised its own criteria for selecting the 2-3 assets to focus on in the trials and teleconferences with the INFFER team were used to assess whether it would be appropriate to apply the PAF to each asset as it had been defined. In some cases this led to significant revision of the asset definitions and the corresponding outcome goals set for the assets.

The INFFER team and the present author provided feedback on drafts of the various PAFs as they progressed. Once the full set of eight PAFs was nearing completion, the present author ran a half-day training session for each CMA on the PAF supplement and the reasoning behind it. The PAF supplement form was revised on the basis of useful feedback received during these training sessions. The present author provided feedback on drafts of the various PAF supplements as they progressed. Ultimately, PAFs for seven of the eight assets were completed to the stage that all parameter values required to calculate a BCI had been assigned. Although the remaining PAF was well-progressed, a few of the parameter values were yet to be decided at the time of reviewing the trials. PAF supplements for all eight assets were completed to the stage that the additional parameter values needed to calculate an MBCI for each asset could be calculated. However, an MBCI could not be calculated for the one asset for which some of the PAF parameter values were yet to be assigned.

The trial process ran from August 2009, when the INFFER training session was held, until February 2010. The process took longer than scheduled (completion was scheduled for November 2009) for a number of reasons. The primary reason for delays was that the method trialled is appreciably more time-consuming and challenging than the investment evaluation processes the staff involved had become accustomed to. Although the 'help-desk' support provided during the course of the trials

seemed to be well appreciated, the fact that it generally led to an iterative process of revising the forms meant that the trials tended to lose momentum as they proceeded and as other pressing work commitments for the participating staff appeared on their horizons. Since the trials were an 'add-on' activity for the CMAs, it was often difficult for the staff involved to maintain their focus on this activity when demands on their time of 'core' CMA activities arose. The challenge of maintaining momentum in applying the method trialled would likely be much reduced were the method to be embedded as a core activity of the CMAs.

Accounting for capacity spillovers from projects by using the Modified BCI, rather than the (standard) BCI, to rank projects changed the ranking of projects for one of the three CMAs. Given the small number of projects (two or three) being compared for each CMA, it would not have been unexpected if projects rankings were unaffected.

10.3 Reviewing the trials

Workshops were run with each of the three CMAs to review their experiences in trialling the supplemented PAF method. These were attended by the CMA staff who had participated in the trials and in some cases by CMA Board members or other CMA staff. Each workshop included a teleconference with the INFFER team in order that its members could share in the feedback on the trials of the PAF, offer responses and answer questions

Reviewing the trials also involved a questionnaire designed to obtain quantitative data on how the trials had been perceived. The questionnaire included included three tables – A, B and C – of items requiring rating-style responses, and a number of additional questions. Table A lists 20 criteria identified as relevant to CMAs in choosing a method for evaluating asset-focussed investments. All respondents were asked to complete this part of the questionnaire. Table B lists the same set of criteria. Respondents were asked to rate (along a seven-point scale from 'much worse' to 'much better') the performance of the PAF method, compared with their CMA's current practice, against each of these criteria. Table C lists a subset of eight of the criteria. These were chosen to rate (along the same seven-point scale) the performance of the supplemented PAF method compared with their CMAs current practice. The additional questions asked those who had participated in the trials of the PAF and PAF supplement how worthwhile their experiences in doing so had been.

The questionnaire was distributed to all 14 attendees at the review workshops, and each CMA was asked to distribute it to the members of its Board. Only the staff who participated directly in the trials were asked to complete the entire questionnaire. Others were asked only to rate the relative importance to their CMA of the various criteria listed in Table A for choosing an evaluation method. Table A was completed by 21 respondents (including six responses from members of two of the Boards and a joint response from the other Board). Table B, and the question about how worthwhile the PAF trial experiences had been, were completed by ten respondents. Table C, and the question about how worthwhile the PAF supplement trial experience had been, were completed by nine respondents.

10.4 Findings from reviewing trials of the PAF

10.4.1 Findings from workshop discussions

The perceived *strengths* of the PAF method compared with the CMAs' current approaches include:

- broadening the range of assets and projects considered when evaluating investment opportunities;

- prompting a more rigorous process of thinking about project development;
- an ability to compare all kinds of projects (e.g., large or small, across different asset classes, etc.);
- accounting better for risks to project success;
- providing increased transparency;
- facilitating adaptive learning by better documenting all the assumptions and judgements made; and
- being better at identifying information gaps.

The perceived *weaknesses* of the PAF method compared with the CMAs' current approaches include:

- requiring considerably more time and effort to apply, at least until users become skilled in its use;
- impractical to apply to the numbers of projects that CMAs have been investing in;
- the language used in the PAF needs some translation if PAF results are to be used by CMAs as evidence of compliance with the NSW Standard for Quality NRM; and
- it is less valuable in the current funding environment than previously when CMAs had greater discretion over how to allocate funds between alternative investment opportunities.

The perceived *obstacles* to applying the PAF method include:

- organisational inertia;
- obtaining a 'critical mass' within CMA staff of the awareness and skills needed to apply the method on an organisation-wide basis and justify it to community and other stakeholders;
- obtaining consistency across a CMA in how the PAF is applied to competing investment opportunities; and
- community pressures to spread investment funds broadly rather than target them strategically.

Actions to overcome such obstacles to applying the PAF method include:

- organisation-wide training (i.e., for CMA staff and Board members);
- establishing a protocol for quality assurance in how the method is applied across a CMA;
- a decision by a CMA's General Manager and Board to adopt the method; and

- a return to longer-term (e.g., 3-year or 5-year) funding cycles which would allow CMAs more time for strategically planning investments.

