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MLA's contribution to the environmental sustainability of the red meat industry: A stocktake of surveys and programs

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Glossary

RDC	Rural Research and Development Corporation
MLA	Meat & Livestock Australia
NRM	natural resource management
HRZ	high rainfall zone

Summary

The key output from this study has been the formation of a mapping framework that will allow MLA, moving forward, to be able to assess their contribution to the environment. The only way that MLA can realistically assess their contribution to the environment is through their impact upon the adoption of environmentally sustainable management practices. In undertaking a stocktake of surveys, this study has been able to confirm that an adoption profile can be constructed for seven management practices.

This study has also assessed whether it will be feasible to allocate the project costs associated with the promotion of these management practices, and environment-related projects more generally, to the framework. Given the current availability of information, it is not possible to allocate costs at the management practice level. In assessing the feasibility, this study has shown that it is only possible to allocate costs at a very high level, and even then, these values only represent project costs, not contribution to the environment per se.

1 Background

In the current political and economic climate, environmental issues are gaining prominence. The importance of including environmental outcomes into existing reporting frameworks is now being recognised as part of a triple-bottom-line approach across all Rural Research and Development Corporations (RDCs). In recognition of the change in the business operating environment, the Meat and Livestock Australia (MLA) are acting to incorporate environmental sustainability into their evaluation and reporting framework.

Guiding the formation of this framework is the Signpost for Agriculture framework, which was constructed for the purpose of facilitating industry in evaluating their contribution to the ecological sustainability of the industry. The Signposts for Agriculture framework will be modified to better reflect the needs of MLA and the agricultural RDC community.

The major challenge with trying to incorporate environmental sustainability into MLA's reporting framework is to develop an approach to measure their contribution without either overstating or minimising their influence over environmental outcomes. The most obvious measurement of MLA's impact on environmental sustainability would be to measure the change in environmental outcomes. However, this option has been discarded since there are too many factors outside the control of MLA (and producers) that affect changes in environmental indicators. Instead, we will benchmark MLA's contribution to environmental sustainability on the basis of their contribution to producers' adoption of management practices which have a demonstrated link to improving environmental outcomes. This is an appropriate measure of MLA's contribution, since they contribute substantially to programs that educate and promote the adoption of sustainable management practices. It also has the relationships with industry that allow the capture of this data at farm level.

In terms of collecting the necessary data to assess MLA's contribution to adoption of management practices, the ideal approach would have been to build-in the collection of information on the adoption rates of management practices. But as this is a relatively recent imperative, MLA has little choice but to utilise the existing information base on MLA programs (which were not targeted at specific environmental outcomes) to assess the contribution that MLA has made to the environmental sustainability of the red meat industry. Exactly how well this data — which was collected for another purpose — can be transferred to a new use was not particularly well known at the inception of this project. Consequently, it was

proposed and accepted that a scoping paper on the survey, their coverage, and the potential linkages between them be undertaken. This is the premise of this report.

To assess MLA's contribution to the environment it is necessary to develop a framework linking together the management practices encouraged by MLA to environmental conditions. This framework is one of the key outputs from this report. This framework will be used to guide which management practices will be examined. Only those management practices that MLA promotes *and* are in the framework will be included for any potential analysis of adoption profiles. This is because the Signpost management practices already have the necessary scientific basis to connect the management practice to environmental outcomes.

A final output from this stocktake will be to assess the feasibility of allocating the costs of MLA programs to the management practices to which they contribute. As with the survey stocktake, there is uncertainty about the nature of, and availability of information, which has lead to this additional stocktake (on program) being incorporated into this stage 1 study.

2 *Mapping framework*

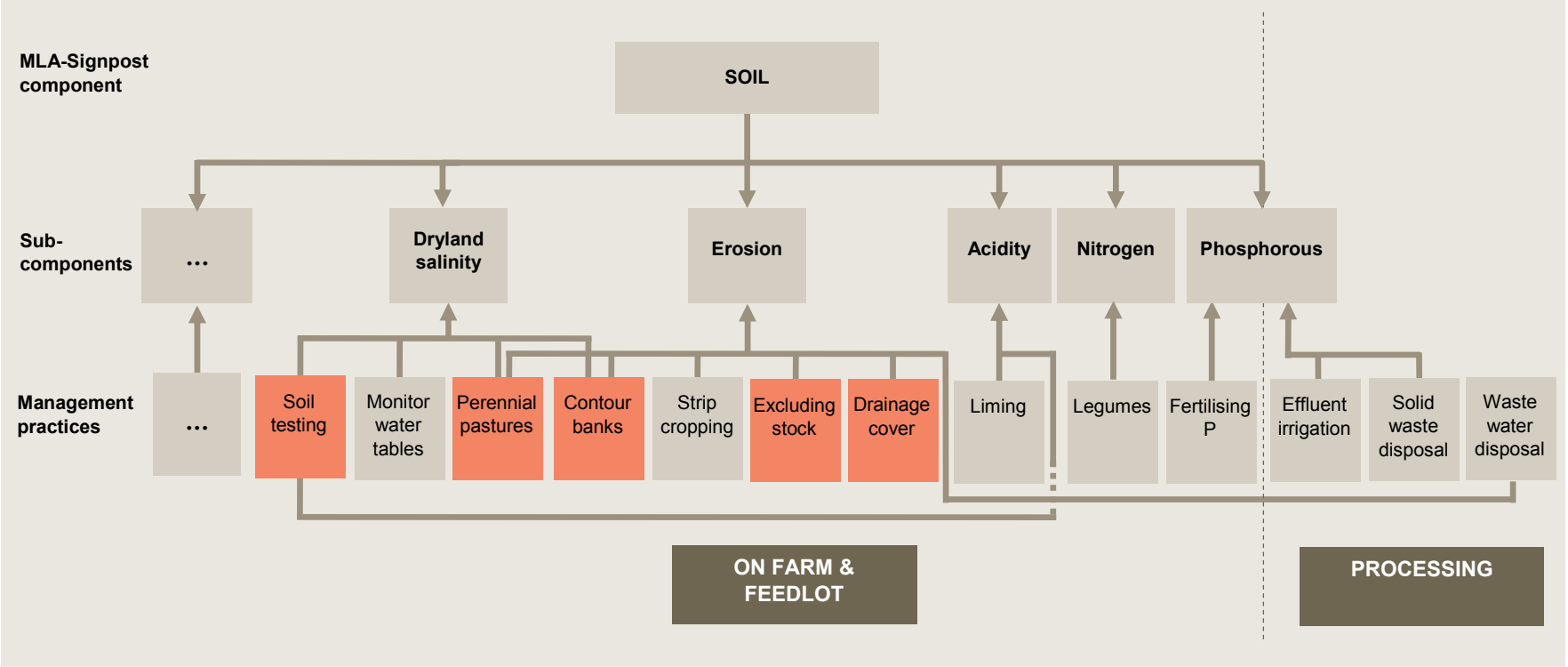
Signposts for Agriculture provides us with a comprehensive framework for thinking about how on-farm activities of agriculture contribute to environmental outcomes, and in turn, the environmental sustainability of the industry. Building upon this framework, TheCIE has extended and modified this framework to make it more tractable and relevant to the MLA and the red meat industry. Specifically, the modifications are:

- the addition of feedlot and processing sectors, to reflect the breadth of the red meat value chain (only on-farm practices are already captured by Signposts);
- inclusion of the four, overarching environmental conditions, decided upon by the RDCs, which overlap well with key headings in the Signposts framework;
- simplification the framework in terms of the numbers of and levels of 'branches' and the environmental issues covered (to better reflect the issues of the industry); and
- the inclusion of management practices as part of the mapping, as opposed to the qualitative discussion provided in Signposts.

The main innovation of this framework is the bringing together of management practices and environmental conditions in the one framework. This allows us to link the management practices, which MLA contributes to the promotion of, and environmental outcomes. Conceptually, it provides a way to demonstrate that MLA's actions are in fact contributing to the environmental sustainability of the industry, even if we may not be able to measure it. The framework is presented in charts 2.1 to 2.5 for each of the environment conditions; soil, water, biodiversity, and atmosphere.

