A common framework for property-level planning and management systems

Road map of requirements, resources and tools

Roger Shaw, Rob Fearon,
Rachel Mackenzie, Michael Bent,
Sarah Bill, Mick Capelin
and Claire Rodgers

December 2005

A common framework for property-level planning and management systems

A road map of requirements, resources and tools

Roger Shaw[1], Rob Fearon[1], Rachel Mackenzie[1], Michael Bent[2], Sarah Bill[3], Mick Capelin[3] and Claire Rodgers[2]

[1] CRC for Coastal Zone, Estuary and Waterway Management, Brisbane

[2] Fitzroy Basin Association Inc., Rockhampton

[3] Department of Natural Resources, Mines and Water, Brisbane

December 2005

CRC for Coastal Zone
Estuary & Waterway Management

A common framework for property-level planning and management systems: A road map of requirements, resources and tools

Written by:

Roger Shaw
Rob Fearon
Rachel Mackenzie
Michael bent
Sarah Bill
Mick Capelin
Claire Rodgers

Executive summary

Property planning and management programs have been promoted for many years. There is currently a proliferation of overlapping approaches to planning and farm management systems. This has arisen for a range of reasons and more recently because of the introduction of regional natural resource management plans, emerging compliance and certification requirements including access to natural resources and because of an increasing sustainability focus from the community. The resulting confusion and difficulty in sourcing the correct and relevant information and knowledge has led to calls for a framework that facilitates the design and implementation of property-level management systems.

Through an initiative of the Fitzroy Basin Association Inc., the Coastal CRC and the (now) Queensland Department of Natural Resources, Mines and Water, a joint project was conducted to create a linking framework that addressed the above issues. The main purpose of the project was to develop a framework for property-level management systems that integrates current systems and tools and accounts for relevant scale, social, economic and environmental issues. Other objectives were to: provide an effective focus for property-level planning and management to deliver profitability and sustainability outcomes; evaluate the framework; obtain agreement from involved stakeholders; and develop an implementation approach.

A common framework has been developed with a focus on sustainable livelihoods encompassing both profitability and sustainability. It provides a holistic and modular road map to allow landholders, industry and regional natural resource management (NRM) bodies and those with an interest in property-level management systems to choose the most appropriate approaches to achieve sustainability outcomes for a property and a catchment.

Since a major current need is for property-level planning and management systems application at the subcatchment scale, the immediate users of the framework are likely to be regional NRM bodies (in association with industry and government), who currently undertake the role of linking landholders with the proper planning activities, information and providers on a catchment basis. Landholders and industry groups, however, may utilise the frameworkís flexible entry options according to their specific needs.

The framework complements and provides links to available systems that encourage effective property-level planning and management being used in Queensland. It meets diverse landholder, industry, regional NRM body and

government needs without duplicating existing approaches and activities. From the extensive review undertaken as part of developing the framework, a wide variety of resources and tools were identified for potential use in various aspects of property management systems. Many of these tools have been developed for specific purposes or industry sectors. The responsibilities of the new regional NRM bodies in protecting and enhancing regional natural, human and infrastructure resources and assets has added an explicit additional stewardship requirement that needs to be met at the catchment scale.

The report is in two parts. Part A details the need and rationale for a common framework. The philosophy of the framework is outlined. The relationship of farm business activities to sustainable outcomes and recommended practices is used as the core element for planning and management. Part B outlines the application of the framework and its implementation, including options to flexibly access the framework and compare the capabilities of the various tools and approaches on offer. Difficulties in application are discussed and thirteen recommendations are given to enhance the implementation of property-level planning and management systems.

Recommendations

The recommendations outlined below will assist in overcoming some of the obstacles to the effective implementation of property-level management systems (PLMS) in Queensland. These recommendations are based on the findings of the project, the development of the framework and also on extensive consultation, including multi-stakeholder workshops held in 2004 and 2005, and are as follows.

1. A strategic PLMS coordination group be established to seek alignment of the many existing activities developing and promoting various forms of PLMS and to broker common agreement between the Farm Management Systems (FMS) initiative, other industry and government initiatives and regional NRM body activities. This group could be based on the current PLMS working group with a revised charter and membership. Information-sharing workshops be held twice a year to allow interested parties to understand current developments.

