

Stakeholder expectations for environmental assurance in agriculture: lessons from the pastoral industry

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Abstract. This paper outlines the expectations of a wide range of stakeholders for environmental assurance in the pastoral industries and agriculture generally. Stakeholders consulted were domestic consumers, rangeland graziers, members of environmental groups, companies within meat and wool supply chains, and agricultural industry, environmental and consumer groups. Most stakeholders were in favour of the application of environmental assurance to agriculture, although supply chains and consumers had less enthusiasm for this than environmental and consumer groups. General public good benefits were more important to environmental and consumer groups, while private benefits were more important to consumers and supply chains. The ‘ideal’ form of environmental assurance appears to be a management system that provides for continuous improvement in environmental, quality and food safety outcomes, combined with elements of ISO 14024 eco-labelling such as life-cycle assessment, environmental performance criteria, third-party certification, labelling and multi-stakeholder involvement. However, market failure prevents this from being implemented and will continue to do so for the foreseeable future. In the short term, members of supply chains (the people that must implement and fund environmental assurance) want this to be kept simple and low cost, to be built into their existing industry standards and to add value to their businesses. As a starting point, several agricultural industry organisations favour the use of a basic management system, combining continuous improvement, risk assessment and industry best management practice programs, which can be built on over time to meet regulator, market and community expectations.

Introduction

Agricultural food chains have great political and economic importance, but their sustainability is being questioned because of their impacts on natural resources (Brah and Schelleman 2000). Improving the sustainability of agriculture and associated sectors is becoming a global imperative, and in this context the triple-bottom line performance of global agri-food chains is being increasingly scrutinised. The pastoral industry in western Queensland, which utilises vast areas of natural landscape, is no exception, as state government regulator, industry organisation, environmental group and market interest in their natural resource management practices is steadily growing.

An important component of the quest for sustainability has been the development of a wide range of environmental standards, including those of the International Organization for Standardization (Anon. 2005a), that can be applied to agricultural supply chains (Mech and Young 2001; Pahl 2004). Standards Australia (2001) define standards as ‘accepted specifications or codes of practice which define materials, methods, processes and practices that, when effectively implemented, ensure that consistent and acceptable levels of quality, performance, safety and reliability are achieved’ (Mech and Young 2001). Toyne *et al.* (2004), quoting Ure (1999), distinguish two main types of environmental standards, these being (i) organisation-oriented or process standards which provide guidance on the procedures or systems used by an organisation to manage the environment; and (ii) production-

oriented standards which specify product features or how a product is to be produced and processed.

Standards, in combination with verification processes such as auditing, determine the credibility of assurances associated with the environmental claims made about organisations and products. Independent or third-party auditing by an accredited organisation of an environmental claim in accordance with an internationally agreed standard provides a highly credible form of assurance. In contrast with this, self-declared assurances made without regard to an agreed standard have low credibility. In this paper, the combinations of environmental standards and auditing procedures are collectively referred to as environmental assurance, and can be made in relation to organisations or products.

The International Social and Environmental Accreditation and Labelling (ISEAL) Alliance (Anon. 2003a) and the Consumers Union (Anon. 2005b) recommend that all interested parties or stakeholders contribute to the development and review of environmental assurance systems, as this will give them greater credibility with consumers and civil society organisations. Also, the improvements in the triple-bottom line outcomes of agriculture that environmental assurance is expected to assist with requires a whole-of-community response, and accordingly, all stakeholders should play some role in the development and implementation of environmental assurance.

Australia has a very active interest in the development and application of environmental and other on-farm standards,

beginning with the first environmental management system (EMS) in agriculture conference (Carruthers and Tinning 1999), and culminating in the development of environmental assurance programs for a wide range of agricultural industry sectors (DAFF 2006). Information on the requirements of industry stakeholders will inform the development of these assurance programs.

The aims of this paper are to:

- (i) describe and contrast the expectations of a wide range of stakeholders for environmental assurance for the pastoral industries specifically and agriculture generally, and
- (ii) describe and discuss a form of agricultural environmental assurance that meets their requirements.

Methods

Quantitative surveys, using different questionnaires, were undertaken for domestic consumers, rangeland graziers and members of environmental groups to record their requirements for environmental assurance. Businesses within meat and wool supply chains and representatives of agricultural industry, consumer and environmental groups were also interviewed for the same purpose.

As different survey instruments were used to record stakeholder requirements, including quantitative and qualitative surveys, different questions, and variable and often low sample sizes, stakeholder responses did not lend themselves to statistical analyses. Also, given the aim of this paper, which was to compare the expectations of stakeholders for environmental assurance, and the general nature of the topics covered, qualitative comparisons were considered appropriate and adequate.

Domestic consumer survey

The market research company, ACNielsen, conducted a phone survey of 605 domestic consumers. The methods described in full by MacNamara and Pahl (2004), are summarised below. The consumer study was based on a national random telephone survey of the main grocery buyer in 605 households. The two consumer focus groups were run in Brisbane during October 2001 for the purpose of informing the development of the phone questionnaire. The questionnaire was subsequently drafted and then pilot tested on 21 November 2001 with actual respondents. Telephone numbers were randomly generated for all areas of Australia to ensure that all households had an equal opportunity to be selected, and quotas were applied to ensure reasonable sample sizes in both metropolitan and regional areas of each state and territory. ACNielsen then conducted the interviews between 23 November and the 2 December 2001.

To allow national population estimates to be provided, survey results were weighted to known population characteristics and extrapolated to the full main grocery buyer population. Survey results were weighted by the number of households and by known age and gender characteristics of the main grocery buyers in each state, as provided from ACNielsen's Homescan Establishment survey ($n = 28970$ households). Weighting to these main grocery buyer characteristics provided a more accurate representation of the national shopper market than weighting to general population statistics.

