RURAL INDUSTRIES RESEARCH
& DEVELOPMENT CORPORATION

# VEMAs

## Designing voluntary environmental management arrangements to improve natural resource management in agriculture and allied rural industries

**A report for the Rural Industries Research and Development Corporation**

by Thea Mech and Michael D. Young
Policy and Economic Research Unit
CSIRO Land and Water

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**Researcher Contact Details**

Dr Thea Mech
Resource Economist
Policy and Economic Research Unit
CSIRO Land and Water
Gate 4 Waite Road
Urrbrae SA 5064

Phone: (08) 8303 8663
Fax: (08) 8303 8582
Email: Thea.Mech@csiro.au

Professor Michael D. Young
Ecological Economist
Policy and Economic Research Unit
CSIRO Land and Water
Gate 4 Waite Road
Urrbrae SA 5064

Phone: (08) 8303 8665
Fax: (08) 8303 8582
Email: Mike.Young@csiro.au

**RIRDC Contact Details**

Rural Industries Research and Development Corporation
Level 1, AMA House
42 Macquarie Street
BARTON ACT 2600
PO Box 4776
KINGSTON ACT 2604

Phone: 02 6272 4539
Fax: 02 6272 5877
Email: rirdc@rirdc.gov.au.
Website: http://www.rirdc.gov.au

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# Foreword

This report presents the findings of a RIRDC-funded research project on the design and development of a range of voluntary approaches to environmental and quality management for application to agriculture and allied rural industries. The report focuses primarily on a range of voluntary environmental management arrangements (VEMAs), notably environmental management systems (EMSs), and also considers other voluntary approaches undertaken for the purposes of quality assurance, food safety and animal welfare. Interest in voluntary approaches to both environmental and quality management is gathering momentum in Australia and overseas. This research sheds light on international developments in a rapidly evolving area that holds much promise for agriculture and rural industries.

The report distinguishes between VEMAs in terms of their design features and their intended environmental, marketplace and community outcomes, and explains the relationships and compatibilities between them and other voluntary arrangements undertaken for environmental, quality, food safety and animal welfare reasons. Importantly, the report seeks to inform, both, stakeholders interested in participating in existing VEMAs, as well as the future architects of new arrangements, of the pros and cons of alternative design options associated with different arrangements, and of the environmental and marketplace implications of choosing between them. The report also explores the potential for integrating diverse voluntary arrangements.

The report sets out principles and guidelines on design and development issues relating to VEMAs for Australian agriculture and rural industries, thereby contributing to policy development in this area. In this regard, the research complements and adds value to the on-going work of the EMS Working Group (EMSWG) of the Sustainable Land and Water Resources Management Committee (SLWRMC). By providing an analytical framework to help diverse stakeholders assess the implications of their decision-making as regards VEMA design, this research intends to increase the probability of success of initiatives, including their integration into regional, national and international systems.

This report, a new addition to RIRDC's diverse range of over 700 research publications, forms part of our Future Agricultural Systems R&D program and the Resilient Agricultural Systems sub-program, which aims to foster agri-industry systems that have sufficient diversity, flexibility and robustness to be resilient and respond to challenges and opportunities. Most of our publications are available for viewing, downloading or purchasing online through our website:

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**Peter Core**
Managing Director
Rural Industries Research and Development Corporation

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# Abbreviations

| | |
|---|---|
| **ACC** | American Chemistry Council |
| **ACEL** | Australian Centre for Environmental Law |
| **AFFA** | Agriculture, Fisheries and Forestry – Australia |
| **AFPA** | American Forest and Paper Association |
| **ALMS** | Australian Landcare Management System |
| **ANU** | Australian National University |
| **ANZECC** | Australian and New Zealand Environment and Conservation Council |
| **ARMCANZ** | Agriculture and Resource Management Council of Australia and New Zealand |
| **BFA** | Biological Farmers of Australia |
| **BMP** | best management practice |
| **BSI** | British Standards Institute |
| **CAC** | command and control |
| **CCFICS** | Codex Committee on Food Import and Export Inspection and Certification Systems |
| **CCNASWP** | Codex Coordinating Committee for North America and the South West Pacific |
| **CCP** | Critical Control Point |
| **CERFLOR** | the Brazilian forest certification scheme |
| **COAG** | Council of Australian Governments |
| **CRC** | Cooperative Research Centre |
| **CSA** | Canadian Standards Association |
| **CSIRO** | Commonwealth Scientific and Industrial Research Organisation |
| **EC** | European Community |
| **EIA** | environmental impact assessment |
| **EMAS** | Eco-Management and Auditing Scheme |
| **EMS** | Environmental Management System |
| **EMSWG** | EMS Working Group<br>*a Working Group of SLWRMC* |
| **ESCD** | environmental supply chain dynamics |
| **ESD** | ecologically sustainable development |
| **EU** | European Union |
| **EUREP-GAP** | Good Agricultural Practice |
| **FAO** | Food and Agriculture Organization (FAO) of the United Nations |
| **FFCS** | Finnish Forestry Certification Scheme |
| **FSC** | Forest Stewardship Council |

| | |
|---|---|
| **GATT** | General Agreement of Trade and Tariffs |
| **HACCP** | Hazard Analysis and Critical Control Point<br>*a methodology for systematically identifying, evaluating and controlling hazards significant for food safety with a focus on preventative measures rather than end-product testing. HACCP is an internationally recognised effective food safety risk management methodology* |
| **ICC** | International Chamber of Commerce |
| **ICM** | integrated catchment management *or* integrated crop management |
| **IEEP** | Institute for European Environmental Policy |
| **IFOAM** | International Federation of Organic Agriculture Movements |
| **IFP** | Integrated Fruit Production |
| **IGAE** | Intergovernmental Agreement on the Environment<br>*approved by all spheres of Australian Government in 1992* |
| **IPM** | integrated pest management |
| **IPPC** | International Plant Protection Convention |
| **ISO** | International Organization for Standardization |
| **ISPMs** | International Standards for Phytosanitary Measures |
| **IWRC** | Iowa Waste Reduction Center, University of Northern Iowa |
| **JAS-ANZ** | Joint Accreditation System of Australia and New Zealand |
| **LCA** | life cycle analysis |
| **LEAF** | Linking Environment and Farming<br>*a scheme of environmental guidelines and self-assessment in UK agriculture* |
| **MRL** | maximum residue limit |
| **MSC** | Marine Stewardship Council |
| **NFU** | National Farmers' Union<br>*the UK farmers' union* |
| **NGO** | non-governmental organisation |
| **NRM** | natural resource management |
| **NRS** | National Residue Survey |
| **OECD** | Organisation for Economic Cooperation and Development |
| **OIE** | Office International de Epizooties<br>*the Paris-based International Animal Health Organization* |
| **QA** | quality assurance |
| **QMS** | Quality Management System |
| **RIRDC** | Rural Industries Research and Development Corporation |
| **SCARM** | Standing Committee on Agriculture and Resource Management<br>*a committee with Commonwealth and State government membership* |
| **SFI** | Sustainable Forestry Initiative |

| | |
|---|---|
| **SLWRMC** | Sustainable Land and Water Resources Management Committee<br>*a subcommittee of SCARM* |
| **SQF** | Safe Quality Food<br>*SQF 1000 and SQF 2000 are quality and food safety codes developed by Agriculture Western Australia* |
| **TBT** | Technical Barriers to Trade |
| **UK** | United Kingdom |
| **UKWAS** | UK Woodland Assurance Scheme |
| **UNCED** | United Nations Conference on Environment and Development |
| **UNCTAD** | United Nations Conference on Trade and Development |
| **US** | United States |
| **VA** | voluntary approach |
| **VEMA** | voluntary environmental management arrangement |
| **WHO** | World Health Organization of the United Nations |
| **WWF** | World Wide Fund for Nature |
| **WTO** | World Trade Organisation |

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# Executive Summary

**A paradigm shift in how natural resource management (NRM) and environmental protection are being thought about and approached is taking place**. This shift is characterised by a search for new management tools and policy instruments that represent a departure from orthodox government programs and regulation. **The new agenda stresses industry's potential to develop its own solutions**. **In the search for new and innovative ways of dealing with environmental problems, the potential of various voluntary environmental management arrangements (VEMAs) is being discussed**.

**VEMAs are a diverse range of arrangements in which firms, and in some cases other organisational structures, may voluntarily choose to participate for the purposes of enhancing environmental management**. As their name implies, all VEMAs share two common features: they are concerned with environmental management, and they are undertaken voluntarily. Thus, **'VEMA' is an umbrella term embracing many very different types of arrangements including environmental management systems (EMSs), as well as various production protocols that may be part of environmental certification schemes and environmental labelling initiatives**. It is acknowledged that some VEMAs do not necessarily result in certification or labelling, though this report focuses on those that do.

**VEMAs are 'voluntary' in the sense that participation in them is not prescribed by law**. By contrast, government legislation and regulations constitute 'formal' or legally-binding arrangements. Although participation in VEMAs, and in other schemes concerned with quality assurance, food safety and animal welfare, is voluntary, access to some markets may require proof of participation in such schemes through third-party verification of compliance against specific standards and criteria. Thus, **while such arrangements are voluntary, their uptake including verifiable compliance against specific criteria and standards may be a precondition of entry to some markets**.

**Public regulatory approaches to environmental protection have improved aspects of environmental quality in a wide range of industry sectors. However, there are limits to what government approaches can achieve on their own**. A key limitation of orthodox regulation is its tendency to stifle an organisation's attempts to develop innovative approaches to environmental management. Moreover, public regulation can be expensive to administer, and governments may face political difficulties in checking compliance and enforcing penalties to internalise environmental costs.

**Although VEMAs hold enormous promise as a possible means of addressing complex environmental and NRM issues, the premature view of VEMAs as an environmental management panacea is cautioned**. Just as orthodox regulation has limitations, so too do VEMAs. The very fact of their voluntariness means that high participation rates cannot be guaranteed. Furthermore, high participation rates in VEMAs are not necessarily synonymous with good environmental performance or outcomes. **An optimum mix of formal government-led and voluntary industry- and community-led approaches, is likely to result in the best environmental, marketplace and social outcomes**.

**Individual VEMAs are distinguished from one another by differences in their key design features**. Key design features are denoted by terms such as 'standards', 'auditing', 'certification' and 'labelling'. **The design specifics of different VEMAs, notably the standards they incorporate, as well as the ways in which these are audited, certified and/or labelled, and by whom, define the differences among VEMAs**. Importantly, a given VEMA's design specifics determine whether and,

if so, how, and by how much, environmental management and outcomes may be enhanced by the implementation of that VEMA.

**Standards are "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."** (Standards Australia, 2001). Different types of environmental standards exist, and according to Ure's (1999) categorisation, there are **two groups of environmental standards**:

- **organisation-oriented standards**, also called **process standards**; and
- **production-oriented standards**, which may be **product standards** or **performance standards**.

**Process standards** specify management processes and procedures to be followed by an organisation for the purposes of environmental management. **Product standards** may define specific features of a final product and may also define how that product must have been produced. **Performance standards** specify acceptable or required levels of performance to be met. Environmental performance standards may relate to the production process, as well as to environmental externalities stemming from the production process.

**Auditing is the systematic examination of an entity, such as an organisation, facility or site, to determine whether, and to what extent, it conforms to specified standards**. A first-party audit is a self-audit, or internal audit, carried out by staff within the organisation. A second-party audit is an external audit of an organisation carried out by customers or buyers. A third-party audit is an external audit carried out by an independent organisation (the third party) on another organisation, for example, for certification purposes. Thus, **the essential difference between first, second and third party audits concerns the level of independence of the person carrying out the audit**.

**Certification and accreditation are different though connected, with accreditation providing public confidence in certification**. Specifically, certification is the successful result of the procedure whereby a third-party gives written assurance that compliance against a clearly identified standard has been achieved, and accreditation assures the public that a certifying body is able to carry out its duties independently, competently and consistently. To provide this assurance, accreditation bodies assess certification bodies against given criteria and, once accredited, the certification body undergoes regular checks. Provided that a certification body is accredited as being independent, competent and consistent, then third-party certification can be used to provide public assurance that certain standards have been met. **The governance arrangements under which accreditation and certification bodies operate are crucially important in allaying 'greenwashing' concerns, and in ensuring international marketplace recognition for certified goods**.

**When a third-party audit results in certification, it is common for that to be accompanied with a statement that effectively allows the certified entity to use a label, or some sort of logo to show that compliance against a particular standard has been achieved**. There is a difference, and sometimes confusion, surrounding the meaning of the terms 'environmental labelling' and 'eco-labelling'. **'Environmental labelling' denotes any type of environmental information to consumers, and 'eco-labelling' specifically denotes life-cycle analysis (LCA) information**.

**The key to understanding VEMAs lies in understanding the standards or criteria that are audited in different environmental certification and labelling schemes**. These standards determine the nature of the green claims that can be made in the event of a successful third party audit. Also, the nature of the audit, that is to say whether it is conducted internally or externally or both, and the nature and identity of the body or authority conducting external auditing and making

labelling recommendations and decisions, convey different messages in the marketplace regarding the levels of certainty, even trustworthiness, associated with the environmental claims made. Thus, **the design specifics, determine the level of consumer confidence and marketplace recognition associated with different schemes**.

**The report presents specific examples voluntary arrangements for environmental management, and for the management of quality, food safety and animal welfare**. Examples include:

- **VEMAs based on organisation-oriented standards**, or process standards. These are environmental management systems (EMS), and include ISO 14001 and the European Union's Eco-Management and Auditing Scheme (EMAS);
- **VEMAs based on production-oriented standards**, or product and performance standards, such as the Integrated Fruit Production (IFP) protocols;
- **VEMAs based on a blend of organisation-oriented and production-oriented standards** including EUREP-GAP, Organic Standards, the Marine Stewardship Council's (MSC) scheme, the Forest Stewardship Council (FSC) and the Finnish Forest Certification Scheme (FFCS);
- **a group of environmental labelling and eco-labelling schemes** in the ISO 14020 series of standards that allow for three environmental labelling possibilities known as Type I, Type II and Type III labelling; and
- **voluntary arrangements for quality assurance, food safety and animal welfare**, including Hazard Analysis Critical Control Point (HACCP) food safety assurance, the Safe Quality Food (SQF) initiative, the ISO 9000 series of standards for quality assurance (QA), three QA codes of practice for Australian agriculture, and the Model Codes of Practice for the Welfare of Animals.

**Different VEMAs will incorporate different types of standards, and other key design features, depending on their objectives and intended outcomes**. Environmental, marketplace and community objectives of VEMAs are given below.

| Environmental objectives | Marketplace objectives | Community objectives |
|---|---|---|
| • continuously improving the way that environmental impacts are managed<br>• enhancing environmental performance<br>• achieving specific environmental outcomes<br>• creating incentives for protecting and maintaining environmental assets | • maintaining access in existing markets<br>• gaining access in existing markets<br>• creating new niche markets<br>• receiving or maintaining access to premium prices | • raising awareness of environmental issues<br>• building industry and community esteem through good stewardship<br>• fostering cultural change in the way agricultural and rural industries approach the environmental and economic aspects of their business |

A consideration of the relative importance of environmental, economic and social objectives and issues in VEMA design applies, both, to the designers of new VEMAs, as well as to prospective participants in already available schemes and initiatives.

**Design choices relating to the strategy for achieving a VEMA's objectives include making choices about whether the VEMA is intended to showcase and champion environmental leadership, in which case the design strategy would involve designing a VEMA resembling an elite club with exclusive membership limited to relatively few high environmental achievers. Alternatively, where a VEMA intends to achieve wide community involvement and awareness raising social and environmental objectives, the strategy could involve designing arrangements to foster inclusiveness and encourage the participation of many**. Such a strategy would probably steer away from setting stringent standards and verifiable environmental performance requirements with harsh penalties for non-compliance. Thus, **with alternative design objectives and strategies in VEMAs, there appears to be a balance between, on the one hand, relatively good environmental outcomes albeit with low participation when a notional green bar is set high and an elite club is created and, on the other hand, good adoption rates being the function of the bar set low**. Where the strategy of creating an elite environmental management club is taken, for example for conserving iconic natural resources, the design rationale is twofold: first, to preserve the iconic resource and, second, to encourage others managing non-iconic resources to lift their game by aspiring to elite club membership. In this way awareness is raised and good environmental practice is encouraged outside the showcase VEMA.

**To make wise choices about a VEMA's design, there has to be clarity about what the VEMA intends to achieve (objectives) and how (strategy)**. **There should also be clarity about the benefits of participation**. This then determines a VEMA's specific key design features, namely: whether to include standards in a VEMA, and if so, what types of standards and how high they should be set; whether the VEMA should be audited and if so, against what standard or criteria, how (internally or externally or both), and by whom (self, accredited auditors, government, an NGO, a coalition of stakeholders, and if so, should these stakeholders be accredited); and whether the VEMA should result in certification and labelling, and if so, by whom (self, accredited certification bodies, government, an NGO, a coalition of stakeholders, and if so, should these stakeholders be accredited). In other words, what should be the nature of stakeholder involvement, how should governance arrangements be structured, and should these ensure international recognition.

Drawing on OECD (1999), **some general recommendations for good VEMA design** include:

- clearly defined objectives and targets;
- characterisation of a counterfactual or business-as-usual scenario to determine environmental and other outcomes in the absence of a VEMA;
- monitoring that provides meaningful and reliable information about whether progress toward achieving objectives and targets is being made, and that is practical and cost-effective;
- involvement from independent third parties to provide public assurance in a given VEMA;
- penalties with teeth for non-compliance to maintain public confidence in a given VEMA, and to prevent free-riding; and
- the provision of good supportive information, such as codes of practice and guidelines for environmental management, as well as relevant training to facilitate VEMA adoption.

**The relevance, indeed importance, of supply chains and supply chain management to the design and development of VEMAs is such that supply chains provide a pathway along which environmental innovations may be made and along which environmental change may happen**. Buyer-supplier relationships are central to decision-making processes of most suppliers, wherein lies the potential to stimulate environmental change along the supply chain. Using the example of a case study from the British and Japanese food retail sectors, Hall (2000) shows that **environmental innovations emerge and are passed along supply chains: first, if there are leaders with sufficient**

**power over downstream suppliers in the chain; second, if there is sufficient technical knowledge along the chain to be able to innovate; and third, where the leaders are themselves under pressure to demonstrate good environmental credentials**.

**The organisational structures of family farms, corporate farms and downstream agri-businesses differ in respects that are likely to affect preferences for different VEMAs, as well as the ease and enthusiasm with which different VEMAs are adopted**. Larger organisational structures and business enterprises such as corporate farms and downstream agri-businesses may enjoy economies of scale, access to greater financial resources than smaller family farms. Also, family farms, corporate farms and downstream agri-businesses are likely to differ with regard to their management culture. For example, larger enterprises, particularly downstream agricultural processors, may already use quality management systems (QMS) and food safety protocols that may confer a management advantage in implementing an EMS, or other environment management related standard, over say a small family farm without such experience. Also, larger organisational structures may employ more staff possibly with technical specialisations and expertise to address specific environmental issues. Such skills specialisation may be absent in smaller enterprises. In summary, it is proposed that knowledge of the nature of the different organisational structures, such as family farms, corporate farms or downstream agri-businesses, should be taken into account when designing new VEMAs. Likewise, **it is important for people making choices about whether a VEMA suits their needs to consider the relevance and appropriateness of a VEMA's objectives to their activities and aspirations, and to consider the possible implications stemming from time and management commitment, and not least cost**.

**World Trade Organization (WTO) Member countries may not use trade restrictions to force their own environmental standards and policies on producers in another country**. There are, however, two ways that can be used to provide incentives for exporting countries to produce their goods in an environmentally-friendly way. One way is to establish an international agreement regarding environmental matters. These agreements are referred to as multilateral environmental agreements (MEAs). The second is to use VEMAs to allow companies and the consumers they supply to discriminate among products produced using high standards, and those using lower standards, for example through the use of a label. In this case, the importing country is not forcing the exporting country to change its production methods, but still ensures its consumers are given the opportunity to purchase only those goods that comply with their own values. This can be an effective way of encouraging safe environmental practices: if consumers overwhelmingly choose green agri-food products, then the countries exporting such products may be encouraged to adopt environmentally-friendly agri-food production techniques to maintain or increase market share.

**Likely future trajectories in the design and development of VEMAs are signalled by three current trends, which indicate the rising prominence of VEMAs in line with emerging community expectations and marketplace developments**. The first trend is one of rising consumer concern regarding environmental, quality, food safety and animal welfare issues which fuels **the emergence, and increasing strength, of green consumer preferences**. This, in turn, is a key factor shaping the second trend, namely **the growing importance of supply chain driven environmental change**. These are important factors shaping the **increasing adoption rates of diverse voluntary arrangements**, the third trend.

**In the design and development of future VEMAs for agriculture and allied rural industries, an important design choice, and indeed opportunity, lies in recognising the potential of EMS**. This potential stems from the fact that EMS is designed as a process standard. Essentially, this means that **EMS can be integrated with other voluntary arrangements and standards and may therefore be used to address a wide range of environmental issues**. Indeed, as a process-based management tool, EMS works best when combined with code of practice information, Best Management Practice

(BMP) guidelines or with guidelines and standards relating to production and performance related specifications. **EMS can be used to exceed legal requirements**, that is to say, to go 'beyond compliance' in addressing environmental, as well as industry and community concerns. Also, **EMS can be implemented by organisations in the agricultural sector, and in allied rural industry sectors, that differ widely in structure and function**. This is important for agricultural and rural industries in the light of increasing vertical integration along agri-food supply chains. Importantly, the degree of international recognition of ISO14001 is important for export sectors such as Australian agriculture.

Finally, it must be remembered that **diverse VEMAs, and other voluntary arrangements for quality management, food safety and animal welfare issues are principally designed and developed for, and implemented by, industry and business operators**. Indeed, the increasing adoption rates of diverse voluntary arrangements, and the growing importance of supply chain driven environmental change, are the commendable responses of industry and business to increasingly strong consumer preferences for safe, clean and green food. However, the best environmental, marketplace and social outcomes are likely to result from an optimum mix of voluntary industry-led and community-led approaches coupled with formal government-led approaches.

**Ultimately, the success of VEMAs depends, and will continue to depend, upon how industry and business embraces them**. To ensure the environmental and commercial sustainability of agricultural and rural industries, perhaps **the most important tasks and challenges ahead involve identifying the nature of the optimum mix of voluntary and formal approaches to environmental management, and creating an enabling environment for industry and business to embrace VEMAs**. **There are opportunities for governments to play important roles in providing such an enabling environment by developing environmental guidelines, targets and standards** for different agricultural and rural industries, **by building effective information networks** to ensure low-cost access to information on VEMA design, development and implementation, and **by encouraging implementation through appropriate incentive mechanisms**.