Each of the three CMAs could envisage applying the PAF method to at least some of their investment decisions. Participants at the review workshop with Border Rivers – Gwydir CMA could envisage applying it for investment priority setting under government funding programs (e.g., the NSW Catchment Action program) where CMA flexibility is not unduly limited by pre-determined program priorities. Participants at the review workshop with Namoi CMA could see the PAF method being used to rank projects under consideration within its annual investment cycle (particularly those that would be targeted at the Catchment Action program). They saw it of value also to their CMA in prompting a greater focus on the feasibility of projects when they are being developed. Participants at the review workshop with Northern Rivers CMA also saw the PAF method as useful in strengthening the feasibility of the projects it puts forward for funding. They saw it also of value as a guide to how funds allocated annually to each of their CMA's two major programs should be allocated between particular projects.

10.4.2 Findings from questionnaire data

Of the 20 criteria listed in the questionnaire as relevant to CMAs in choosing a method to evaluate asset-focussed investments, the three ranked on average as of *greatest* importance across the three CMAs were:

1st ‘strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes';

2nd ‘strengthens your CMA's confidence that the prioritised investments represent ‘value for money'’; and

3rd ‘is practical to apply given the skills and time available to CMA staff'.

The high rankings for these three criteria are highly consistent with the emphases of INFFER generally and its PAF method in particular.

The three criteria ranked on average as of *least* importance across the three CMAs were:

18th ‘recognises the benefits from investing in innovative investment options rather than just 'tried and true' options';

19th ‘avoids subjective judgments'; and

20th ‘identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals'.

The lowest importance ranking for the three CMAs combined of the criterion ‘identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals' runs against the strong emphasis placed on this criterion in developing the PAF method.

The three criteria that the PAF method performed *best* against on average across the three CMAs, compared with their current evaluation practices, were:

1st ‘provides a quantitative basis for ranking investment options across different asset classes';

2nd ‘makes transparent all the judgements and assumptions that need to be made’; and

3rd ‘provides a quantitative basis for ranking investment options’.

Each of these criteria was emphasised strongly in developing the PAF method.

The three criteria that the PAF method performed *worst* against on average across the three CMAs, compared with the CMAs’ current evaluation practices, were:

18th ‘is consistent with the philosophy of integrated catchment management’;

19th ‘avoids subjective judgments’; and

20th ‘is practical to apply given the skills and time available to CMA staff’.

The criterion ‘is practical to apply given the skills and time available to CMA staff’ was the only one against which the performance of the PAF method was rated lower on average by the three CMAs than their current practices. As observed above, this criterion was ranked across the three CMAs the third most important criterion for choosing an evaluation method. Despite close attention to this criterion in developing the PAF method, it is evident that the CMAs are not convinced enough has been done in this direction.

Of the ten questionnaire respondents who participated in trialling the PAF method, three rated this experience as highly worthwhile, six as moderately worthwhile, and one as slightly worthwhile.

10.5 Findings from reviewing trials of the PAF *supplement*

10.5.1 Findings from workshop discussions

The perceived *strengths* of the PAF supplement method compared with the CMAs’ current approaches include:

- raising awareness of the capacity spillover effects of projects;
- accounting for capacity spillovers quantitatively rather than intuitively; and
- revealing the difference that accounting for a project’s capacity spillovers makes to its (M)BCI and to its ranking vis-à-vis other projects.

The perceived *weaknesses* of the PAF supplement method compared with the CMAs’ current approaches include:

- lack of information and evidence on which to predict the kinds of capacity spillovers that may occur and what their strength might be;
- the method’s need for predictions of CMA investment budgets ten years ahead, and for predictions of how budgets will be apportioned between different areas of

investment, is difficult to satisfy in the current environment where funding is short-term and CMAs have limited autonomy in how funds are to be used[19].

The perceived *obstacles* to applying the PAF supplement method include:

- CMA staff are often not familiar with thinking about capacity spillovers from projects; and
- difficulty of articulating what capacity spillovers might be expected from a particular project rather than from a CMA's investments more generally.

Opportunities that were identified for addressing perceived weaknesses in the PAF supplement method and perceived obstacles to its application include:

- ensuring that the process of completing the PAF supplement is a collective effort, since group discussion on the basis of shared knowledge and experience tends to be invaluable for anticipating capacity spillovers and gauging their likely strength;
- including in the manual for the PAF supplement form a standard list of capacity spillovers that users of the form could use as a basis for identifying those relevant to their particular context;
- providing greater guidance in the manual for the PAF supplement on the multiplier values relevant for measuring the strength of particular kinds of capacity spillover;
- CMAs recording in a dedicated database the capacity spillovers identified for different projects, and the multiplier values assigned to them, so such an accumulating database can be used as a guide for setting multiplier values for subsequent projects;
- adding to existing CMA monitoring and evaluation processes to collect the kinds of data required to increase confidence in the identification of capacity spillovers and in quantifying their effects; and
- using sensitivity testing as a means of dealing with uncertainties regarding the values of multipliers, future investment budgets and future apportionments of those budgets.

Each of the three CMAs could envisage applying the PAF supplement method to at least some of their investment decisions. Participants at the review workshop with Border Rivers – Gwydir CMA could envisage applying this method were its use simplified by standardising to some extent the identification of capacity spillovers and estimation of the strength of their effects. Participants at the review workshop with Namoi CMA could see their CMA applying the method, although they wanted to undertake further testing of the method to better appreciate its sensitivity to the multiplier values assigned to capacity spillovers. Participants at the review workshop with Northern Rivers CMA could see their CMA applying the method as a way of helping them to better justify investment priority-setting decisions to their community stakeholders.