The questions posed to the main grocery buyer that are addressed in this paper are:

- (i) What do you think are the main issues in relation to the environmental effects of sheep and cattle grazing?
- (ii) How confident are you with the environmental claims made on the products currently in the supermarkets?
 - (A) Not at all confident
 - (B) Somewhat confident
 - (C) Very confident
 - (D) Don't know
- (iii) How important do you think it is to have a system in place that guarantees that meat is 'environmentally friendly'?
 - (A) Not at all important
 - (B) Quite unimportant
 - (C) Neither important or unimportant
 - (D) Quite important
 - (E) Very important
 - (F) Don't know
- (iv) Which of these would you need to see on a label and in an advertisement in order to trust that system?
 - (A) Celebrity endorsement
 - (B) Government regulation
 - (C) Environmental group endorsement
 - (D) None/nothing
 - (E) Other (specify)
 - (F) Don't know

Rangeland grazier survey

ACNielsen also conducted a national phone survey of the main decision makers on 300 pastoral enterprises. The survey methods are described by Pahl (2003), and summarised below. Two grazier focus groups were conducted at Morven and Bollon in south-west Queensland in September 2001 for the purpose of informing the design of the phone survey questionnaire. The questionnaire for the survey was then pilot tested on 21 November 2001, and the 300 interviews were conducted over the period from 23 November to 11 December 2001.

A list of rangeland graziers was provided by several state government agencies. The sample consisted of sheep, goat and cattle producers from the rangeland pastoral zones of Queensland, South Australia, New South Wales, Northern Territory and Western Australia, with the predominant land tenure being grazing lease. The Queensland pastoral list included many small properties compared to the other states and territory, and hence this sample was restricted to pastoral properties with more than 5000 sheep or 800 cattle, and to pastoralists with both sheep and cattle, providing they had more than 1000 sheep and 100 cattle.

The questions that were posed to them that are addressed in this paper are:

- (i) As a grazier, what do you think are the main environmental issues or impacts in the rangelands?
- (ii) Is it important for environmental accreditation to result in a product label or logo that can be used to differentiate rangeland food and fibre in domestic and overseas markets?
 - (A) Very important
 - (B) Quite important
 - (C) Not very important
 - (D) Not at all important
 - (E) Don't know

- (iii) Should the following organisations have some role in the development and operation of environmental accreditation schemes?
- (A) Industry groups
 - (B) Consumer groups
 - (C) Pastoralists
 - (D) Government
 - (E) Private consultants
 - (F) Conservation groups
 - (G) Retail and processing sector
 - (H) Other (specify)
- (iv) Of the organisations identified as having a role in question (iii) above, who should take the lead role?
- (v) How desirable is it for environmental accreditation schemes to be audited?
- (A) Very desirable
 - (B) Quite desirable
 - (C) Not very desirable
 - (D) Not at all desirable
 - (E) Don't know
- (vi) Who should audit the scheme? Should it be:
- (A) Self-audit or vendor declaration (by grazier)
 - (B) A local Landcare or catchment group
 - (C) A licensed independent auditor
- (ii) How much involvement do you think the following organisations or agencies should have in the development of an environmental assurance scheme for sheep and cattle industries?
- (A) Producers and rural industry groups
 - (B) Government agency or department
 - (C) Conservation organisations
 - (D) Consumer groups
 - (E) Research organisation
 - (F) Retail and processing sector
 - (G) Other (specify)
- (iii) How much involvement do you think the following organisations or agencies should have in the auditing of an environmental assurance scheme for sheep and cattle industries?
- (A) Producers and rural industry groups
 - (B) Government agency or department
 - (C) Conservation organisations
 - (D) Consumer groups
 - (E) Research organisation
 - (F) Retail and processing sector
 - (G) Other (specify)
- (iv) To what extent do the following factors increase your level of acceptance and trust of an environmentally assured product?
- (A) Adherence to a recognised standard
 - (B) Process of continuous improvement in environmental management
 - (C) Quantity and quality of information provided to substantiate claims
 - (D) Achieving environmental performance benchmarks
 - (E) Environmental licensing of producers
 - (F) Price premiums on products
 - (G) Endorsement by a reputable organisation
 - (H) Other (specify)

Environmental group member survey

A mail and internet survey of members of environmental groups was undertaken in June 2002 in accordance with the methods described by Longworth and James (2004). The survey was preceded by two focus groups in Brisbane, consisting of members of the Queensland Conservation Council and associated groups. The questionnaire was then drafted and pilot tested.

The survey questionnaire was available both in a paper format and online on a secure web server. The online version was advertised in nationwide periodicals of the World Wide Fund for Nature (WWF), the Nature Conservation Council of NSW (NCCNSW), the Arid Lands Environment Centre (ALEC) and the Environment Centre of the Northern Territory (ECNT). Recipients of the paper version were also invited to the online version in the introductory notes, as an alternative to mailing. Only 55 surveys were completed using the online version, despite the fact that 85% of respondents had access to the internet and email.

A total of 11450 copies of the paper questionnaire were distributed, with 5500 to the entire readership of the periodical *Environment SA* of the Conservation Council of South Australia (CCSA), 5000 randomly inserted into the Australian Conservation Foundation (ACF) *Habitat* magazine, 500 to the entire readership of the Queensland Conservation Council (QCC) publication *Spinifex*, and 450 to the entire readership of the Conservation Council of Western Australia (CCWA) publication *Greener Times*.

The questions that were posed to them that are addressed in this paper are:

- (i) What do you think are the main environmental issues associated with sheep and cattle grazing in Australia? Please list up to three in order of importance to you, beginning with the most important.

Wool supply chain interviews

Wool supply-chain research occurred through a series of interviews with 13 Australian wool supply chain companies. Wool brokers, scourers, top-makers, spinners, weavers, knitters, product manufacturers and retailers were interviewed during July 2001 (Table 1). Interviews were conducted by phone or during personal visits, and for more detail of the methods used see Twyford-Jones *et al.* (2005).

The objective of the interviews was to gather information on the influence of environmental issues on raw and processed wool buying and selling, and the desirable characteristics of an environmental assurance system for wool processing and production.

Questions asked of these wool supply chain companies addressed in this paper are:

- (i) Please identify the environmental issues that you see as being most important at the wool production end of the wool chain.
- (ii) What do you consider to be the most important environmental issues for your business?
- (iii) What would an assurance scheme need in order to be considered useful and credible for wool processing?