# 1 Introduction to Voluntary Arrangements for Environmental and Quality Management

## 1.1 Background

A paradigm shift in how natural resource management (NRM) and environmental protection are being thought about and approached is taking place. This shift is characterised by a search for new management tools and policy instruments that represent a departure from orthodox government programs and regulation. The new agenda stresses the potential of industry to develop its own solutions.

In this search for new and innovative ways of dealing with environmental problems, voluntary environmental management arrangements (VEMAs) are being discussed. VEMAs include a diverse range of environmental certification schemes and labelling initiatives, including environmental management systems (EMSs) and various production protocols that may be certified and/or labelled.[1] Collectively, these industry-based approaches offer enormous promise. While the principal objectives of VEMAs are concerned with environmental outcomes, VEMAs also have the potential to deliver marketplace and community outcomes. Industry, conservation and community groups and governments are all exploring ways to harness their potential. Many producers are seeking ways to use VEMAs to increase or maintain profits. This report assembles and organises what is known in this rapidly evolving area, and attempts to bring clarity to a confusing array of information and nomenclature.

Growing interest in VEMAs is demonstrated by the fact that on-the-ground activities, research inquiry, and policy development in this area are gathering momentum in Australia and elsewhere. Internationally, the rising interest in VEMAs is illustrated by the increasing use of voluntary approaches to achieving environmental goals in a range of industries. According to the OECD (1999):

- in the European Union (EU), more than 300 environmental agreements have been negotiated;
- in Japan, some 30,000 local pollution control agreements have been negotiated; and
- in the USA, the federal government has recently surveyed over 40 voluntary programmes that it manages.

Other indicators of increasing use and acceptance of voluntary approaches to environmental management are that, since the origin of the ISO14000 series of environmental management standards in September 1996, the number of certificates awarded to firms in diverse industry sectors has grown to 22,897 worldwide (ISO, 2000). Also, the number of corporations voluntarily engaging in environmental performance reporting has grown. Similarly, the growing interest in quality, food safety and animal welfare practices, indeed even their emerging mainstream acceptance, indicates the strong likelihood of increasingly prominent roles of these voluntary arrangements in the future.

[1] Thus, EMSs are a subset of the full suite of VEMAs under consideration.

Environmental and quality management issues sometimes share common ground. Importantly, this report recognises and draws attention to the nexus between environmental considerations on the one hand, and quality, food safety and animal welfare considerations on the other. The interconnectedness of environmental, quality and food safety issues represents a point of departure towards identifying possible ways of integrating environmental and quality considerations in the design of future voluntary arrangements.

### 1.1.1 Limitations of orthodox government regulation in achieving environmental outcomes

Public regulatory and related incentive approaches to environmental protection have resulted in improvements to aspects of environmental quality in a wide range of industry sectors. However, there are limits to what these orthodox approaches can achieve on their own. A key limitation of orthodox regulation lies in the rigid, inflexible and prescriptive nature of its command and control (CAC) approach which tends to stifle an organisation's attempts to develop innovative approaches to environmental management (Coglianese and Nash, 2001).

Generally speaking, most significant improvements resulting from public environmental regulation have taken place in non-agricultural sectors characterised by point-source pollution problems that respond to end-of-pipe regulatory solutions. By contrast, non-point source pollution and natural resource consumption continue to present environmental management challenges as they tend to fall outside the purview of orthodox regulation and, owing to their often complex nature, do not easily lend themselves to traditional regulatory control (Elliot and Charnley, 1998, in Coglianese and Nash, 2001). Some traditional regulatory approaches are expensive to administer, especially when the goals pursued are complex. Similarly, high transaction costs tend to be characteristic of government environmental programmes that offer incentives, such as payments or regulatory relief, to encourage programme uptake. Moreover, governments may often be faced with political difficulties when it comes to checking compliance and enforcing the penalties necessary to internalise environmental costs incurred.

Recognition of the limitations of orthodox approaches to environmental management in agricultural and non-agricultural sectors has been accompanied by calls from industry, government and the community alike for new approaches to environmental protection and natural resource management (Ayres and Braithwaite, 1992; Chertow and Esty, 1997; Coglianese and Nash, 2001; Gunningham et al., 1999; and OECD, 1999). This call to explore new approaches to environmental management is especially pertinent to the case of agriculture and allied rural industries and forms the subject of this report.

In this report, the term VEMA has been coined to denote these new approaches to environmental management. The report focuses on how VEMAs should be designed in order to overcome some of the key limitations inherent in orthodox regulatory approaches to environmental management, as well as on possible ways of integrating voluntary arrangements in the related areas of environmental and quality management.

## 1.2 What is a voluntary environmental management arrangement?

### 1.2.1 Definition of a VEMA

Voluntary environmental management arrangements (VEMAs) are defined, quite simply, as a diverse range of arrangements in which firms, and in some cases other organisational structures, may voluntarily

choose to participate for the purposes of enhancing environmental management. Thus, 'VEMA' is an umbrella term denoting many very different types of arrangements such as environmental management systems (EMS), and diverse production protocols that may be part of environmental certification schemes and environmental labelling and eco-labelling initiatives[2].

Although the focus of this report is on voluntary arrangements that result in certification and/or labelling, it is important to appreciate that some VEMAs do not necessarily result in certification or labelling. As their name implies, all VEMAs share two common features: they are concerned with environmental management, and they are undertaken voluntarily. However, the similarity between different VEMAs ends there, and it is important to appreciate that while the term VEMA is a generic one, terms such as 'EMS' or 'eco-label' are very specific in meaning.

### 1.2.2 How VEMAs enhance environmental management

To understand how VEMAs enhance environmental management, it is necessary to understand the precise meanings of terms such as 'standards', 'auditing', 'certification' and 'labelling', amongst others, which denote key design features of VEMAs.[3] Furthermore, it is important to appreciate that each of these key design features has a number of possible variations. For example, different types of standards exist, as do different types of auditing, certification and labelling. It is also important to appreciate that it is possible for diverse stakeholder groups and authorities to assemble these key design features in different combinations to yield differently designed VEMAs. The challenge, which this report seeks to address, is the need to assemble these features in the most appropriate way to achieve the environmental, economic and social outcomes sought.

Thus, while the term VEMA broadly defines any voluntary activity concerned with environmental management, the specifics of the key design features are critical. The 'devil is in the detail', and subtle differences in design choices can have major implications in terms of the likelihood that outcomes will be achieved. Depending on the design of the specific arrangement in question, a VEMA may aim to enhance environmental management by improving the way environmental impacts are managed, by lifting the firm's level of environment performance, or by seeking to deliver specific environmental outcomes.

Depending on the nature of a given arrangement, a VEMA may aid firms, or other organisations, to achieve compliance with formal environmental regulation, or it may even enable firms to demonstrate environmental management practice that goes 'beyond compliance'. In instances where formal environmental regulation and other non-legislated government programmes simply do not exist, VEMAs may provide informal environmental management guidelines[4], or, effectively, surrogate environmental regulation and policy. This is especially pertinent to the case of agriculture where, generally speaking, the environmental impacts arising from agricultural activities tend not to respond to orthodox government

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[2] Although VEMAs intend to enhance environmental management, it is recognised that this does not always necessarily occur. For example, the use of an environmental label may, in some cases, not necessarily mean that enhanced environmental management has actually taken place, a fact that fuels consumer concerns about 'greenwashing'.

[3] Definitions of the terms used to describe the design features of such VEMAs are presented in Chapter 2.

[4] For example, a VEMA such as an EMS provides guidelines for the development of a management system to improve the way environmental impacts are managed, but does not prescribe specific production protocols and environmental performance requirements. By contrast, other VEMAs provide guidelines relating to production protocols and to environmental performance. Such VEMAs include, amongst others, organic farming guidelines and the EUREP-GAP protocols. In other words, depending on the specific VEMA in question, the environmental management guidelines may relate to management systems processes or to environmental aspects of production and environmental performance.

approaches. The reasons for this tend to be complex but are typically characterised by complex institutional and socio-political forces that present additional barriers to the use of instruments commonly used in non-agricultural sectors.

### 1.2.3 The distinction between voluntary and formal arrangements

VEMAs are 'voluntary' in the sense that participation in them is not prescribed by law. By contrast, pieces of legislation along with the regulations that exist under legislation constitute 'formal' or legally-binding arrangements. It is mandatory to comply with such formal arrangements, with failure to comply potentially resulting in penalties enforceable by law.

Although participation in VEMAs, as well as in various other schemes concerned with quality assurance, food safety and animal welfare, is voluntary, access to some markets may require proof of participation in such schemes including third-party verification of compliance against specific natural resource management, environmental protection, food safety and quality, and animal welfare criteria. Different markets, and even different buyers within the same market, may specify different environmental, quality and welfare requirements. Thus, while such arrangements are voluntary in the sense that their uptake is not prescribed by law, their uptake including verifiable compliance against specific criteria and standards may be a precondition of entry to some markets.

Thus, in line with literature in this emerging area, the words 'formal' and 'voluntary' are used throughout this report to distinguish between arrangements that are prescribed by law, and those that are not, respectively (Coglianese and Nash, 2001; OECD, 1999). However, it is recognised that third party verification of compliance against VEMAs and other voluntary arrangements relating to food safety, quality and animal welfare is, in some cases, effectively prescribed by markets.

Although participation in VEMAs, and in different quality assurance, food safety and animal welfare schemes is voluntary, governments in some countries have been exploring the potential of regulatory and financial relief initiatives as an incentive to encourage the adoption of voluntary arrangements.

### 1.2.4 VEMAs, quality assurance, food safety and animal welfare

Environmental, quality, food safety and animal welfare aspects of productive activities in agriculture and the rural industries may often be interconnected. In other words, the way in which agri-food goods are produced determines both their environmental and quality credentials, as poor environmental and quality management practices potentially result in products that impact negatively on the environment as well as on human, animal and plant health. For example, with respect to agro-chemical use, poor management practices may result in environmental contamination problems and in residue-containing products that pose health risks to consumers. The nexus among environmental, quality and food safety issues represents a point of departure towards identifying possible ways of integrating environmental and quality considerations in the design of future voluntary arrangements.

## 1.3 VEMAs in the context of other environmental management approaches taken and instruments used

Alternative environmental management approaches and instruments are designed to have specific features depending on their objectives and the nature of the environmental problem being addressed. Thus, different types of instruments for achieving environmental outcomes are used within the context of

different approaches to environmental management. Environmental management approaches may be classified into three broad categories according to the type of instruments used to achieve environmental outcomes (OECD, 1999; Environment Australia, 1997).

First, regulatory instruments are tools designed and administered in the context of formal government legislation and regulation, and include mandatory rules such as emission standards, as well as bans relating to certain products or production methods. Second, market-based instruments are designed to provide economic or financial incentives to improve environmental management practice and outcomes. Market-based instruments include environmental levies and charges, tradeable licences and permits, as well as refund systems and regulatory relief initiatives. Market-based instruments may be designed and administered either in the contexts of formal public regulation or voluntary initiatives. Third, voluntary instruments are tools for enhancing environmental management that firms and other organisations may voluntarily choose to use. VEMAs are voluntary instruments which, as noted above, are usually designed and administered in the context of partnerships among stakeholder groups, though may also take place as a unilateral commitment by industry.

While different categories of environmental management approaches and instruments exist each with something valuable to offer, the use of single types of approaches and instruments "has substantial limitations as a 'stand alone' strategy", with no single approach or instrument working "across the board" (Sinclair et al., 1998). In other words, an optimum mix of approaches and instruments is likely to deliver the best environmental, marketplace and community outcomes (Sinclair et al., 1998; OECD, 1999).

Although VEMAs hold enormous promise as a possible means of addressing complex environmental and NRM issues, the premature view of VEMAs as an environmental management panacea is cautioned. Just as orthodox regulation has limitations, so too do VEMAs. The very fact of their voluntariness means that high participation rates cannot be guaranteed. Moreover, high participation rates in VEMAs are not necessarily synonymous with good environmental performance or outcomes. Indeed, gauging a VEMA's impact on enhanced environmental quality on the basis of participation rates is problematic. Research evidence suggests that schemes with low requirements for environmental performance and outcomes tend to have relatively high adoption rates, and that low participation is associated with programmes demanding high environmental performance and outcomes (Nash and Ehrenfeld, 2001).[5]

Therefore, the design conundrum for architects of VEMAs is how to design schemes that both attract high participation and deliver meaningful improvements in environmental quality. For this reason, it is advocated that the potential contribution of VEMAs in achieving meaningful environmental management outcomes should ideally be viewed as complementary to other available environmental management approaches and instruments. In other words, to gauge the long-term potential of VEMAs in achieving meaningful outcomes, their optimal design and implementation should be considered alongside the use of other instruments and approaches. Furthermore, the long-term potential of VEMAs should be considered in the context of likely future trajectories of agri-food sector and economy-wide development, nationally and internationally, as well as in the context of society's increasing understanding of, and concern about, environmental problems.

## 1.4 VEMAs in the context of partnerships between different stakeholder groups

VEMAs usually take place within a context of diverse partnerships among different stakeholder groups sharing a mutual desire to enhance environmental management, but setting different environmental

[5] The experience the US EPA's StarTrak Program is covered in Chapter 4.

objectives, employing alternative strategies and approaches with varying environmental outcomes. Indeed, an important indicator of the growing interest in VEMAs is the degree of interest in them shown by non-governmental organisations (NGOs) such as environmental and community groups, as well as by business and industry. In the development of different VEMAs, it can be generalised that different interests drive these different stakeholder groups. For example, environmental and community groups may be driven by environmental concerns and the desire to accelerate adoption of environmentally-friendly practices, whereas industry stakeholders may be driven by new opportunities to compete for market share.

Partnerships may include, in various combinations, individual producers or groups of producers, industry bodies, retailers, public agencies and non-governmental organisations (NGOs) and, although entered into voluntarily, may be designed to be legally or contractually binding. NGOs involved in VEMAs include, amongst others, the World Wide Fund for Nature (WWF), the International Organization for Standardization (ISO) and the International Federation of Organic Agriculture Movements (IFOAM). Such VEMAs include the ISO14000 series of standards for environmental management, the European Eco-Management and Auditing Scheme (EMAS), the EUREP-GAP protocols, organic and biodynamic farming standards and protocols, the UK initiative Linking Environment and Farming (LEAF), the Marine Stewardship Council (MSC) and the Forest Stewardship Council (FSC) schemes, and a range of other forestry certification initiatives.

Although most VEMAs take place within the context of partnerships among different stakeholder groups, VEMAs may also take the form of unilateral commitments set within a single industry stakeholder group independently of government involvement. The American Chemistry Council's (ACC) Responsible Care programme is a well-known example of a unilateral commitment to enhance environmental management in the US chemical industry (Nash and Ehrenfeld, 2001; and OECD, 1999). Other VEMAs may take place within a supply chain context, again, independently of government involvement. This is an interesting feature of the EUREP-GAP protocols developed by large supermarket chains and imposed upon suppliers.

Some VEMAs involve negotiated agreements between a specific industry, or even a specific industry operator, and a public environmental authority. A prominent example of an industry-government partnership involving negotiated agreements for environmental management is given by the Dutch negotiated agreements, also called environmental covenants, for pollution abatement (OECD, 1999).

Finally, it is recognised that voluntary activities undertaken by individuals, firms and other groups to enhance environmental management practice and outcomes may take place outside organised schemes involving set standards, auditing, certification or eco-labelling. Clearly, such voluntary activities constitute what has been defined as a VEMA, and the importance of the contribution of such VEMAs to environmental management and to the wider community is fully acknowledged. However, these VEMAs are not detailed in this report. Rather, this report focuses on VEMAs that set out to provide public assurance of environmental protection or NRM outcomes through the award of a certificate or label that means a firm, or other organisation, can demonstrate compliance against specified standards and criteria. The VEMAs described in this report include environmental management systems (EMSs) and production protocols, which, if successfully audited, may result in certification and/or labelling. Some voluntary arrangements relating to quality assurance, food safety and animal welfare are also described.

# 2 Key Design Features of Voluntary Arrangements for Environmental and Quality Management

## 2.1 Introduction

As their name implies, all VEMAs share two broad features in common: they are concerned with environmental management, and they are undertaken voluntarily. Looking beyond these two generic common features, individual VEMAs may be distinguished from one another by differences in their key design features. That is to say, the design specifics of different VEMAs, notably the standards they incorporate, as well as the ways in which these are audited, certified and/or labelled, and by whom, define the differences among VEMAs. Importantly, moreover, the design specifics of a given VEMA determine whether and, if so, how, and by how much, environmental management may be enhanced by the implementation of that VEMA.

This chapter describes the key design features of different voluntary arrangements for environmental management, as well as for the management of quality, food safety and animal welfare. In other words, the building blocks used to assemble different voluntary arrangements are described. In so doing, the chapter aims to clarify the potential confusion that arises from the fact that some of the words that are often used to describe types of VEMAs (environmental certification schemes, environmental auditing schemes, environmental labelling initiatives) are also used to describe their key design features (auditing, certification and labelling).

## 2.2 Definition of terms relating to key design features of VEMAs

Key design features of VEMAs are denoted by terms such as 'standards', 'auditing', 'certification' and 'labelling'. Different types of standards exist, as do different types of auditing, certification and labelling. These terms are defined and explained in this section.

### 2.2.1 Standards

Standards Australia (2001) defines 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." Different types of standards exist and, according to Ure's (1999) categorisation, environmental standards may be placed into two main groups:

- First, 'organisation-oriented standards' provide specifications relating to management processes followed by an organisation for the purposes of environmental management. The term 'process standard' commonly denotes environmental management processes and procedures to be followed and, as such, is synonymous with 'organisation-oriented standard'.

- Second, 'production-oriented standards' provide specifications relating to aspects of the production process, or to the product itself. That is to say, 'production-oriented standards' are, effectively,

production protocols, defining either how a product must be produced, or specifying features of a final product. In defining how a product must be produced, a standard may effectively be specifying acceptable levels of environmental impacts or, in other words, required levels of environmental performance. Thus, 'production-oriented standards' embrace both 'product standards' and 'performance standards'.

To summarise, there are two groups of environmental standards: organisation-oriented standards, also called process standards, which specify environmental management processes and procedures to be followed by an organisation; and production-oriented standards, which may be product standards or performance standards. The former define specific features of a final product and may also define how that product must have been produced, whereas the latter specify acceptable or required levels of environmental performance. Performance standards may sometimes specify required environmental outcomes. A VEMA will incorporate different types of standards depending on its objectives and intended outcomes. Standards Australia (2001) also notes that standards are "voluntary compliance documents that only become mandatory if called up through legislation or contractual obligation".

*Process standards*

Process standards specify procedures to be followed for the purposes of environmental management.

Examples of process standards are the ISO 14001 and ISO14004 standards. These standards detail the processes that a firm, or other organisation, may choose to follow for the purposes of managing environmental impacts. The ISO 14001 standard provides the EMS specification, and the ISO 14004 standard provides guidelines on the EMS's component parts, how it is implemented, and discusses principal issues involved. These process standards have also been referred to as "organisation-oriented standards" since they address "organisation-wide environmental systems and functions" and because they "provide comprehensive guidance for establishing, maintaining and evaluating an environmental management system (EMS)" (Ure, 1999). Thus, the emphasis is on management processes, tracking internal events, continual improvement and learning-by-doing.

*Product standards*

Product standards, also termed production protocols, define specific features associated with a marketed product. These features can be either identified in the final product or in the way it was produced. Product standards for agricultural and rural industry products, which include environmental management elements, may make specifications regarding pesticide use, the use of other agro-chemicals, and various permitted animal and crop husbandry practices.

Integrating an EMS process standard with a product standard that specifies environmental features of the production process, and not just features of the final product, is an intuitively obvious step towards efficiency gains and cost reduction. However, that is not to say that an EMS process standard could not be used in addition to, or alongside, a product standard that only specifies features of the final product. Indeed, in the interests of efficiency, there is a real opportunity to integrate environmental standards with those that focus on product quality.

*Performance standards*

A performance standard specifies a level of environmental performance to be met. Environmental performance standards may relate to the production process, as well as to environmental externalities that may stem from the production process.

Environmental performance standards for application at an enterprise level may be designed with 'higher level', or 'bigger scale', performance targets in mind. Classical examples include issues associated with impacts of agricultural practices on surface and groundwater quality and on the air. For example, industry bodies may set industry level environmental performance targets which may be translated into enterprise-level performance standards. Or, a catchment management authority may set catchment scale environmental performance targets which may be translated into enterprise-level performance standards. In other words, the macro-level identification of areas and issues for environmental management attention may provide a point of departure for defining micro-level performance standards and criteria.

With the exception of formal regulations under Acts such as state level Environment Protection Acts where intensive agricultural and rural industries such as pig, beef, poultry and aquaculture enterprises are subject to end-of-pipe type regulations with respect to their waste and water management practices, there is a paucity of environmental and NRM performance standards in most agricultural industries. However, with regard to VEMAs, it is acknowledged that in the case of the forestry and wood products industries two forestry certification schemes do specify performance standards. These include the Forest Stewardship Council (FSC) scheme and the Finnish Forest Certification Scheme (FFCS) (Kanowski et al., 1999).

### 2.2.2 Auditing

Auditing refers to the systematic examination of an entity, such as a firm, organisation, facility or site, to determine whether, and to what extent, it has and is conforming to specified standards. Once again, the terms used to discuss different types of audits have specific meanings. There are self-audits, second-party audits and third-party audits.

*First-party audit or self-audit*

A first-party audit, or self-audit, is an internal audit. It is an audit carried out by an organisation on itself. Periodic self-audit is a mandatory feature of some VEMAs, such as ISO14001, regardless of whether third-party auditing and certification are sought.

*Second-party audit*

A second-party audit is an external audit. It is an audit carried out by one organisation, working on its own behalf, on another. For example, a second-party audit of an entity may be carried out either by that entity's clients, or buyers, or financiers. Clients may wish to second-party audit a firm to be assured that goods and services comply against specified standards. Where VEMAs are implemented along supply chains, suppliers use second-party audits as a means to provide assurance to their customers and, also, to manage risk.

*Third-party audit*

A third-party audit is also an external audit of an entity. It is an audit by an independent organisation (the third party) on another organisation. Third-party audits may be carried out by regulators, financiers, or by accredited certification bodies. For example, when a need for a certification has been perceived, a third-party audit may be carried out. In such a case, a certification body that is accredited to perform the task carries out the audit. Third-party auditors are required to act in an independent, competent and consistent manner.

### 2.2.3 Certification

Certification is the successful result of the procedure whereby a third-party gives written assurance that they have methodically assessed the extent of compliance with a clearly identified set of process standards, performance standards and/or product standards and have adequate confidence that the processes and practices followed conform with the VEMA's standards.

Provided that a certification body is accredited as being independent, competent and consistent, then third-party certification can be used to provide public assurance that certain standards, such as process, performance or product standards, have been met.