[19] This perceived weakness was not actually identified in a review workshop, but rather during the meeting with staff of Namoi CMA held on 16th December 2009 at which the PAF supplement method was explained.

10.5.2 Findings from questionnaire data

The performance of the supplemented PAF method compared with the CMAs' current practice was rated by respondents against eight of the full set of criteria referred to in section 10.4.2. Hence, the perceived performance of the PAF and PAF supplement methods can be compared against these eight criteria. The performance of the supplemented PAF method was perceived on average across the three CMAs as *superior* to the standard PAF method against the following six of these criteria (although the superiority against the 1st and 3rd of the criteria listed below was negligible):

- 'strengthens your CMA's confidence that the prioritised investments represent 'value for money'';
- 'is practical to apply given the skills and time available to CMA staff';
- 'helps justify investment decisions to your CMA's regional community';
- 'is consistent with the philosophy of integrated catchment management';
- 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments'; and
- 'avoids subjective judgments'.

The superiority of the supplemented PAF method compared with the standard PAF method was greatest in absolute terms against the criterion 'accounts for the effects of investment options on the community and other capacities needed for your CMA's ongoing investments'. This is encouraging given that the supplementation of the PAF method was designed explicitly to improve its performance against this criterion. Nevertheless, the influence of this superiority on motivating adoption by the CMAs of the supplemented PAF method may be limited given that this criterion was ranked across the three CMAs only 16th in importance out of 20 criteria for choosing a method to evaluate asset-focussed investments.

The performance of the supplemented PAF method was perceived on average across the three CMAs as *inferior* to the standard PAF method against the following two of the eight criteria:

- 'makes transparent all the judgements and assumptions that need to be made'; and
- 'helps justify investment proposals to government investors'.

As was true for the PAF method, the criterion 'is practical to apply given the skills and time available to CMA staff' was the only one against which the perceived performance of the supplemented PAF method was rated lower on average by the three CMAs than that of their current practices. This criterion was ranked across these CMAs the third most important criterion for choosing an evaluation method, however, so poor perceived performance against this criterion remains a significant hurdle to be straddled in gaining adoption of the supplemented PAF method.

Of the nine respondents from the three CMAs who participated directly in trialling the PAF supplement, two rated the experience as highly worthwhile, five as moderately worthwhile, and two as slightly worthwhile. The ten respondents who participated in trialling the PAF tended to find completing this form a more worthwhile experience (three ratings of highly worthwhile, six of moderately worthwhile and one of slightly worthwhile) than that of completing the PAF supplement (although the difference was not large).

10.6 Closing comments

We observed in section 1 that methods of evaluating and prioritising investment decisions are value articulating institutions. An economic choice between them should therefore be guided by what economists refer to as the comparative institutions approach. This approach recognises the real-world constraints on implementing institutional alternatives such that few alternatives are implemented as ideally intended. Accordingly, it compares the alternatives as they would actually be implemented. Among these real-world constraints are the preferences that intended users apply when assessing the value to them of the alternatives. All else equal, we can expect a given alternative's quality of implementation to be higher the closer its attributes match the preferences of intended users.

Representatives from the three participating CMAs indicated their preferences for attributes of a method for evaluating investments when, in responding to the review questionnaire (see section 10.3), they rated the relative importance of various criteria for choosing such a method. They also rated the performance of the standard and supplemented PAF methods, compared with their CMAs' current evaluation practices, against these criteria. Analysis of the questionnaire data indicates that the emphasis of these methods on an economic way of thinking is well-matched with these users' preferences given the high importance rating they gave on average to the criterion, 'Strengthens your CMAs confidence that prioritised investments represent 'value for money''. Moreover, both the standard and supplemented PAF methods were rated on average as performing better against this criterion than the CMAs' current evaluation practices. Indeed, both these methods were rated on average as performing better against all but one of the listed criteria than current practice. However, the criterion against which these methods were rated on average as performing worse than current practice – 'Is practical to apply given the skills and time available to CMA staff' – was rated on average the third most important out of the 20 listed. Moreover, performance of these methods against this criterion was rated on average as *substantially* worse than current practice.

It seems therefore that the three participating CMAs face formidable obstacles in proceeding to adopt the supplemented PAF method (or the standard PAF method for that matter) due to their perceptions that the method is less practical to apply than their current practices given the available skills of their staff and the time they have available for evaluating investments. The degree to which these obstacles actually impede adoption of the method can be lessened by finding ways to develop the requisite skills and free up staff time. As participants in the review workshops emphasised, progress in this direction may be rapid were the leadership of the CMAs to commit to applying the method, especially if external support were provided (e.g., for training staff and providing quality assurance). Any such obstacles could also be mitigated by strengthening CMAs' incentives to adopt evaluation methods likely to increase the value of benefits obtained from their investments. Such incentives could be strengthened significantly by investing governments prioritising more systematically the investment funding bids they receive according to each bid's rigor in demonstrating its cost-effectiveness. A move in this direction by investing governments would increase markedly the rewards that CMAs and other regional NRM organisations perceive from evaluating their investment proposals more rigorously.

Even so, adopting the supplemented PAF method all at once may be too much to ask of most regional NRM organisations. The INFFER team has reported how it remains under pressure from such organisations to further simplify the standard PAF method. Hence, it seems advisable to work with them in gaining confidence with this method and embedding it in their cultures before expecting them to build on that method using the PAF supplement. Although discussions during the review workshops highlighted the value that CMA staff saw from the PAF supplement's accounting for capacity spillovers, they also highlighted their lack of confidence in identifying such spillovers and estimating the parameter values needed to quantify their economic impacts. Building this

confidence through learning-by-doing is probably a task that would best wait until regional NRM organisations have gained confidence and proficiency in the standard PAF process.