Meat supply chain interviews

Representatives from 14 meat-products supply chain companies were interviewed during August 2002, with details of the methodology provided by Twyford-Jones *et al.* (2005). Businesses included abattoirs (domestic and export), wholesalers (domestic and export) and major retailers across Queensland, New South Wales and Victoria (see Table 1). The objective of the interviews was to gather information on the important intrinsic and extrinsic characteristics of meat that are influenced by the production system, and the desirable characteristics of an environmental assurance scheme.

Compared with wool supply chains, processors and other members of meat supply chains have much closer linkages with graziers, use a wider range of standards and many more labels. For these reasons the questions put to meat supply chains were different to those used for wool supply chains.

The questions asked of the meat supply chain companies addressed in this paper are:

- (i) Do your production specifications include environmental issues?
- (ii) Do you prefer that one assurance scheme address all of your meat specifications, or would you prefer to use separate schemes, such as quality, safety and environmental?
- (iii) What would an assurance scheme used by graziers for meat production need for you to consider it workable and credible?
- (iv) Do products that carry an industry, national or international quality/environmental label compete with your own brands of labelled meat?

Agricultural industry, consumer and environmental group interviews

Representatives of eight agricultural industry, eight consumer and eight environmental organisations (Table 2) were interviewed to explore and record their perceptions and expectations for agricultural environmental assurance. The methodology used was convergent interviewing, which is based on paired interviews that are conducted as structured dialogue (Dick 1998). This

interviewing method allows the interviewee to raise and explain issues that are important to them, rather than respond to questions that are important to the interviewer.

Two separate interviews, each with one or more members of a single organisation within the same stakeholder category (e.g. agricultural organisations), were conducted in close succession. This first pair of interviews began with the broad question, “What do you think the ‘ideal’ environmental assurance scheme might look like?” Responses to this question and other comments and views expressed by the interviewees were recorded. After this first pair of interviews the similarities and differences between the two sets of data were identified and additional probing questions were developed to explore these similarities and differences in opinions on environmental assurance with the next pair of interviewees. This was done to test convergent information and explore and explain divergence, and was repeated on two further occasions until all eight organisations were interviewed. In this way, representatives of the stakeholder groups identified and explained their requirements for the composition and operation of agricultural environmental assurance.

The interviews with the 24 organisations were conducted over a period of 6 weeks during May–June 2002, predominantly in person, with a few interviews conducted by phone when circumstances prevented face-to-face meetings. Each interview lasted about 1.5–2.0 hours. The order in which organisations were interviewed was based on their availability.

Results

The expectations of stakeholders for environmental assurance are reported under the headings of domestic consumer survey, rangeland grazier survey, environmental group member survey, wool supply chain interviews, meat supply chain interviews, and agricultural industry, consumer and environmental group interviews.

Domestic consumer survey

The responses of consumers to the six survey questions relating to the nature or form of environmental assurance they expected for meat and other agricultural products are provided below.

Table 1. Australian wool and meat supply chain companies interviewed

Wool supply chain companies (n = 13)		Meat supply chain companies (n = 14)	
Company	Business	Company	Business
Australian Wool Network	Broker	Castricum Brothers	Processor and wholesaler
Goulburn Wool Scour	Scourer	Coles Myer	Retailer
Fletchers Wool Exports	Topmaker	Southern Meat Co.	Wholesaler and retailer
Australian Topmaking Services	Topmaker	Polkinghorn’s	Supply chain and retailer
Riverina Wool Combers	Topmaker	Australian Country Choice	Producer and processor
Port Phillip Wool Processing	Topmaker	Bindaree Beef	Processor
Geelong Wool Combers	Topmaker	Tender Plus	Processor and wholesaler
Elite Fibre Australia	Topmaker and spinner	Monbeef	Processor
Australian Country Spinners	Spinner	Colonial Meat Packers	Processor
Macquarie Textiles	Spinner, and weaver	IMT Processing	Processor
Defab	Weaver	Nolan Meat	Processor
Austrim Textiles	Weaver, knitter	Consolidated Meat Group	Processor
Woolaby	Apparel manufacturer	Cargill Foods Australia	Processor
		Woolworths	Retailer

Table 2. Industry, environmental and consumer organisations interviewed

Industry (<i>n</i> = 8)	Environmental (<i>n</i> = 8)	Consumer (<i>n</i> = 8)
Queensland Fruit and Vegetable Growers (now Growcom)	New South Wales Nature Conservation Council	Consumers Association of SA
Queensland Farmers Federation	Greenpeace	Faculty of Health and Behavioural Science, University of Wollongong
Agforce	Brisbane Region Environment Council	Australian Consumers Association
Cattle Council of Australia	Queensland Conservation Council	Australian Community Foods
Australian Meat Council	Wildlife Preservation Society	<i>Australian Women's Weekly</i> and <i>Women's Day</i>
Meat and Livestock Australia	Greening Australia	<i>Vogue</i>
Kangaroo Industry Association of Australia	World Wide Fund for Nature	Queensland Consumers Association
Australian Wool Innovation	Victorian Catchment Management Council	Brisbane Consumers Association

When they were asked, 'What do you think the main issues are in relation to the environmental effects of sheep and cattle grazing?' [question (i)], 49% either thought there were no environmental issues associated with livestock grazing or they did not know of any (Table 3). For the 51% of respondents that could identify one or more issues, no single issue was dominant, with little difference between the four or five top ranked issues.

When consumers were asked how confident they were with the environmental claims made on products currently in the supermarkets [question (ii)], only 8% were 'very confident', 62% were 'somewhat confident', 27% were 'not at all confident' and 3% of respondents answered 'don't know'.

Not surprisingly then, when consumers were asked how important it is to have a system in place that guarantees that meat is 'environmentally friendly' [question (iii)], 90% thought that this was either 'quite important' or 'very important' (Table 4).