### 2.2.4 Accreditation

The purpose of accreditation is to provide confidence in certification (JAS-ANZ website, www.jas.anz.com.au). In other words, accreditation provides public assurance that a certifying body is able to carry out its duties independently, competently and consistently. To provide this assurance, accreditation bodies assess certification bodies against given criteria[6] and, once accredited, the certification body is subject to regular surveillance (Brockway, 1997). Strict governance arrangements and administrative procedures may be used to give credibility to the accreditation processes used. Thus, accreditation is the formal recognition of competence that an authoritative body gives to another body or person in order to empower them to perform specified tasks such as third-party auditing against given standards for the purposes of certification.

*Harmonised accreditation*

Accreditation operates primarily at the national level. If a VEMA to be certified consistently across the world, it is necessary for national accreditation systems to harmonize the criteria used for accrediting certification bodies. It is also necessary to examine differing standards across the world and to clarify differences between standards to the market.

*The roles of certification and accreditation in ensuring international marketplace recognition*

The governance arrangements under which accreditation and certification bodies carry out their duties intend to ensure international marketplace recognition for certified goods. In order to provide public assurance of environmental outcomes of VEMAs, and to reap marketplace rewards from implementing VEMAs, it is critical for VEMA certification processes to be independent and competent,[7] as well as consistent. As noted above, it is the role of the accreditation body to ensure these criteria are met (Brockway, 1997).

Independent certification ensures that certification decisions are made by impartial individuals with no interest, pecuniary or otherwise, in the result of the certification process. To ensure independence of certification decisions, investigation of potential conflicts of interest affecting all parties in auditing and certification processes should be made transparent in order to enable it to be appropriately managed.

To provide third party certification of compliance against a VEMA's standards, the certification body must be competent. In other words, it must possess relevant specialist competencies including:

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[6] In the case of ISO, these criteria are based on international standards.

[7] Although the same independence requirements can apply to certification bodies acting in different fields, this is not the case with competence requirements, which must be tailored to a given specialist field (Brockway, 1997).

- understanding the standards to which an organisation is being certified, understanding pertinent NRM and environmental protection issues;

- demonstrating technical knowledge of the activities undertaken by the organisation being certified;

- demonstrating knowledge of NRM and environmental legislation with which the organisation being certified must comply; and

- management system assessment skills.

To be accredited, a certification body must show that it possesses these competencies at, both, management level, as well as at the audit personnel level. At management level, a certification body must have the competence to appoint an appropriate audit team, and to make a certification decision based on the audit team's report. Due to the need for competent certification, certification bodies are only accredited to work in defined areas limited by their ability to demonstrate competent skills and availability of personnel. Assessing the competence of a certification body's audit team is central to the accreditation process, and is done by witnessing audit teams at work. A range of competencies is required in an audit and it is therefore unusual for a certification audit to be conducted by a single person. For any given audit, emphasis must be given to selecting appropriate audit teams (Brockway, 1997).

### 2.2.5 Environmental labelling and eco-labelling

There is a difference, and considerable confusion, surrounding the meaning of the terms 'environmental labelling' and 'eco-labelling', accompanied by a lack of clarity regarding the classification of different labelling schemes. Appleton (1997) writes that the 1991 study 'Environmental Labelling in OECD Countries' defined environmental labelling as the "voluntary granting of labels by a private or public body in order to inform consumers and thereby promote consumer products which are determined to be environmentally more friendly than other functionally and competitively similar products". In 1993, the Secretariat of the United Nations Conference on Trade and Development (UNCTAD) offered a similar definition, namely that environmental labelling is "the use of labels in order to inform consumers that a labelled product is environmentally more friendly relative to other products in the same category" (Appleton, 1997). Although both the OECD and UNCTAD recognise three broad categories of labels, including life-cycle labels, single-issue labels and negative labels the latter two were excluded from their definitions of environmental labelling. Indeed, UNCTAD explicitly equated both environmental labelling and eco-labelling with product labels that communicated the results of life cycle analyses (LCAs).

By contrast, the 1992 definition of environmental labelling offered by the GATT Secretariat as "systems for the usually voluntary granting of labels by a private or public body in order to inform consumers" encompassed all single issue labels and negative labels, as well as the life-cycle labels (Appleton, 1997). The inclusion of all three label categories in the GATT definition stems from the GATT Secretariat's interest in the trade implications of labelling. In 1993, the GATT Secretariat differentiated between environmental labelling and eco-labelling, with environmental labelling referring to all three label categories, that is life-cycle labels, single issue labels and negative labels, and eco-labelling denoting labels reflecting the results of LCAs. Similarly, an OECD study conducted in 1994 used environmental labelling as an umbrella term to denote three subgroups of labels, including eco-labels communicating information from life-cycle schemes, as well as single issue voluntary labels, and single issue mandatory, or negative, labels. Although as Salzman (1994; in Appleton, 1997) acknowledges "that much of the [environmental labelling and eco-labelling] debate is 'confused', and that there are many ways to classify environmental labels", there appears to be an emerging consensus that environmental labels provide any

type of environmental information, whereas eco-labels are a specific type of environmental label awarded on the basis of LCA.

In line with the emerging consensus among the OECD, and the UNCTAD and GATT Secretariats, this report defines:

- 'environmental labelling' as labelling to denote any type of environmental information provided to consumers, and

- 'eco-labelling' as labelling specifically denoting life-cycle analysis (LCA) information.

When a third-party audit results in certification, it is common for that to be accompanied with a statement that effectively licences the entity to use a label, or some sort of logo to show that compliance against a particular standard has been achieved. That is, typically, there is a close nexus between a certificate and a label. Like environmental certification, environmental labelling reduces the cost of assuring the public about an environmental claim. Typically, environmental labelling schemes are supported by communication strategies that seek to convince the public and consumers that the claims made are genuine.

As in the case of environmental certification, the standards or criteria that are audited in environmental labelling schemes determine what claims can be made and how much public assurance can be provided. Significantly, the nature of the audit, that is to say whether it is conducted internally or externally or both, and the nature and identity of the body or authority conducting external auditing and making labelling recommendations and decisions, conveys different messages in the marketplace regarding the levels of certainty, even trustworthiness, associated with the environmental claims made. Thus, the design specifics, in other words the details, tend to determine the level of consumer confidence associated with different schemes.

**Box 1 Summary of terms used to denote key design features of VEMAs**

**Standards** are "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" (Standards Australia, 2001). Different types of standards exist. *Process standards* specify procedures to be followed for the purposes of environmental management. *Product standards* define specific features of a final product, and may also define how that product must have been produced in order to comply with the standard. An environmental *performance standard* specifies a level of environmental performance to be met.

**Auditing** is the systematic examination of an entity, such as an organisation, facility or site, to determine whether, and to what extent, it conforms to specified standards. A *first-party audit* is a self-audit or an internal audit. It is an audit carried out by staff within a firm, or other organisation. A *second-party audit* is an external audit of a firm, or other organisation, carried out by customers or buyers. A *third-party audit* is an external audit carried out by an independent organisation (the third party) on another organisation. Third-party audits are carried out by regulators and financiers. Third-party audits are also carried out for the purposes of certification, in which case they are carried out by accredited certification bodies to ensure that the decision to recommend certification is made independently, competently and consistently. The essential difference between first, second and third party audits concerns the level of independence of the person carrying out the audit.

**Certification** is the successful result of the procedure whereby a third-party gives written assurance that compliance against a clearly identified standard, or standards, has been achieved.

**Accreditation** is the formal recognition of competence that an authoritative body gives to another body or person to empower them to perform specified tasks such as third-party auditing against given standards for the purposes of certification. Accreditation assures the public that a certifying body is able to carry out its duties independently, competently and consistently. In other words, accreditation provides confidence in certification.

**Environmental labelling** denotes any type of environmental information to consumers, whereas *eco-labelling* is a specific type of environmental labelling denoting life-cycle analysis (LCA) information (Appleton, 1997).

## 2.3 Assembling key design features to yield different VEMAs

The key design features described above and summarised in Box 1, may be assembled in different ways to build different VEMAs that intend to achieve different outcomes. Choices about the best way to do this depend primarily upon the reason for establishing the VEMA. Table 1 describes specific and well-known VEMAs according to the types of standards they incorporate (process, performance and product standards), their auditing requirements (by first, second and/or third parties), and whether they result in certification and/or labelling. Figure 1 illustrates the different types of standards that VEMAs incorporate.

**Table 1 Key design features of specific VEMAs**

| VEMA | Key design feature | | | |
|---|---|---|---|---|
| | **Standards**[1] | **Auditing**[2] | **Certification**[3] | **Labelling**[4] |
| **ISO 14001** | Organisation-oriented standard, ie: process standard. Option to integrate product and performance standards | 1st and 2nd party auditing possible, and 3rd party auditing necessary if certification and/or labelling are sought | Certification possible following successful 3rd party audit | Not possible to use as a product label. However, a mark or a logo may be used in recognition of certification |
| **EMAS** | Organisation-oriented standard, ie: process standard, with option to integrate product and performance standards | | | Not possible to use as a product label |
| **EUREP-GAP** | Production-oriented standards, ie: production protocols/product standards, with a recently integrated process standard | | | Compliance against EUREP-GAP protocols required by some supermarkets which may use own label to make green claims |
| **Organic and biodynamic farming standards** | Production-oriented standards, ie: production protocols/product standards | | | Various organic labels exist |
| **IFP** | Production-oriented standards, ie: production protocols/product standards | | | - |
| **Marine Stewardship Council, MSC** | Blend of organisation- and production-oriented standards | | | MSC logo used to discriminate products for market advantage |
| **Forest Stewardship Council, FSC** | Blend of organisation- and production-oriented standards | | | FSC logo used to discriminate products for market advantage |
| **Finnish Forest Certification Scheme, FFCS** | Blend of organisation- and production-oriented standards | | | - |

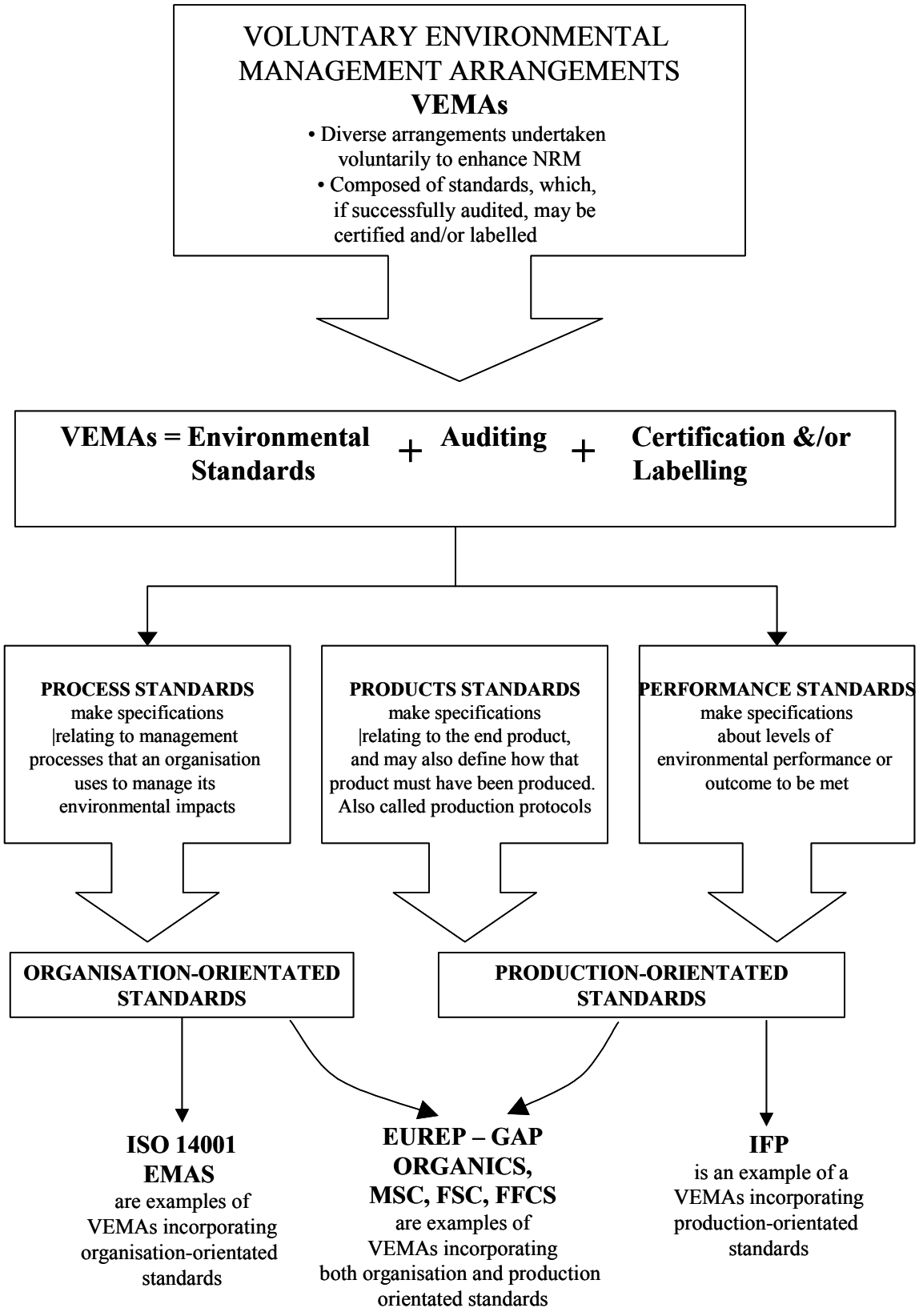
[1] Standards are defined as "accepted specifications or codes of practice which define materials, methods, processes and practices that, when effectively implemented, ensure that consistent and acceptable levels of quality, performance, safety and reliability are achieved" (Standards Australia, 2001). With regard to matters environmental, standards may relate to management processes, performance, and product specifications.

[2] Auditing refers to the systematic examination of an entity, such as a firm, organisation, facility or site, to determine whether, and to what extent, it has and is conforming to specified standards.

[3] Certification is the successful result of the procedure whereby a third-party gives written assurance that compliance against a clearly identified standard, or standards, has been achieved.

[4] Labelling is labelling to denote any type of environmental information to consumers.

**Figure 1 VEMAs and the different environmental standards they incorporate**



# 3 Examples of Voluntary Arrangements for Environmental and Quality Management

Specific examples of voluntary arrangements for environmental management, and for the management of quality, food safety and animal welfare, are described in this chapter, and some common confusions surrounding EMSs and other VEMAs, and related concepts, are clarified. The specific examples of voluntary arrangements that are presented include:

- VEMAs based on organisation-oriented standards, or process standards. These are environmental management systems (EMS), and include ISO 14001 and the European Union's Eco-Management and Auditing Scheme (EMAS) (section 3.1);

- VEMAs based on production-oriented standards, or product and performance standards[8]. VEMAs based on production-oriented standards include the Integrated Fruit Production (IFP) protocols (section 3.2);

- VEMAs based on a blend of organisation-oriented and production-oriented standards. These VEMAs include EUREP-GAP, Organic Standards, and several environmental certification schemes including the Marine Stewardship Council's (MSC) scheme, the Forest Stewardship Council (FSC) and the Finnish Forest Certification Scheme (FFCS) (section 3.3);

- a group of environmental labelling and eco-labelling schemes in the ISO 14020 series of standards that allow for three environmental labelling possibilities known as Type I, Type II and Type III labelling (section 3.4); and

- voluntary arrangements for quality assurance, food safety and animal welfare, including Hazard Analysis Critical Control Point (HACCP) food safety assurance, the Safe Quality Food (SQF) initiative, the ISO 9000 series of standards for quality assurance (QA), three QA codes of practice for Australian agriculture, and the Model Codes of Practice for the Welfare of Animals (section 3.5).

## 3.1 VEMAs based on organisation-oriented (process) standards: environmental management systems

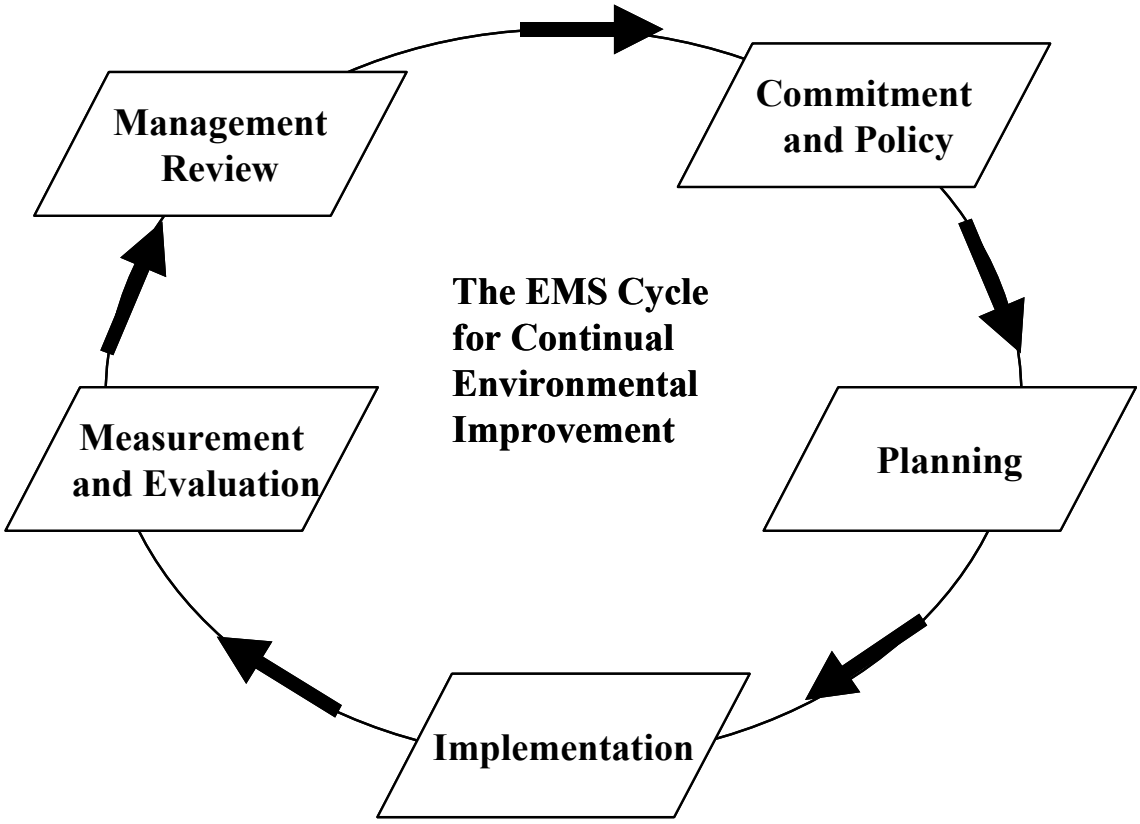
An environmental management system (EMS) is a management tool that an organisation uses to reach environmental goals. All EMSs are cyclical and iterative management processes designed to achieve continual environmental improvement. An EMS may only be implemented by an organisation to improve the management of environmental impacts over which it has control.

[8] In other words, these VEMAs are based on product standards, also termed production protocols. These standards make specifications about the final product itself, as well as the way in which it was produced. Production-oriented standards also include performance standards that specify required levels of environmental performance. Environmental performance standards may relate, both, to the production process, and to environmental externalities arising from it.

Prior to implementing an EMS, an organisation identifies its legal and regulatory obligations, which may include compliance against minimum standards, and also identifies environmental aspects, impacts and risks of its operations. Having done this, the EMS may be implemented.

An EMS consists, quite simply, of a cyclical management process where an organisation: first, defines its environmental policy and makes a commitment to work towards specified environmental goals; second, establishes a plan to work towards its environmental goals; third, implements the plan by, where necessary, assigning responsibilities, allocating resources and acquiring new skills; fourth, checks progress through systematic measurement and evaluation; and fifth, reviews its progress and acts to correct problems. The organisation then returns to the first step and revisits its environmental policy with a view to improving it, and to committing itself to working towards improved environmental goals, and so on. Thus, the EMS is designed to achieve continual environmental improvement. This cyclical management process is summarised in Figure 2. Importantly, an EMS requires an internal audit to be made with external auditing being optional.

**Figure 2 The EMS cycle for continual environmental improvement**




*Source: Baker (2000). Adapted from AS/NZS ISO 14004*

The EMS tool works by creating internal rules and organisational structures and, importantly, by fostering new behavioural norms within an organisation. Thus, EMSs are defined as "formal structures of rules and resources that managers adopt to establish organisational routines that help achieve corporate environmental goals. They are a subset of management systems in general" (Nash and Ehrenfeld, 2001). While public regulation imposes on organisations from the outside, an EMS constitutes "regulation from the inside". In other words, it is "a regulatory structure that arises from within an organisation" and it is

comprised of "a collection of internal efforts at policymaking, planning, and implementation that yields benefits for the organisation as well as potential benefits for society at large" (Coglianese and Nash, 2001).

*Different types of EMS*

Broadly speaking, three different types of EMSs have been developed over the last decade by individual firms, trade associations and standards organisations, respectively (Nash and Ehrenfeld, 2001). These are:

- first, firm-structured EMSs have arisen endogenously within firms and corporations to address corporate environmental goals;

- second, environmental codes of practice developed by industry or trade associations have, in turn, been developed into EMSs. Perhaps the best-known example of a trade association EMS is given by the Responsible Care Initiative of the American Chemistry Council (ACC); and

- third, standards for EMSs have been developed by standards organisations, notably by ISO, the International Organisation for Standardization, which has developed the ISO14000 series of standards.

These three different types of EMSs all conform to the EMS definition given above. As such, all three EMS types conform to the ISO 14001 process standard and, arguably therefore, there is no such thing as an EMS that does not conform with ISO 14001. That is to say, there is no such thing as an EMS that would be incompatible with the ISO14001 process standard. Of all VEMAs, EMSs in particular, are designed and developed to deliver solutions to environmental problems in a flexible manner, and the variability, even malleability, of EMSs contrasts dramatically with the rigidity usually associated with government regulation, or indeed, some other VEMAs. Given the flexibility of their design, standards for EMSs may be implemented in a range of agricultural and rural industries. Two well-known examples of EMSs, the internationally recognised ISO14001 standard and the European Eco-Management and Auditing Scheme (EMAS), both of which are standardised EMSs, are described below.

### 3.1.1 ISO 14001 and ISO 14004

The ISO 14001 standard provides the EMS specification of the International Organization for Standardization (ISO), and the ISO 14004[9] provides guidelines on the EMS's component parts, how it is implemented, and discusses principal issues involved. Essentially, these standards detail the processes that a firm, or other organisation, may choose to follow for the purposes of managing its environmental impacts. This is an internationally recognised standard for EMS, and is illustrated by the EMS cycle for continual improvement, illustrated in Figure 2 above.