In the meantime, further research would help redress the lack of knowledge in this area that lessens the confidence with which regional NRM organisations currently can account for capacity spillovers from projects they propose to undertake. This research could involve a series of case studies of how asset-focused investments by such organisations in the past generated capacity spillovers that affected the feasibility of subsequent investments. It should be noted in any case that each of the three participating CMAs found the process of completing the PAF supplement form to be valuable for considering the capacity spillover effects of their proposed projects even where the information relied upon to complete the form was of low quality.

Finally, we can expect regional NRM organisations to be motivated to account for capacity spillovers when evaluating asset-focussed investment projects only to the extent they feel confident that the investments those spillovers are expected to impact upon will actually occur (and indeed that governments will continue to fund these organisations so they remain able to undertake such investments). The shift in recent years by Australian governments to shorter-term NRM funding commitments and to leaving regional NRM organisations less discretion in how funds are to be invested tends to work against this confidence. Indeed, uncertainty of such organisations regarding their own persistence, their future investment budgets and governments' future investment priorities lessens their motivation to pursue any kind of strategy of building community and socio-economic capacities that have value beyond the short term.

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APPENDIX A: THE PAF SUPPLEMENT

Supplement to the INFFER Project Assessment Form (PAF):

Accounting for consequences of the current project for the feasibility of other asset-focused investments

This supplementary form is designed to be completed after Section 4, and prior to Section 5, in the INFFER PAF. Detailed guidance on how to complete this supplementary form is provided in a supplement to the PAF Instruction Manual.

Question S.1 relates to the consequences of the 'current project' (i.e., works and actions specified in Section 2 of the PAF, and delivery mechanisms specified in Section 4) for the feasibility of your organisation's investments in protecting or enhancing natural assets more generally. We are concerned here with two aspects of socio-economic feasibility considered in the PAF. These are:

- adoptability of beneficial on-ground works and actions by landholders and other private citizens; and
- socio-political risks to achieving investment goals.

The term 'capacity spillover' describes instances where implementing the current project affects the capacities available for, and thus the feasibility of, implementing other areas of investment. Consider the following example of a *beneficial* capacity spillover from a project. A Catchment Management Authority (CMA) implements a project to connect riparian vegetation along a particular reach of river. Financial incentives are offered to landholders to fence that river reach, and extension activities are also provided. Revegetation is undertaken by the CMA. As a result of this project, the landholders in this area improve their understanding of riparian vegetation and develop stronger relationships with the CMA. This results in a beneficial capacity spillover for further investments in this area since the area's landholders will be better informed and more easily engaged.

Consider the following example of an *adverse* capacity spillover. A CMA implements a soil health project in a particular sub-catchment. Extension activities are used to encourage landholders to adopt specific on-ground practices. However, many landholders discover these practices to be less effective and more costly than they were advised. This results in an adverse capacity spillover for other investments in this subcatchment (and perhaps beyond) since landholders will be less trusting of CMA advice and thus less easily engaged.

S.1 Ongoing investment budget and its allocation

(a) Predict the average annual budget (including in-kind contributions) your organisation will have available over the next 10 years for <u>both</u> 'asset-focused' and 'capacity-focused' investments. Asset-focused investments are direct investments in protecting or enhancing your region's natural assets. Capacity-focused investments are investments in building the capacities needed for effective asset-focused investments.

Record this value here: _____ *$ million per year*

(b) Predict the average value of the annual budget (including in-kind contributions) your organisation will have available over the next 10 years for just capacity-focused investments.

Record this value here: _____ *$ million per year*

(c) Predict the average annual cost of the current project (including ongoing maintenance costs) over the next 10 years. This average cost is given by adding the upfront cost of the project to the total maintenance costs over the remaining years of the 10-year period, and then dividing this sum by 10. Note: If the responses to (a) and (b) exclude in-kind contributions, the response here should also (for consistency) exclude in-kind contributions.

Record this value here: _____ *$ million per year*

(d) Calculate the average annual budget your organisation will have available over the next 10 years for asset-focused investments other than the current project. This calculation involves adding the values from parts (b) and (c) of this question, and subtracting this sum from the value obtained in part (a).

Record this value (Q) here for calculation of the modified Benefit: Cost Index later:

Q	*$ million per year*

(e) Predict how Q will be apportioned, on average over the next 10 years, between areas of asset-focused investment other than the current project. (Note: The word 'area' here refers to a focus of investment rather than necessarily to a geographic area).

Area of investment	Proportion of *Q*
	[q1]
	[q2]
	[q3]
	[q4]
	[q5]
	[q6]
	[q7]
	[q8]
Total (should sum to 1.0)	

(f) Justification and information source(s)

S.2 Consequences of current project for private citizens' adoption of on-ground works and actions targeted by other investments

(a) List any outputs, outcomes or other effects of implementing the current project that could possibly strengthen or weaken adoption by private citizens of the kinds of on-ground works and actions targeted by any of the areas of investment listed under Question S.1(e) (either by encouraging beneficial practices or discouraging adverse practices). In compiling this list, consider the on-ground works and actions, and corresponding delivery mechanisms, which constitute the project.

(b) Consider each of the areas of investment listed under Question S.1(e), and the outputs, outcomes or other effects of the current project listed in part (a). Given the scale of the current project, its geographical proximity to these areas of investment, and other practical considerations, is the project likely to significantly affect adoption by private citizens of the on-ground works and actions targeted by any of these areas of investment?