When given a choice of what they would need to see on a label and in an advertisement in order to trust an environmental assurance system [question (vi)], 67% of respondents answered 'government regulation' and 46% answered 'endorsement by an environmental group'. Only 4% answered 'endorsement by a celebrity', 1% answered 'other', and 2% answered 'don't know'.

Rangeland grazer survey

The responses of 300 rangeland graziers to the six survey questions relating to the nature or form of environmental assurance expected by them are provided below. Graziers identified a wide range of environmental issues or impacts that they associated with grazing in the rangelands [question (ii)]. The most prevalent issue was weeds, pests or disease, followed

Table 3. The main environmental issues associated with sheep and cattle grazing identified by consumers during the ACNielsen national consumer survey (*n* = 605)

Environmental issue	Response (%)	Environmental issue	Response (%)
Don't know	32	Hormone use	8
None	17	Land pollution	6
Soil erosion	15	Green house gases	4
Over-grazing	12	Loss of wildlife	2
Chemical use	12	Salinity	2
Animal welfare	10	Water pollution	2
Tree clearing	9	Other	6

by a decline in water quality or quantity, and overgrazing (Table 5).

When asked is it important for environmental assurance to result in a product label or logo that can be used to differentiate rangeland food and fibre in domestic and overseas markets [question (ii)], 47% said this was 'very important' and 34% said it was 'quite important'. Only 8% and 7% said this was 'not very important' and 'not at all important', respectively.

Graziers believed that many stakeholder groups should play a role in the development and operation of environmental assurance schemes [question (iii)]. Almost all graziers interviewed said that they ('pastoralists') should play a role, and a high proportion of respondents also saw roles for 'industry groups', 'government', 'retailers and processors', and 'consumer groups' (Table 6). When asked which of the organisations identified as playing a role should lead the development and operation of environmental assurance [question (iv)], the dominant response was 'graziers', dropping markedly to 'industry groups' and then 'government' (Table 6).

The majority of graziers expressed a desire for auditing to be a requirement of environmental assurance [question (v)], with 41% saying this was 'very desirable' and 32% saying it was 'quite desirable'. Thirteen percent responded that this was 'not very desirable', and 9% said it was 'not at all desirable'. When asked who should conduct auditing [question (vi)], 63% of respondents chose a 'licensed independent auditor', 21% chose a local 'Landcare or Catchment group', and 16% chose 'self-audit or vendor declaration'.

Environmental group member survey

A total of 1051 mail questionnaires were received, and this combined with the 55 responses through the website gave a total

Table 4. The level of importance placed on an 'environmentally friendly' guarantee for meat by consumers during the ACNielsen national survey (*n* = 605)

Level of importance	Response (%)
Very important	60
Quite important	30
Neither important or unimportant	4
Quite unimportant	4
Not at all important	1
Don't know	1

Table 5. The main environmental issues or impacts in the rangelands identified by graziers during the ACNielsen national survey (n = 300)

Environmental issue or impact	Response (%)	Environmental issue or impact	Response (%)
Weeds, pests and disease	38	Weather, drought or flood	6
Decline in water quality and quantity	26	Fire and fire management	5
Overgrazing	24	Chemical use and residues	4
Soil degradation or erosion	16	Salinity	4
Feral animals	12	Shrub and tree increase	4
Loss or decline of pastures	12	Other	15
Tree clearing and land development	10	No environmental impacts	8

of 1106 responses to the four questions asked. Members of environmental groups identified a wide range of environmental issues associated with sheep and cattle grazing in Australia [question (i)], with the main categories being erosion, vegetation impacts, over-grazing and biodiversity impacts (Table 7). The respondents demonstrated an in-depth knowledge of environmental issues and impacts associated with livestock grazing, as demonstrated by the very specific subcategories of issues mentioned by them.

Members of environmental groups also believed that a wide range of stakeholders should play a role in the development of an environmental assurance scheme for sheep and cattle industries [question (ii)]. The most popular choices were ‘producers and rural industry groups’, ‘conservation organisations’, and ‘other’ (community group such as Landcare, and government agencies) (Table 8). Members of environmental groups also saw roles for a range of organisations in auditing environmental assurance schemes [question (iii)]. This time the most popular choices were ‘government agency’, ‘other’ (independent auditors) and ‘conservation organisations’ (Table 8). Much lesser roles in auditing were seen for members of supply chains, such as ‘producers and rural industry groups’, and the ‘retail and processing sector’.

Several factors increase the level of acceptance of environmental claims by members of environmental groups [question (iv)]. Those that very much increase the levels of trust are ‘adherence to a recognised standard’ and the ‘quantity and quality of information provided to substantiate claims’, with both being chosen by 67% of respondents, followed closely by ‘achieving environmental performance benchmarks’ (65%) and a ‘process of continuous improvement in environmental

Table 6. The organisations identified by graziers as having some role in the development and operation of environmental assurance, and then the lead role (n = 300)

Organisation	Some role (%)	Lead role (%)
Graziers	98	58
Industry organisations	86	20
Government	80	10
Retailers and processors	75	3
Consumer groups	72	2
Private consultants	52	0
Conservation groups	47	0
Other		4
Don't know		4

management’ (63%). Fewer respondents rated ‘environmental licensing of producers’ (55%) and ‘endorsement by a reputable organisation’ (43%) as very much increasing their levels of trust, dropping markedly to 15% for ‘price premiums on products’.

Wool supply chain interviews

The responses of the wool supply chain businesses to the three interview questions are provided below. Of the 13 companies asked to identify the environmental issue that they thought was most important at the farm level [question (i)], 10 mentioned chemical residues, one mentioned general sustainability, and two companies could not think of any important issues.

When asked to identify the environmental issues that were most important to their business [question (ii)], five mentions were made of chemical residues and water quality, four of industry sustainability, and one each of waste management, odour, and energy use. One business said there were no environmental issues that affected them, as their customers were predominantly interested in the price of yarn.