2. The seven (or more) groups with an interest or role in PLMS negotiate their roles and responsibilities through their peak bodies or otherwise to seek common directions, minimise gaps and reduce overlaps and duplication. This could be facilitated by the strategic PLMS coordination group.

3. A scoping, options and recommendations position paper on incentives and the need to demonstrate stewardship of natural resources for PLMS be developed that increases transparency and minimises fears and concerns expressed by landholders and other groups about government processes and requirements. This could be led by government in association with industry and NRM bodies.

4. The PLMS framework and planning and management systems be implemented on government-owned land (or leasehold land), in consultation with private landholders in catchments adjacent to these holdings to demonstrate the support of PLMS and stewardship by state and local governments and their corporations.

5. Industry and NRM bodies continue to focus on coordinating their programs to deal with all farming and grazing enterprises and to address the gaps and overlaps as identified through this project. This will allow a targeted, modular approach to adoption of various tools and programs for specific purposes that minimises the confusion and misconceptions surrounding the many existing systems.

6. Frameworks be developed to effectively integrate tools and approaches across industry sectors for multi-commodity enterprises and catchment

planning. This is best led by the industry bodies in association with regional NRM groups.

7. Commonality in information access across all the developing initiatives be actively pursued through the promotion of draft protocols for information access (through Information Queensland). This can be achieved through collaboratively drafting standards for required information to support applications for natural resource access and use through the Queensland Governmentís OnePlan, and to ensure consistency across the government agency partners. The process to also include effective access by landholders.

8. NRM bodies, industry bodies, Information Queensland and other stakeholders agree on a consistent process for data collection, access and sharing, including how information can be accessed by landholders.

9. The one inclusive name used to cover property planning and management activities be íproperty-level management systemsí (PLMS) to minimise confusion, and a standard set of agreed terms relevant to PLMS be used, initially based on Appendix 1 of this report.

10. Guidelines be developed for use by landholders and providers of PLMS services so that providers can state how their services align with regional NRM body, industry and legislative requirements. This will minimise confusion and false expectations. The development could be led by regional NRM bodies in collaboration with the other parties including providers.

11. Some common agreed standard for describing recommended practice options be determined to allow ease of consideration and reporting across industry, mixed commodity enterprises and catchments.

12. The risk management approach be clarified. In the strict sense of the Australian Standard AS/NZS 4360:2004, risk management is considered directly applicable to any change that affects the objectives, not just negative change. Proactive management within an adaptive management cycle that accounts for both capturing opportunities and managing risk is a more acceptable alternative that needs further development. Also, the coincidence of multiple risks is not well treated in current risk assessment approaches.

13. Several modules that are currently not well developed such as biodiversity, ecosystem productivity and services, profitability, floodplain management, roads and stock routes, revegetation and fire and wildlife management could be considered as generic modules created jointly with potential for adaptation for each industry sector or climatic region as appropriate.

Contents

List of tables

List of figures

1. Introduction and rationale

Property management planning (PMP) has been a significant program of industry organisations and federal and state governments for many years and forms part of the National Property Management Planning Strategy (NFF 1999). Because of recent compliance issues and the emphasis on accreditation and sustainability, many groups are developing or refining processes and programs that have relevance to PMP. Governments are being requested to minimise institutional and bureaucratic impediments and duplication. In Queensland, approval of plans is required for access to, and management of, some natural resources such as water and vegetation. National and regional initiatives such as the Reef Water Quality Protection Plan now require actions at the property level to manage and conserve natural resources and their broader catchment and regional impacts.

There is a proliferation of overlapping approaches because of new regional natural resource management (NRM) plans, requirements to obtain access to natural resources, Farm Management Systems (QFF 2005a,b) and other industry approaches and compliance, certification and sustainability initiatives. The resulting confusion and difficulty in sourcing the correct and relevant data and information has led to the need for a common framework for property-level management systems. The word ësystemsí is used to indicate that planning, implementation, monitoring and review are integral parts of management for properties and associated business activities. These systems are generally based on a cycle of continuous improvement through the steps of plan-do-check-review.