☐ Yes: go to Question S.2(c).

☐ No: proceed to Question S.3. When transferring data from this form into the Excel file for the Modified BCI calculator, record values of "1" for *ma11-ma85* in Table 2 of the "PAF supplement values" worksheet of the file.

(c) List below all the areas of investment listed under Question S.1(e) (in the same order). For each of these, identify the various ways (if any) that adoption by private citizens of the on-ground works and actions targeted by the area of investment would be increased or decreased by implementing the current project. Choose from the following options to indicate the direction and strength of each of these effects, and insert the corresponding multiplier value in the rightmost column.

Small increase (decrease) in adoption of beneficial (adverse) practices	1.01	Small decrease (increase) in adoption of beneficial (adverse) practices	0.99
Moderate increase (decrease) in adoption of beneficial (adverse) practices	1.03	Moderate decrease (increase) in adoption of beneficial (adverse) practices	0.97
Larger increase (decrease) in adoption of beneficial (adverse) practices	1.05	Larger decrease (increase) in adoption of beneficial (adverse) practices	0.95

Where more than one such effect is listed for a particular area of investment, your rating of the strength of each subsequent effect should reflect the degree to which it amplifies or reverses the relevant effects on that area of investment of effects listed previously. The less that a particular effect is expected to influence private adoption of on-ground works and actions over and above the effects of previously-listed effects, the lower should the strength of that effect be rated.

Area of investment	Effects of current project on the adoptability of on-ground practices targeted by other areas of investment	Multiplier
		[ma11]
		[ma12]
		[ma13]
		[ma21]
		[ma22]
		[ma23]
		[ma31]
		[ma32]
		[ma33]
		[ma41]
		[ma42]
		[ma43]
		[ma51]
		[ma52]
		[ma53]
		[ma61]
		[ma62]
		[ma63]
		[ma71]
		[ma72]
		[ma73]
		[ma81]
		[ma82]
		[ma83]

(c) Briefly outline the causal links between the current project and each of the effects listed.

(d) Justification and information source(s)

S.3 Consequences of current project for socio-political risks faced by other investments

(a) List any outputs, outcomes or other effects of implementing the current project that could possibly strengthen or weaken the 'socio-political' risks faced by any of the areas of investment listed under Question S.1(e) arising from (i) non-cooperation by other organisations responsible for natural resource management; and (ii) social, administrative or political constraints. In compiling this list, consider the on-ground works and actions, and the corresponding delivery mechanisms, which constitute the project.

(b) *Consider each of the areas of investment listed under Question S.1(e), and the outputs, outcomes or other effects of the current project listed in part (a). Given the scale of the current project, its geographical proximity to these areas of investment, and other practical considerations, is the project likely to significantly affect the socio-political risks faced by any of these areas of investment?*

☐ Yes: go to Question S.3(c).

☐ No: proceed to Question S.4. When transferring data from this form into the Excel file for the Modified BCI calculator, record values of "1" for *mp11-mp85* of Table 3 in the "PAF supplement values" worksheet of the file.

(c) List below all the areas of investment listed under Question S.1(e) (in the same order). For each of these, identify the various ways (if any) the socio-political risks it faces are expected to be increased or decreased by implementing the current project. Choose from the following options to indicate the direction and strength of each of these effects, and insert the corresponding multiplier value in the rightmost column.

Small increase in risk	0.99	Small decrease in risk	1.01
Moderate increase in risk	0.97	Moderate decrease in risk	1.03
Larger increase in risk	0.95	Larger decrease in risk	1.05

Where more than one such effect is listed for a particular area of investment, your rating of the strength of each subsequent effect should reflect the degree to which it amplifies or reverses the relevant effects on that area of investment of effects listed previously. The less that a particular effect is expected to influence the socio-political risk of investment failure over and above the effects of previously-listed effects, the lower should the strength of that effect be rated.

Area of investment	Effects of current project on the socio-political risks faced by each area of investment	Multiplier
		[mp11]
		[mp12]
		[mp13]
		[mp21]
		[mp22]
		[mp23]
		[mp31]
		[mp32]
		[mp33]
		[mp41]
		[mp42]
		[mp43]
		[mp51]
		[mp52]
		[mp53]
		[mp61]
		[mp62]
		[mp63]
		[mp71]
		[mp72]
		[mp73]
		[mp81]
		[mp82]
		[mp83]

(c) Briefly outline the causal links between the current project and each of the effects listed.

(d) Justification and information source(s)

S.4 Consequences of current project for investments by other organisations

(a) Note in words any beneficial effects from the current project on the capacities of other organisations to implement asset-focused investments of their own over the next ten years.

(b) Note in words any adverse effects from the current project on the capacities of other organisations to implement asset-focused investments of their own over the next ten years.

S.5 Knowledge gaps and quality of information for this supplementary section

(a) Note key knowledge gaps in this section that may require additional research, analysis or investigation (e.g. about cause and effect relationships).

(b) Score the quality of information used to underpin your responses to questions in this supplement to INFFER's Project Assessment Form.

Very poor	Poor	Medium	Good	Very good
1☐	2☐	3☐	4☐	5☐

Consistency check S1

Are any of the multiplier values recorded under Questions S.2(b) and S.3(b) less than 1?

☐ Yes: consider modifying the project to avoid the adverse capacity spillovers responsible for these values.

☐ No: go to Section 5 of the PAF.