These supply chain companies were also asked what an environmental assurance scheme would need for them to consider it useful and credible [question (iii)]. The application of the scheme to the entire supply chain was mentioned four times, declarations for chemical residues was also mentioned four times, and there was one mention each for setting a high standard, monitoring all environmental issues, waste management at the processing level, labelling, on-farm sustainability, support from the Woolmark Co. and a guarantee of quality. Two companies mentioned that it was important for the one standard to be applied across the entire industry because reductions in environmental impacts were often costly, and as their customers were sensitive to price, it was important that all companies operated under the same standard.

Meat supply chain interviews

The responses of 14 meat supply chain companies to the four interview questions are provided below. When asked whether their specifications for meat production included environmental issues [question (i)], there were only three mentions of chemical residues and one mention of organic production. At the same time, all of the companies said that they had a wide range of supplier specifications for eating quality and food safety.

Businesses within meat supply chains, which often use several assurance schemes, were asked whether they preferred to use one or several schemes to address their meat production specifications [question (ii)]. Eight businesses said that they

Table 7. Categories and subcategories of environmental issues mentioned by members of environmental groups during a mail and web survey (n = 1106)

Category	Response (%)	Subcategory
Erosion	24	Soil compaction or disturbance, soil loss, waterway edges
Vegetation impacts	17	Clearing, selective grazing, trampling
Overgrazing	17	Grazing in droughts, poor management, high stock densities, rotation of paddocks, spelling, inappropriate stock, animal cruelty or welfare
Biodiversity impact	15	Culling of competitors, direct competition, habitat loss, change in habitat or vegetation, burning, provision of water points
Water use	10	Diversion, alteration of natural flows, groundwater, salinity, inefficient use, uncapped bores
Pollution	9	Chemicals in environment, chemicals in food, greenhouse gases, stock feces
Ferals and weeds	5	Exotic or weed plants, feral animals, spread assisted
Other	3	Fertilisers, nutrient loss, flies, genetic modification of organisms, stock disease, energy use, political-socio-economic issues

preferred to use just one integrated scheme, addressing quality, safety and the environment. Two companies said that food safety was the only issue that needed to be addressed, and recommended Hazard Analysis and Critical Control Points (HACCP) (Mortimer and Wallace 1998). One company said that several schemes were needed for different markets, another wished to address environmental issues separately, and two others said they would develop their own systems, but did not specify what these were.

When asked what an assurance scheme used by graziers would need for them to consider it workable and credible [question (iii)], second- or third-party auditing was mentioned seven times, third-party only auditing was mentioned twice, cost-effectiveness and adding value was mentioned four times, and integration of issues such as quality, safety, animal welfare and the environment was mentioned on three occasions. Single mentions were made of accurate first-party auditing, alignment with the principles of Flockcare, user-friendly and sensible, traceability and transparency.

Members of meat supply chains were also asked whether an industry, national or international meat label would compete with their own brands or labels [question (iv)]. Ten companies answered yes to this question, compared with four who answered no.

Agricultural industry, consumer and environmental group interviews

A wide range of requirements for agricultural environmental assurance were recorded during interviews with the stakeholder

Table 8. Stakeholder groups identified by members of environmental groups as having some role in the development and auditing of environmental assurance schemes (n = 1106)

Development of schemes		Auditing of schemes	
Group	Response (%)	Group	Response (%)
Producers/rural industry	83	Government agency	64
Conservation group	75	Independent auditor	55
Community group	66	Conservation group	55
Research organisation	63	Community group	44
Government agency	61	Research organisation	44
Consumer group	36	Producers/rural industry	39
Retail and processing	16	Retail and processing	10

groups. These requirements were then categorised under headings that represented the main components of environmental assurance, being standards (including type, adoption and application), issues and principles, development of standards, auditing and product labelling. The responses of stakeholders were then summarised under these headings and presented in Table 9. For more details on the results of these interviews, see King and Pahl (2005).

At the time of interviewing, most stakeholders were confused about the environmental and other standards available that could be used for environmental assurance. For example, agricultural industry groups frequently used the term EMS rather than environmental assurance as a generic term for environmental standards and auditing processes. Similarly, environmental groups also used EMS in a generic sense, while consumer groups more consistently used the term environmental assurance. Therefore, mentions of terms such as EMS, environmental labelling and quality assurance (QA) by stakeholder groups did not imply that these were the standards they preferred to be used for environmental assurance, as these and other terms were sometimes used interchangeably.

In relation to standards, agricultural industry groups required environmental assurance to be integrated into the industry standards for QA and food safety, and particularly those used in international markets. For consumer and environmental groups, it was more important that standards accounted for the true social and environmental costs of production, including biodiversity and ecosystem functioning (Table 9).

Agricultural industry groups also wanted environmental assurance to be voluntary, whereas consumer and environmental groups required regulations to maximise participation rates or compliance. Other major differences were that agricultural industry groups wanted to lead the development of environmental assurance, and they expected it to be customised for particular commodity sectors, based on continuous improvement, and to add value to supply chains. In contrast, consumer and environmental groups wanted environmental assurance to be developed by a multi-stakeholder working party, expected it to be customised for regions or ecosystems and contain minimum environmental performance measures that were benchmarks for sustainability. They did not mention that it should add value to a business.

Table 9. Requirements of industry, consumer and environmental groups for agricultural environmental assurance
QA, quality assurance

Requirement categories	Industry groups (<i>n</i> = 8)	Consumer groups (<i>n</i> = 8)	Environmental groups (<i>n</i> = 8)
Standards			
Mode of adoption	Voluntary	Voluntary with regulatory backup	Voluntary with regulatory backup
Standards mentioned	International industry QA standards. EMS, eco-labelling	QA	EMS, eco-labelling
Scale of operation	Global	Global	Global
Scope of standards	Continuous improvement + BMP	Sustainability first, then continuous improvement	Sustainability first, then continuous improvement
Application of standards	Commodity sectors	Regions or ecosystems	Regions or ecosystems
Focus of standards	Integrate with QA and food safety	Account for true costs of production, food safety	Account for true costs of production, biodiversity, ecosystem functioning
Life cycle	Entire supply chain	Entire supply chain	Entire supply chain
Issues and principles			
Objectives	Triple-bottom line: economic emphasis	Triple-bottom line: equal emphasis	Triple-bottom line: equal emphasis
Performance measures	Regional measures	Measurable criteria relevant to consumers	Mandatory minimum environmental measures
Benefit–cost ratio	Benefits > costs, add value to business	Not mentioned	Not mentioned
Transparency of operation	Not mentioned	Consumers and wider community	Consumers and wider community
Development of standards			
Leadership	Industry	Multi-stakeholder	Multi-stakeholder
Auditing			
Level of auditing	1st to 3rd party	Not mentioned	3rd party
Labelling			
Number of labels	Single national label	Multiple labels	Single national label

Consumer and environmental groups also required that the operation of environmental assurance be fully transparent, with information on its operation readily available to consumers and the wider community. By comparison, transparency was not mentioned by agricultural industry groups.