To validate the connection that this framework is drawing between MLA's actions in contributing to the adoption of management practices and environmental outcomes, it is necessary to demonstrate that the management practices positively contribute to the environment. For this reason, the on-farm management practices have been sourced directly from the Signposts for Agriculture literature, which is supported by extensive research.

2.1 Mapping framework for Soil component



Source: Compiled by TheCIE, based upon the Signposts for Agriculture Framework.

2.2 Clarifying key management practices

Selectively excluding stock from waterways (Excluding stock)

This includes:

- the erection of fences to restrict or prevent stock access to a waterway, major drainage line or riparian land on a permanent or seasonal basis; *with*
- the provision of stock water access achieved through:
  - specially prepared access points along the waterway, or
  - troughs.

This management practice is actually quite encompassing of many different methods that produce the same outcome — restricted access for stock to waterways.

Maintaining groundcover along drainage lines (Drainage cover)

This practice is only focused on maintaining groundcover surrounding drainage lines (as opposed to groundcover more generally); however there are several methods that this could be achieved through:

- tactical (rotational) grazing *and* maintenance of dry matter feed; and
- fencing the area off and slashing to it prevent build-up of dry material that could obstruct surface flow.

For this management practice, it is necessary that the method of implementation is actually undertaken in the context of maintaining *drainage* groundcover, since tactical grazing and fencing off are also applicable outside of this context.

Piping stock water supplies

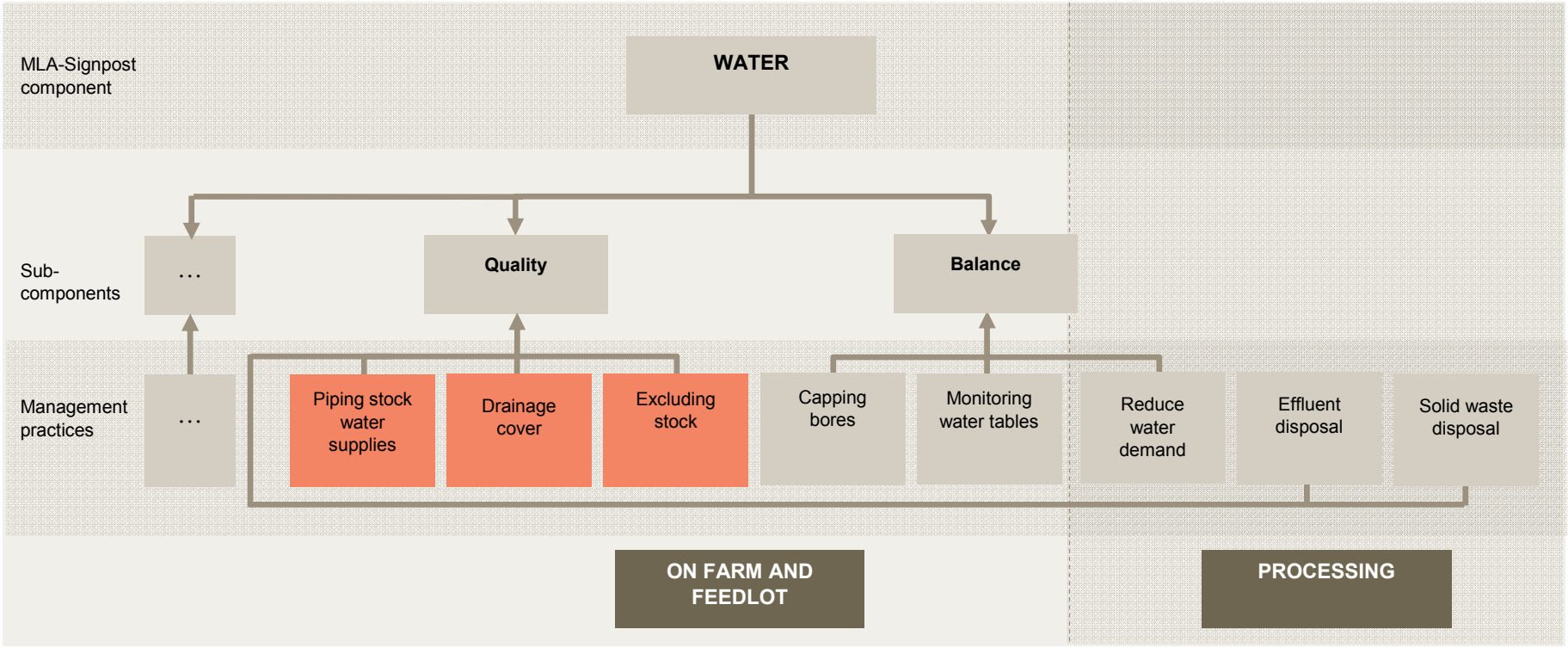
- Installation of a piped and reticulated watering system. These are used to either fed troughs or nose pumps directly or via a tank.
- This practice is aimed at rehabilitating artesian bores, to replace wasteful bore drains with efficient piped systems.

Capping and piping artesian bores (Capping bores)

- Rehabilitate artesian bores and replace wasteful bore drains with efficient piped systems to enable greater control of water use.

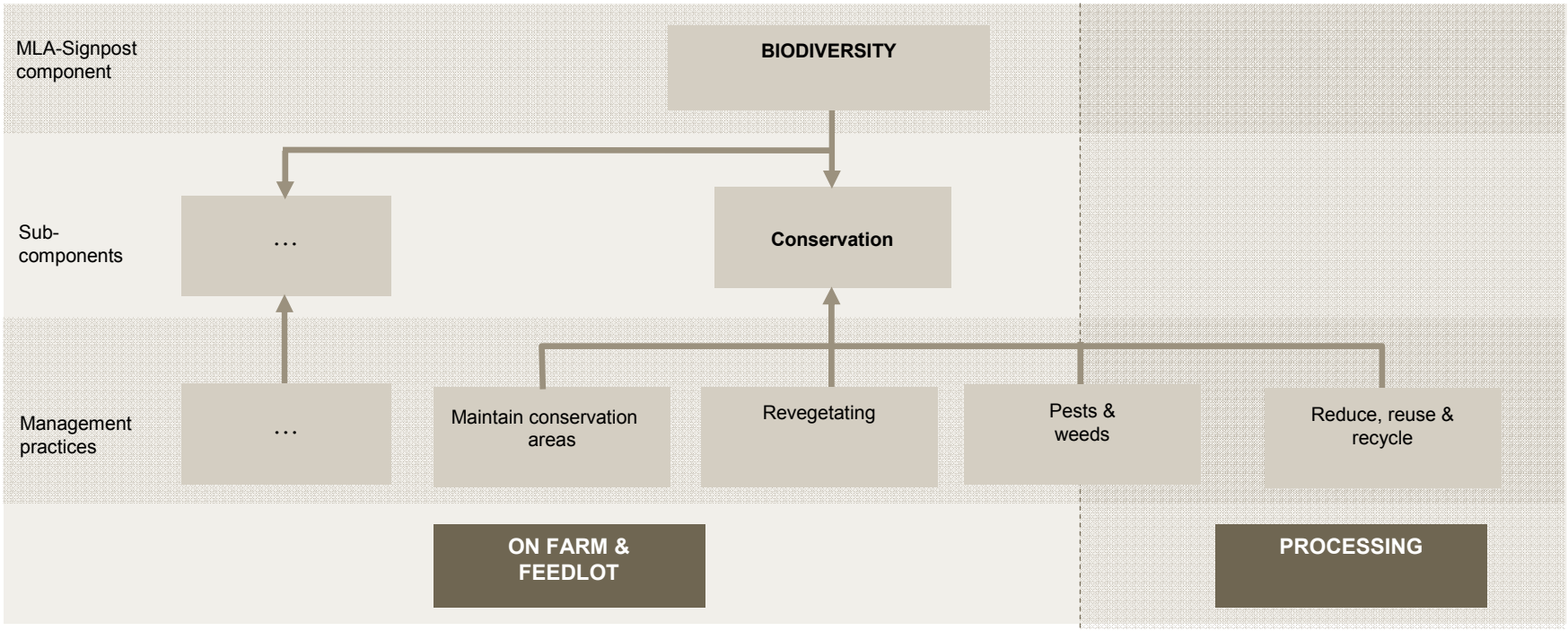
Source: Signposts for Agriculture: Beef Industry Profile.