APPENDIX B: QUESTIONNAIRE DISTRIBUTED TO REVIEW WORKSHOP PARTICIPANTS AND CMA BOARD MEMBERS

REVIEW OF A METHOD FOR EVALUATING INVESTMENT OPTIONS FOR NATURAL ASSETS

Confidentiality: Responses to the following questions will be reported on an aggregated basis for your CMA rather than attributed to individuals. However, some disaggregation may be required to distinguish between responses from those involved directly in the trials and others participating in the review meeting.

Some general information about you:

Name of your CMA (circle as appropriate):	Border Rivers – Gwydir Namoi Northern Rivers
Your relationship to the CMA (circle as appropriate):	CMA staff CMA board Other: please specify: _____
Did you participate directly in one or more of the trials?	Yes No
Answer the next question only if your response to previous question was 'No'	
Have you attended any previous meetings about this project?	Yes No

Instructions:

The following pages contain three tables – Tables A, B and C – plus four additional questions on the final page. Participants in the trials are asked to respond to all items. Others at the review meeting are asked to respond to all items in Table A, and are also welcome to respond (on the basis of information and discussions during the meeting) to items in Tables B and C. The four questions on the final page are relevant only for participants in the trials.

Table A lists various criteria that you may, or may not, feel are relevant to your CMA in choosing a method for evaluating investments in natural assets. For each criterion, please rate what you perceive to be its importance to your CMA for this purpose – by ticking one box on a 7-point scale of importance from 'very low' to 'very high'. If any criteria relevant to your CMA are not listed in the table, please add these criteria at the bottom of the table and rate your perception of the importance of each to your CMA. Add these criteria also to the bottom of Table B and, where relevant, also to the bottom of Table C

Table B lists the same set of criteria. Within this table you are asked to rate against each criterion your perception of the performance of INFFER's PAF method of evaluating investments relative to your CMA's current practice. Please do so in respect of each criterion by ticking one box on a 7-point scale of relative performance from 'much worse' to 'much better' (the scale midpoint being 'about same').

Table C lists a subset of the full set of criteria. This subset was chosen to rate the performance of the 'supplemented PAF' method for evaluating investments relative to your CMA's current practice. (This supplemented method involves completion of INFFER's PAF as well as completion of the PAF supplement form that was developed to account for capacity spillover effects of the investment option being evaluated.) In this table, please tick one box for each criterion to indicate your perception of the supplemented PAF method's relative performance against that criterion compared with that of your CMA's current practice. Again a 7-point scale is used, where relative performance ranges from 'much worse' to 'much better' (with 'about same' being the scale midpoint).

Suggestion: *Before starting to tick the boxes in each table, read the list of criteria and identify those for which you are likely to provide the lowest and highest scores. This will help avoid situations where you have left yourself insufficient latitude to tick scores higher or lower than those you have already ticked.*

TABLE A: RATING THE IMPORTANCE OF VARIOUS CRITERIA IN CHOOSING A METHOD FOR EVALUATING INVESTMENTS	**Importance of criterion**						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Criteria: The method …	**Very low**						**Very high**
Can incorporate local knowledge and values							
Makes transparent all the judgements and assumptions that need to be made							
Is based on sound biophysical science							
Provides a quantitative basis for ranking investment options							
Is practical to apply given the skills and time available to CMA staff							
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes							
Avoids subjective judgments							
Provides a quantitative basis for ranking investment options across different asset classes							
Is consistent with the philosophy of integrated catchment management							
Helps justify investment proposals to government investors							
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment							
Helps justify investment decisions to your CMA's regional community							
Is based on sound economics							
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options							
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments							
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'							
Accounts for the technical risks that investment options may face							
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals							
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive							
Accounts for the social, bureaucratic and political risks that investment options may face							
Other 1:							
Other 2:							
Other 3:							

TABLE B: COMPARING INFFER'S PAF METHOD AND YOUR CMA'S CURRENT PRACTICE AGAINST THE VARIOUS CRITERIA	**Performance of INFFER relative to current practice**						
	-3	**-2**	**-1**	**0**	**+1**	**+2**	**+3**
Criteria: The method …	**Much worse**			**About same**			**Much better**
Can incorporate local knowledge and values							
Makes transparent all the judgements and assumptions that need to be made							
Is based on sound biophysical science							
Provides a quantitative basis for ranking investment options							
Is practical to apply given the skills and time available to CMA staff							
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes							
Avoids subjective judgments							
Provides a quantitative basis for ranking investment options across different asset classes							
Is consistent with the philosophy of integrated catchment management							
Helps justify investment proposals to government investors							
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment							
Helps justify investment decisions to your CMA's regional community							
Is based on sound economics							
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options							
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments							
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'							
Accounts for the technical risks that investment options may face							
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals							
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive							
Accounts for the social, bureaucratic and political risks that investment options may face							
Other 1:							
Other 2:							
Other 3:							

TABLE C: COMPARING THE 'SUPPLEMENTED' PAF METHOD AND YOUR CMA'S CURRENT PRACTICE AGAINST SELECTED CRITERIA	**Performance of 'supplemented' PAF method relative to current practice**						
	-3	**-2**	**-1**	**0**	**+1**	**+2**	**+3**
Criteria: The method …	**Much worse**			**About same**			**Much better**
Makes transparent all the judgements and assumptions that need to be made							
Avoids subjective judgments							
Is practical to apply given the skills and time available to CMA staff							
Helps justify investment proposals to government investors							
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments							
Is consistent with the philosophy of integrated catchment management							
Helps justify investment decisions to your CMA's regional community							
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'							
Other 1:							
Other 2:							
Other 3:							

Further questions (to be answered only by those participating in the trials):

1. How much did the manual for *INFFER's Project Assessment Form* (PAF) help you when completing that form? (Circle one option)

Considerable help	Moderate help	Minor help	No help – I referred to the manual but it didn't help	No help – I didn't get around to consulting the manual	No help – I didn't need any because the form was clear enough by itself

Comment:

2. How much did the manual for the *supplementary form to the PAF* help you when completing that form? (Circle one option)

Considerable help	Moderate help	Minor help	No help – I referred to the manual but it didn't help	No help – I didn't get around to consulting the manual	No help – I didn't need any because the form was clear enough by itself

Comment:

3. How worthwhile for you was the experience of completing *INFFER's PAF*? (Circle one option)

Highly	Moderately	Slightly	Not at all

Comment:

4. How worthwhile for you was the experience of completing the *supplementary form to the PAF*? (Circle one option)

Highly	Moderately	Slightly	Not at all

Comment:

Thanks very much for your feedback.