Surprisingly, consumer groups did not mention a need for auditing. Agricultural industry groups were mixed in their needs for auditing, with requirements ranging from first- to third-party audits, whereas environmental groups had a strong preference for third-party auditing.

All three stakeholder groups wanted environmental assurance to operate at a global scale and be applied across supply chains, and only consumer groups wanted more than one national label. They required several labels to satisfy the need for consumer choice.

Discussion

The stakeholders consulted during this study expressed a wide range of views regarding the application of environmental assurance to the pastoral industries and agriculture generally. Some stakeholders, such as environmental and consumer groups, were highly supportive of environmental assurance, particularly within the context of improving the social and environmental performance of agriculture. Other stakeholders, particularly meat and wool supply chain companies, were more guarded in their support for environmental assurance. Although they perceived some triple-bottom line benefits, they were concerned about the additional costs of environmental assurance and who will pay for these.

During these interviews, productive stakeholder dialogue with regard to the application of environmental assurance to Australian agriculture was impeded by a lack of understanding

of the range of standards available, their different objectives and processes, and their varying advantages and disadvantages. Many people interviewed during this study did not appear to distinguish between EMS, environmental labelling and QA, and often used these terms interchangeably. Similarly, consumers have a very poor understanding of environmental assurance, believing organic to be a better descriptor of ‘environment friendly’ than ‘produced with less harm to the environment’ (Pahl 2007). Ridley (2001) also noted that although EMS was a popular topic in some segments of the agricultural community, there was much confusion and rhetoric surrounding it.

Most stakeholders are not at a stage in their understanding of environmental assurance to make firm recommendations on the specific standards that should be used within agriculture, but they do have expectations for the elements and practices that should be contained within them. These are discussed below under the same headings used to categorise the responses of agricultural industry, environmental and consumer groups interviewed during this study (Table 9): standards, issues and principles, development of standards, auditing and product labelling.

Standards

The need for standards to be voluntary was widespread, although some environmental and consumer groups expressed the view that legislation should be used as a back-up to voluntary approaches that were failing, effectively meaning that adoption should be mandatory. This is consistent with the findings of Anon. (2003*b*) that industry generally favoured a voluntary approach, while consumer and environmental organisations preferred legislative approaches.

Agricultural industry organisations seemed to be of the opinion that environmental assurance should be predominantly

based on a process standard, such as EMS, although several of them had reservations about use of the full ISO 14001 standard, believing this to be costly, complex and not easily adapted to farms. Ridley (2001), who reviewed several EMS related programs in several countries, reported that one of the lessons learnt was that a full ISO 14001 EMS is not practical for most family farms. This has since been verified for grains and livestock farms in Australia (Seymour *et al.* 2007).

Environmental and consumer groups also were in favour of using continuous improvement standards such as EMS, but were adamant that these must be underpinned by minimum environmental performance measures. They also believed that standards should address the entire supply chain or life cycle of the product, and operate at global scales to ensure the well-being of people and environments in other countries.

Equivalence with international standards, especially those in Australia's major export markets, was a common desire amongst stakeholders, particularly the agricultural industry organisations and businesses within meat and wool supply chains. Backshall (2000) also noted that organisations trading in produce indicated that environmental assurance systems must be recognised internationally and be comparable with standards used by the major export markets. Agricultural industry organisations generally preferred environmental assurance to be based on existing industry QA and food safety standards, giving rise to a single common industry standard that addresses several supply chain requirements. This mirrors the requirements of food processors and retailers in the European Union that expect common industry standards such as EUREPGAP (Anon. 2005c) to be adopted by all of their suppliers, including those in other countries (Pahl 2004).

Consumers in Australia and overseas generally have little knowledge of standards and verification processes. When presented with alternatives, they indicate a preference for national and international standards certified by a third party, as these are regarded as the most credible standards available (DiMatteo 2000). Government regulation of product claims and endorsement by reputable and well-known environmental organisations also increased the validity of claims for consumers. High consumer regard for standards developed by a range of stakeholders was also reported by Anon. (2003a) and Anon. (2005b).

Australian agricultural stakeholders appear to be following the trends set by international organisations with regard to recommendations for environmental assurance. Anon. (2003a) recommends that standards for environmental assurance should:

- (i) be established on the basis of genuine need,
- (ii) be voluntary private sector initiatives that do not act as technical barriers to trade,
- (iii) be focused on best social and environmental production practices in their respective fields,
- (iv) take into account the ecological, cultural, and economic realities of the parts of the world in which they operate,
- (v) be based on process and production methods (PPM) that assess how a product was produced rather than characteristics of the product itself,
- (vi) incorporate both performance and management-based elements to improve management practices as well as long-term sustainability, and

- (vii) embody a culture of continuous improvement to accommodate evolving best practices and improve stakeholder participation.

Environmental issues and principles

The stakeholders consulted expected environmental assurance to address several environmental issues, although only those people closely associated with food and fibre production or with environmental groups had knowledge of specific issues. The environmental issues they want addressed are soil degradation and erosion, vegetation change and loss, decline in water quality and flows, chemical residues, land pollution, salinity, weeds and feral animals. In particular, environmental groups wanted all environmental issues on farms addressed, and not just those with a high profile. Environmental groups also identified several principles for environmental assurance, including:

- (i) minimum environmental performance measures that are benchmarks of sustainability,
- (ii) an emphasis on ecosystem functioning and maintenance of biodiversity,
- (iii) alignment with the priority environmental issues of catchments, and
- (iv) continuous improvement of environmental management practices.