2.3 Mapping framework for Water component



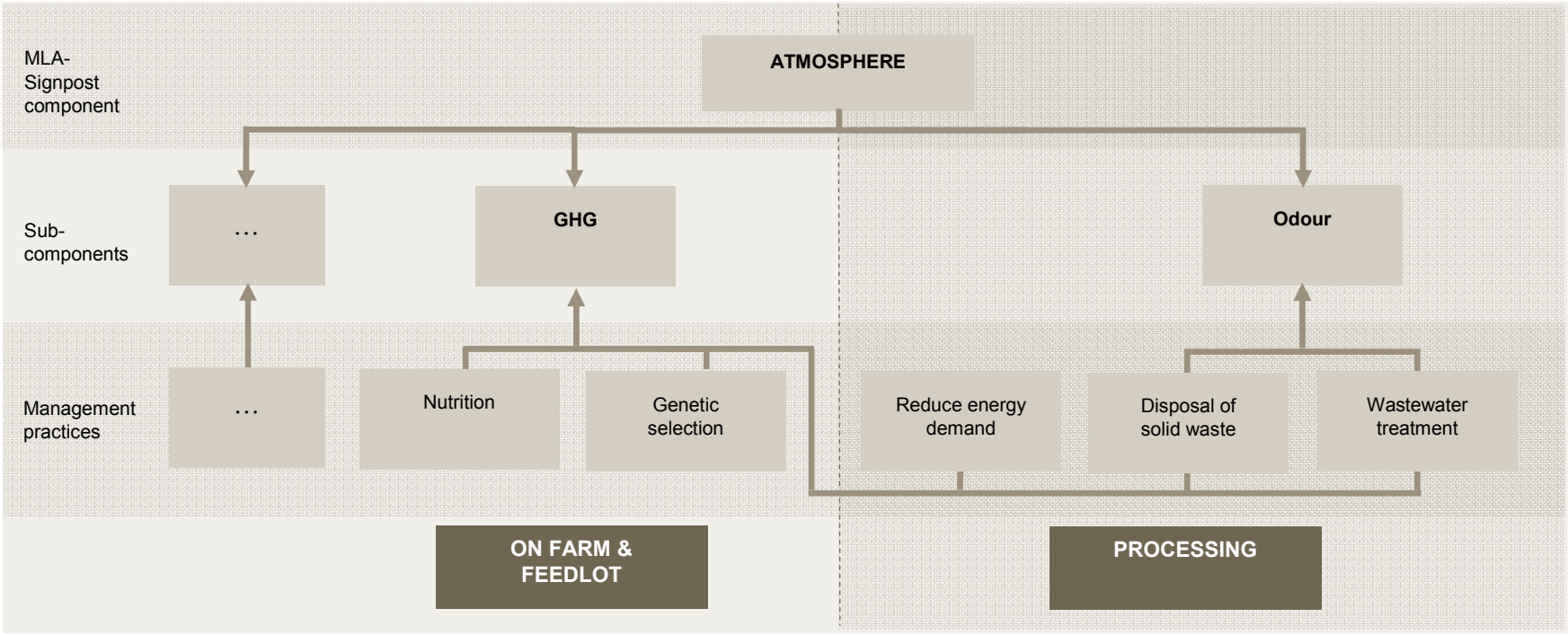
Source: Compiled by TheCIE, based upon the Signposts for Agriculture Framework.

2.4 **Mapping framework for Biodiversity component**



Source: Compiled by TheCIE, based upon the Signposts for Agriculture Framework.

2.5 Mapping framework for Atmosphere component



Source: Compiled by TheCIE, based upon the Signposts for Agriculture Framework.

Naturally, this leads to gaps between the coverage of the framework, and the management practices promoted by MLA due to the retrospective application of this framework to MLA programs. These gaps provide the opportunity to challenge the organisation to think about several questions.

- Does MLA need to reassess the management practices that it encourages, such that they better reflect those already in the framework?
- Should MLA change the framework to better reflect the work that MLA undertakes?
- Or alternatively, does it matter that there are gaps in what MLA promotes, and the coverage of the framework?

What the framework is unable to depict, but should also be taken into consideration when looking at the implications of these 'gaps', is the work being undertaken by other RDCs. Given the considerable overlap in interests between MLA and other RDCs, it is feasible that another RDC may already promote a 'framework' management practice. In which case it may not be appropriate, or would just create duplication, to promote this practice. That is, it may not be necessary or appropriate for MLA to be across the whole framework, due to the work being undertaken by other RDCs.

While the Signposts for Agriculture management practices will be taken as a given for the time being, any modification to the inclusion or exclusion of management practices must have scientific evidence supporting this action. Specifically, weight of evidence that demonstrates the link between management practice and environmental outcomes such that we can purport that implementing a particular management practice contributes to the ecological sustainability of the red meat industry.

3 Survey stocktake

The purpose of this stocktake is to ascertain whether it will be feasible to construct a time profile of adoption for any of the management practices identified in the mapping framework. To achieve this end, all industry and program surveys that include natural resource management (NRM) and environmental sustainability issues in the context of the red meat industry have been collated.

To develop a time series between the different surveys there are several elements that must be present for a given management practice:

- the questions must be the same,
- the same *type* of data must be collected, and
- the survey methodologies must not differ substantially.

But the technical issues associated with the surveys and developing a time series of adoption rates are just part of the process required in determining MLA's contribution to the adoption of particular management practices. To determine MLA's *contribution* to any estimated adoption profile, it is also necessary to construct a baseline for comparison of adoption rates — that is what would have happened to adoption rates without the MLA activities — and determine what proportion of any change in producers' behaviour can be attributed to the actions of MLA.

Survey collection

All surveys on NRM and environment issues, which have direct relation to MLA activities, were collected from MLA. There is an inherent bias in the coverage of these surveys to on-farm activities, since the feedlot and processing sectors have regulated environmental standards, and therefore have less need to survey NRM issues.

Many of the surveys were focused on specific programs (which MLA had invested in), with the questions designed to facilitate an evaluation of the program. These surveys typically had a focus on the specifics of the program, as well as establishing attribution of changed behaviour back to the program. In contrast, industry based surveys tended to ask questions about NRM, but omitted a link back to MLA.

In an ideal scenario, we would have both questions on NRM as well as the ability to confidently attribute changes in behaviour to a producer's interaction with MLA. However, there are several key elements required of a survey, that if present, will

potentially enable the survey to be used to assess MLA's contribution to the adoption of management practices. Specifically, a survey must include:

- questions on NRM, and related practices
- questions on the adoption of management practices
- a representative cross-section of participants in the red meat industry.

Based upon these criteria, and given the surveys provided by MLA, there are four surveys that can be taken to the next 'round' of comparison:

- MLA Producer R&D awareness & adoption research (2003)
- LPI awareness & adoption research (2005)
- Landleader (2001)
- Sustainable Grazing Systems (SGS) (2001).

Survey questions

The first and 'necessary' condition for constructing a time profile of adoption is that the survey questions must ask the same question about the management practice. If the question is not asked in the same way, this can change the meaning that can be derived from the response.

Given the surveys listed above, we now compare the coverage of management practices, and the questions asked. Where there is an overlap in management practice, the survey questions have been extracted and compared. This is presented in tables 3.1 to 3.4, for each of the components.