APPENDIX C: QUESTIONNAIRE DATA

Table C1: Individual responses from Border Rivers – Gwydir CMA staff in respect of criteria listed in Table A of the questionnaire

Criteria: The method …	Score by respondent							
	S1	S2	S3	S4	S5	S6	S7	S8
Can incorporate local knowledge and values	5	4	5	7	7	5	6	5
Makes transparent all the judgements and assumptions that need to be made	5	7	5	7	5	4	7	7
Is based on sound biophysical science	6	7	4	7	5	6	7	7
Provides a quantitative basis for ranking investment options	4	5	4	7	6	6	7	5
Is practical to apply given the skills and time available to CMA staff	6	7	3	7	4	7	7	7
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	6	7	4	7	7	5	6	7
Avoids subjective judgments	4	7	2	7	6	4	6	6
Provides a quantitative basis for ranking investment options across different asset classes	4	5	4	7	6	6	6	5
Is consistent with the philosophy of integrated catchment management	5	5	2	5	5	6	3	5
Helps justify investment proposals to government investors	6	5	3	**7**	7	5	4	5
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	4	7	4	5	6	4	5	5
Helps justify investment decisions to your CMA's regional community	6	7	2	6	7	7	5	5
Is based on sound economics	5	7	2	7	6	5	4	5
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	4	6	3	6	6	3	5	4
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	6	6	3	6	6	5	3	4
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	6	7	2	7	6	6	5	6
Accounts for the technical risks that investment options may face	6	7	2	6	6	2	4	6
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	6	5	3	7	6	5	3	5
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	4	5	3	6	6	5	4	5
Accounts for the social, bureaucratic and political risks that investment options may face	6	5	2	6	6	6	3	5

Table C2: Individual responses from Border Rivers – Gwydir CMA staff in respect of the criteria listed in Table B of the questionnaire

Criteria:	Respondent scores			
The method …	**S1**	**S2**	**S3**	**S4**
Can incorporate local knowledge and values	0	3	0	0
Makes transparent all the judgements and assumptions that need to be made	1	3	0	1
Is based on sound biophysical science	0	3	0	0
Provides a quantitative basis for ranking investment options	2	3	1	1
Is practical to apply given the skills and time available to CMA staff	-1	-1	-1	-2
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	0	3	0	0
Avoids subjective judgments	1	2	-1	-3
Provides a quantitative basis for ranking investment options across different asset classes	2	3	1	1
Is consistent with the philosophy of integrated catchment management	0	1	0	0
Helps justify investment proposals to government investors	1	3	0	2
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	1	3	0	0
Helps justify investment decisions to your CMA's regional community	1	3	-1	2
Is based on sound economics	1	3	-1	0
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	0	3	-1	0
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	1	2	1	0
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1	3	0	1
Accounts for the technical risks that investment options may face	0	3	0	0
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	0	3	-1	0
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	0	1	-1	1
Accounts for the social, bureaucratic and political risks that investment options may face	1	3	-1	0

Table C3: Individual responses from Border Rivers – Gwydir CMA staff in respect of the criteria listed in Table C of the questionnaire

Criteria: The method …	Score by respondent*		
	S1	S2	S4
Makes transparent all the judgements and assumptions that need to be made	1	3	1
Avoids subjective judgments	1	3	-1
Is practical to apply given the skills and time available to CMA staff	-1	-1	0
Helps justify investment proposals to government investors	1	2	0
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	2	3	1
Is consistent with the philosophy of integrated catchment management	0	2	1
Helps justify investment decisions to your CMA's regional community	1	3	0
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1	3	-1

Table C4: Individual responses from Namoi CMA staff and Board members in respect of criteria listed in Table A of the questionnaire

Criteria:	Score by respondent							
The method …	**S1**	**S2**	**S3**	**B1**	**B2**	**B3**	**B4**	**B5**
Can incorporate local knowledge and values	6	5	7	5	6	6	7	6
Makes transparent all the judgements and assumptions that need to be made	5	7	7	4	6	5	6	6
Is based on sound biophysical science	4	7	7	3	6	7	5	6
Provides a quantitative basis for ranking investment options	5	6	6	4	4	6	6	5
Is practical to apply given the skills and time available to CMA staff	3	7	5	4	7	6	6	5
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	5	7	7	3	7	6	7	7
Avoids subjective judgments	3	5	5	4	6	5	4	4
Provides a quantitative basis for ranking investment options across different asset classes	4	5	6	5	4	5	4	6
Is consistent with the philosophy of integrated catchment management	3	6	6	4	5	6	6	7
Helps justify investment proposals to government investors	5	6	7	5	5	4	6	6
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	5	6	7	5	6	6	5	5
Helps justify investment decisions to your CMA's regional community	5	6	7	4	6	5	6	5
Is based on sound economics	4	6	7	4	5	6	5	6
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	2	6	5	5	6	5	6	6
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	3	5	6	4	6	5	4	5
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	3	7	7	5	6	6	7	6
Accounts for the technical risks that investment options may face	4	6	6	4	6	6	5	6
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	2	5	5	4	5	1	6	5
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	2	6	6	4	6	3	5	5
Accounts for the social, bureaucratic and political risks that investment options may face	3	5	7	4	5	5	6	6