Recent experiences in the Fitzroy region and other areas in Queensland have led to calls for an integrative framework for property-level management systems (PLMS) by landholders, industry and government. Such a framework would minimise duplication, identify complementary or alternative approaches and tools and describe the strengths and weaknesses of existing systems. Use of the framework would then result in the effective and efficient planning of on-farm strategies and practices that are robust and acceptable, and would encourage implementation, monitoring and review.

A second important need is that the changed on-farm practices do actually make the expected differences and are not a waste of landholder effort for minimal on-farm and off-farm effect. Furthermore, changes made in isolation may not significantly improve the overall situation. This can only be assessed if a holistic framework is used as the integrating mechanism.

Through an initiative of the Fitzroy Basin Association Inc., the Coastal CRC and the (now) Queensland Department of Natural Resources, Mines and Water (NRMW), a joint project was conducted to create a linking framework that addressed the above issues. The main purpose of the project was to develop a framework for property-level management systems that integrates current systems and tools and accounts for relevant scale, social, economic and environmental issues. Other objectives were to: provide an effective focus for property-level planning and management to deliver profitability and sustainability outcomes; evaluate the framework; obtain agreement from involved stakeholders; and develop an implementation approach.

A common framework for property-level management systems needs to link existing approaches and programs. It needs to encompass a range of approaches from various groups with an interest in property planning and management from a productivity, regulatory, service provider, industry and natural resource management perspective.

There are many definitions used for common terms related to PLMS and this impedes integrated planning and management. These terms are defined in Appendix 1 to minimise confusion and provide a common understanding.

The project involved an extensive review of the commonly used property planning and management programs and tools commonly being used in Queensland as well as some others nationally. A review of frameworks for property planning in use internationally was used to develop the overall framework. Discussions with landholders, industry groups, NRM bodies and government agency staff and presentations to various groups and NRM bodies refined some of the attributes and workability of the framework.

The proposed framework meets diverse landholder, industry and government needs and directions without duplicating existing approaches and activities. It can be used in group, individual or farm management team settings. The primary purpose is for PLMS application at a subcatchment scale.

This report provides a review of existing systems and a focus for PLMS integration and outlines how these various approaches and tools can be used collaboratively to achieve a holistic property planning and management approach that concentrates on achieving desired outcomes. The report addresses the objectives of the project and is presented in two parts.

Part A: The concept and framework

- Develops a common framework for PLMS and outlines the philosophy and rationale
- Demonstrates how the common framework provides an effective focus for property-level planning and management to deliver outcomes
- Provides a framework to integrate current systems and tools and incorporates a consideration of scale and social, economic and environmental aspects of PLMS.

Part B: The use of the framework guides and flexible access

- The application of the framework through a series of guides and information resources
- A stepwise guide to planning and management for sustainable livelihoods
- How the various tools and approaches can be used to provide a holistic farm management system
- Flexible options for using the framework to meet landholder and regional NRM body priorities and to ensure legislative, regional and other requirements are addressed.

The framework is designed for application in Queensland but is readily adaptable to other local conditions and requirements.

Part A: The concept and framework

2. Why a common framework is needed

The following are reasons why a common framework is required.

2.1 Increased interest in property-level planning

The certification of regional NRM plans and the statutory requirements for property management planning have considerably increased the interest in planning. In Queensland, memoranda of understanding have been developed between some industry organisations and both NRM bodies and State Government to jointly progress various farm management system (FMS) approaches that can achieve accreditation and provide surety for landholders and their enterprises.

2.2 Poor coordination across diverse processes

The diversity of approaches to property-level planning and management and the existence of past and currently developing tools and management practices means that for property-level and subcatchment scale planning, there are a wide range of approaches to choose from that are often not consistent or complementary and may not meet the objectives of regional NRM bodies. Many are focussed on a single industry, making application difficult across mixed commodity properties.

2.3 Confusion over diverse regulations and requirements

Landholders are increasingly uncertain about their statutory and non-statutory obligations as a consequence of recent changes to vegetation management legislation and proposed changes to leasehold land arrangements, product quality systems and requirements for land and water management plans. Further development of initiatives such as the Reef Water Quality Protection Plan and environmental management systems which require additional information and approaches are a further complicating factor. Many of these planning arrangements overlap but use different definitions and contrasting approaches that add further confusion.