3.1 Soil-related survey questions

Sub-component	*Survey*	*Management practice*[a]	*Survey question*
Erosion	SGS		Do you use any of the following practices in managing soil erosion?
		Contour banks	▪ Create contour banks
		Perennial pastures	▪ Sow permanent pastures
		Drainage cover	▪ Manage grazing to maintain ground cover
	Awareness (2003)		Do you use any of the following practices in managing soil erosion?
		Contour banks	▪ Create contour banks
		Perennial pastures	▪ Sow permanent pastures
		Drainage cover	▪ Manage grazing to maintain ground cover

Continued on next page

3.1 Soil-related survey questions Continued

Sub-component	*Survey*	*Management practice*[a]	*Survey question*
Erosion (continued)	Awareness (2005)		Do you use any of the following practices in managing soil erosion?
		Contour banks	▪ Create contour banks
		Perennial pastures	▪ Sow permanent pastures
		Drainage cover	▪ Manage grazing to maintain ground cover
	Landleader	Drainage cover	Do you consciously maintain ground cover to manage run-off?
			▪ Yes, no, sometimes
Acidity	SGS		Do you use any of the following practices to manage soil acidity?
		Liming	▪ Apply lime
		Soil testing	▪ Soil tests to determine soil pH
	Awareness (2003)		Do you use any of the following practices in managing soil acidity?
		Soil testing	▪ Soil tests to determine soil pH
	Awareness (2005)		Do you use any of the following practices in managing soil acidity?
		Soil testing	▪ Soil tests to determine soil pH
	Landleader	Soil testing	What pH tests do you undertake to monitor the soil acidity on your property?
			▪ Surface pH test
			▪ Sub-soil pH tests
Phosphorus	Landleader		If you applied phosphorus fertiliser, on average how many units of p did you apply
		Fertilising — Phosphorus	▪ Crops, Pasture, did not (Units of P/Ha or units of P/Ac)
Dryland salinity	SGS		Do you use any of the following practices in managing dryland salinity?
		Perennial pastures	▪ Sown permanent pastures
	Awareness (2003)		Do you use any of the following practices in managing soil salinity?
		Perennial pastures	▪ Sow permanent pastures
	Awareness (2005)		Do you use any of the following practices in managing soil salinity?
		Perennial pastures	▪ Sow permanent pastures
	Landleader		Do you conduct soil or plant tissues tests on your property
		Soil testing	▪ Yes, no, sometimes

[a] Nomenclature for management practices is taken from the MLA-Signposts mapping framework.

Note: *MLA Producer R&D awareness research (2003)* and *LPI awareness & adoption research (2005)* abbreviated to *Awareness (2003)* and *Awareness (2005)* respectively.

Source: Compiled by TheCIE.

3.2 Water-related survey questions

Sub-component	*Survey*	*Management practice*[a]	*Survey question*
Quality	SGS		Do you use any of the following practices in managing water quality?
		Excluding stock	▪ Fence off river banks
		Piping stock water supplies	▪ Water stocks mostly by troughs
	Awareness (2003)		Do you use any of the following practices in managing water quality?
		Excluding stock	▪ Fence off river banks
		Piping stock water supplies	▪ Water stocks mostly by troughs
	Awareness (2005)		Do you use any of the following practices in managing water quality?
		Excluding stock	▪ Fence off river banks
		Piping stock water supplies	▪ Water stocks mostly by troughs
	Landleader	Excluding stock	How many kilometres of rivers, creeks or watercourse are managed in the following way?
			▪ River, creek or stream is fenced into a riparian paddock which is managed specifically to protect the waterway (report in kilometres)

[a] Nomenclature for management practices is taken from the MLA-Signposts mapping framework.

Note: *MLA Producer R&D awareness research (2003)* and *LPI awareness & adoption research (2005)* abbreviated to *Awareness (2003)* and *Awareness (2005)* respectively.

Source: Compiled by TheCIE.

3.3 Biodiversity-related survey questions

Sub-component	*Survey*	*Management practice*[a]	*Survey question*
Conservation	Landleader	Pest and weed	Do you actively control weeds in your native vegetation?
			▪ Yes, no, sometimes
	Landleader	Revegetating	How many hectares of your property have been revegetated with native vegetation?
			▪ Ha or Ac (during 2006/07)
			▪ Ha or Ac (since 1990)

[a] Nomenclature for management practices is taken from the MLA-Signposts mapping framework.

Source: Compiled by TheCIE.

3.4 **Atmosphere-related survey questions**

Sub-component	*Survey*	*Management practice*[a]	*Survey question*
GHG	Landleader	Nutrition	Do you actively optimise the quality and digestibility of feed intake? ▪ Yes; no; unsure
	Landleader	Genetic selection	Do you actively select against unproductive animals? ▪ Yes; no; unsure

[a] Nomenclature for management practices is taken from the MLA-Signposts mapping framework.

Source: Compiled by TheCIE.

As these tables illustrate, Awareness (2003), Awareness (2005) and SGS surveys ask several of the same questions. The Landleader survey, which asks questions on several relevant management practices either:

- asks them in such a way that doesn't allow for comparison with other surveys, or
- asks questions on management practices for which there is no other survey to compare with.

Since we are only interested in management practices for which the same question is asked in more than one survey, the management practices for which there is the possibility of constructing a time profile are:

- contour banks
- perennial pastures (erosion)
- perennial pastures (salinity)
- soil testing
- drainage cover
- exclusion of stock
- piping stock water supplies

Now that we've established that there are 7 management practices with more than one set of observations, it is now necessary to compare the survey methodology of these surveys and assess whether any comparison between their observations is feasible.

Survey methodology

In determining whether the survey methodology is similar enough to enable comparison of observations across different surveys, one of the key things to ascertain is whether the surveys in fact sample the same population.

Table 3.5 presents a summary of the key elements of sampling methodology for each of the surveys.

3.5 Summary of sampling methodology

Survey	*Frame*	*Sample*	*Stratification*	*Comment*
SGS	Business Register (ABS) ▪ 31 972 producers	1632	▪ High rainfall zone ▪ ANZSIC[b] ▪ Farm size	▪ Frame was reduced to only those farms with at least 100 sheep or 30 beef ▪ Estimated value of agricultural operations greater than $22 500[a].
Awareness (2003)	Solutions Rural database ▪ 90 000 producers ▪ 2000 producers were removed from frame to avoid the potential for heavy respondent burden.	800 ▪ North? ▪ South?	▪ Agricultural zone ▪ ANZSIC[b] ▪ Farm size (area)	▪ Only Southern beef (and sheep?) surveyed on management practices ▪ Quota sampling of strata employed
Awareness (2005)	Axiom's 'FARMbase' ▪ 73 592 red meat producers	907 ▪ Southern beef: n=321 ▪ Southern lamb: n=270	▪ Broadacre – High rainfall – Pastoral – Wheat sheep	▪ Only Southern beef (and sheep?) surveyed on management practices

[a] Australian Standard Industrial Classification, 1983 (ABS cat. No. 1201.0). [b] ANZSIC: Australian and New Zealand Standard Industrial Classification, 1993, (ABS cat. No. 1292.0].

Note: MLA Producer R&D awareness research (2003) and MLA Producer R&D awareness research (2005) abbreviated to Awareness (2003) and Awareness (2005) respectively; ND = not defined; MP = management practice.

Source: Solutions Marketing and Research 2003, *Producer R&D Awareness and Adoption Research: Southern Producers Report*; prepared for Meat & Livestock Australia. Hooper S, Rile C and Lubulwa C 2001, *Sustainable Grazing Systems (SGS) Survey*, ABARE, prepared for Meat & Livestock Australia. Logan J 2005, *LPI Awareness and Adoption*, Axiom Research, prepared for Meat & Livestock Australia.

This table shows that all three surveys are quite similar in their stratifications and sample size. The frame differs for each survey, which is not ideal, since the sample is drawn from the frame (see box 3.6 for a definition of terms). Without comparing each of the elements (producers) within the frames used in each of the surveys, the similarity/difference between each of these surveys cannot be ascertained.

The sample size for each of the surveys is quite similar, which infers that quality of the estimates constructed for each survey should be similar. In breaking the population into strata, and selecting the sample for each strata, it improves the accuracy of an estimate for a given sample size. This may enable reporting or at a more disaggregated level (say, geographical zone) than would be possible under simple random sampling.[1]

[1] This is because stratified sampling only has errors in the estimates for each stratum, whereas simple random sampling there are also errors due to weighting the strata incorrectly (Mansfield 1990, p. 218).