Table C5: Individual responses from Namoi CMA staff in respect of the criteria listed in Table B of the questionnaire

Criteria:	Respondent scores		
The method …	**S1**	**S2**	**S3**
Can incorporate local knowledge and values	0	0	0
Makes transparent all the judgements and assumptions that need to be made	1	1	1
Is based on sound biophysical science	-1	0	0
Provides a quantitative basis for ranking investment options	1	0	2
Is practical to apply given the skills and time available to CMA staff	-2	-1	-2
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	1	0	2
Avoids subjective judgments	-2	0	0
Provides a quantitative basis for ranking investment options across different asset classes	1	1	2
Is consistent with the philosophy of integrated catchment management	-2	1	0
Helps justify investment proposals to government investors	1	2	0
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	0	1	0
Helps justify investment decisions to your CMA's regional community	0	0	0
Is based on sound economics	1	0	0
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	-2	0	-1
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	1	0	1
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	0	0	0
Accounts for the technical risks that investment options may face	-1	0	0
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	-1	0	1
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	-2	2	0
Accounts for the social, bureaucratic and political risks that investment options may face	1	0	0

Table C6: Individual responses from Namoi CMA staff in respect of the criteria listed in Table C of the questionnaire

Criteria: The method …	Score by respondent		
	S1	S2	S3
Makes transparent all the judgements and assumptions that need to be made	1	1	0
Avoids subjective judgments	-1	0	1
Is practical to apply given the skills and time available to CMA staff	-1	0	-2
Helps justify investment proposals to government investors	1	0	0
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	2	2	1
Is consistent with the philosophy of integrated catchment management	1	0	0
Helps justify investment decisions to your CMA's regional community	1	0	0
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1	0	1

Table C7: Individual responses from Northern Rivers CMA staff and Board in respect of criteria listed in Table A of the questionnaire

Criteria: The method …	Score by respondent			
	S1	S2	S3	B1
Can incorporate local knowledge and values	5	6	4	7
Makes transparent all the judgements and assumptions that need to be made	3	6	5	7
Is based on sound biophysical science	3	6	4	7
Provides a quantitative basis for ranking investment options	5	7	5	7
Is practical to apply given the skills and time available to CMA staff	3	7	6	7
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	5	6	4	7
Avoids subjective judgments	1	6	5	6
Provides a quantitative basis for ranking investment options across different asset classes	5	6	6	7
Is consistent with the philosophy of integrated catchment management	4	7	3	7
Helps justify investment proposals to government investors	6	6	4	7
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	4	6	6	6
Helps justify investment decisions to your CMA's regional community	5	6	4	7
Is based on sound economics	2	6	6	6
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	3	5	4	6
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	5	6	3	6
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	6	6	6	6
Accounts for the technical risks that investment options may face	6	6	4	6
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	5	6	3	6
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	6	6	3	5
Accounts for the social, bureaucratic and political risks that investment options may face	6	6	3	6

Table C8: Individual responses from Northern Rivers CMA staff in respect of criteria listed in Table B of the questionnaire

Criteria:	Respondent scores		
The method …	**S1**	**S2**	**S3**
Can incorporate local knowledge and values	-1	0	1
Makes transparent all the judgements and assumptions that need to be made	1	2	3
Is based on sound biophysical science	1	1	1
Provides a quantitative basis for ranking investment options	3	1	0
Is practical to apply given the skills and time available to CMA staff	-2	-1	-3
Strengthens your CMA's confidence that investments will achieve their intended biophysical outcomes	2	1	2
Avoids subjective judgments	0	1	2
Provides a quantitative basis for ranking investment options across different asset classes	0	2	2
Is consistent with the philosophy of integrated catchment management	0	1	0
Helps justify investment proposals to government investors	2	1	1
Accounts for the likelihood of citizens (e.g., landholders) making the behaviour changes needed for success of an investment	1	1	2
Helps justify investment decisions to your CMA's regional community	2	1	1
Is based on sound economics	2	1	0
Recognises the benefits from investing in innovative investment options rather than just 'tried and true' options	2	0	1
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	0	1	0
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	2	1	1
Accounts for the technical risks that investment options may face	0	1	1
Identifies appropriate mechanisms to motivate the various actions required for investments to achieve their goals	1	0	0
Recognises the benefits from investing in important issues that nonetheless may be controversial or divisive	2	0	1
Accounts for the social, bureaucratic and political risks that investment options may face	1	0	0

Table C9: Individual responses from Northern Rivers CMA staff in respect of the criteria listed in Table C of the questionnaire

Criteria: The method …	Score by respondent		
	S1	S2	S3
Makes transparent all the judgements and assumptions that need to be made	1	1	3
Avoids subjective judgments	0	0	2
Is practical to apply given the skills and time available to CMA staff	-2	-1	-3
Helps justify investment proposals to government investors	2	1	1
Accounts for the effects of investment options on the community & other capacities needed for your CMA's ongoing investments	1	1	0
Is consistent with the philosophy of integrated catchment management	0	1	0
Helps justify investment decisions to your CMA's regional community	1	1	1
Strengthens your CMA's confidence that the prioritised investments represent 'value for money'	1	1	1