The process standard ISO 14001 and its accompanying ISO 14004 guidelines are well designed for several reasons. First, they may be used by organisations that differ widely in structure and function. Second, the fact that these standards are designed as process standards, rather than performance standards, means that they do not stifle an organisation's attempts to innovate in developing innovative approaches to managing environmental impacts. As noted by Coglianese and Nash (2001), flexibility in deciding how to address environmental impacts encourages innovation. Third, the ISO 14000 series of environmental management standards is recognised up and down supply chains, across sectors, and internationally. This is important for agricultural and rural industries in the light of increasing vertical integration along agri-food supply chains, and because agri-food products are inputs to other non-agricultural non-rural industries. It is also

[9] The ISO 14004 EMS guidelines are general guidelines on principles, system and supporting techniques (Standards Australia, 1996).

important given the level of Australian agricultural exports. For example, according to ABARE (2001), between 1999 and 2000, 64 per cent of Australia's farm output, equivalent in value terms to over $18 billion, was traded internationally.[10]

A common criticism of ISO 14001 is that it is only a process standard and, as such, does not specify performance criteria or standards. While it is true that ISO 14001 is a process standard, it is important to understand that this standard's accompanying guidelines, namely the ISO 14004 guidelines, clearly state that requirements of the ISO 14001 process standard include compliance with prevailing environmental legislation and regulations, as well as with "other requirements to which the organization subscribes, that are applicable to the environmental aspects of its activities, products or services" (Standards Australia, 1996). Also, with respect to the setting of objectives and targets, the ISO 14004 guidelines state that "[w]hen establishing and reviewing its objectives, an organization shall consider the legal and other requirements, its significant environmental aspects, its technological options and its financial, operational and business requirements, and the views of interested parties" (Standards Australia, 1996). The ISO 14004 guidelines elaborate that these 'other requirements' may include industry codes of practice, agreements with public authorities and non-regulatory guidelines, as well as international environmental guiding principles[11] (Standards Australia 1996).

In further response to the common criticism that ISO 14001 is a process standard, the fact that ISO 14001 is a process standard actually gives enormous flexibility, adaptability and innovation potential. As a process-based management tool, ISO 14001 works best when combined with relevant code of practice information, Best Management Practice (BMP) guidelines or with specific performance guidelines, standards and benchmarks tailored to the industry and enterprise in question. It is acknowledged that such codes of practice, BMPs and performance criteria for environmental management are currently being developed in diverse agricultural and rural industry sectors in Australia and overseas.

### 3.1.2 The Eco-Management and Auditing Scheme (EMAS)

The European Union (EU) Council Regulation (EEC) No. 1836/93 allows voluntary participation by companies in an EU-wide Eco-Management and Auditing Scheme, commonly called EMAS. Although a formal Regulation, EMAS specifies that participation is voluntary. Making EMAS a formal Regulation reflects the EU's market-oriented approach to environmental policy. Essentially, EMAS is an ISO 14001-consistent EMS (Figure 2) and, as such it is committed to continual improvement in the way that environmental impacts are managed. However, there are some differences. Honkasalo (1998) notes that although EMAS and ISO 14001 resemble each other closely, EMAS differs from ISO 14001 in that it requires a greater degree of transparency to the public than does ISO14001. Also, the certification process of the ISO14001 standard covers only the management system. By contrast, in EMAS, information dealing with emissions and levels of environmental impacts, in other words performance-related information, is also checked. A very important difference between ISO14001 and EMAS is that ISO14001 may be applied to all organizations, whereas only industrial-type sites and organisations can participate in EMAS. Thus, while the vast majority of companies participating in EMAS are in non-agricultural sectors, there are some industrial-type rural industry firms participating in this scheme.

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[10] According to ABARE (2001), between 1999 and 2000, the gross value of farm production amounted to $30,807 million. Of this total, sales within the farm sector amounted to $2,156 million. Therefore, the gross value of farm sales to other sectors equated to $28,650 million. Of this $28,650 million, $18,379 million (64 per cent) was exported.

[11] The ISO 14004 EMS guidelines clearly recognise the relevance of applying international environmental guiding principles including, first, the Rio Declaration on Environment and Development and, second, the International Chamber of Commerce (ICC) Business Charter for Sustainable Development to EMS. These principles are included in an Annex to the ISO 14004 guidelines.

**Box 2 Why a farmer may wish to implement an EMS**

Farmers have stated their desire to:

- prove that they are good stewards and demonstrate due diligence;
- have flexibility in selecting the environmental issues of importance to them, and to use their own suite of indicators for monitoring progress toward management of these issues;
- be in control of the process and make it work for them;
- gain some sort of recognition (either community support and/or market benefit) for their good resource management;
- provide a point of differentiation between themselves and other producers;
- position themselves to gain regulatory relief and/or market access as well as to answer any criticisms on environmental grounds from competitors;
- have some guidance in adopting improved resource management that also allows them to achieve some of the other outcomes above;
- use management approaches that are compatible with other management work, such as quality assurance (QA) and minimise the amount of paperwork and time spent in managing a complex system.

EMS addresses these myriad considerations by providing a flexible process with direction but without being prescriptive. Importantly, flexibility allows for individual innovation in developing solutions to problems.

*Source: Carruthers (2000)*

## 3.2 VEMAs based on production-oriented (product and performance) standards

### 3.2.1 Integrated Fruit Production (IFP) for apples and pears

Another example of production protocols for the farm sector is given by the Integrated Fruit Production (IFP) guidelines for apples and pears. Fruit growers in the Adelaide Hills are successfully complying with these protocols, which are EUREP-GAP consistent.

### 3.2.2 Linking Environment and Farming (LEAF)

Linking Environment and Farming (LEAF) is a VEMA from the UK. Even though it does not incorporate actual standards,[12] it does provide production-oriented guidelines to farmers, and for this reason has been included. LEAF is an Integrated Crop Management (ICM) initiative that sets best management practice (BMP) guidelines for crop rotation, variety selection, cultivation techniques, plant nutrition, crop protection and wildlife and landscape management, and conducts a farming-tailored environmental audit called the LEAF audit. This is divided into seven individual modules including planning, soil management and crop nutrition, crop protection, pollution control and waste management, energy efficiency, landscape and wildlife features and animal husbandry.

## 3.3 VEMAs based on organisation-oriented (process) and production-oriented (product and performance) standards

### 3.3.1 The EUREP-GAP protocol for fresh fruit and vegetables

An example of a production protocol for agricultural and rural industry products, which includes environmental management elements, is given by the European EUREP-GAP production protocol for fresh fruit and vegetables, where GAP denotes good agricultural practice. This protocol specifies environmental management aspects relating to fruit and vegetable production. Critically, this protocol is designed for integration with quality assurance protocols.

According to the March 2001 version of EUREP-GAP, the protocols provide a way of blending Integrated Pest Management (IPM) and Integrated Crop Management (ICM) practices for the purposes of commercial agricultural production. The adoption of IPM and ICM is viewed by EUREP-GAP members as essential for the long-term improvement and sustainability of agricultural production. EUREP-GAP supports the principles of Hazard Analysis Critical Control Points (HACCP) and encourages its use.

The latest version of the protocols also states that "[i]t is essential that all organisations involved in the food production chain accept their share of the tasks and responsibilities to ensure that GAP is fully implemented and supported. If consumer confidence in fresh produce is to be maintained, such standards of good agricultural practice must be adopted, and examples of poor practice must be eliminated from the industry" (EUREP-GAP, 2001). Growers receive their EUREP-GAP approval through independent

[12] Although the LEAF initiative refers to 'ICM standards', these are not standards as defined by Standards Australia (2001; refer to Box 1). Rather, LEAF's 'ICM standards' resemble best management practice (BMP) guidelines, that is to say, relatively broad recommendations as compared to standards, which are more specific in nature.

verification from a verification body that is approved by EUREP. The verification process must follow the rules described in the EUREP-GAP General Regulations for Fresh Fruits and Vegetables, with the timing of the verification process being agreed with the retailer customer.

An interesting feature of the EUREP-GAP protocols is that they are partitioned into required and encouraged protocols, as illustrated by the extracts presented in the below table. It is suggested that, with time, the 'encouraged' practices may be expected to become 'required' ones, with the rate of change being driven by competition among retailers for customers demanding safe, clean, green food.

Production protocols for agricultural and rural industry products may be a blend of both product standards and performance standards. Production protocols may often be complied with, and be audited and certified, without an accompanying process standard, or management system, in place. However, some production protocols are now being designed for use explicitly within a management system context. For example, the EUREP-GAP protocols specify, first, the product standards and performance standards to be met and, second, that these must be met within either an EMS or a quality management system (QMS) context. In 1999, the UK supermarket chain Sainsburys drew the EUREP-GAP protocol to the attention of all of its overseas suppliers of fresh and frozen produce. It plans that all overseas suppliers will be verified as complying with the EUREP-GAP protocols by 2003.

**Table 2 Extracts from the EUREP-GAP protocol for fresh fruits and vegetables**

| Required actions[1] | Encouraged actions |
|---|---|
| *Record keeping*<br>Growers must keep up to date records to demonstrate all production activities comply with GAP, and to help trace the history of products from farm to final consumer. Appropriate records must be kept for a minimum of five years, unless required for a longer period. Retrospective records are not required prior to application of approval. | |
| *Quality of irrigation water*<br>Sewage water must never be used for irrigation. | Based upon risk assessments, irrigation water sources should be analysed at least once a year for microbial, chemical and mineral pollutants by a suitable laboratory. The analysis results should be compared against accepted standards and adverse results acted upon. |
| Supply of irrigation water | To protect the environment, water should not be abstracted from unsustainable sources. Advice on abstraction should be sought from water authorities. |
| Impact of farming on the environment | In the light of consumer concern, growers should understand and assess the impact their farming activities have on the environment, and consider how they can enhance the environment for the benefit of the local community and flora and fauna. |
| *Wildlife and conservation policy*<br>A key aim must be the enhancement of environmental biodiversity on the farm through a conservation management plan. This could be a regional activity rather than an individual one. | Growers should have wildlife and conservation policy plans for their properties. These policy plans should be compatible with sustainable commercial agricultural production and should aim to minimise environmental impact of the agricultural activity.<br>Key elements of these plans should be to:<br>• conduct a baseline audit to understand existing animal and plant diversity on the farm. Conservation organisations can help conduct surveys to measure biodiversity and identify areas of concern;<br>• take action to avoid damage and deterioration of habitats; and<br>• create an action plan to enhance habitats and increase biodiversity on the farm. |
| Unproductive sites | Consideration should be given to the conversion of unproductive sites (such as low lying wet areas, woodlands, headland strips or areas of impoverished soil) to conservation areas for the encouragement of natural flora and fauna. |

*Source: EUREP-GAP (2001; the latest version of the protocols).*

[1] The above protocols are extracts, and as such only represent a small portion of the entire set of protocols.

### 3.3.2 Organic and biodynamic standards

Organic farming, according to the Australian National Standards for Organic and Biodynamic Produce (cited in McCoy and Parlevliet, 2000) is defined as follows: " 'Organic' farming systems include those which are referred to as 'biodynamic', 'biological', or 'ecological'. Irrespective of which term is used, the basic principles remain the same; namely production without the use of synthetic chemicals which aims to achieve optimum quantities of produce and food of nutritional quality. Organic farming aims to nurture and maintain the land for future generations. Emphasis is placed on the use of renewable resources, the need for conservation of energy, soil and water resources and the maintenance of environmental quality. The production cycle is as closed as possible, with some use of external inputs permitted. These systems strive to be sustainable." (McCoy and Parlevliet, 2000).

Organic and biodynamic standards are a good example of production protocols with environmental management aspects that also incorporate a process standard. According to the most recent version of the Organic Standard of the Biological Farmers of Australia (BFA),[13] the scope of the BFA standard is such that "[t]his Standard outlines the minimum requirements for BFA certification of Organic produce under the BFA certification system. This Standard also outlines requirements for Codex HACCP for safe food production, whilst also listing basic requirements for managing an organic EMS (Environmental Management System) and biodynamic production." (BFA, 2001). Owing to the fact that organic and biodynamic production protocols blend environmental, food safety and quality issues, McCoy and Parlevliet (2000) note that "the term organic or organically produced has become widely accepted by consumers as meaning safe, healthy and environmentally friendly."

Global trade in organic farm produce was worth some US$11 billion in 1997, and organic foods have been the fastest growing sector of food industries in the USA, Japan and parts of Europe. Specifically, Europe and Japan have had the fastest growing consumer demand for organic produce, and US and New Zealand producers have been the quickest to respond to these market demands (McCoy and Parlevliet, 2000). McCoy and Parlevliet (2000) also note that although Australian organic produce has established a good international reputation, Australia has been slow in providing a supply response to organic market demands. Industry sources estimate the value of Australian organic farming to be between A$200 and A$250 million, with exports accounting for approximately A$30 to A$50 million. Australia's relatively limited organic production presents the key obstacle to capturing a greater share of this fast-expanding market (McCoy and Parlevliet, 2000).

*Environmental aspects of the Organic Standard of the Biological Farmers of Australia*

The BFA's current Organic Standard provides general standards relating to environmental and biodiversity management (BFA, 2001). These general standards are presented in Box 3 overleaf.

[13] The most recent version of the BFA Standard is version 4 which came into effect on 1 September 2001. This standard is available from the BFA website: www.bfa.com.au/downloads.

**Box 3 Environmental and biodiversity management in the BFA's Organic Standard**

The most recent version of the Organic Standard of the Biological Farmer's of Australia (BFA) contains the following general standards regarding environmental and biodiversity management. These points have been reproduced verbatim from subsection 4.7 of the BFA's current Organic Standard:

- Management, protection and enhancement of biodiversity and environmental aspects on organic farming operations shall be a priority of certified operators. Management decisions shall take into account impact on native flora and fauna. Changes to the natural or existing state of the farming operation (such as clearing) shall take into consideration hydrological issues, as well as impacts to biodiversity on-farm. Practices such as shelter belts, corridors, wetlands and remnant vegetation protection are considered aspects of biodiversity management.
- Management shall aim to ensure provision for regionally appropriate tree, bush and/or native grassland areas so as to enhance on-farm flora and fauna protection and biodiversity. From June 2005, this area should comprise greater than 5% of total farmland area for farms greater that 10ha, and be documented annually in the Organic Management Plan.
- Where production systems are deemed by the certification office to be natural areas of significance or production systems inherently based upon ecological aspects, monitoring procedures shall be in place to assess and verify ongoing sustainable practices. For example, such monitoring may include photo point monitoring of pasture and floral species in rangeland management operations.
- All certified operations shall ensure identification of critical environmental aspects which are relevant to their production system and outline management plans in the Organic Management Plan to address these aspects.
- All operations, whether primary production or processing, shall ensure that production activities add positively to the environment of the region within which the production system is based, whilst minimising all forms of environmental pollution where possible.
- Where there are noted serious or critical environmental issues pertaining to the relevant sector or operation being certified, such operations shall have in place a management system which is documented and monitored in relation to its performance on these environmental issues. These shall require a continued improvement in management practices and environmental outcomes. Organic certification may entail acknowledgment of existing environmental management systems where these conform to the above noted requirements.
- Burning of stubble and residues is a restricted practice due to destruction of nutrients and organic matter. Stubble burning shall not be practices on a regular basis and shall only occur after written permission from the Certification Office (CO).
- The clearing of primary forest on certified lands is not permitted.
- Genetic Engineering/Genetically Modified Organisms – At all times GE products and processes are prohibited in organic production systems.

*Source: Subsection 4.7 of the BFA's organic farming standard; BFA (2001)*

### 3.3.3 The Marine Stewardship Council (MSC) scheme

Most environmental certification schemes exist in the forestry and wood products sector. However, a notable example of an environmental certification scheme in a non-forestry sector is given by the Marine Stewardship Council (MSC) scheme. The Marine Stewardship Council (MSC) is a not-for-profit agency that campaigns for sustainable fishing. The MSC's fisheries certification scheme, a joint initiative between the World Wide Fund for Nature (WWF) and Unilever, has been designed to promote environmentally sustainable fisheries management and fishing practices. Fisheries that can demonstrate compliance against the MSC's standards, as detailed in the Council's 'Principles and Criteria for Sustainable Fishing', may become certified under the MSC's fisheries certification scheme, subject to a successful audit by a MSC accredited certification body. MSC-certified fisheries may then use the MSC's 'Fish Forever' label. The MSC's 'Principles and Criteria for Sustainable Fishing' relate to issues such as resource sustainability, the minimisation of ecosystem impacts, as well as management operations. To date, MSC-certified fisheries include Alaskan salmon, New Zealand hoki, Western Australian lobster, Burry Inlet cockles and Thames Blackwater herring fisheries. The Western Australian Rock Lobster fishery was the world's first fishery to become certified under the MSC's certification scheme and to use the MSC's 'Fish Forever' label. (The Economist, 2001; and Nind, Catherine, pers. comm.).

**Box 4 The Marine Stewardship Council**

The website maintained by the Marine Stewardship Council (MSC) states that globally, issues of declining fish stocks and damaged marine ecosystems are raising concerns among seafood consumers, the fishing industry and conservation groups

In response, the internationally recognised MSC is bringing stakeholders together to create change. The MSC provides its label to fisheries meeting a strict standard of sustainability. The MSC label allows consumers to quickly identify certified seafood, or 'The Best Environmental Choice in Seafood', i.e.: produce which is not overfished or harvested in ways that harm the ocean ecosystem.

The MSC label is accompanied by the statement: "*This product comes from a fishery which meets the Marine Stewardship Council's environmental standard for a well-managed and sustainable fishery.*"

The MSC website goes on to list fisheries authorised to use the FSC label and places where FSC fish can be purchased. Members of the Council have backgrounds in fishing, politics, processing and environmental representation. The overall structure is designed to maximise opportunity for scientific objectivity and lack of compromise.

*Source: www.msc.org*

### 3.3.4 The Forest Stewardship Council (FSC) scheme

The Forest Stewardship Council's (FSC) forest certification scheme is perhaps the best known and most widely practiced of all forest certification schemes (Kanowski et al., 1999). In 1993, following interest by traders to demonstrate the environmental management merits of their timber products, a coalition of environmental groups enjoying strong support from the World Wide Fund for Nature (WWF), along with community groups, forestry and wood sector workers, and certifiers, launched the FSC for forest certification purposes. The scheme became operational in 1995 when four independent third-party certification agents became accredited. In August 1999, some 17 million hectares of forests had been certified under the FSC scheme, largely in Sweden, Poland and the United States. In order to receive certification, forest owners and managers need to comply with a set of principles and criteria for sustainable forest management that have been developed under the FSC scheme. These principles and criteria encompass both process and performance aspects, though interestingly, Kanowski et al. (1999) note that a feature of the FSC principles and criteria is that they do not constitute a certifiable performance standard. Under the scheme, forest owners and managers are regularly inspected, or audited, by the independent third-party certification agents. An important feature of the FSC scheme is that it endorses, by means of a system of accreditation, other organisations to independently assess the environmental performance of forest owners and managers. Thus, the FSC scheme does not certify forest management and chain-of-custody by itself. At the end of 1998, the FSC had accredited six organisations to independently certify forest management as sustainable according to FSC principles and criteria. There are two stages to independent FSC certification. First, an assessment of forest management practice is required. Second, there is a requirement for a supply chain, or chain-of-custody, verification through processing and manufacturing through to the end product. Group certification of collectively organised forest owners and managers is possible under the FSC scheme, in which case the group as a whole applies for group certification and a group certificate is issued. (Kanowski et al., 1999).

### 3.3.5 The Finnish Forest Certification Scheme (FFCS)

The Finnish Forest Certification Scheme (FFCS) is a national forest certification scheme that began in 1996. The scheme was jointly developed by a peak body of the Finnish forestry industry, a forest industry workers union, and two environmental NGOs including WWF Finland and the Finnish Association for Nature Conservation. The FFCS was specifically designed for the forest certification of non-industrial privately owned forests. The standards in this scheme are based on EMAS, ISO14001, FSC principles and criteria, as well as other European standards and criteria. In 1999, the National Forest Certification Council was set up to oversee the development of this scheme, and internal auditing processes begun covering some 12 million hectares of forests to check compliance against the FFCS standards. As with FSC, group certification of collectively organised forest owners and managers is possible under the FFCSC scheme (Kanowski et al., 1999).

In addition to the forest certification schemes describes above, other schemes designed for the forestry and wood products sector include the Canadian Standards for Sustainable Forestry, the Sustainable Forestry Initiative (SFI), , the Indonesian LEI-FSC Initiative, the Malaysian National Timber Certification Council and the UK Woodland Assurance Scheme. There are several initiatives working towards the mutual recognition of these various certification schemes (Kanowski et al., 1999).

Furthermore, environmental certification is a rapidly developing area, and there are new forest certification standards and schemes currently being developed. For example, the Brazilian National Certification Scheme (CERFLOR) is that country's national forest certification standard. Since 1999, this standard has been undergoing development by the national standards organisation of Brazil in partnership with the Brazilian Society for Silviculture for the forest certification of large-scale, industrial plantation forests.

The latest information available reports that these standards are being based largely on procedures set out in the ISO 14000 series of standards, with a focus on voluntary participation, self-regulation and independence. The objective of CERFLOR certification has been given as positively distinguishing Brazilian forest products in international markets. However, as of 1999, no forests had yet been certified under this scheme (Kanowski et al., 1999). Also, an Australian Forestry Standard is currently being developed (Standards Australia, 2001).

## 3.4 Environmental labelling and eco-labelling

In the ISO 14000 series of environmental management standards, there are several environmental labelling possibilities. For example, in the ISO 14020 series of standards there are three environmental labelling possibilities known as Type I, Type II and Type III labelling. These labels are considered in this section.[14]

### 3.4.1 ISO 14024 Type I labelling schemes

The principles upon which Type I labelling schemes are based are described in the ISO14024 standard. Type I labelling schemes involve third-party auditing to determine, on the basis of scientific assessments, on whether a product may be considered to be environmentally preferable over similar products. The intention of this labelling, according to Ure (1999), is to relieve consumers of the task of comparing competing environmental claims in making a decision on what constitutes a better environmental product. Rather, "[t]hey merely have to decide whether or not they have confidence in the body operating the scheme to make the decision" (Ure, 1999).

Type I labelling is:

- voluntary;
- involves auditing by a third-party;
- results in product labelling provided that certain environmental and performance criteria are satisfied;
- based upon established environmental criteria, available for public scrutiny, for different product categories; and
- used to identify and promote products deemed to exhibit environmental leadership.