3.6 Statistical terms

Sample

A subset of measurements taken from the population in which we are interested

Frame

A complete list of all elements or units in a population of interest. For example, the class role would be a frame for a class of students, the class being the population.

Sample stratification

This is a process of dividing the population into strata (groups) such that these strata reflect minimal variation in the measurement of a characteristic within the strata, and differ greatly in the measurement of a characteristic across strata. The sample is then selected from the strata.

Quota sampling

Quota sampling occurs when the population is divided into groups/strata, and the sampler then includes a certain number of elements from each group. This may be done to ensure that the sample is representative of the groups/strata in the population, but by removing the randomness of selection there is no way to determine how large the sampling errors are likely to be.

Source: Mansfield E 1990, *Statistics for Business and Economics: Methods and Applications*, 4th edn, WW Norton and Company Inc., USA.

The fact that the same producers have been targeted in each of these surveys, means that although different geographical classifications may have been used, the regions covered are comparable.

The other key aspect of survey methodology that can significantly impact upon the comparability of surveys is the mode of collection. Surveys can be conducted either over the phone or internet, through the mail, or in person. Each of these modes has with it a range of benefits and costs, which need to be viewed in the context of the demographics of the population being surveyed as well as the type of information being collected. The surveys that we are attempting to compare were all conducted over the phone. Therefore the mode of delivery is not a source of bias in the reported results.

Counterfactual and attribution

Thus far our focus has been upon determining whether it is appropriate to compare the adoption rate of a management practices across surveys. Parallel to this process is determining a counterfactual for any time profile that we construct. That is, what would the adoption profile look like if MLA had not invested in the promotion of the reported management practices. This is then compared to the observed adoption rates from the survey results.

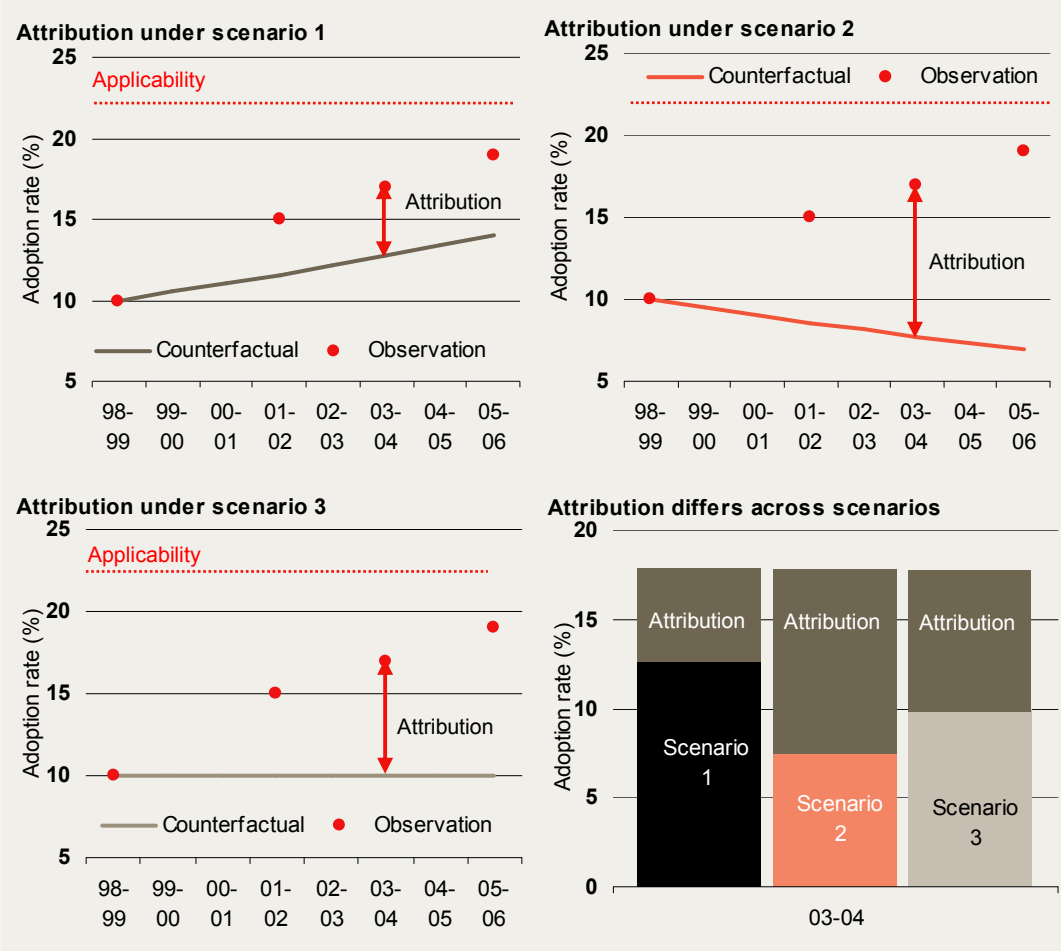
The counterfactual is used to provide context to observed figures. It is also instrumental in determining how much of the observed adoption profile can be attributed to the MLA. Attribution is particularly important in this study, since there may be many reasons why a producer would adopt a particular management practice. It is therefore important to identify those producers who have adopted the management practice *because* of MLA's activities. The proportion of the adoption profile that can be attributed to MLA is the difference between the observed adoption profile and the counterfactual.

However, establishing the counterfactual is a difficult task, as it requires hypothesising about something that *could* have happened. Sometimes we can construct a counterfactual from a control population that is unexposed to a given 'shock'. However, in this scenario, we don't have a specified shock, because we're looking at the aggregation of MLA's investments and we have no clear way to specify what MLA's programs contributed to the adoption of particular management practices. Therefore, for analytical purposes we will construct three possible scenarios of what *may* have been observed in the absence of MLA expenditure contributing to the adoption of these management practices:

- scenario 1: adoption may have increased over time
- scenario 2: adoption may have decreased over time
- scenario 3: adoption may have remained unchanged.

A stylised illustration of the counterfactual and the determination of attribution are provided in chart 3.7. Included in this chart are the three scenarios for the counterfactual, presented as one scenario per panel, as well as the data points that we can obtain from surveys. The first panel shows the counterfactual to MLA involvement is an increase in adoption rate over time; the second, a decrease over time; and the third, no change. The attribution to MLA is largest for scenario 2, where adoption would have decreased but for MLA investment. The differing magnitude of attribution across these three scenarios is presented in the fourth panel for the year 2007-08.

3.7 **Potential counterfactual and attribution**



Source: TheCIE

The values presented on this chart are illustrative, but the timing of these data points reflects when the surveys were collected. The first data point in 1998-99 reflects when the Signposts stocktake was undertaken. If this data point is comparable to the other data points (as we have already established in the survey stocktake that they are), then this will be used as the starting point for the counterfactual. The Signposts observation is particularly useful for this purpose, since MLA was a new organisation at this time and can't be expected to have contributed to the adoption rate observed at that time.

Feasibility of constructing a time profile of adoption

To determine whether it will be feasible to construct a time profile for adoption of particular management practices, we began with our comparison of survey questions. This exercise revealed that there are seven management practices that we have three observations for: 2001, 2003 and 2005. The second exercise was to compare the survey methodology. This process revealed that although there are differences in

the sampling, it may be feasible to manipulate the data such that the analysis reflects the same population over time.

The next step in establishing MLA's contribution to the adoption profile is to determine the proportion of farmers that adopt a management practice did so because of MLA's activities. This requires constructing a counterfactual to MLA's investment. Because counterfactuals by their very nature of looking at what *could* have happened, they are difficult to develop. Therefore, multiple scenarios will be presented. This infers that any estimate of MLA's attribution won't be a single number, but rather an estimate under each scenario.

4 Program stocktake

The Program stocktake is being undertaken to assess whether it is possible to determine how much MLA has invested in the environment. Given that MLA typically invests in management practices through programs, this framework is well designed to demonstrate how MLA's investment in programs is an investment in improving environmental conditions. How this works in practice is best illustrated through an example, which is presented in box 4.1.