2.4 Necessary best practice knowledge is vague, inconsistent and difficult to access

Many landholders are keen to adopt ìbestî management practices that provide some certification of on-farm practices for compliance, environmental outcomes or market advantage. However, what is a recommended practice is often vaguely expressed and the information on the effectiveness of the practice in actually achieving measurable improvements in productivity or sustainability is frequently lacking. Regional arrangements and interactions have a significant effect on practice change, but more specific information on current practices and response to regional NRM requirements is required, particularly if accreditation is to be obtained and the targets set by regional NRM bodies are to be achieved.

2.5 Consistency required within catchments and across multiple commodity enterprises

The variable comprehensiveness of planning tools, resources and industry approaches means that catchment and regional targets will be difficult to meet unless there is an amalgamation of suitable tools based on regional and catchment requirements. Not all approaches are equally applicable and a road map of the available modules, their content and applicability is required, particularly where completing a planning module will lead to some form of certification.

2.6 Need for effective performance evaluation of implementation and outcomes

To meet regional NRM plan requirements, industry codes of practice, access to natural resources and compliance with statutory requirements, some standardised auditing arrangements and processes are required. With such a diverse range of tools and resources, a minimum standard is necessary so that landholders and others know how each module or tool meets that standard for planning and implementation. This is particularly the case if there are compliance aspects associated with its purpose. Once plans are in place there is an ongoing requirement for revision, monitoring and compliance. Environmental management systems (EMS) have fairly consistent processes and generally follow some or all of the international standards of ISO 9000 or ISO 14001. Product quality standards are variable and requirements differ considerably.

2.7   Few accessible and meaningful incentives

The types of incentives traditionally available for complying with requirements of government or legislation based on performance of certain duties have been financial. There needs to be a broader range of incentive mechanisms (not just financial) that actually meet landholdersí needs as well as the needs of NRM bodies, industry, government and the community to achieve a win-win situation. Such incentives need to be complementary across the programs if common outcomes are to be achieved.

2.8   Enable NRM bodies to tailor property planning activities to meet targets

NRM bodies have the opportunity to align property planning activities and incentives. They may also select available modules or commission appropriate modules that can meet local management action targets and requirements for asset maintenance and enhancement.

3. Designing a common framework for property planning and management

3.1 A common framework

The purpose of a common framework is to provide a high level of integration of existing and proposed activities in property planning and management. It can help identify overlapping approaches and the key gaps to be addressed. The word áframeworkí has a range of meanings and is defined here as:

> A representation of the linkages of various components in a system and their interactions. It describes the concepts, principles and important steps and options to arrive at an integrated management system.

A road map is a common term that has a similar meaning of showing the linkages between places and their spatial relationships to provide a direction to reach the objective. Using this analogy, an effective framework for PLMS provides the following elements.

- A **holistic and modular view** to ensure all the relevant aspects are related even if they are not all required at any given time or for an immediate purpose.

- A **mental picture of the linkages** between the system components of a property plan as well as the roles of different interested groups.

- A **guide to users** through a stepped process and a comparison of the range of approaches, tools and options available. The guide should include:
    - Identification of the necessary statutory and non-statutory requirements, initiatives, incentives and sources of knowledge to allow a farm plan to be completed, accepted and implemented
    - Adoption of an adaptive management (plan-do-check-review) approach to achieve continuous improvement and to manage uncertainties and risks in planning and implementation.

- **Multiple and flexible access points** to allow for a wide range of requirements of landholders and groups with minimal time and cost.

The first three of these elements are outlined in more detail in Section 4. Further details on the third and fourth elements are provided in Part B (Sections 5 and 6).

3.2   Framework philosophy and concepts

The philosophy of the framework is based on achieving outcomes. Effective planning and implementation comes from starting with desired outcomes (What do we want to achieve?) and working through planning steps (How can we achieve this?) to the necessary actions, implementation and an improvement review process within a timeframe. This ensures that any actions implemented have a consistent and larger purpose towards the desired outcomes. Such a process facilitates linking to adjacent property, catchment or regional plans and national initiatives.

Outcomes are achieved through setting *goals and targets* for a property, based on conducting *business activities*. Business activities are the means of achieving the goals and outcomes. They are conducted by adopting one or more *recommended practice options* that meet property, sustainability, catchment and regional policy, planning and legislation requirements.