Type I labels are not single issue labels, rather they consider multiple issues and are based on a simplified life-cycle analysis which considers the impacts of manufacturing, processing, use and disposal of the product on non-renewable resources. Furthermore, industry and community stakeholders are involved in the setting of criteria, and only products that meet and surpass a threshold score qualify for the Type I label. Advantages of the ISO 14024 standard for Type I labelling schemes are that the standard provides a

[14] In addition to the ISO 14020 series, the ISO 14040 series of standards is concerned with life-cycle analyses (LCAs) and also allows for labelling. However, this type of labelling is not dealt with in this report. Across agricultural and non-agricultural industries, life cycle analysis (LCA) provides a means of environmental auditing or, in other words, an assessment of practices and performance against some given benchmark or standard or regulatory requirement.

common framework for new labelling schemes, and that it sets out common criteria to help different schemes converge and mutually recognise one another (Ure, 1999).

### 3.4.2 ISO 14021 Type II labelling schemes

The principles upon which Type II labelling schemes are based are described in the ISO14021 interim standard. Type II labelling schemes make environmental claims on products labels and in related marketing such as 'recyclable', 'biodegradable', 'ozone friendly' or '60 per cent phosphate free' (Ure, 1999). Agricultural and rural industry examples of Type II labels would make claims such as, for example, 'pesticide free' on fruit and vegetables, 'GMO free' on soya bean products, or 'dolphin friendly' on cans of tuna. Given consumer concern regarding the possibly misleading nature of some environmental claims made on product labels, the rationale for Type II labelling is to help improve the quality and validity of environmental claims made. Part of the problem concerning the validity of environmental claims on labels stems from the differences in laws and national guidelines between countries regarding what constitutes a valid claim. Often it is these variations between national guidelines that create problems in international markets. Currently, the ISO 14021 standard is an interim standard in Australia, but when finalised, it is intended to help harmonise guidelines by establishing a uniform approach to the scientific and technical assessment of claims made. This is intended to ensure claims are accurate, scientifically verifiable, thereby improving cross-country understanding of claims made (Ure, 1999).

### 3.4.3 ISO 14025 Type III labelling schemes

The principles upon which Type III labelling schemes are based are described in the proposed ISO14025 standard, which is not yet published. Proposed Type III labelling, like Type I labelling, is designed to involve third-party assessment for a label to be issued. However, unlike Type I labels which identifies and promotes products deemed to exhibit environmental leadership, Type III labels indicate environmental performance against a range of environmental indicators. These indicators are established using a life-cycle approach similar to that used in Type I labelling, and performance against these indicators is third-party verified. The purpose of Type III labels is to help consumers make consumption choices among competing products on the basis of differing environmental performance shown by the indices (Ure, 1999).

## 3.5 Voluntary arrangements for quality assurance, food safety and animal welfare

This section overviews a number of voluntary arrangements undertaken for the purposes of quality assurance, food safety and animal welfare.[15] While a great number of voluntary arrangements for QA and food safety exist, the arrangements covered here include:

- the Hazard Analysis Critical Control Point (HACCP) system for food safety;
- the Safe Quality Food (SQF) initiative, which is a HACCP based supplier assurance code for the food industry with food safety and quality aspects;
- the ISO 9000 series of standards for quality assurance (QA);
- three QA codes of practice for Australian agriculture which include Cattlecare, Flockcare and Graincare; and
- the Model Codes of Practice for the Welfare of Animals.

### 3.5.1 HACCP

The Hazard Analysis Critical Control Point (HACCP) system is an internationally recognised system for assuring food safety. It operates by identifying, evaluating, and controlling hazards that are significant for food safety. The system was "established to control and monitor every step of a food process to evolve as a preventative rather than inspection-oriented end-product testing system" (Fabiansson and Cunningham, 2000).

The Codex Alimentarius Commission produces the description and guidelines of the HACCP system. Codex is a committee of the Food and Agriculture Organization (FAO) of the United Nations, and the World Health Organization (WHO) of the United Nations, that is involved in the setting of international food standards (Fabiansson and Cunningham, 2000).

HACCP is based upon seven principles and fifteen steps shown in the box overleaf.

[15] There are many voluntary arrangements for QA and food safety in existence. Given that the main focus of this report is on voluntary arrangements for environmental management and how these intersect with voluntary approaches to QA, food safety and animal welfare, a review covering the full breadth of voluntary arrangements for QA and food safety is not considered appropriate. For a fuller treatment of QA and food safety systems for Australian agriculture and food industries, the reader is directed to Fabiansson and Cunningham (2000).

**Box 5 The seven principles and fifteen steps of HACCP**

| | | |
|---|---|---|
| 1 | Assemble the HACCP team and define the scope of the HACCP plan | |
| 2 | Describe the product and its distribution method | |
| 3 | Describe the intended use of the product | |
| 4 | Construct a detailed flow diagram of the process | |
| 5 | Conduct on-site verification of flow diagram | |
| 6 | List all potential hazards associated with each step, conduct a hazard analysis and consider any control measures to control hazards | *Principle 1* |
| 7 | Determine Critical Control Points (CCPs) | *Principle 2* |
| 8 | Establish Critical Limits for each CCP, as per the Australian Standard where applicable | *Principle 3* |
| 9 | Establish a monitoring system for each CCP | *Principle 4* |
| 10 | Establish corrective action plans for CCP deviations that may occur | *Principle 5* |
| 11 | Establish verification procedures | *Principle 6* |
| 12 | Establish record keeping and documentation | *Principle 7* |
| 13 | Determine what training is needed for all staff including employees, supervisors and QA people so all understand what HACCP means to the premises and to them. Make sure people understand what the different terms used in the Australian Standard mean, including, for example, hazard analysis, critical control point, verification, quality assurance, and so on, so that people are talking a common language | |
| 14 | Start monitoring the CCPs using forms and evaluate the usefulness of the forms for improving the product and process control and providing trend analysis of the procedures | |
| 15 | Gather information on tests associated with microbiological standards contained in the ARMCANZ requirements as a complements to verification activities identified in Step 11 | |

*Source: SCARM (1997)*

### 3.5.2 The SQF 1000 quality code

The Safe Quality Food (SQF) initiative SQF1000 is a HACCP based supplier assurance code for the food industry. Conceived by the AGWEST Trade and Development division of Agriculture Western Australia, this code has been developed for primary producers supplying agri-food goods that require further processing prior to consumption, and for small food businesses that store, transport or distribute food and that are subject to food safety regulations. The SQF 1000 quality code enables adopters to demonstrate that they supply safe food. The code also enables adopters to address customer specified food quality requirements. SQF 1000 is HACCP based (Agriculture Western Australia, 2000).

Promoters of the SQF quality code claim that it is simpler than HACCP but that it gives customers the same assurance. In addition to the SQF 1000 quality code, there is also the SQF 2000 quality code. Developed in 1995, SQF 2000 is a system that integrates HACCP with ISO 9000, which is described below. Red Globe Table Grape growers in Western Australia claim that SQF 2000 has resulted in 17 per cent more profit, 51 per cent less waste, an increase in the price premium of 13 per cent and a 70 cent/carton reduction in packing costs (Cooper, 2000).

### 3.5.3 ISO 9000

ISO 9000 is an internationally agreed and recognised series of standards for quality management and quality management systems (QMS) that can be independently verified. The series includes the ISO 9001, ISO 9002 and ISO 9003 standards. ISO 9002 is the standard for quality systems, and provides the model for quality assurance in production and installation. As such, it is the standard from the ISO 9000 series that is applicable for food production and processing (Fabiansson and Cunningham, 2000).

Food and beverage companies are increasingly adopting the ISO 9000 series of standards ahead of inspection as an efficient way of achieving total quality control. The adoption of ISO 9000 standards is a key factor in improving competitiveness and expanding exports, with leading food retail chains such as Sainsburys and Marks and Spencer in the UK, among others, requiring verifiable compliance against ISO 9000 standards as a minimum requirement from their suppliers.

### 3.5.4 Codes of practice for quality assurance in agriculture

Good quality, according to the late Dr W Edwards Deming, cited in the Cattlecare and Flockcare On-farm Quality Assurance Manuals is “not necessarily high quality, but a predictable degree of uniformity, with specifications suited to customers needs” (Cattlecare, 2000; and Flockcare, 2000). According to these quality assurance (QA) manuals, ‘quality’ embraces four things:

- fitness for purpose;
- conformance to requirements;
- conformance to specifications; and
- consistency of product.

Also according to these manuals, 'quality assurance' involves being able to assure customers that a quality product that meets customer specifications can be produced consistently.

Three codes of practice for quality assurance that are currently being used in Australian agriculture include Cattlecare, Flockcare and Graincare. These QA codes of practice are based upon the ISO 9002 standard for quality assurance and HACCP. The benefits of these codes of practice are, according to the Cattlecare and Flockcare On-farm Quality Assurance Manuals, improved product consistency, food safety, livestock health, risk management, improved competitiveness, greater professionalism, preferred supplier status, international recognition and market access, and product differentiation. The compatibility of these codes of practice with the ISO standard means that in the event that a Cattlecare or Flockcare certified producer would wish to become either ISO 9002 or HACCP certified, the fundamentals would already be in place via the codes of practice. (Cattlecare, 2000; and Flockcare, 2000).

The experience of Cattlecare in Australia is such that some 5,000 properties were participating in September 2001. These properties hold some 5 million cattle, equivalent to 25 per cent of the national herd. Also at this time, there were about 800 properties with about 2.2 million sheep participating in Flockcare (Bob Barwell, National Coordinator, 2000 pers. comm.).

### 3.5.5 The Model Codes of Practice for the Welfare of Animals

The Australian Model Codes of Practice for the Welfare of Animals have been developed as models to encourage and enable the States to develop their own codes of practice to meet regional and local animal welfare needs. Basic animal welfare needs include animals having access to clean water, air and food, taking appropriate precautions against drought, as well as protecting animals from climatic extremes and predation. The Model Codes have been developed by State and Federal government departments responsible for agriculture and animal welfare, and CSIRO. Development of these codes has involved extensive consultation with industry, as well as animal welfare groups (SCARM, 1992).

Currently, Model Codes of Practice for the Welfare of Animals include codes for cattle, sheep, pigs, domestic poultry, road transport of livestock, rail transport of livestock, air transport of livestock, livestock and poultry at slaughtering establishments, sea transport of livestock, saleyards, goats, intensive husbandry of rabbits, deer farming, and the destruction or capture, handling and marketing of feral livestock animals (SCARM, 1992).

## 3.6 Untangling the web

*Clarification of common confusions surrounding VEMAs, EMSs and related concepts*

To clarify some common confusions surrounding VEMAs, EMSs and related concepts, it is noted that:

- Not all VEMAs are EMSs, and VEMAs do not necessarily include an EMS component. However, an EMS may be used as the management tool to implement other VEMAs. That is to say, an EMS may be used as the management tool, or vehicle, that an enterprise uses to implement Codes of Practice, Best Management Practice guidelines, production protocols, eco-labelling initiatives or other non-EMS certification schemes. Indeed, it is now stipulated in the EUREP-GAP set of production protocols that the use of a management system to implement the production protocols is mandatory for enterprises wishing to be publicly recognised as being EUREP-GAP consistent.

- Accreditation and certification differ in meaning.[16] Accreditation is the formal recognition of competence that an authoritative body gives to another body or person in order to empower them to perform specified tasks such as third-party auditing against given standards for the purposes of certification. Thus, accreditation provides public assurance that a certifying body is able to carry out its duties independently, competently and consistently. Certification is the written assurance given by an accredited third-party that compliance against a clearly identified standard has been methodically assessed such that it may be confidently claimed that compliance against that standard has been satisfactorily met. Thus, certification provides public assurance that a specific standard has been complied with.

- The key to understanding VEMAs lies in understanding standards. This is because achievement of a standard, or compliance against a standard, by an organisation is what is audited and certified.

- Certification provides public assurance that a specific standard has been complied with. Certification does not necessarily provide public assurance of good environmental outcomes.

- EMS certification is not the same as environmental labelling. However, EMSs may be used as management tools by firms that produce goods with environmental labels. In other words, a certified EMS *per se* does not necessarily produce labelled goods, but it is a management system that could be used to incorporate other labelling initiatives. Thus, the EMS could help deliver a labelled product such as a pesticide-free peach, or dolphin-friendly seafood, or a product with some other environmental characteristic.

- In the case of ISO14001, there are strict rules in place that mean that ISO 14001 certification cannot be used for labelling purposes.

- There is a difference between environmental labelling and eco-labelling.

- Confusion sometimes arises from the fact that some of the words that describe types of VEMAs (environmental certification schemes, environmental auditing schemes, environmental labelling initiatives) are also used to describe their key design features (auditing, certification and labelling).

*EMSs and auditing and certification*

To clarify the relationships between EMSs and auditing and certification processes, it is noted that:

- an enterprise may choose to implement an EMS, without choosing to undergo third-party auditing and certification. However, auditing (self-auditing and/or second-party auditing) is a requirement of having an EMS in place;

- if an enterprise wishes to be certified as having an EMS, it must undergo a third-party audit by a certification body that is empowered to carry out the tasks involved in third-party auditing and certification. Only accredited certification bodies are so empowered;

[16] In practice, the words 'accreditation' and 'certification' are frequently used interchangeably, or otherwise misused. The above definitions attempt to explain why phrases such as 'an accredited EMS', 'accredited standards', 'certified standards', 'accredited plans' and 'accredited standards' are meaningless and generate confusion. For our purposes, only a certification body may be accredited, and only an organisation's compliance against a specified standard may be certified.

- if an Australian agricultural or other rural industry enterprise wishes to implement an EMS that is audited and certified by a third-party, the only EMS that currently exists for this purpose is the international EMS process standard ISO14001; and

- in Australia, third-party auditing for ISO14001 certification can only be conducted by a JAS-ANZ[17] accredited certification body.

*Industry, regional and catchment approaches to EMS*

An EMS is a management tool that an organisation uses to manage its environmental impacts and to reach environmental goals. Therefore, an EMS may only be implemented by an organisation to manage the resources over which that organisation has specific control. This means that concepts such as an 'industry EMS', a 'regional EMS', a 'catchment EMS', or a 'national EMS' are meaningless. However, an 'industry approach to EMS' or a 'regional approach to EMS' or a 'catchment approach to EMS' can mean that enterprise-level EMSs are designed to incorporate industry, regional or catchment policies, initiatives, or targets. In other words, an 'industry approach to EMS', a 'regional approach to EMS' or a 'catchment approach to EMS' can be used to denote the existence of industry, regional and catchment scale institutions in which enterprise-level EMSs are embedded, and which provide broad directions and guidance regarding environmental management that are implemented at the enterprise level, but which achieve industry, regional or catchment scale environmental outcomes. It is possible also for a natural resource management agency, a catchment management authority or water supply company to establish and use an EMS to help it achieve its objectives.

[17] JAS-ANZ is the Joint Accreditation System of Australia and New Zealand.

# 4 Factors Affecting the Design of VEMAs for Agriculture and Allied Rural Industries

This chapter discusses the factors affecting and shaping the design of VEMAs for agriculture and associated rural industries. The objectives sought by implementing VEMAs are key factors affecting their design. The intended environmental, marketplace and community objectives of VEMAs are considered, as are the tensions and complementarities that exist between them. Also discussed are the possible design configurations of different strategies to achieve a VEMA's objectives. The importance of viewing VEMAs in a broad institutional context is explained, and different institutions affecting and shaping the design of VEMAs are discussed.

The importance to VEMA design and development of two aspects of modern industrial organisation in the primary industries are also covered: first, supply chains, which provide pathways along which environmental innovations take place are discussed, and second, the nature of the different organisational structures, such as family farms, corporate farms or downstream agri-businesses. Essentially, it is proposed that knowledge of the nature of the different organisational structures, such as family farms, corporate farms or downstream agri-businesses, should be taken into account when designing new VEMAs, as these differ in ways likely to affect the preferences for different VEMAs, as well as the ease and enthusiasm with which different VEMAs are adopted.

## 4.1 Environmental, marketplace and community objectives of VEMAs

Depending on the specific objectives of a given VEMA, participation in these voluntary initiatives has the potential to deliver a range of outcomes. Environmental, marketplace and community objectives of VEMAs, and their intended outcomes are described in sections 4.1.1, 4.1.2 and 4.1.3 below.

### 4.1.1 Environmental objectives

Environmental objectives of VEMAs may involve:

- continuously improving the way that environmental impacts are managed;
- enhancing environmental performance;
- achieving specific environmental outcomes; and
- creating incentives for the protection and maintenance of valuable environmental assets.

### 4.1.2 Marketplace objectives

Marketplace objectives of VEMAs may include:

- maintaining access in existing markets;

- gaining access in existing markets;
- creating new niche markets;
- receiving or maintaining access to premium prices; and
- reduced costs, for example through cheaper or preferential access to government programs.

### 4.1.3 Community objectives

Community objectives of VEMAs may include:

- raising awareness of environmental issues;
- building industry and community esteem through good stewardship; and
- fostering cultural change in the way agricultural and rural industries approach the environmental and economic aspects of their business.

### 4.1.4 Tensions and complementarities among the objectives

An oft cited benefit of different VEMAs is that the firms, or other organisations, implementing such schemes and initiatives will reap environmental benefits and economic rewards alike. Although evidence of such win-win situations exists (Thomas, 2001; Porter and van der Linde, 1995, in Coglianese and Nash, 2001; Hart and Ahuja, 1996, in Coglianese and Nash, 2001), some authors advocate the caution of this rhetoric. For example, in an article entitled 'It's Not Easy Being Green' Walley and Whitehead (1994) make the point that ambitious environmental aims have a price attached and that while "the current talk of win-win solutions [satisfying both environmental and marketplace objectives] is cheap" whereas "environmental initiatives are not".

Coglianese and Nash (2001) also recognise this and, with specific reference to implementing EMSs in firms, note not only the cost implications of meaningful environmental change, but also the difficulties in making changes to the business and management culture of an enterprise. Thus, both tensions and complementarities exist between the environmental, marketplace and community objectives of VEMAs.

## 4.2 Design objectives and design strategies of VEMAs

A fundamental factor affecting the design of a VEMA for agriculture, or an allied rural industry, is its objective. The objective plus the strategy chosen to achieve that objective are the two single most important determining factors shaping the architecture of a VEMA.

As regards the VEMA's objectives, the relative importance placed on desired environmental outcomes versus marketplace outcomes versus community outcomes should be reflected in the relative importance of environmental versus marketplace versus community considerations apparent in the VEMA's aims. This consideration of the relative importance of environmental, economic and social issues in VEMA design

applies, both, to the designers of new VEMAs, as well as to prospective participants in already available schemes and initiatives.

From the perspective of a VEMA designer, the relative importance placed on desired environmental outcomes versus marketplace outcomes versus community outcomes should be reflected in the relative importance of environmental versus marketplace versus community considerations in the VEMA's aims and its final design. Similarly, from the perspective of a primary producer making a choice about whether or not to participate in a VEMA, and if so which one, the relative importance placed on desired environmental, marketplace and community outcomes by the primary producer should determine the VEMA chosen. Thus, in its objectives, one VEMA may place strong importance on good environmental outcomes and on publicly demonstrating high levels of verifiable environmental performance or of improvement in environmental quality, and relatively less importance on marketplace and community outcomes. By contrast, another VEMA may place emphasis on social outcomes such as wide community involvement and the general raising of awareness on given environmental issues, but may place a lighter emphasis, or indeed none at all, on demonstrable environmental outcomes.

As regards the strategy to achieve a VEMA's objectives, this too has several possible design configurations. Clearly, the objectives of a VEMA, and the relative importance of environmental, marketplace and community aims, determine the strategy chosen to a large extent. Design choices relating to the strategy for achieving a VEMA's objectives include making choices about whether the VEMA is intended to showcase and champion environmental leadership, in which case the design strategy would involve designing a VEMA resembling an elite club with exclusive membership limited to relatively few high environmental achievers.[18] Alternatively, where a VEMA intends to achieve wide community involvement and awareness raising social and environmental objectives, the strategy could involve designing arrangements to foster inclusiveness and encourage the participation of many. Such a strategy would probably steer away from setting stringent standards and verifiable environmental performance requirements with harsh penalties for non-compliance. Thus, with alternative design objectives and strategies in VEMAs, there appears to be a balance between, on the one hand, relatively good environmental outcomes albeit with low participation when a notional green bar is set high and an elite club is created and, on the other hand, good adoption rates being the function of the bar set low.

Where the strategy of creating an elite environmental management club is taken, for example for the conservation of iconic natural resources, the design rationale is twofold: first, to preserve the iconic resource and, second, to encourage others managing non-iconic resources to lift their game by aspiring to elite club membership. In this way, awareness is raised and good environmental management and performance is encouraged outside the showcase VEMA.

With regard to these design choices for strategies to achieve a VEMA's objectives, it is recalled that high participation rates in VEMAs do not necessarily indicate good environmental performance or outcomes. Indeed, gauging a VEMA's impact on enhanced environmental quality on the basis of adoption rates is problematic, with research evidence suggesting that schemes with low requirements for environmental performance and outcomes tend to have relatively high adoption rates, and that low participation is associated with programmes demanding high environmental performance and outcomes (Nash and Ehrenfeld, 2001; Chapter 1). For example, the US Environment Protection Agency initiated a VEMA called the StarTrak Program in 1996. This programme's aim was to explore the potential of granting the environmental management status of "excellence" by using third party EMS audits as a substitute for regular government inspections to test for compliance against formal regulatory requirements.

[18] While elite VEMAs are likely to lead to marketplace benefits such as market premiums and access to new markets, the extent of such market niches is likely to be limited. Unfortunately there has been relatively little empirical research carried out on the market benefits associated with different VEMAs.

The StarTrak Program did not set out to grant "excellence" status to firms on the basis of EMS implementation alone. Rather, the green bar was set high, and to qualify for admittance into the program, a participant had to demonstrate a history of strong compliance with environmental regulations, a track record of 'beyond compliance' environmental management and pollution prevention, plus a formal EMS. Furthermore, it was mandatory under the StarTrak Program to disclose compliance and EMS audits publicly and to publish an environmental performance report every year. Participation in the programme was very low, with only 15 participants after two years. However, it would be misleading to suggest that the low participation in this programme arose purely from the programme's high environmental demands. Other reasons contributed to the low participation, not least the fact that EPA's expectations regarding what constituted 'beyond compliance' environmental management were not made clear, and therefore participants were not aware of how they were under-performing in the programme, nor did they know what to do to remedy their performance. Furthermore, the benefits of participation were not adequately clear (Nash and Ehrenfeld, 2001).

In summary, to make wise choices about a VEMA's design, there has to be clarity about what the VEMA intends to achieve (objectives) and how (strategy). There should also be clarity about the benefits of participation. This then determines a VEMA's specific key design features,[19] namely:

- whether to include standards in a VEMA, and if so, what types of standards and how high they should be set;

- whether the VEMA should be audited and if so, against what standard or criteria, how (internally or externally or both), and by whom (self, accredited auditors, government, an NGO, a coalition of stakeholders, and if so, should these stakeholders be accredited); and

- whether the VEMA should result in certification and labelling, and if so, by whom (self, accredited certification bodies, government, an NGO, a coalition of stakeholders, and if so, should these stakeholders be accredited). In other words, what should be the nature of stakeholder involvement, how should governance arrangements be structured, and should these ensure international recognition.