An abbreviated framework is presented in chart 4.2, which demonstrates how the costs are allocated across the framework. Since 'excluding stock' is relevant to both the water and soil component, it is necessary to separate the investment between these two components. In this example the investment is split evenly between both components, indicating that excluding stock from waterways benefits soil and water health equally.

4.1 The logic of allocating costs across the framework

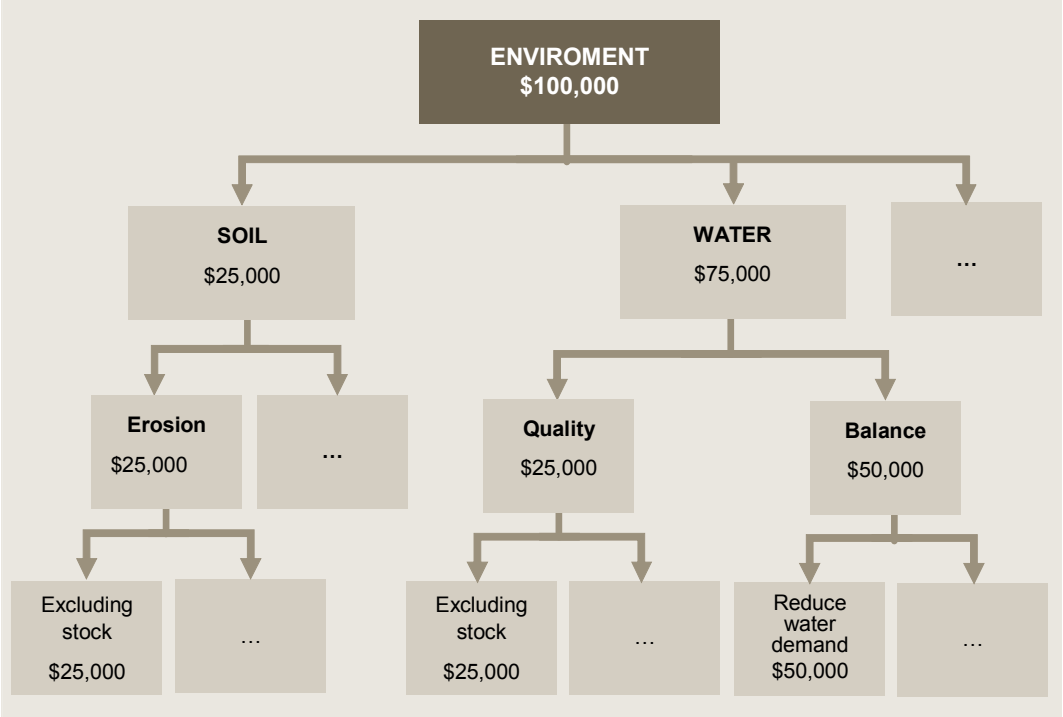
Suppose that MLA invested in a project worth $500,000 with 2 other research and development corporations, where MLA's contribution is $200,000. The objective of the project is to deliver a new system to producers which enables more efficient delivery of water to stock, and greater control over water flow. It is assumed that 50% of the investment in this project benefits the environment. This system benefits the environment in that it eliminates the need for cattle to go to waterways (rivers, creeks, etc), reducing damage done to riparian zones, as well as most likely reducing the quantity of water used. As part of delivering this new system to producers, MLA is encouraging excluding stock from waterways.

Now, for the calculations:

- MLA's contribution: $200,000
  - Share: $200,000/ $500,000 = 40%
- Investment in the environment: 50%of total project costs = $250,000
  - MLA contribution: 40% x $250,000 = $100,000
- MLA's investment to be split between the two management practices that it contributes to the environment through:
  - Fencing off waterways: 1/2 x $100,000 = $50,000
  - Reduced water demand: 1/2 x $100,000 = $50,000

Source: TheCIE.

4.2 An example of costs allocation across the framework



Source: TheCIE.

The purpose of allocating project costs across the framework is to clearly illustrate through which management practices MLA has contributed to the environmental sustainability of the industry. As demonstrated by this example, the value of investment allocated to each of the components is quite subjective, as judgements are made about the proportion of investment allocated to the components. The more information that is available, the better the basis there is for making decisions reducing the need for judgement. However, as a minimum, there are only three key pieces of information required to allocate costs to the framework:

- The cost of the program, and MLA's contribution to it; and
- *How* the program has contributed to the environment, and what proportion of the program costs can be deemed as contributing to the environment.

Program information

In determining the feasibility of allocating all costs across the framework, the key source of information used is the 'Pooled sample: Environment Cluster', which is part of a larger series 'Measuring and communicating the value of R&D'.[2] This study presents an evaluation of five 'investments' comprised of 40 projects taken from the

[2] Chudleigh, P. and Simpson, S. (2008), 'Pooled Sample: Environment cluster', Measuring and communicating the value of R&D, Prepared by Agtrans Research for Meat and Livestock Australia.

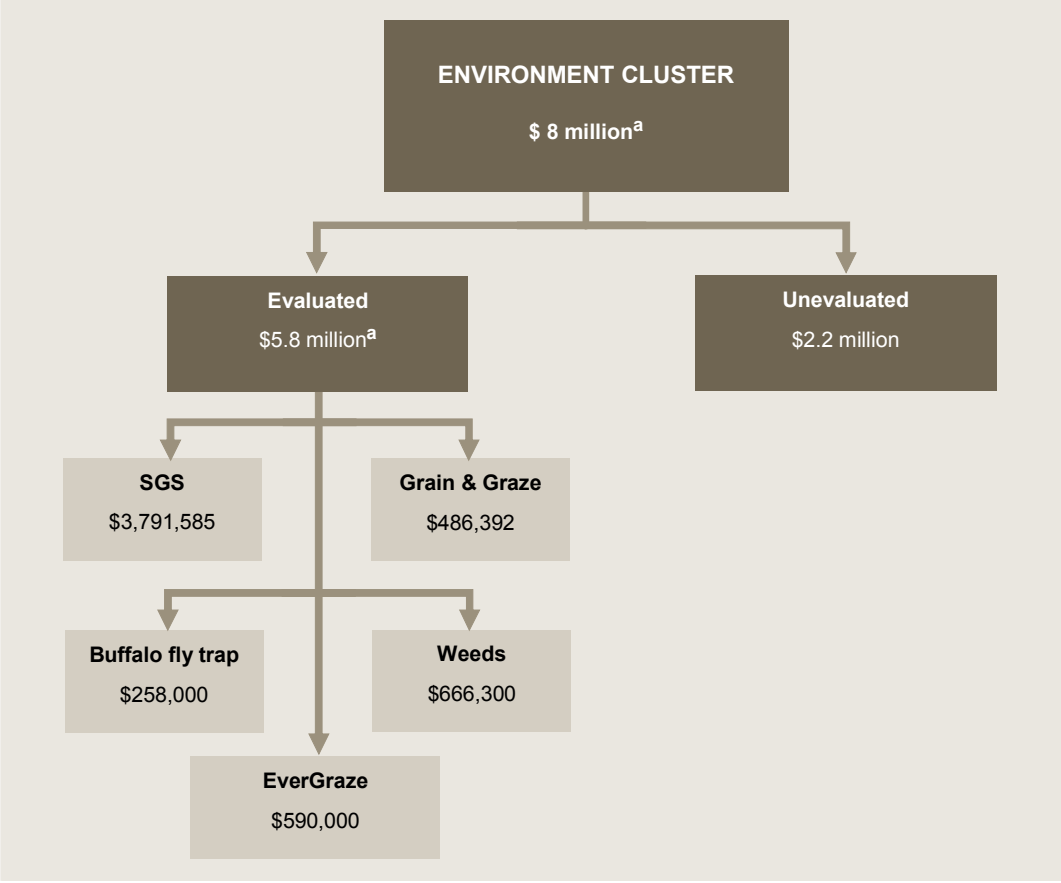
environment portfolio. The benefit of using this evaluation, with the project information aggregated to five investments, is that it is much easier to identify how the investment has contributed to the environment. The drawback from this approach is that the aggregated information may include projects that may not have contributed substantially to the environmental outcome achieved by the investment. But for our purposes, it will be taken as a given that projects that have been included in the environment portfolio have a significant link to the environment.