Strategic (long-term) planning including an assessment of opportunities and risks and *tactical (short-term)* and *operational (implementation) planning* are conducted for each of the business activities, or for the whole farm where they have not been done already. The implementation is followed by a *performance check* and a periodic *improvement review* to ensure the activities continue to contribute to the desired outcomes.

Adaptive management has been the benchmark for planning for natural resource management issues and sustainability for over 30 years, particularly where the available knowledge is incomplete and the outcomes are uncertain. The steps of 'Plan', 'Do', 'Check' and 'Review' are commonly used by many people but not necessarily in a formal manner. Taking action on the best information available at the time is the most appropriate approach for continually changing situations. Variable knowledge, climate, episodic events, markets and ecosystems, and the uncertainty of predicting the best course of action into the future requires an adaptive management approach. This means incorporating performance and monitoring with adjustment of the goals and strategies to ensure the desired outcomes are being achieved.

The advantages of a formal process are that documentation of decisions, background information, criteria for decision-making and the rationale of the plan can be changed and re-assessed over time, as well as being available for others as may be required.

The purpose of the framework is to achieve realistic and sustainable outcomes. It is constructed around the requirements for a full property management plan, implementation and management process to provide the overall context. Individual and industry-specific business activities and approaches that have been developed, or are being developed and implemented separately, are an integral part of the framework.

4.   Elements of the framework

4.1   Holistic and modular view

Ecosystems and sustainability are the two concepts that provide a holistic and integrating approach (see definitions in Appendix 1) to PLMS. Sustainability is increasingly on the agenda for communities, corporations and government (Goldies, Douglas & Furnass 2005). Lumley and Armstrong (2004) traced the origins of sustainability through the nineteenth century finding a strong focus which can provide useful foundations for current sustainability policies. ìSustainable livelihoodsí embody the values of sustainability within the context of businesses and people making a living (Chambers & Conway 1991; Hussein 2002). The concept provides a systematic basis for how people manage assets within the context of vulnerability and institutional arrangements (Farrington, Ramasut & Walker 2002). Ecologically sustainable development (ESD) provides a concept for further development of resources. These are all convergent approaches that provide a holistic framework.

All Australian governments have signed on to ESD principles and their implementation. While varying interpretations of sustainability exist, the concept is seen as the most appropriate principle by which to assess proposed actions to ensure minimal harm now and in the future and to develop maximum productivity.

A useful definition of ESD is:

> ìEcologically sustainable development means using, conserving and enhancing the **communityís resources** so that **ecological processes** on which life depends are maintained and the total **quality of life**, now and in the future, **can be increased**î (ESD Steering Committee 1992).

The key principles are given in bold italics above and form the basis for this framework. They require an emphasis on stewardship, holistic and integrated approaches to the property within the catchment context and consideration of quality of life which is broader than profitability and environmental management.

While various definitions of sustainability exist, the use of **sustainable livelihoods** as promoted widely by several organisations internationally offers a tangible goal for landholders. Sustainability is a communal process at global, national, regional and business levels that incorporates the sustainable livelihoods of each enterprise and activity.

ìSustainable livelihoods consist of the capabilities, assets (both material and social) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets and provide net benefits to other livelihoods locally and more widely, both now and in the future, while not undermining the natural resource baseî (FAO no date). The United Nations Development Program has drawn on the support given to sustainable livelihoods by the international community at the World Summit for Social Development by making the concept central to its operational mandate (UNDP 1999).

Sustainable livelihoods is much broader than the commonly used ìminimal environmental harmî approach expressed in many environmental management systems in that it takes into consideration aspirations, profitability, opportunities, risks, visions and motivations as well as sustainability. Visions provide the personal motivation for change and development as expressed by Meadows (1999): ìA vision articulates a future that someone deeply wants, and does it so clearly and compellingly that it summons up the energy, agreement, sympathy, political will, creativity, resources or whatever to make that future happen.î The concept of sustainable livelihoods is used here and not the whole sustainable livelihoods planning framework and associated processes.