### 4.2.1 General recommendations for VEMA design

Drawing on OECD (1999), some general recommendations for good VEMA design include:

- clearly defined objectives and targets;

- characterisation of a counterfactual, or business-as-usual scenario to determine environmental and other outcomes in the absence of a VEMA;

- monitoring that provides meaningful and reliable information about whether progress toward achieving objectives and targets is being made, and that is practical and cost-effective;

- involvement from independent third parties to provide public assurance in a given VEMA;

- penalties with teeth for non-compliance to maintain public confidence in a given VEMA, and to prevent free-riding; and

[19] See Chapter 2.

- the provision of good supportive information, such as codes of environmental management practice and BMP guidelines for environmental management, as well as relevant training workshops to facilitate VEMA participation and implementation.

## 4.3 The institutions in which VEMAs are embedded

*What are institutions?*

Institutions are the diverse social norms, sets of rules, compliance procedures, moral and ethical behavioural conventions that have evolved over time. Institutions are "the rules of society or of organisations that facilitate coordination among people by helping them form expectations which each person can reasonably hold in dealing with others." Importantly, "[i]nstitutions provide the framework within which human beings interact. They establish the cooperative and competitive relationships which constitute a society and more specifically an economic order." (North, 1981).

Social scientists devised the concepts of institutions because of the inadequacy of classical economic and sociological schools of thought in explaining socio-economics, political and cultural phenomena. It is important to recognise that the term 'institution' should not be understood in a narrow context of being synonymous with 'government agency'.

*Why look at VEMAs in an institutional context?*

Natural resource management and environmental protection are, ultimately, about people management (Gleeson, Tony, pers. comm., 2001), and this occurs in an institutional context. Understanding the design of institutional arrangements relating to NRM practices is fundamental to identifying the institutional determinants of good NRM practice, the barriers to it, and to illuminating how those barriers may be overcome. For this reason, the research focuses attention on, both, the design of VEMAs, as well as on the design of the institutions in which these voluntary arrangements are embedded, in which they operate, and in which they deliver environmental outcomes.

By elucidating the institutional determinants relating to the design and development of VEMAs, the research aims to shed light on institutional barriers to designing and implementing VEMAs appropriate for agriculture and the rural industries, as well as on how to overcome those barriers. In this way, the research intends to increase the probability of success of diverse VEMAs, including their integration into regional, national and international systems.

*Overview of the institutions relevant to the design and development of VEMAs*

Institutions relevant to the design, development and implementation of VEMAs include:

- *legislation and regulations* relating to NRM, environmental protection and regional planning. These are pertinent to the design and development of VEMAs as they set legally binding minimum compliance levels;

- *government policies, plans and strategies* relating to environmental management that are not enshrined in statutory documents or under regulations and legislation. These are relevant to the design and development of VEMAs as they articulate governments' positions regarding given environmental issues, as well as the possible intent of governments to regulate those areas in the future;

- *international treaties and conventions* relating to environmental issues such as biodiversity conservation and climate change. For example, Australia signed the Convention on Biological

Diversity and the Framework Convention on Climate Change at the United Nations Conference on Environment and Development (UNCED) in 1992, and subsequently ratified the latter convention. Such international treaties and conventions are pertinent to the design and development of VEMAs inasmuch as they indicate, both, areas in which governments may focus future policy and regulatory attention, and areas of concern to domestic consumers and overseas markets;

- *standards organisations* such as Standards Australia, and its overseas counterparts, are independent companies which prepare and publish most technical and commercial standards used voluntarily. Standards organisations are highly relevant to the design and development of VEMAs as they design and develop standards through open consultative processes in which all stakeholders may participate, and they publish standards with national and international recognition;

- *accreditation bodies* are the authoritative bodies that empower another body or person to perform specified tasks such as third party auditing against given standards for the purposes of certification or labelling. In other words, accreditation bodies provide the formal recognition that third parties are able to carry out their duties independently, competently and consistently. Thus, accreditation bodies are highly relevant to the design and development of VEMAs as they provide the mechanism via which third parties provide assurance to the public of environmental claims made. An example of an accreditation body is given by JAS-ANZ, which, like Standards Australia, has overseas counterparts;

- *supply chains*. In line with North's (1981) definition of institutions given above, supply chains provide a framework within which human beings interact, and within which the cooperative and competitive relationships constituting a society and economic order are established. The relevance, indeed importance, of supply chains and supply chain management to the design and development of VEMAs is such that supply chains provide a pathway along which environmental innovations can be made and along which environmental change can, and already does happen;

- *self-regulatory arrangements* such as voluntary Codes of Practice and Best Management Practice (BMP) guidelines that relate to NRM practices and environmental protection. These are relevant to the design and development of VEMAs as, where they exist, they can provide industry operators with guidance on NRM practices to incorporate into the design of their EMSs and other VEMAs;

- *public voluntary programs* where government agencies responsible for NRM and environmental protection invite enterprises to adhere voluntarily to given environmental commitments. Some public voluntary programs actually constitute an audited and certified EMS. This, for example, is the case with the Eco-Management Audit and Certification Scheme (EMAS) in the European Union (EU), which details systems design criteria, and which has been described as constituting "optional regulation" (OECD, 1999). Other public voluntary programs, may be other types of VEMAs, though an EMS could be used to assist and enable enterprises meet the required environmental commitments;

- *negotiated agreements between industry and public authorities* designed to achieve specific NRM and environmental protection outcomes. Negotiated agreements are arrangements that involve a partnership between an industry operator and a federal, state, regional or local government authority. Entry into such a partnership may assist enterprises to achieve compliance or to operate at beyond compliance levels. Depending on the nature of the agreement negotiated, these partnerships may or may not be legally binding. The OECD (1999) notes that these negotiated agreements are often signed at the national level between an industry sector and government authority, though negotiated agreements with individual firms also exist. It is worth noting that such agreements are relevant to the design and development of EMSs as they can provide an appropriate institutional setting in which EMSs can be used to address specific environmental problems;

- *environmental partnerships between stakeholder groups*, for example, between industry and non-governmental organisations (NGOs). These are relevant to the design and development of VEMAs as they can provide the institutional context in which VEMAs could be used to deliver solutions to specific environmental problems. Participation in an industry-NGO partnership may facilitate the industry to operate at or beyond compliance levels; and

- *the organisational flexibility* of a given VEMA which determines whether an individual enterprise may make a unilateral commitment to implement that system, and which also determines whether sectorally-defined or regionally-defined groups of enterprises may collectively choose to implement it.

Whether, and how, these institutions determine, encourage or impede the design and development of VEMAs depends on the specifics of the institutional arrangement in question. The research identifies the institutional determinants of, as well as the barriers to, the successful design of different voluntary arrangements. The report presents this research, and provides an analytical framework to help diverse stakeholders assess the implications of their decision-making regarding the design and development of VEMAs, as well as the institutional arrangements within which VEMAs function. Importantly, the research identifies principles and guidelines on design and development issues relating to VEMAs for Australian agriculture and rural industries, and recommends measures to overcoming institutional barriers to the design, development and implementation of different arrangements. In so doing, the research intends to make a significant contribution to contemporary Australian policy development in this area.

*Overview of institutions relevant to the design and development of VEMAs for Australian agriculture and rural industries*

With particular reference to the design, development and implementation of VEMAs for agriculture and the rural industries in Australia, relevant institutions and institutional arrangements include:

- *Federal and State legislation* relating to NRM, environmental protection, water resource management and regional planning;

- *public policies and plans* relating to ecologically sustainable development (ESD) and integrated catchment management (ICM), and including, amongst others, the National Action Plan for Salinity and Water Quality, the Basin Sustainability Plan for the Murray Darling Basin, state-level water management, salinity management and biodiversity management plans;

- *government agreements* including the Intergovernmental Agreement on the Environment (IGAE) approved by all spheres of Australian government in 1992, and the National Agreement on Environmental Impact Assessment (EIA) endorsed by the Australian and New Zealand Environment and Conservation Council (ANZECC) are, in broad terms, relevant to the design and development of VEMAs;

- *national strategies* including the National Strategy for ESD released in 1992, the National Water Quality Management Strategy released in 1992 along with the Australian Water Quality Guidelines for Fresh and Marine Waters, the National Greenhouse Response Strategy endorsed by the Council of Australian Governments (COAG) also in 1992, and reviewed in 1996, the National Biodiversity Conservation Strategy adopted by Commonwealth, State and Territory governments in 1995, and the National Strategy for Rangeland Management released in 1996. These national strategies are relevant to the design and development of VEMAs as they identify environmental problem areas where VEMAs could be used to make a difference. They also indicate areas in which governments may focus greater policy and regulatory attention in the future, as well as areas of concern to domestic consumers and overseas markets;

- *the environmental partnership between six governments and communities in the Murray-Darling Basin* which intends to move towards Integrated Catchment Management (ICM) in the Basin. A recent voluntary statement of commitment by community and governments regarding future NRM in the Murray-Darling Basin is found in the document *Integrated Catchment Management in the Murray-Darling Basin, 2001-2010. Delivering a sustainable future.* (Murray-Darling Basin Ministerial Council, 2001);

- *overseas market requirements relating to environmental issues***;**

- *voluntary community initiatives*, such as the National Landcare Program launched in 1992 and, more recently, the Australian Landcare Management System (ALMS) which is currently undergoing development;

- *Standards Australia*; and

- *The Joint Accreditation System of Australia and New Zealand (JAS-ANZ).*

*Standards Australia*

The role of Standards Australia, which operates as an independent company, is to prepare and publish a range of voluntary standards used in Australia. Indeed, Standards Australia prepares and publishes most of the voluntary technical and commercial standards used in this country. Standards Australia develops standards through consultative and iterative processes in which diverse stakeholder groups may take part. The development of standards takes place "through an open process of consultation and consensus, in which all interested parties are invited to participate" (Standards Australia, 1996). Also, Standards Australia is formally recognised as Australia's peak national standards body through a Memorandum of Understanding with the Commonwealth government (Standards Australia, 1996).

Standards New Zealand is that country's counterpart standards organisation. Australian/New Zealand Standards are prepared by committees of experts from industry and government, and also include consumers and other stakeholders. This intends to ensure that published standards reflect up-to-date scientific and technical knowledge and industry experience, and that they represent a consensus of views of representative stakeholder interests and concerns. Once published, Australian/New Zealand Standards are continually reviewed and updated regularly in order to take account of changing technology (Standards Australia, 1996).

Importantly, Standards Australia and Standards New Zealand hold responsibility for ensuring that national and joint Australian/New Zealand Standards incorporate up-to-date international experience, and that Australian and New Zealand viewpoints are considered in the development of standards internationally. This vitally important role intends to facilitate the competitiveness of Australian and New Zealand industries in international markets. Both Standards Australia and Standards New Zealand are the national members of the International Organization for Standardization, or ISO (Standards Australia, 1996).

*The Joint Accreditation System of Australia and New Zealand (JAS-ANZ)*

JAS-ANZ is the joint accreditation body for Australia and New Zealand for the certification of management systems, products and personnel. The role of JAS-ANZ is to enhance trans-Tasman trade and achieve international recognition of the excellence of Australian and New Zealand goods and services. Specifically, the objectives of JAS-ANZ[20] are to:

- develop mutual recognition in overseas markets for Australian and New Zealand producers, exports and personnel;
- establish strong links with counterpart bodies; and
- establish mutual recognition agreements with other accreditation bodies and relevant organisations with national or regional coverage on a bilateral and multilateral basis as appropriate.

JAS-ANZ was established under a Treaty between the Governments of Australia and New Zealand in October 1991, and operates as a not-for-profit, self funding international organisation. In March 1996, a regulation was made under the *Australian International Organizations (Privileges and Immunities) Act 1963* declaring JAS-ANZ to be an international organisation to which the Act applies. Although JAS-ANZ is the joint accreditation body for Australia and New Zealand, the JAS-ANZ Board places no geographic limitations on the organisation's operations. This means that JAS-ANZ accepts applications from certification bodies operating anywhere in the world, and JAS-ANZ accreditation programmes are open to all certification bodies, regardless of size, location or affiliations, whose operations include activities for which accreditation programmes are currently available (JAS-ANZ website: www.jas-anz.com.au).

[20] Information sourced from the JAS-ANZ website: www.jas-anz.com.au.

### 4.3.1 Institutional settings of different VEMAs

The institutional settings of different VEMAs include:

- their *policy framework*, or policy setting. This defines the scope of the scheme, its objectives, and any standards and conditions of the scheme. In other words, the policy framework defines what, if anything, is to be certified and/or labelled under that scheme. Clearly this varies from scheme to scheme. The policy framework of a given scheme may include the following elements:

    - consistency with domestic legislation and other legally binding regulatory standards relating to NRM, environmental protection, water resource management and regional and development planning;

    - consistency with non-legislated national principles and policies such as, in the case of Australia, the National Strategy for ESD released in 1992, the National Water Quality Management Strategy released in 1992 along with the Australian Water Quality Guidelines for Fresh and Marine Waters, the National Greenhouse Response Strategy endorsed by the Council of Australian Governments (COAG) also in 1992, and reviewed in 1996, the National Biodiversity Conservation Strategy adopted by Commonwealth, State and Territory governments in 1995, and the National Strategy for Rangeland Management released in 1996, and the National Action Plan to combat salinity; and

    - consistency with international principles and policies, including for example, compatibility with WTO rules, MSC and FSC international principles and criteria;

- the *accreditation process* associated with the particular scheme. Accreditation provides public assurance that certification and labeling decisions are carried out independently, competently and consistently. In other words, the accreditation process of a particular scheme establishes that scheme's credibility in the sense of its recognition and acceptance by the wider community and by overseas markets. A scheme's accreditation process may include third party auditing of the body making certification and labeling recommendations and decisions, though in some cases it may be self-regulated;

- whether the *lead agencies* involved are industry associations, government agencies, non-governmental agencies, or indeed a partnership between different stakeholder groups; and

- their *country coverage* and whether they are *internationally recognised*.

## 4.4 Supply chain management

A supply chain is, strictly speaking, an institution. In line with North's (1981) definition of institutions given above, it provides a framework within which human beings interact, and within which the cooperative and competitive relationships constituting a society and economic order are established. Historically, over the course of the agricultural sector's economic development, increasing vertical integration has taken place, such that the development of supply chains is a function of economic development. Because supply chains and increasing vertical integration are key features of modern industrial organisation and market structures, understanding how they work, that is to say their dynamics, is key to understanding the environmental implications of modern industrial organisation and market structures. Moreover, understanding how supply chains work is key if they are to be harnessed for NRM

and environmental protection purposes. Ultimately, green consumer preferences drive environmental innovations along supply chains.

The relevance, indeed importance, of supply chains and supply chain management to the design and development of VEMAs is such that supply chains provide a pathway along which environmental innovations may be made and along which environmental change may happen. Hall (2000) investigates the circumstances under which such "environmental innovations diffuse from a customer firm to a supplier firm" a phenomenon he defines as environmental supply chain dynamics (ESCD). Buyer-supplier relationships are central to decision-making processes of most suppliers, wherein lies the potential to stimulate environmental change along the supply chain. Using the example of a case study from the British and Japanese food retail sectors, Hall (2000) shows that environmental innovations emerge and are passed along supply chains:

- first, if there are leaders with sufficient power over downstream suppliers in the chain;
- second, if there is sufficient technical knowledge along the chain to be able to innovate; and
- third, where the leaders are themselves under pressure to demonstrate good environmental credentials.

An agricultural example environmental innovations taking place along supply chains is given by Sainsburys supermarkets which have demanded that all suppliers of fresh fruit and vegetables comply with the EUREP-GAP protocols. It is envisaged that by 2003 all overseas suppliers will be verified as complying with these standards. Other primary sector examples of supply chain dynamics driving environmental management change and innovation are given by the various forest certification schemes that provide consumers of the end product with information on the quality of a forest's environmental management. In the case of many forest certification schemes, consumers, via retailers, seek assurance that products are correctly identified as originating from certified forests. Kanowski et al. (2000) note that the key supply chain issues associated with forest certification and labelling are "clear and verifiable chain of custody procedures", "the ability of certification schemes and retailers to specify and control the use of labels and claims", and "the reduction of proliferation and duplication in labelling, but the retention of clarity and accuracy in labelling."

## 4.5 Family farms, corporate farms and downstream agri-business: The nature of the organisational structures participating in VEMAs

Following on from the importance of supply chains and supply chain management in effecting environmental improvement, this section discusses a related issue of modern industrial organisation in the primary industries. It is speculated that key differences between diverse organisational structures in the primary sector will determine how relevant, adaptable and attractive a given VEMA will be to different organisational structures. In other words, it is proposed that the organisational structures of family farms, corporate farms and downstream agri-businesses differ in respects that are likely to affect the preference for different VEMAs, as well as the ease and enthusiasm with which different VEMAs are adopted.

Larger organisational structures and business enterprises such as corporate farms and downstream agri-businesses may enjoy economies of scale, access to greater financial resources than smaller family farms. Also, family farms, corporate farms and downstream agri-businesses are likely to differ with regard to their management culture. For example, larger enterprises, particularly downstream agricultural processors, may already use quality management systems (QMS) and food safety protocols that may confer a

management advantage in implementing an EMS, or other environment management related standard, over say a small family farm without such experience. Also, larger organisational structures may employ more staff possibly with technical specialisations and expertise to address specific environmental issues. Such skills specialisation may be absent in smaller enterprises.

In summary, it is proposed that knowledge of the nature of the different organisational structures, such as family farms, corporate farms or downstream agri-businesses, should be taken into account when designing new VEMAs. Likewise, it is important for people making choices about whether a VEMA suits their needs to consider the relevance and appropriateness of a VEMA's objectives to their activities and aspirations, and to consider the possible implications stemming from time and management commitment, and not least cost.

## 4.6 Costs and benefits

Finally, the costs and benefits involved in undertaking voluntary approaches to environmental and quality management are important factors shaping, both, the design and development of VEMAs, as well as their adoption rates. Indeed, the design and development of new VEMAs is likely to be an expensive exercise, as is their subsequent promotion and maintenance. To be successful, VEMAs will need large numbers of participants and other interested parties to champion their cause, and to contribute to the inevitable costs. Participation in VEMAs is driven by the benefits offered, including environmental, marketplace and community benefits. Large scale benefits are only likely to be achievable if, and only if, there is a critical mass of participants. Thus, great care must be taken in making decisions whether to build new VEMAs, or whether to extend or modify existing ones. Modifying or extending an existing VEMA is likely result in an arrangement with added value, with development costs kept relatively low. Conversely, the costs of developing new VEMAs are likely to be greater. Moreover, it is argued, the development of many new VEMAs is likely to diminish the value of existing ones.

# 5 Global Issues Relating to the Design of Voluntary Arrangements for Environmental and Quality Management for Agriculture and Allied Rural Industries

Key global issues relevant to voluntary arrangements for environmental and quality management are covered in this chapter. These global issues relate to international trade in agricultural products and to the setting of international standards for human, animal and plant health. By illuminating these global issues, this chapter provides a context in which people design new voluntary arrangements, in which people decide which voluntary arrangements to take up, and in which existing voluntary arrangements function.

The international trade issues relevant to voluntary arrangements for environmental and quality management that are discussed include two World Trade Organization (WTO) agreements including The Agreement on the Application of Sanitary and Phytosanitary Measures, known as the SPS Agreement, and The Agreement on Technical Barriers to Trade, known as the TBT Agreement. Also in relation to WTO rules, some pertinent issues relating to international trade disputes fought on environmental grounds are discussed.

Another key global issue germane to the design and uptake of diverse voluntary arrangements for agriculture concerns international standards. Three key organisations are involved in the setting of international standards relating to human, animal and plant health. These include, first, the Codex Alimentarius Commission of the Food and Agriculture Organization (FAO) of the United Nations, and the World Health Organization (WHO) of the United Nations. The FAO/WHO Codex Alimentarius Commission is the relevant international standard setting organisation for food and human health. Codex recommendations exist, for example, for maximum residue limits (MRLs) for pesticides and veterinary drugs. Second, the International Animal Health Organization, also known as the Office International des Epizooties, is concerned with the setting of standards for animal health. Third, the FAO's Secretariat of the International Plant Protection Convention is concerned with the setting of plant health standards. An overview of these international standards and standard setting organisations is presented.

## 5.1 International trade rules

There are two WTO agreements that explicitly recognise different countries' environment objectives relating to trade matters. These agreements relate to Sanitary and Phytosanitary (SPS) measures, that is to say, those concerned with animal and plant health and hygiene, and to Technical Barriers to Trade (TBT) and product and industrial standards.

### 5.1.1 The SPS Agreement

The SPS Agreement entered into force with the establishment of the World Trade Organization on 1 January, 1995.[21] This agreement sets out the basic trade-related rules for designing and applying food safety and animal and plant health standards. The intention of the SPS Agreement is to ensure that

[21] The full title of what is commonly called the SPS Agreement is *The Agreement on the Application on Sanitary and Phytosanitary Measures of the WTO*.

consumers in a WTO Member country are supplied with food that is safe to eat by the standards that that Member country considers appropriate. At the same time, the intention of the SPS Agreement is to ensure that strict health and safety regulations are not being used as an excuse for protecting domestic producers. Sanitary measures relating to human and animal health and phytosanitary measures relating to plant health apply to domestically produced food or local animal and plant diseases, as well as to products coming from other countries.

For the purposes of the SPS Agreement, sanitary and phytosanitary measures are defined as any measures applied:

- to protect human or animal life from risks arising from additives, contaminants, toxins or disease-causing organisms in their food;
- to protect human life from plant- or animal-carried diseases;
- to protect animal or plant life from pests, diseases, or disease-causing organisms; and
- to prevent or limit other damage to a country from the entry, establishment or spread of pests.

These include sanitary and phytosanitary measures taken to protect the health of fish and wild fauna, as well as of forests and wild flora. Measures for environmental protection, other than as defined above, to protect consumer interests, or for the welfare of animals are not covered by the SPS Agreement. These concerns, however, are addressed by other WTO agreements such as the TBT Agreement, or Article XX of GATT, 1994 (WTO website: www.wto.org, 2001).

While the SPS Agreement allows countries to set their own standards, it specifies that these must be based on science, and that they should be applied only to the extent necessary to protect human, animal or plant life or health. The SPS agreement also clearly states that a country's standards should not arbitrarily and unjustifiably discriminate countries where identical or similar conditions prevail. WTO Member countries are encouraged to use international standards, guidelines and recommendations where they exist. Importantly, provided scientific justification exists, WTO Member countries may design and implement higher or more stringent domestic measures and standards than prevailing international ones. These higher standards must be based on an appropriate risk assessment to show the standard-setting approach is consistent and justifiable, and not arbitrary. Thus, the SPS Agreement still allows countries to use different standards and different methods of inspecting products (WTO website: www.wto.org, 2001).