The other benefit from using this study is that it provides very good coverage of the environment portfolio; 40 of the 58 projects in the environment portfolio are evaluated in this study. Using this one study we capture two-thirds of the environment portfolio, vastly more efficiently than if we were to look at each individual project from the environment portfolio.

Investment costs

The total value investment made by MLA in environment related projects from 1997-98 to 2005-06 projects is $8 million (nominal). The breakdown of the investment is presented in chart 4.3.

4.3 **MLA investment in the environment**



[a] This figure is based on the reported project costs, rather than the figure presented in the report, although the figures are very similar.
Data source: Agtrans and TheCIE calculations.

Around $5.8 million of this total investment has been evaluated. The investment that has been evaluated may be able to be allocated across the framework based upon the contribution that each investment has made to the environment. This is now discussed.

Contribution to the environment

This section looks at the individual 'investments' so as to develop an understanding of how they contribute to the environment and whether the Agtrans (2006) report provides sufficient information to be able to allocate MLA investment costs across the framework.

Sustainable Grazing Systems

The program Sustainable Grazing Systems was introduced to address declining pasture productivity and sustainability. The program was designed to provide producers an alternative way to manage their pasture, animal and land such that it would restore productivity and be more environmentally sustainable.

The program included components that focused upon research, capacity building, training and communicating with producers and the community. Through these components the SGS program was able to engage with producers, and influence their management practices. To that end, this program has been quite successful at achieving its productivity and sustainability objectives.

Producers had much greater awareness of environmental issues on their properties and about the best practice response. This program encouraged the use of more perennial species, as well as rotational grazing. The adoption of these management practices has lead to more effective use of surface and groundwater. This may subsequently reduce water table accessions with less water logging and salinity (where salt is in the profile).

Grain & Graze

The Grain & Graze program was a program introduced to promote increased profitability and enhanced natural resource condition across the medium rainfall zone for mixed enterprise farming. One of the three objectives of this program was to build natural capital through the improvement of water quality, and to enhance the condition and diversity of plants and wildlife.

The Grain & Graze promoted a variety of management practices in pursuit of its environmental objective, which were tailored to reflect the requirements of the region. Included in the management practices promoted are: the establishment of perennial pastures, pasture rotation and soil biodiversity monitoring.

The extent of adoption of these management practices is unclear, as is the impact that it has had upon the natural resource condition on-farm and regionally.

Buffalo fly

The program was introduced to develop an alternative treatment of buffalo fly, which substantially reduces the productivity of cattle, which was non-insecticidal. The research project developed a Buffalo fly tunnel trap, which enables the treatment of cattle for buffalo fly, without the need for the use of insecticides. This benefits the environment, from the reduced level of chemical use.

Weeds

This program was commissioned to develop biological control agents for weeds. In addition to delivering agents, this project has also developed an integrated weed management approach, which incorporates biological control, herbicide control, grazing management and pasture renovation. The outputs from this projected have benefited the environment in the reduced use of chemicals, as well as the biodiversity gains from better controlling weeds.

EverGraze

EverGraze is a program that undertakes research into the use of different perennial species in conjunction with new farming systems in the high rainfall zone (HRZ). This research is then used to develop different pasture designs that meet the needs of high performance prime lamb production systems. The use of perennial pastures can improve the productivity of lamb, as well as improve the natural resource condition on and off-farm. Perennials use excess water in the environment, which lowers water tables, and improves water quality. This also benefits aquatic biodiversity.

Feasibility of allocating costs

From the discussion of the evaluated investments it is apparent that MLA has indeed contributed to the environment. Allocating the costs associated with these projects to the area of the environment benefited, however, still remains a challenging task. Any allocation of costs is very subjective since it will rely upon a judgement of the relative contribution of an investment to specific management practices and environment components.

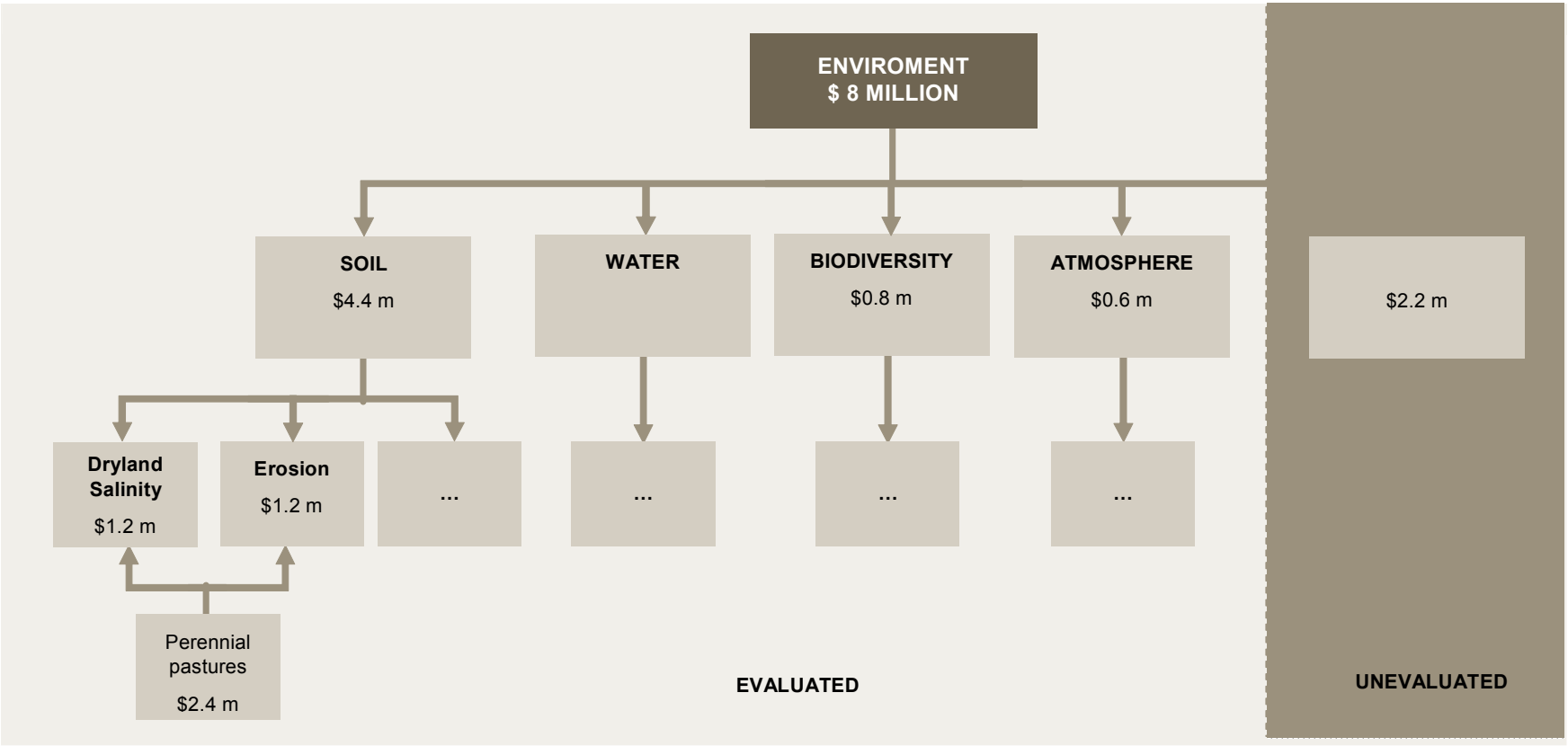
For unevaluated projects, there is no possibility of being able to allocate their costs, since there is no way to ascertain how much (as a proportion of project costs) they contribute to the environment, or in what way. Therefore, we cannot allocate these costs with any more detail than to include them at the highest level (that is, environment).