These results are similar to those reported by Backshall (2000), where the WWF, Australian Conservation Foundation (ACF), and the Western Australian Conservation Council (WACC) indicated that environmental assurance needs to:

- (i) integrate with catchment planning processes and priorities,
- (ii) be highly transparent with regard to processes and outcomes,
- (iii) have environmental performance indicators that can be monitored to determine progress and outcomes, and
- (iv) demonstrate chain of custody for products.

Environmental and consumer groups also expected that environmental assurance would account for the full environmental and social costs of production. Consequently, they believed that the price of food and fibre should increase where there are high environmental costs. This is consistent with the long-term goal of the European Union, which is to ensure that the price paid by consumers for a product includes the costs of all the environmental impacts that it creates (Anon. 2003b).

A major difference of opinion exists between the agricultural industry groups and environmental and consumer groups with regard to the application of standards used for environmental assurance (see Table 9). Agricultural industry groups prefer standards to be applied to particular commodity sectors, such as sheep or cattle production. By contrast, environmental and consumer groups want standards to be applied to units of land, such as regional ecosystems. They expressed concern that existing forms of environmental assurance assume that the current land use is sustainable and appropriate, and believe that a continuous improvement process should only be applied to a business when it has met minimum benchmarks for sustainability. This is supported by Ridley (2001) who noted that under some circumstances a continuous improvement system such as EMS may only encourage incremental improvement in what is an unsustainable land use.

In comparison, Australian consumers, processors and retailers identified few environmental issues and principles, and seemed to have a limited understanding or interest of the environmental aspects of farms. Many could not identify any issues at all. The only issue that was commonly raised by these stakeholders was chemical residues in food and fibre, and the human and environmental health issues associated with these. This is consistent with work published by Backshall (2000), in which environmental issues were the least important of 10 factors that influence the decisions to purchase produce by food processors and retailers, with the most important being the availability of supply and compliance with product specifications.

Development of standards

Most agricultural industry organisations and graziers believed that they should lead the development of standards, although some thought these should be developed by retailers or processors, believing that environmental assurance should be driven by demand, rather than supply. Australian processors and retailers seemed to favour this approach, which is what occurred with the development of the major European Union and now global standard EUREPGAP (Pahl 2004).

Environmental and consumer groups expressed a desire for a multi-stakeholder working group, where no single organisation is dominant, to develop environmental assurance standards. Similarly, Backshall (2000) noted that endorsement by WWF, ACF and the WACC required their active involvement in the development of environmental assurance, and Ridley (2001) recommended that standards such as EMS be developed through partnerships.

In order to gain consumer, environmental and other community group acceptance of environmental assurance standards, there is a need for these to be developed by multi-stakeholder groups. This is the view of Anon. (2003a) and Anon. (2005b), who recommend that all certification standards should be developed with input from multiple stakeholders including consumers, industry, environmentalists and social representatives. The importance of wide stakeholder involvement is further evident in the work by Brynne and Mallet (2005), which contains recommendations on how to consult with and involve stakeholders in the development of standards.

Auditing

Auditing is a major element of contention, owing to its cost and requirement for well-documented production practices. Environmental and consumer groups voice a clear preference for auditing to be conducted by independent or third-party organisations. Backshall (2000) also reported that several environmental groups regarded independent auditing and certification as essential. Similarly, organisations representing consumers, such as the Consumers Union, note that explicit claims and statements communicated to consumers should be validated through third-party verification, by an independent body open to public scrutiny (Anon. 2005b).

Consumers in Australia and overseas generally have limited awareness of the range of auditing processes available, and, therefore, cannot make informed judgements on auditing. Nikolic and Habul (2003), quoting Baker (1998), noted that certification

as an attribute of food quality that influenced purchasing, was rated as important by only 10% of consumers, probably reflecting their limited knowledge of this topic. This seems ironic given their low levels of trust in the environmental claims made about products (Bougherara and Grolleau 2004; MacNamara and Pahl 2004). However, when given a choice during surveys, consumers often express a strong preference for product claims to be certified by government or other independent third-parties (DiMatteo 2000; MacNamara and Pahl 2004).

In contrast with environmental and consumer groups, members of meat and wool supply chains are much less supportive of third-party auditing. They often oppose the need for audits, and if this is not possible, then they prefer first- or second party audits. However, processors and retailers often feel that internal audits lack the credibility and rigour essential for supply-chain transactions, and prefer independent auditing by accredited certification bodies. Cary *et al.* (2004) noted that processors and retailers place importance on independent auditing, being concerned that products marketed as 'green' or 'environmentally friendly' were not supported by certification or legislation that authenticated the production process. The predominant opinion was that consumers would not trust such claims and there would be no competitive advantage in marketing products with unsubstantiated claims.

Product labelling

Most stakeholders, including environmental groups, agricultural industry organisations and graziers, desire just one unique and prominent product label, such as one national eco-label that has high recognition and credibility. Cary *et al.* (2004) also found that members of supply chains were concerned that there were too many labels and certifying bodies, even with organic, and preferred a single, industry-wide certification agency.

In contrast, consumer groups and some members of supply chains require flexibility and freedom to develop a range of environmental labels, arguing that this suits the need for product diversity demanded by producers and consumers alike. However, points of difference between product labels are often unclear, and result in consumer confusion when many environmental labels are on offer.

Meat and wool processors, wholesalers and retailers who have their own labels are reluctant to trade in products carrying other labels, and seem particularly wary of products bearing national or international eco-labels (Pahl 2004). Some retailers believe that eco-labels may compete with their own labelled products, or indicate that the many unlabelled products on their shelves are environmentally inferior (Cary *et al.* 2004). In this regard, retailers may prefer assurance standards that do not confer product labels, allowing them flexibility to build on this in a way that best suits their strategic market position (Pahl 2004). This appears to be a trend in the large food supermarket chains in Europe and the United Kingdom, where on-farm assurance is used to underpin a particular whole-of-store image, or their own claims and labels on individual products.