The WTO has a series of rules relating to international trade to prevent standards being used as a means by which WTO Member countries[22] may unfairly and unjustifiably restrict imports. Under what is known as the SPS Agreement[23] which relates to human, plant and animal health, Article 4 requires that Member

[22] The WTO can only set rules for its Members, which exclude, among others, China and Russia.

[23] The full title of what is commonly called the SPS Agreement is *The Agreement on the Application of Sanitary and Phytosanitary Measures of the WTO*. This agreement sets out the basic rules for food safety and animal and plant health standards. While it allows countries to set their own standards, it specifies that these must be based on science, and that they should be applied only to the extent necessary to protect human, animal or plant life or health. The SPS agreement also clearly states that a country's standards should not arbitrarily or unjustifiably discriminate between countries where identical or similar conditions prevail. WTO Member countries are encouraged to use international standards, guidelines and recommendations where they exist. Importantly, provided there is scientific justification, WTO Member countries may design and implement higher or more stringent domestic measures and standards than prevailing international ones. These higher standards must be based on an appropriate risk assessment to show the standard-setting approach is consistent and justifiable, and not

countries recognise that different measures can have equivalent outcomes in terms of the level of health protection achieved. However, if there are non-equivalent outcomes in the level of health protection achieved, then standards can be justifiably used as an import restriction.[24]

WTO Member countries may choose whatever level of health protection they desire. But, having chosen that level, they must prove that the exporting country's standard is non-equivalent if they wish to exclude it. That is, by use of a scientific risk assessment, a WTO Member country must prove that its own measure is the only one that will achieve the outcome it desires. This approach intends to ensure that standards are not used unjustifiably to restrict trade.

In the event that a country's agri-food exports are banned by another country on the justifiable grounds that the exporting country's legislated standards are found to be non-equivalent under the SPS Agreement, agri-food producers in the exporting country who are able to verify compliance against voluntarily undertaken standards that do meet the importing countries more stringent requirements should be able to continue exporting. For example, in the case of US beef producers exporting to the EU, those producers who were able to demonstrate their beef production took place without the use of hormone growth promoters enjoyed continued access to EU markets.

All countries maintain measures to ensure that food is safe for consumers, and to prevent the spread of pests or diseases among animals and plants. Sanitary and phytosanitary measures can take many forms, such as requiring products to come from a disease-free area, inspection of products, specific treatment or processing of products, setting of allowable maximum levels of pesticide residues or permitted use of only certain additives in food. While sanitary and phytosanitary measures, by definition, relate to food safety and animal and plant health issues, there may sometimes be an overlap with environmental issues. For example, as regards plant health, there may be instances where imports of an agri-food product are contaminated by a pest or disease. The failure to ban such imports may result not only in obvious detrimental impacts to the importing country's primary industries, but also in wider negative environmental impacts beyond the primary sector (WTO website: www.wto.org, 2001). There are numerous examples of detrimental environmental and economic impacts resulting from the spread of exotic species and diseases in Australia and overseas.

### 5.1.2 The TBT Agreement

The Agreement on Technical Barriers to Trade, commonly referred to as the TBT Agreement, was negotiated in 1979. This agreement was developed primarily for the purpose of regulating technical issues arising from the specification of sanitary and phytosanitary measures. An important distinction to make is that the TBT Agreement was not developed for the purpose of regulating sanitary and phytosanitary measures themselves. Rather, it was developed for the purpose of regulating technical requirements resulting from food safety and animal and plant health measures, including issues such as pesticide residue

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arbitrary. Thus, the SPS agreement still allows countries to use different standards and different methods of inspecting products.

[24] For example, if one country controls air pollution by mandating the installation of catalytic converters on cars, and another by requiring the use of diesel fuels, and these two approaches have equivalent net impacts on air quality, then countries should allow the import of the others cars. However, strictly speaking it would have to be ensured that the imported car could only use diesel fuel or otherwise the importing country could exclude the diesel cars on the grounds that they cannot control the type of fuel people put in their cars, so cannot guarantee that the standard will be met. Therefore, if a WTO Member country wished to achieve a certain level of air pollution and set a standard through catalytic converters, then if that standard were not reached by diesel fuels, and the importing country were able to prove scientifically that this was the case, then the imports of the diesel-fueled cars could fairly and justifiably be restricted.

limits, inspection requirements and labelling. The TBT Agreement covers all technical regulations, voluntary standards and the procedures to ensure that these are met, except when these are sanitary or phytosanitary measures as defined by the SPS Agreement.

Governments that were members of the 1979 TBT Agreement agreed to use relevant international standards, such as those for food safety developed by the Codex Alimentarius, except when they considered that these standards would not adequately protect health. They also agreed to notify other governments, through the GATT Secretariat, of any technical regulations that were not based on international standards. The TBT Agreement included provisions for settling trade disputes arising from the use of food safety and other technical restrictions (WTO website: www.wto.org, 2001).

### 5.1.3 Distinguishing between the SPS and TBT Agreements

The SPS and TBT Agreements have some common elements, including basic obligations for non-discrimination and similar requirements for the advance notification of proposed measures and the creation of information offices, known as "enquiry points". However, key differences exist in many of the substantive rules. For example, both agreements encourage the use of international standards. However, under the SPS Agreement the only justification for not using such standards for food safety and animal/plant health protection are scientific arguments resulting from an assessment of the potential health risks. By contrast, under the TBT Agreement, governments may decide that international standards are not appropriate, say, for technological or geographical reasons (WTO website: www.wto.org, 2001).

Also, sanitary and phytosanitary measures may be imposed only to the extent necessary to protect human, animal or plant health, on the basis of scientific information. Governments may, however, introduce TBT regulations when necessary to meet a number of objectives, such as national security or the prevention of deceptive practices. Because the obligations that governments have accepted are different under the two agreements, it is important to know whether a measure is a sanitary or phytosanitary measure, or a measure subject to the TBT Agreement. While TBT measures could cover any subject from car safety to energy-saving devices, with regard to agri-food products the kinds of issues that are normally subject to the TBT Agreement include labelling requirements, nutrition claims and concerns, quality and packaging regulations. These are generally not considered to be sanitary or phytosanitary measures and hence are considered under the TBT Agreement. Regulations that address microbiological contamination of food, or set allowable levels of pesticide or veterinary drug residues, or identify permitted food additives, are included under the SPS Agreement. Some packaging and labelling requirements, if directly related to the safety of the food, are also subject to the SPS Agreement (WTO website: www.wto.org, 2001).

## 5.2 International trade disputes fought on environmental grounds

In a well-known case concerning US imports of Mexican tuna, the USA banned the imports of Mexican tuna on the grounds that Mexico did not require its fishing fleet to use fishing practices to exclude dolphins from the tuna catch. This international trade dispute centred on two key issues: first, whether one country could dictate to another what its environmental regulations and policies should be; and second, whether trade rules permit action to be taken against the methods used to produce goods, rather than some inherent quality or feature of the good in question. This case continues to attract interest because of its implications for environmental dispute resolution.

Mexico requested that a panel help settle the trade dispute, and this panel concluded that the US could not embargo imports of tuna products from Mexico simply because Mexican regulations regarding the way tuna was produced did not meet US regulatory requirements. However, the panel did find that the US

could apply its regulations on the quality or content of the tuna imported. The debate surrounding the quality or content of the final tuna product versus the way it was produced came to be known as a 'product versus process' trade issue. Effectively, GATT rules prohibited one country from taking trade action against another country for the purpose of attempting to enforce their own domestic laws in the other country, even to protect animal health or exhaustible natural resources.

The GATT decision was grounded in the notion of 'extra-territoriality', that is to say, the unacceptability of one country imposing its laws, regulations, policies and values outside its jurisdiction. The rationale for this decision was that if the US arguments had been accepted, then any country could embargo products from another country on the grounds that the exporting country had different environmental, health and social policies from its own. Effectively, any other decision could have led to a possible flood of protectionist abuses, conflicting with the main purpose of achieving predictability of trade through rules established as part of the multilateral trade system established under GATT, latterly the WTO.[25] It is important to note that the task of the panel appointed to settle the trade dispute was restricted to examining how GATT rules applied to the dispute, and was not about the environmental correctness of Mexican fishing regulations. The panel also judged the US policy of requiring tuna products to be labelled as dolphin-safe, enabling consumers to make informed purchasing decisions. The panel concluded that dolphin-safe labelling did not breach GATT rules because it was designed to prevent deceptive advertising practices on all tuna products, whether imported or domestically produced (WTO website: www.wto.org, 2001).

WTO Member countries may not use trade restrictions to force their own environmental standards and policies on producers in another country. There are, however, two ways that can be used to provide incentives for exporting countries to produce their goods in an environmentally-friendly way. One way is to establish an international agreement regarding environmental matters. These agreements are often referred to as multilateral environmental agreements, or MEAs.[26] The second is to use one or more voluntary environmental management agreements (VEMAs) to allow companies and the consumers they supply to discriminate between products produced using high standards, and those using lower standards, for example through the use of a label. In this case, the importing country is not forcing the exporting country to change its production methods, but still ensures its consumers are given the opportunity to purchase only those goods that comply with their own values. This can be an effective way of encouraging safe environmental practices: if consumers overwhelmingly choose dolphin-safe tuna and turtle-safe shrimps, then tuna and shrimp exporting countries may be encouraged to adopt dolphin-safe tuna and turtle-safe shrimp fishing techniques to maintain or increase their market share.

## 5.3 International standards relevant to agriculture and allied rural industries

International standards that are relevant to agriculture and allied rural industries include:

- international food standards of the Codex Alimentarius Commission;
- international animal health standards of the International Animal Health Organization; and
- international plant health standards of the International Plant Protection Convention.

[25] The GATT became the WTO on 1 January, 1995.

[26] There is on-going debate about whether WTO rules, for example in the SPS Agreement and the TBT Agreement, or whether MEAs take precedence (James, Sallie, pers. comm., 2001).

### 5.3.1 International food standards and the Codex Alimentarius Commission

The Codex Alimentarius of the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) of the United Nations is a set of international food standards, codes of practice, guidelines and recommendations. The Codex Alimentarius Commission is the entity responsible for the development of these standards. The Codex Alimentarius has relevance to international trade in agri-food products. Indeed, the WTO cites Codex standards, guidelines and recommendations as the preferred international measures for facilitating international trade in food, and the SPS and TBT Agreements encourage the international harmonization of food standards. Because of this, Codex standards effectively provide the benchmarks against which national food measures and regulations are evaluated by the WTO. The standards also provide a global reference point for consumers, food producers and processors, national food control agencies and the international food trade (FAO website: www.fao.org).

### 5.3.2 International animal health standards and the International Animal Health Organization

The roles of the International Animal Health Organization, also called the Office International de Epizooties (OIE) are to guarantee the transparency of animal disease status world-wide, to collect, analyse and disseminate veterinary scientific information, to provide expertise and promote international solidarity for the control of animal diseases, and to guarantee the sanitary safety of world trade by developing sanitary rules for international trade in animals and animal products. In order to guarantee the sanitary safety of global trade in animal products, the International Animal Health Organization prepares documents relating to rules that Member countries can apply for animal disease protection, without erecting unjustified sanitary barriers. The key documents produced are the International Animal Health Code, the Manual of Standards for Diagnostic Tests and Vaccines, the International Aquatic Animal Health Code and theDiagnostic Manual for Aquatic Animal Disease. These standards and codes are prepared by elected expert-based commission and working groups of internationally renowned scientists, most of whom are participate in a network of about 150 collaborating centres and laboratories that also contribute towards the scientific objectives of the International Animal Health Organization. The WTO recognises these standards and codes as reference international sanitary rules.

### 5.3.3 International plant health standards and the International Plant Protection Convention

The International Plant Protection Convention (IPPC) is a multilateral treaty administered via the Plant Protection Service of the Food and Agriculture Organization of the United Nations (FAO). The IPPC's role is to prevent the spread and introduction of pests of plants and plant products and to promote control measures. For this purpose, the convention is the source for International Standards for Phytosanitary Measures (ISPMs) that affect global trade in plant products, and is recognised as such under the SPS Agreement of the WTO. The IPPC contains provisions for standard setting procedures. More than a hundred governments are contracting parties to the IPPC (FAO website: www.fao.org).

### 5.3.4 International standards in a national context: Codex Australia and the National Residue Survey

The international food standards developed by the Codex Alimentarius Commission of FAO/WHO provide a global reference point for consumers, food producers and processors, national food control agencies and the international food trade (FAO website: www.fao.org). Within the Australian context, Codex Australia is the national counterpart organisation to the Codex Alimentarius Commission. The

functions of Codex Australia[27] are, effectively, to place these international standards within a national context, by:

- acting as a link between the Codex Secretariat and Member Countries;
- coordinating relevant Codex activities within Australia;
- receiving Codex final texts and working documents and ensuring that they are circulated to interested stakeholders within Australia, for example, governments, industries and consumers;
- coordinating Australia's input to the global work of Codex; and
- providing the host country secretariat for the Codex Committee on Food Import and Export Inspection and Certification Systems (CCFICS) and Codex Coordinating Committee for North America and the South West Pacific (CCNASWP).

An important part of the work of Codex Australia that is carried out for the purpose of ensuring the product integrity of agricultural produce is performed by the Australian National Residue Survey (NRS). This is a program of the Residues and Standards Branch of the Federal Department of Agriculture, Fisheries and Forestry - Australia (AFFA). Its specific function is to monitor chemical residues in agricultural produce from Australia. At present, monitoring is limited to chemical residues in raw food commodities, and the survey monitors chemical residues and environmental contaminants in the products of participating industries such as crops, meat and grains. Residue monitoring is a key element of the national strategy to minimise undesirable residues and environmental contaminants in farm goods. Monitoring identifies potential problems and indicates any follow-up action required. Chemical residue surveys are an important measure of product quality, notably so for exporting countries such as Australia (NRS website: www.nrs.gov.au).

[27] Information sourced from the website of the Australian National Residue Survey (NRS): www.nrs.gov.au.

# 6 Choices and Opportunities for the Design and Development of VEMAs for Agriculture and Allied Rural Industries

## 6.1 Likely future trajectories in the design and development of VEMAs for agriculture and allied rural industries

The likely future trajectories in the design and development of VEMAs are signalled by current trends. There are three key current trends, which are interconnected. The first trend is one of growing consumer concern regarding environmental, quality, food safety and animal welfare issues. Hence, the emergence of green consumer preferences and the rising demand for safe, clean and green agri-food products. This, in turn, is a key factor shaping the second trend, namely the increasing importance of supply chain driven environmental change. The emergence, and indeed increasing strength, of green consumer preferences, along with the rising importance of supply chain driven environmental change, are important factors shaping the third trend, namely the fact that adoption rates of diverse voluntary arrangements are increasing.

This report considers these current trends to signal the rising prominence of VEMAs in line with emerging community expectations and marketplace developments. In other words, interest in and demand for VEMAs is likely to grow. The three current trends are overviewed in sections 6.1.1, 6.1.2 and 6.1.3, respectively.

### 6.1.1 Green consumer preferences

Consumer concerns regarding environmental, quality, food safety and animal welfare issues are shaping the emergence, and indeed increasing strength, of green consumer preferences. An indicator of these growing preferences for clean, green and safe food is given by worldwide growth in demand for organic produce. Globally, there is an annual growth in demand for organic produce of between 20 and 50 per cent, with the total value of produce expected to reach A$150 billion by 2005 (Queensland Department of Primary Industries, 2001).

*Green consumer preferences and the demand for environmental certification initiatives in Australian agriculture*

Within an Australian context, Backshall (2000) recently conducted a survey of green consumer preferences and demand for environmental certification initiatives in agriculture for Agriculture WA. Primary produce traders and stakeholders from Australia and overseas took part in the survey, which revealed that environmental management issues influenced the activities of almost half (45 per cent) of the organisations surveyed. The trading practices of those surveyed were influenced by environmental considerations in the sense that, for example, special terms were offered to some suppliers demonstrating sustainable practices, and other suppliers were actually required by customers to participate in environmental assurance schemes.

Backshall (2000) reports that, among the organisations surveyed, the most important environmental issues for an environmental certification scheme were soil erosion and contamination, chemical usage and disposal, genetically modified organisms and biodiversity. These issues are reported as being

"consistently of the highest concern across all markets and all commodities" (Backshall, 2000). The survey also examined differences among various types of produce and export markets, revealing that changes to buying policies or customer demands were most likely to occur in organisations associated with grains, processed and packaged meat, and within developed Asian markets such as Japan, Singapore and Taiwan (Backshall, 2000).

*Green supplier preferences*

Similarly, it is important to note that green supplier preferences exist. Suppliers in diverse industries seek to satisfy green consumer preferences not only because of marketplace benefits, but for other reasons too. The environmental values, attitudes and beliefs held by managers are key determinants in shaping the production decisions of firms (Nakamura et al., 2001).

### 6.1.2 Supply chain driven environmental change

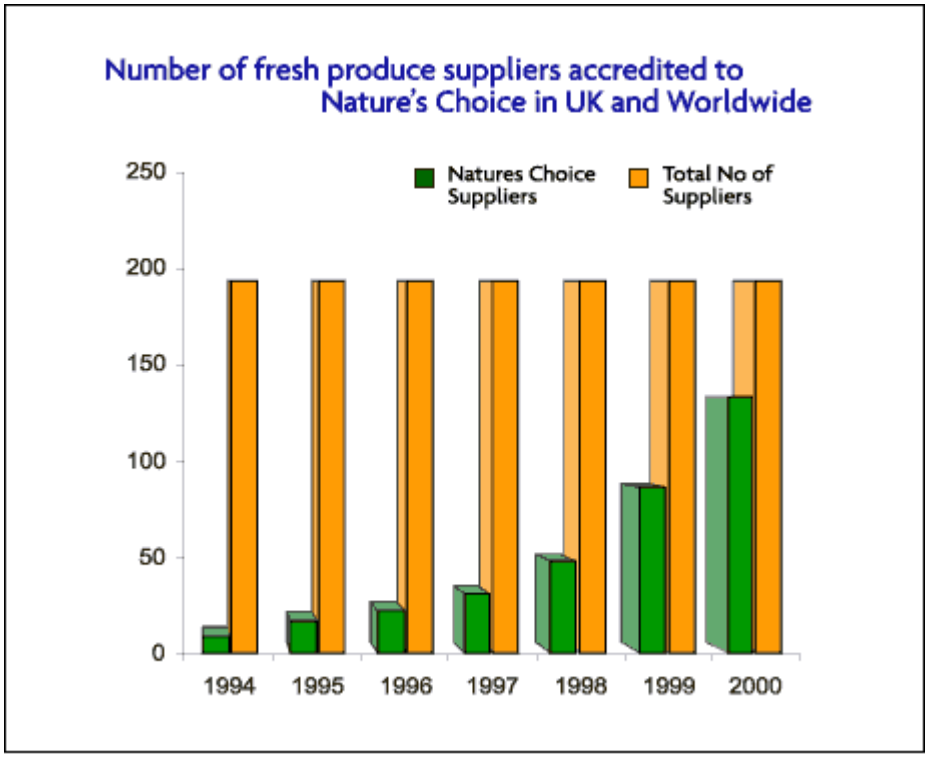
Environmental innovations are increasingly being driven across supply chains, particularly by leaders with sufficient power over downstream suppliers in the chain. Large overseas supermarket chains such as the UK-based Tescos and Sainsburys provide excellent examples of such leaders.

Tesco, for example, is "striving for the highest environmental standards in the entire industry" (www.tesco.com), and promotes the fact that many of the standards it applies to its business activities far exceed legal requirements. The supermarket's website provides the information that "Tesco also asks its suppliers to adhere to many of these standards too, promoting sound environmental practices, not just within Tesco but throughout manufacturing and retail chains all over the world" (www.tesco.com). The website also notes that environmental standards and codes of practice are assessed and reviewed on an ongoing basis in line with consumer expectations: "[c]alling upon expertise from all quarters, each code of practice is re-examined continually, seeking ways to improve them still further. Our customers expect no less. Such is our commitment to developing sound environmental policies that Tesco staff are often invited to join influential national policy groups so that the company's own expertise may be used to help other businesses across the country" (www.tesco.com).

A specific example of a supply chain driven environmental innovation is given by Tesco's Nature's Choice code of practice for environmental management. According to the Tesco website, "[a]ll UK growers of fresh fruit, vegetables, flowers and other ornamental plants have to meet strict rules protecting wildlife and the land - i.e. the farm's biodiversity - in order to do business with Tesco. These rules are being introduced to suppliers around the world, particularly Spain and the Netherlands, and as far afield as Kenya, Australia and New Zealand." This code of practice "promotes the use of beneficial insects rather than chemicals to control pests, encourages water and energy efficiency and ensures recycling. Growers are asked to draw up a farm conservation plan, which guides them in protecting important wildlife and landscapes." Also, Tesco monitors the effects of Nature's Choice on farmland birds such as the song thrush, lapwing and grey partridge. In addition, Tesco is championing the cause of the skylark, having donated £200,000 to the Royal Society for the Protection of Birds to find out why the skylark has declined in numbers by 60% over the past 25 years and to identify solutions. In addition, British suppliers are compliant with the NFU Assured Produce Scheme" (www.tesco.com).

The following figure illustrates the rising importance of Tesco's Nature's Choice, between 1994 and 2000. Increasing participation in this code of practice for environmental management reflects growing consumer concern regarding environmental issues, and consequently changing consumer preferences.

**Figure 3 Growth in participation in Tesco's Nature's Choice**




*Source: Tesco's website: www.tesco.com*

Similarly, the Sainsburys chain of supermarkets sources all UK fresh fruit and vegetables from farmers who have been independently verified as complying with Integrated Crop Management (ICM) standards under the UK's National Farmers' Union (NFU) Assured Produce Scheme. With regard to overseas suppliers of fresh fruit and vegetables, Sainsburys plans that all offshore suppliers will be independently verified as complying with the standards set in the EUREP-GAP protocol by 2003 (www.j-sainsbury.co.uk).

### 6.1.3 Increasing adoption rates of diverse voluntary arrangements

An increasing number of businesses and other organisations, both in agricultural and other industry sectors, are successfully implementing diverse voluntary arrangements for environmental and quality management (ISO, 2001).

With regard to the ISO 14000 series of standards for environmental management, a total of 22, 897 certificates had been awarded in different industry sectors at the end of the year 2000. By comparison, 14, 106 certificates had been issued at the end of 1999. Thus, in one year, the number of certificates issued grew by 8, 791 certificates, a very significant rise. With specific regard to the agricultural and fishing sectors, only 16 certificates had been issued worldwide at the end of 1998, a figure that grew to 205 certificates by the end of the year 2000 (ISO, 2001).