Allocating costs

Given the current availability of information, it is not possible to comprehensively allocate the MLA project costs to the environmental component that they may contribute to. Where there is limited scope to allocate costs at the very high level of the MLA-Signposts mapping framework, this has been done to provide an illustration as to how the framework can be used for this purpose. This is presented in chart 4.4. The calculations used to allocate the costs are in appendix B.

The full costs of the evaluated investments have been allocated to the components of the environment, even though it is unlikely that the full project budget was directed at the environment. This means that the values allocated to each of the components must be interpreted as the value of investment costs for projects related to the environment. So, taking the Environment figure of $8 million; this should be interpreted as MLA has contributed $8 million to environment-related projects — not that MLA has invested $8 million in the environment.

4.4 **Allocating investment in environment-related projects across the framework**



Source: Compiled by TheCIE using data from the Agtrans (2006) report.

Appendixes

A Documents provided

Table A.1 provides a list of all the documents provided by MLA in undertaking the stocktake of the surveys.

A.1 Documents provided for survey stocktake

Survey	*Document type*	*File name/document name*
MLA Management practices survey 2005-06	Report	ABARE management practices survey 2005-2006 final report
ABARE 2005-06	Draft report	
ABARE 2004	Draft report, survey methodology	ABARE_REPORT_2004 NRM on Aust Farms
Landleader survey 2008	Data	Copy of Landleader Survey 2008_National Data
	Data	Confidential Landleader Survey 2008_responses to section 7
	Questionnaire	(2007-12-03) Landleader Questionnaire_Version 2_FINAL_low resolution
	Questionnaire	Landleader draft Report to Industry CATI July 2007 (BEEF)
	Questionnaire	Landleader draft Report to Industry CATI July 2007 (4)
	Report	BestPractice_2008_ALL_NRM_CMA
	Report	NrmCma_2008_Murrumbidgee CMA
	Report	GH Final Report MLA021008
	Report	Appendix 3 2008 Individual Report
	Report	Appendix 4 Roberts Evaluation
	Report	Final Report_MLA_Landleader
Draft environmental stewardship for LPA	Questionnaire	Environmental module — Southern Australia — Checklist Items 9Nov07
	Report	Environmental stewardship module 9 Nov07
	Questionnaire	Environmental module — Northern Australia 9Nov07 — Checklist
Confidential BMP — All NRM report	—	—
NBP survey 2000 (NFS Ltd)	Report, data	NBP quantitative producer survey 2000

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A.1 **Documents provided for survey stocktake** Continued

Survey	*Document type*	*File name/document name*
QFD Survey Jan 2001 (QFD team)	Report, survey methodology, questionnaire	QFD Final Report BFGEN.004
SGS survey by ABARE 2001	Report, survey methodology	SGS survey report — ABARE 2001
	Report, survey methodology	ABARE survey — SGS
	Results, data	ABARE Tables — SGS
	Report	Nutrients — SGS
	Report	Pasture — SGS
	Report	WATER — SGS
	Report	Pre-Expt modelling — MRC SGS
	Questionnaire	mlasgs final-final questions 260401
Grain & Graze 2008	Report	GG Program Evaluation — Summary Report
	Report	G&G FinalReportNOC_V1 3
	Report	Overview of MIDAS2
Solutions for R&D awareness research 2003	Report	Awareness, Adoption Survey Northern data tables, Solutions — Dec 2003
	Data	Awareness, Adoption Survey Northern final report — Solutions Jan 2004
	Report	Awareness, Adoption Survey Southern Producers Final Report — Solutions Dec 2003
	Data	Awareness, Adoption Survey Southern Producers Tables — Solutions Dec 2003
	Questionnaire	Awareness Adoption Survey Southern Producers Questionnaire
	Questionnaire	Awareness Adoption Survey Northern Producers Questionnaire
Awareness Adoption Jul 2005 (Axiom)	Report	Axiom_MLA_LPI_2005_Presentation_07-02-06
	Questionnaire	Axiom 2005 — LPI2005_NthSth_Producers_Questionnaire_v10
EDGE/MBfP Jul 2005 (Axiom)	Report	(12-10-2005) Edge_MBfP_ MLA_Summary_Report
	Report	MLA Edge-MBfP Producers Report 02-08-2005
	Data	More Beef — Main Data Tables (FinalV2)
	Questionnaire	EDGE_MBfP_Producers_Questionnaire_v5
	Data	Edge — Main Data Tables (Final)

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A.1 **Documents provided for survey stocktake** Continued

Survey	*Document type*	*File name/document name*
Best practice survey: NRM and Australian Wool Producers	Report, survey methodology	Best Prac Survey Final Report 19.8.02
	Report	PB030472
Benchmarking of environmental performance	Questionnaire	MLA client questionnaire
EcoRange	Report	EcoRange Vol 4 Aust rangeland grazier survey
	Report	EcoRange Vol 2 Review of on-farm standards
	Report	EcoRange Vol 1 Overview
Industry performance review	Report	Industry Environmental Performance Review Report
Effluent treatment in the Australian meat industry	Report	M 050 Effluent treatment in the Aust meat industry
Awareness Adoption KPI 2006 (Axiom)	Report. survey methodology, and questionnaire	KPI Survey Final Report July 2006
	Questionnaire	KPI survey 2006 — Questionnaire
Awareness Adoption KPI eval 2007 (Axiom)	Report, survey methodology, and questionnaire	Axiom 2007 — KPI_Survey_Report_FINAL
	Questionnaire	Axiom 2007 KPI survey — questionnaire
The impact of feedlot investment	Report	FLOT 404 Final Report
Eco-efficiency Manual for meat processing	Report	Final Eco Efficiency kit with Links
Natural resource management on farms	Report	46200_2006-07 ABS NRM survey
Bestwool/bestlamb program	Report, survey methodology, and questionnaire	BESTWOOL BESTLAMB Review Report July 06
		HA Bestwool_Bestlamb Evaluation Draft Report 270208

Source: Compiled by TheCIE.

B Calculations for allocating costs to framework

Presented in tables B.1 to B.6 are the calculations used to estimate the contribution of MLA project investments to the various components within the framework.

B.1 Investment costs allocated to perennials

Investment	*Share*	*Value*	*Contribution*
	%	$	$
SGS	50	3 791 585	1 895 792
Grain & Graze	33	486 392	162 130
Evergraze	50	590 000	295 000
Perennials			**2 352 922**

Note: Contribution = share x value.

Data source: Calculated by TheCIE using Agtrans data.

B.2 Investment costs allocated to dryland salinity

Investment	*Share*	*Value*	*Contribution*
	%	$	$
Perennial	50	2 352 922	1 176 461
Dryland salinity			**1 176 461**

Note: Contribution = share x value.

Data source: Calculated by TheCIE using Agtrans data.

B.3 Investment costs allocated to erosion

Investment	*Share*	*Value*	*Contribution*
	%	$	$
Perennial	50	2 352 922	1 176 461
Erosion			**1 176 461**

Note: Contribution = share x value.

Data source: Calculated by TheCIE using Agtrans data.

B.4 Investment costs allocated to soil

Investment	*Share*	*Value*	*Contribution*
	%	$	$
Dryland salinity	100	1 176 461	1 176 461
Erosion	100	1 176 461	1 176 461
Rotational grazing			2 057 922
▪ SGS		1 895 792	
▪ Grain & Graze		162 130	
Soil			**4 410 844**

Note: Contribution = share x value.

Data source: Calculated by TheCIE using Agtrans data.

B.5 Investment costs allocated to biodiversity

Investment	*Share*	*Value*	*Contribution*
	%	$	$
Grain & Graze	33	486 392	162 130
Weeds	50	666 300	333 150
Evergraze	50	590 000	295 000
Biodiversity			**790 280**

Note: Contribution = share x value.

Data source: Calculated by TheCIE using Agtrans data.

B.6 Investment costs allocated to atmosphere

Investment	*Share*	*Value*	*Contribution*
	%	$	$
Weeds	50	666 300	333 150
Buffalo fly	100	258 000	258 000
Atmosphere			**591 150**

Note: Contribution = share x value.

Data source: Calculated by TheCIE using Agtrans data.