However, eco-labelling is very popular with producers, environmental and consumer groups, even though it has struggled to gain a firm hold in the market place. Although there are a small number of examples where eco-labelling appears to have delivered market benefits (Anon. 1999b), this seems to be

the exception (Durham *et al.* 2003; Twyford-Jones *et al.* 2005). Most large Australian produce companies interviewed by Cary *et al.* (2004) saw little benefit in the use of green trademarks or brands from certifying bodies on foods, as demand was low and the costs would be higher (modifying production systems, inspection and certification regimes, and labelling costs).

The 'ideal' agricultural environmental assurance scheme?

In this study, stakeholders were able to voice their expectations for environmental assurance without needing to give a lot of thought to how their requirements might be achieved. Consequently, the list of elements and processes drawn from the surveys and interviews represent a form of environmental assurance that could only be implemented in an 'ideal' world, where there were no significant barriers to implementation. Had stakeholders firstly been given responsibility for implementing environmental assurance, and then asked to identify the elements and processes they would include, the list would probably have been very different. In an 'ideal' world, stakeholders want environmental assurance to:

- (i) be developed and reviewed by a multi-stakeholder working party,
- (ii) be applied to the entire supply chain or life-cycle of the product,
- (iii) be capable of being integrated with the quality, safety and other requirements of markets,
- (iv) have international recognition and equivalence with international standards,
- (v) contain a process for continuous improvement,
- (vi) include minimum environmental performance targets,
- (vii) account for the full environmental, social and economic costs of production,
- (viii) address on-farm environmental issues in the context of catchment priorities,
- (ix) be highly transparent with regard to processes and outcomes,
- (x) be certified by independent (third-party) auditors, and
- (xi) confer one or more product labels.

This form of environmental assurance is mainly proposed and driven by community organisations and government agencies that have staff with the time and capacity to research, develop and promote agricultural environmental assurance. Also, a common feature of these organisations is that they are not closely involved in the implementation of environmental assurance, and, as such, are not required to implement and fund this. Instead, they are more interested in the common public good that may arise from this form of environmental assurance.

The 'ideal' nature of this form of environmental assurance is evident in that there is no single standard currently available that addresses all of these issues. The requirements of stakeholders could only be met through a combination of standards, such as management system standards that provide for continuous improvement in the environment (ISO 14001), quality (ISO 9001) and food safety (HACCP), and the ISO 14024 eco-labelling standard that provides life-cycle assessment, multi-stakeholder involvement, environmental performance benchmarks, and product labelling.

Other stakeholders, such as producers, processors and retailers, while seeing the merits of this 'ideal' form of

environmental assurance, have concerns about its application to agriculture (Backshall 2000). They operate businesses within supply chains, and, as such, would be responsible for implementing environmental assurance. They would be required to develop and apply environmental assurance to their own businesses, work out how this relates to their trading partners, modify their production practices, introduce additional monitoring and record keeping, undergo auditing, add labels or brands to their packaging, and work out how to pass on the costs of this to their customers. They know that they will be paying for this in the first instance, seeing few immediate private benefits arising from implementation, and are concerned that they will lose business by passing on the costs to their customers, particularly in export markets where competing suppliers do not comply with the same standards (Williams 2005). Owing to their concerns about the costs of implementation and compatibility with their trading practices, businesses that operate in food and fibre supply chains also require environmental assurance to:

- (i) be closely aligned with existing industry supply-chain standards,
- (ii) be kept simple and with minimal documentation, and
- (iii) add value to their products and businesses.

These requirements reflect their concern for the costs of implementing environmental assurance. They know that consumer demand for environmentally assured products is low, that consumers believe 'green' products to be over-priced and are not willing to pay higher prices for them (Giraud 2003). They also know that the low profit margins of producers, processors and retailers make it very difficult for any of these sectors to absorb these additional costs. Under these circumstances it is not surprising that agricultural supply chains in Australia are struggling to implement forms of environmental assurance such as ISO 14001 (see Banney 2002; Seymour *et al.* 2007; Sallur *et al.* 2007).

For these reasons members of supply chains also require environmental assurance to be implemented slowly and in an incremental fashion, enabling them to adapt their businesses to the new procedures and costs. As this will take time, with some producers taking more time than others, Banney (2002), Pahl (2004) and Seymour *et al.* (2007) recommend that environmental assurance be provided in the form of modules or tiers that allow for incremental adoption. Banney (2002) recommended that environmental assurance within the red-meat industries take the form of a four-tiered approach, beginning with an environmental self-assessment, followed by an environmental checklist, an industry EMS and finally an EMS that is certified to the ISO 14001 standard. Seymour *et al.* (2007) recommended a similar approach, where four levels of EMS are integrated with four levels of QA, culminating in certified management systems. Further discussion and recommendations on the actions that need to be taken to encourage more widespread adoption of environmental assurance in agriculture are provided by Pahl (2007).

Conclusions

Environmental and consumer groups (who do not operate supply chains) are mostly concerned with achieving general public-good outcomes, and, accordingly, want environmental

assurance to account for the full environmental, social and economic costs of production. They want all environmental aspects of agriculture addressed, as well as ecosystem functioning and biodiversity conservation. Participating producers must firstly meet minimum environmental performance measures, being benchmarks for sustainability, and then continuously improve on this over time. All of this should be implemented in accordance with widely agreed international standards, with verification of compliance provided by an independent auditor.

This 'ideal' form of environmental assurance does not currently exist in practice, and given the magnitude of constraints operating within global supply chains, the conditions needed for its implementation will not occur in the foreseeable future.

In the short term, members of supply chains (the people that must implement and fund environmental assurance) want this to be kept simple and low cost, to be built into their existing industry QA and food safety schemes, and to add value to their businesses. As a starting point, several agricultural industry organisations favour the use of a basic management system that is a combination of continuous improvement, risk assessment and industry BMP programs (Anon. 2005*d*), and then incrementally move towards compliance with similar standards used in international supply chains.

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