With regard to the ISO 9000 series of standards for quality management, at least 408, 631 ISO 9000 certificates had been awarded in diverse industry sectors in 158 countries by the end of 2000. This represented an increase of 64, 988 certificates since the end of 1999, when 343, 643 certificates has been issued in 150 countries. With specific regard to the agricultural and fishing sectors, 610

certificates had been issued across the world at the end of 1998, a figure that grew to 1, 745 certificates by the end of the year 2000 (ISO, 2001).

## 6.2 A constellation of alternative options for designing VEMAs: the choice of alternatives

In designing and developing a new VEMA, there has to be clarity about:

- what the VEMA intends to achieve (objectives) and how (strategy);
- the benefits of participation;
- the nature of stakeholder involvement; and
- the structure of governance arrangements.

This then determines the alternative options for VEMA design including the specific standards to incorporate within a VEMA, the VEMA's auditing, certification and/or labelling requirements, and how these collectively ensure marketplace recognition and community acceptance.[28]

### 6.2.1 General recommendations for good VEMA design

To summarise, drawing on OECD (1999), some general recommendations for good VEMA design include:

- clearly defining the intended objectives and targets of the voluntary arrangements;
- characterising a counterfactual, or business-as-usual scenario to determine environmental and other outcomes in the absence of the VEMA;
- ensuring monitoring provides meaningful and reliable information about whether progress toward achieving objectives and targets is being made;
- ensuring monitoring is practical and cost-effective;
- involving independent third parties to provide public assurance in a VEMA that may result in certification and/or labelling;
- including penalties with teeth for non-compliance to maintain public confidence in a given VEMA, and to prevent free-riding; and

[28] See also section 4.2.

- providing good supportive information, such as codes of practice and BMP guidelines for environmental management, as well as relevant training workshops to facilitate VEMA participation and implementation.

### 6.2.2 EMSs and good VEMA design

An important design choice, and indeed opportunity, in the design and development of VEMAs for agriculture and allied rural industries lies in recognising the potential of EMS, which stems from the fact that EMS is designed as a process standard. Essentially, this means that:

- EMS can be integrated with other voluntary arrangements and standards, and may be combined with codes of practice, guidelines, standards and benchmarks tailored to the industry and enterprise in question. In this way, EMS may be used to address a wide range of environmental issues;

- EMS can be used to exceed legal requirements, that is to say, to go 'beyond compliance' in addressing environmental, as well as industry and community concerns; and

- EMS can be implemented by organisations in the agricultural sector, and in allied rural industry sectors, that differ widely in structure and function.

*Integrating EMS with other voluntary arrangements and standards*

In making choices either about how to design a new VEMA, or in making choices about which VEMA to adopt, it is important to understand that because EMS is designed as a process standard, it can be used to integrate relevant product standards and performance standards, where they exist. Indeed, as a process-based management tool, ISO 14001 works best when combined with relevant code of practice information, Best Management Practice (BMP) guidelines or with specific performance guidelines, standards and benchmarks tailored to the industry and enterprise in question.

An example of integrating EMS with other voluntary arrangements and standards is given as follows. Two voluntary arrangements for agriculture and the rural industries that stipulate production-oriented standards, namely the Organic Standard of the Biological Farmers of Australia (BFA), and the EUREP-GAP protocol, have recently integrated a process standard. In the case of the BFA's Organic Standard this process standard is an EMS, whereas in the case of the EUREP-GAP protocol the process standard may be either an environmental or quality management system. Also, several environmental certification schemes in the forest sector integrate process standards with product and performance requirements. Thus, while an EMS is a VEMA in itself, it can also be a component of other VEMAs.

*Using EMS to go 'beyond compliance'*

EMS can be used to exceed legal requirements, that is to say, to go 'beyond compliance' in addressing environmental, as well as industry and community concerns. For example, with reference to ISO 14001, it is important to understand that this standard's accompanying guidelines, the ISO 14004 guidelines, clearly state that requirements of the ISO 14001 process standard include compliance with prevailing environmental legislation and regulations, as well as with "other requirements to which the organization subscribes, that are applicable to the environmental aspects of its activities, products or services" (Standards Australia, 1996).

The ISO 14004 guidelines elaborate that these 'other requirements' may include industry codes of practice, agreements with public authorities and non-regulatory guidelines, as well as international environmental guiding principles. Also, with respect to the setting of objectives and targets, the ISO 14004 guidelines state that "[w]hen establishing and reviewing its objectives, an organization shall consider the legal and other requirements, its significant environmental aspects, its technological options and its financial, operational and business requirements, and the views of interested parties" (Standards Australia, 1996).

*Implementing EMS in organisations that differ widely in structure and function*

EMSs, notably the process standard ISO 14001 and its accompanying ISO 14004 guidelines, are well designed because they may be used by organisations that differ widely in structure and function. With respect to agriculture and the rural industries, this means that EMS is applicable to farms in different sectors, or even farms in the same sector but in different regions that may be faced with quite distinct environmental problems. Furthermore, the fact that EMS may be used by organisations that vary in structure and function means that EMS is recognised up and down supply chains. This is important for agricultural and rural industries in the light of increasing vertical integration along agri-food supply chains, and because some agri-food products are inputs to other industries, including non-agricultural non-rural industries. Also the degree of international recognition of ISO14001 is important for export sectors such as Australian agriculture.

## 6.3 Opportunities for the role of government

To facilitate the design and development of VEMAs, government has opportunities to provide supportive information to industry and to educate business and the wider community about voluntary arrangements in general. More specifically, there are opportunities for governments to commit resources to the development of environmental guidelines, targets and standards for different agricultural and rural industries. An important role of government could be to foster the formation of partnerships between stakeholder groups, including industry and peak industry bodies, research organisations, public agencies and community and environmental groups to provide an interface for translating technical knowledge and community concerns relating to environmental management into environmental guidelines, targets and standards applicable at the farm-level.

Also, there are opportunities for governments to commit resources to State and Territory government agencies responsible for natural resource management and environmental protection in the primary industries to encourage implementation of voluntary arrangements for environmental and quality management, food safety and animal welfare. An important opportunity for the role for government is to build information networks and ensure low-cost access to information on VEMA design, development and implementation. For example, with specific regard to EMS, a coordinated body of appropriately trained EMS officers could provide extension services in promoting and fostering EMS development on farms and allied agricultural and rural industries. Their hands-on industry involvement would also make them well placed to provide input, along with other stakeholders, into the development of environmental guidelines, targets and standards for agriculture and allied rural industries. It is acknowledged that in some States work in these areas is already progressing.

A specific way in which governments could support VEMA development in industry would be to make information on legal and regulatory obligations relating to environmental management and protection readily available. For example, information relating to existing NRM and environmental regulations and legislation relevant to Australian agriculture and rural industries could be compiled, periodically updated and made available free-of-charge. The explicit purpose of such a user-friendly 'Guide to Environmental Regulation for Agriculture and the Rural Industries in Australia' would be to

provide information needed by operators in agricultural and allied rural industries to comply with state and federal regulations relating to NRM and environmental protection. It is suggested that there is an opportunity for such a publication to be co-sponsored by Federal and State government agencies responsible for administering NRM, environmental protection and regional planning legislation applicable to agriculture and the rural industries. Such a guide could be structured along the lines of the 'Handbook of Environmental Regulations for Agribusiness' produced by the Iowa Waste Reduction Center of the University of Northern Iowa (IWRC, 2000). This handbook contains regulatory information on waste management and pollution prevention that is specific to different agribusiness sectors. The handbook presents information on regulations that apply to different operations, how operators can comply and how they can get more help and information. Alternatively, an Australian guide to environmental regulation for the primary industries could draw on the 'Manual of Environmental Policy'[29] produced by the Institute for European Environmental Policy (IEEP) for guidance on appropriate presentation. This manual appraises its users on developments in European legislation and in the corresponding UK implementing legislation, and analyses and evaluates the implications of over 500 European Community (EC) Directives and Regulations (IEEP, 2000, 1999, 1998 1997, 1996). It provides an authoritative source of information on rapidly changing developments in EC environmental regulation relating to, amongst other things, the management of water, waste, air, harmful substances, wildlife and the countryside. Also, the manual lists all adopted EU environmental legislation, plus summaries of proposed environmental legislation and the details of environmental proposals under development.

An important opportunity for the role of government is to provide regulatory relief incentives to organisations implementing VEMAs and achieving good outcomes. As already discussed, public regulation can be expensive to administer, and governments may face political difficulties, not to mention high costs, in checking compliance and enforcing penalties to internalise the costs of environmental externalities. Moreover, there are limits to what government approaches can achieve on their own.[30] Owing to these reasons, there is a case for governments to provide regulatory relief incentives to industry operators and businesses demonstrating good environmental behaviour by implementing VEMAs, and by having their VEMAs independently audited and certified and/or labelled. In instances where industry operators and businesses are able to demonstrate good environmental behaviour regulatory relief could include, for example, rebates on natural resource management levies, or lower fees for licences, leases and registrations relating to environmental management. Box 6 summarises a regulatory relief approach that is presently being used in Victoria. Innovatively, the suite of arrangements used combine strong community-based governance arrangements, fee rebates, as well as increased regulatory flexibility. Arguably, such arrangements give natural resource managers access to better feedback on their management practice, for example through benchmarking, and provide public assurance that natural resources are being well managed.

[29] "Environmental policy in the UK is now inextricably linked with that of the European Community (EC). In the last thirty years, the EC has developed comprehensive policy measures across a extensive range of environmental issues. This has been done in response to the growing recognition of the value of co-ordinated action to solve common problems, and to ensure that the single market in Europe is based on common environmental standards. The EC is now the world leader in environmental legislation and an understanding of these policies and their effects on a UK practice is essential for anyone who is interested in or affected by environmental policy" (IEEP, 2000).

[30] Refer to section 1.1.1.

**Box 6 A regulatory relief initiative of the Victorian EPA**

*The Accredited Licensee System for Trade Waste Management*

In July 1993, the Victorian Environment Protection Agency (EPA) released a discussion paper entitled 'A question of Trust: Accredited Licence Concept.' Soon after, in 1994, the Government of Victoria amended its legislation to enable the EPA to rebate 25 per cent of licence fees and offer increased regulatory flexibility to businesses certified as being able to "demonstrate a high level of environmental performance and an ongoing capacity to maintain and improve this performance." To benefit from this regulatory relief scheme, the requirements include:

- an Environmental Management System consistent with a recognised standard such as ISO 14001 and certified as such by an EPA-appointed Environmental Auditor;
- an Environmental Audit Program; and
- an Environmental Improvement Plan.

As well as a 25 per cent fee reduction, a certified licensee may undertake works that would otherwise require EPA approval, provided the work is not classed as "significant" and would not increase the volume of waste produced. Certification status is reviewed every 5 years.

*Source: EPA Information Bulletin, Publication 619, June 1998; Environmental Protection Act 1970 as amended, sections 26A-D.*

## 6.4 A final word

It must be remembered that diverse VEMAs, and other voluntary arrangements for quality management, food safety and animal welfare issues are principally designed and developed for, and implemented by, industry and business operators. Indeed, the increasing adoption rates of diverse voluntary arrangements, and the growing importance of supply chain driven environmental change, are the commendable responses of industry and business to increasingly strong consumer preferences for safe, clean and green food. However, although VEMAs hold enormous promise as a possible means of addressing complex environmental and NRM issues, the premature view of VEMAs as an environmental management panacea is cautioned. VEMAs, like orthodox regulatory approaches to environmental management, have limitations, and the best environmental, marketplace and social outcomes are likely to result from an optimum mix of voluntary industry-led and community-led approaches coupled with formal government-led approaches.

Ultimately, the success of VEMAs depends, and will continue to depend, upon how industry and business embraces them. To ensure the environmental and commercial sustainability of agricultural and rural industries, perhaps the most important tasks and challenges ahead involve identifying the nature of the optimum mix of voluntary and formal approaches, and creating an enabling environment for industry and business to embrace VEMAs. There are opportunities for government to play important roles in providing such an enabling environment by developing environmental guidelines, targets and standards for different agricultural and rural industries, by building effective information networks to ensure low-cost access to information on VEMA design, development and implementation, and by encouraging implementation through appropriate incentive mechanisms.

# References


ABARE (2001). ***Outlook 2001. Capturing Growth Opportunities.*** Proceedings of the National Outlook Conference, 27 February-1 March, vol. 2, Agriculture and Regional Australia, ABARE, Canberra.

Agriculture Western Australia (2000). ***SQF 1000 Quality Code.*** A HACCP Based Supplier Assurance Code for the Food Industry. Published by Ag West Trade and Development, Perth, February 2000.

Appleton, Arthur Edmond (ed.) (1997). ***Environmental Labelling Programmes. International Trade Law Implications.*** International Environmental Law and Policy Series. Kluwer Law International.

Ayres, Ian and John Braithwaite (1992). ***Responsive Regulation. Transcending the Deregulation Debate.*** Oxford University Press.

Backshall, Peter (2000). ***Environmental Accreditation System. Market Analysis Project.*** Report prepared for Agriculture WA, October 2000.

Baker, David (2000). ***Framework for a Wine and Grape Industry Approach to Environmental Management.*** A Discussion Paper of the Cooperative Research Centre (CRC) for Viticulture.

BFA (2001). ***BFA Organic Standard-Version 4.*** The Organic Farming Standard of the Biological Farmers of Australia. Downloaded from the BFA website: www.bfa.com.au/standards

Brockway, Roger (1997). ***Certification and harmonization of environmental management systems.*** Chapter 19 in: Hillary, Ruth (ed.) (1997). Environmental Management Systems and Cleaner Production. Centre for Environmental Technology, Imperial College of Science and Technology, UK. Wiley Publishers.

Carraro, Carlo and François Lévêque (eds.) (1999). ***Voluntary Approaches in Environmental Policy.*** Fondazione Eni Enrico Mattei (FEEM) on Economics, Energy and Environment. Kluwer Academic Publishers.

Carruthers, Genevieve (2000). ***Environmental management systems and ISO 14001 – what do they mean?*** Australian Farm Journal.

Cattlecare (2000). ***Cattlecare On-farm Quality Assurance Manual.*** National On Farm Quality Assurance Manual Version 1.

Chertow, Marian R. and Daniel C. Esty (eds.) (1997). ***Thinking Ecologically. The Next Generation of Environmental Policy.*** Yale University Press.

Coglianese, Cary and Jennifer Nash (eds.) (2001). ***Regulating from the Inside. Can Environmental Management Systems Achieve Policy Goals?*** Resources for the Future, RFF Press, Washington D.C.

Cooper, K. (2000). ***Quality That Pays: the SQF International Code.*** Food in Canada, Summer 2000.

Environment Australia (1997). ***Environmental Economics Round Table Proceedings.*** Convened by Senator Robert Hill, Minister for the Environment, Canberra 10 July 1997. Environmental Economics Research Paper No. 6.

EUREP-GAP (2001). ***The EUREP-GAP Protocol for Fresh Fruits and Vegetables.*** March 2001 version.

Fabiansson, Stefan and David Cunningham (2000). ***Evolution of Australian Food Quality Systems. A brief de scription of industry food safety system implementation.*** Food and Gene Technology Program, Bureau of Rural Sciences (BRS), Australia.

Flockcare (2000). ***Flockcare On-farm Quality Assurance Manual.*** National On Farm Quality Assurance Manual Version 1.

Gunningham, Neil, Martin Phillipson and Peter Grabosky (1999). ***Harnessing Third Parties as Surrogate Regulators. Achieving Environmental Outcomes by Alternative Means.*** Australian Centre for Environmental Law (ACEL), the Australian National University (ANU), November 1999.

Harris, Jonathan, M. (1996). ***World agricultural futures: regional sustainability and ecological limits.*** Ecological Economics, Volume 17, pp. 95-115.

Hall, Jeremy (2000). ***Environmental supply chain dynamics.*** Journal of Cleaner Production, Volume 8, pp. 455 to 471.

Hawken, Paul (1993). ***The Ecology of Commerce. How Business Can Save the Planet.*** Published by Weidenfeld and Nicolson, London.

Heinze, K (2000). ***Credible 'Clean and Green': Investigation of the international framework and critical design features of a credible EMS for Australian agriculture.*** CSIRO Land and Water, February 2000.

Hillary, Ruth (ed.) (1997). ***Environmental Management Systems and Cleaner Production.*** Centre for Environmental Technology, Imperial College of Science and Technology, UK. Wiley Publishers.

Honkasalo, Antero (1998). ***The EMAS scheme: a management tool and instrument of environmental policy.*** Journal of Cleaner Production, Volume 6, pp. 119 to 128.

IEEP (2000, 1999, 1998 1997, 1996). ***Manual of Environmental Policy: The EU and Britain.*** Institute for European Environmental Policy, IEEP, London.

ISO (2000). ***The ISO Survey of ISO 9000 and 14000 Certificates. Tenth Cycle.*** Downloaded from the website of the International Organization for Standardization (ISO): www.iso.ch/iso/en/iso9000-14000/pdf/survey10thcycle.pdf

IWRC (2000). ***Handbook of Environmental Regulations for Agribusiness.*** Iowa Waste Reduction Center, University of Northern Iowa. Downloaded from the IWRC website: www.iwrc.org/pubs/AgHandbook.pdf

Kanowski, Peter, Darren Sinclair and Blair Freeman (1999). ***International Approaches to Forest Management Certification and Labelling of Forest Products: A Review.*** A report prepared for Agriculture, Fisheries and Forestry-Australia (AFFA) by the Department of Forestry of the Australian National University (ANU), the Australian Centre for Environmental Law (ACEL) of the Australian National University (ANU), and Fortech.

Kanowski, Peter, Darren Sinclair, Blair Freeman and Stephen Bass (2000). ***Establishing comparability and equivalence amongst forest management certification schemes. Critical elements for the assessment of schemes.*** A report prepared for Agriculture, Fisheries, and Forestry – Australia (AFFA). September 2000.

Marsden, Terry, Jo Banks and Gillian Bristow (2000). ***Food Supply Chain Approaches: Exploring their Role in Rural Development.*** Sociologia Ruralis, Volume 40, Number 4, October 2000.

McCoy, S. and G. Parlevliet (2000). ***Export Market Potential for Clean and Organic Agricultural Products.*** A report of the Rural Industries Research and Development Corporation (RIRDC) on Organic Produce Research and Development. RIRDC Publication No. 00/76. RIRDC Project No. DAW-85A.

Murray-Darling Basin Ministerial Council (2001). ***Integrated Catchment Management in the Murray-Darling Basin, 2001-2010. Delivering a sustainable future.*** June 2001.

Nakamura, Masao, Takuya Takahashi and Ilan Vertinsky (2001). ***Why Japanese Firms Choose to Certify: A Study of Managerial Responses to Environmental Issues.*** Journal of Environmental Economics and Management, Volume 42, pp. 23 to 52.

Nash, Jennifer and John R. Ehrenfeld (2001). ***Factors that shape EMS outcomes in firms.*** Chapter 3 in: Coglianese, Cary and Jennifer Nash (eds.) (2001). Regulating from the Inside. Can Environmental Management Systems Achieve Policy Goals? Resources for the Future, RFF Press, Washington D.C.

North, Douglass, C. (1981). ***Structure and Change in Economic History***. Norton Publishers.

OECD (1998). ***The Future of Food. Long-term Prospects for the Agro-food sector.***

OECD (1999). ***Voluntary Approaches for Environmental Policy. An Assessment.*** Organisation for Economic Cooperation and Development, Paris.

Pfliegner, Kerstin (1997). ***International voluntary standards–the potential for trade barriers.*** Chapter 4 in: Hillary, Ruth (ed.) (1997). Environmental Management Systems and Cleaner Production. Centre for Environmental Technology, Imperial College of Science and Technology, UK. Wiley Publishers.

Queensland Department of Primary Industries (2001). ***Organics opportunities and options: Sheep meat and wool. A guide for producers considering organic sheep meat and wool production.*** Report prepared by the Department of Primary Industries, Queensland.

Ruhl, J. B. (2000). ***Farms, Their Environmental Harms and Environmental Law.*** Ecology Law Quarterly, vol. 27, pp. 263-349.

Runge, Ford, C. (1997). ***Environmental Protection from Farm to Market.*** Chapter Thirteen in Chertow, Marian R. and Daniel C. Esty (eds.) (1997). Thinking Ecologically. The Next Generation of Environmental Policy. Yale University Press.

SCARM (1992). ***Model Code of Practice for the Welfare of Animals. Cattle.*** SCA (Standing Committee on Agriculture) Report Series – No. 39. Standing Committee on Agriculture and Resource Management. Published by CSIRO Publishing, Australia.

SCARM (1997). ***A guide to the implementation and auditing of HACCP.*** Standing Committee on Agriculture and Resource Management (SCARM), Report No. 60.

Sexton, Ken, Alfred A. Marcus, K. William Easter, and Timothy D. Burkhardt (eds.) (1999). ***Better Environmental Decisions. Strategies for Governments, Businesses and Communities.*** Island Press, Washington D.C.

Sinclair, Darren, Neil Gunningham and Peter Grabosky (1998). ***Environmental Protection: Towards a Broader Range of Policy Instruments.*** Australian Centre for Environmental Law (ACEL), the Australian National University (ANU), February 1998.

Standards Australia (1996). ***Environmental Management Systems – General guidelines on principles, systems and supporting techniques.*** AS/NZS ISO 14004: 1996.

Standards Australia (1999). ***Environmental management - Vocabulary.*** Australian Standard, AS ISO 14050 – 1999.

Standards Australia (2001). ***Forest Management - Economic, Social, Environmental and Cultural Criteria and Requirements for Wood Production (The Australian Forestry Standard).*** Draft Australian Standard for Comment. Date of issue: 11 August 2001, closing date for comment: 19 October 2001. Reference Number DR 01249.

The Economist (2001). ***Fishy maths. Putting a price on sustainable fishing.*** Article from The Economist print edition, August 16, 2001.

Thomas, Alison (2001). ***Corporate Environmental Policy and Abnormal Stock Price Returns: An Empirical Investigation.*** Business Strategy and the Environment, Volume 10, pp. 125 to 134.

Ure, Gordon (1999). ***How Green Is My Label?*** Chapter Sixteen in: Carruthers, Genevieve and Tinning, Gavin (eds.) (1999). Environmental Management Systems in Agriculture. Proceedings of a National Workshop, May 26-28, 1999. A report for the Rural Industries Research and Development Corporation (RIRDC). RIRDC publication no 99/94, published in October 1999.

Wall, Ellen, Alfons Weersink and Clarence Swanton (2001). ***Agriculture and ISO 14001.*** Food Policy, Volume 26, pp.35 to 48.

Walley, Noah and Bradley Whitehead (1994). ***It's Not East Being Green.*** Harvard Business Review, pp. 46-52, May-June 1994

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