Sustainability as a concept has been around for a long time but is only recently becoming prominent as a goal and process for societies. In a review of the Master of Business Administration Degree courses in Australian institutions (Tilbury, Crawley & Berry 2005), very few courses regarded sustainability seriously enough to warrant being considered ìleading edgeí in an international focus. Government grants have been given in some cases (Lane 2005) to fund the development of suitable modules on sustainability to incorporate into these courses.

The concept of sustainable livelihoods provides a realistic focus and motivation to achieve sustainable outcomes at a property and catchment scale. Taking this approach, PLMS needs to consider outcomes that contribute to sustainable livelihoods and ESD principles. Similar approaches have been adopted by the Murray Darling Basin Commission Landmark project (Clifton et al. 2004) and the Millennium Ecosystem Assessment (Alcamo et al. 2003).

Table 1 lists ten sustainability outcomes that address overall sustainability though ESD and sustainable livelihoods covering environmental, social and economic aspects of farming.

Table 1. Ten sustainability outcomes and their components that form the basis of the common framework

Sustainability outcome	Sustainability components
1. Landscape health	Soils ñ capability and health Water ñ quality and quantity Floodplains, wetlands and riparian areas Vegetation Animals and health
2. Coastal and marine health	Wetlands and estuaries Coastal stability Water quality Fisheries
3. Biodiversity	Native and remnant vegetation Wildlife breeding and corridors Heritage areas and parks Fire Farming impacts
4. Air quality, climate	Climate Greenhouse Particulates, dust Odour and noise Ozone depletion
5. Ecosystem productivity and services	Asset protection and conservation Sustainable utilisation Exhaustive use Flood and drought mitigation Energy use Wildlife management Resilience ñ environmental, social and economic Existence value
6. Enterprise viability and productivity	Farm layout and potentia Food processing Product processing Market access Cost benefit analysis Skills and ability Resources management Infrastructure People management Financial management Strategic planning Succession planning Risk planning and management E-commerce Recordkeeping
7. Waste, hazard and risk	Off-site impacts Biosecurity Chemicals and hazardous substances Waste recycling and management, composting Emergency planning and response Fuels and lubricants Workplace health and safety
8. Quality of life	Life goals and priorities Family Cultural Indigenous Holistic management
9. Quality assurance	Food safety Monitoring Indicators Accreditations Compliance Liability
10. Governance	Adaptive management Enterprise Catchment, community and regional relationships Environmental justice Multi-objective decision-making Resource use tradeoffs

Table 1 is an amalgam from many sources and the references above and has also been derived from consideration of the many components people consider important in sustainability (for example, USEPA 2004) and arranging them into a consistent framework.

Table 2 shows the alignment between the sustainability outcomes listed in Table 1 and the assets identified by different regional groups and represented in their regional NRM plans. While there is a close alignment, the sustainability outcomes are broader than the management actions and priorities in the regional NRM plans. For example, the landscape health outcome incorporates land and water and weed issues. Those matters for targets to maintain or enhance assets that were mandated by the Commonwealth are common across all regional NRM groups. Coastal assets are included where the region includes a coastal area. Other assets have been identified in accordance with local priorities.

Table 2. Alignment of the ten sustainability outcomes with regional NRM assets

Sustainability outcome	Queensland NRM regions												
	Desert Channels	Southern Gulf	Northern Gulf	Cape York	Far North Queensland	Burdekin Dry Tropics	Mackay Whitsundays	Fitzroy	Burnett Mary	Murray Darling	Condamine Alliance	SEQ Western Catchments	South East Queensland
1. Landscape health	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Coastal and marine health		✓		✓	✓	✓	✓	✓	✓				✓
3. Biodiversity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Air quality, climate		✓			✓	✓	✓	✓	✓	✓		✓	✓
5. Ecosystem productivity and services				✓									
6. Enterprise viability and productivity	✓			✓		✓		✓	✓		✓	✓	
7. Waste, hazard and risk management										✓			
8. Quality of life	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9. Quality assurance													
10. Governance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Note: The table is indicative and only accounts for the major management actions and targets. The plans sometimes include related aspects under different headings.

4.2   Links between sustainability components and between interest groups

The components of each of the sustainability outcomes (Table 1) reflect a more comprehensive framework than is commonly addressed in PLMS as discussed in Section 5. The framework needs to provide a holistic approach describing all the components even though only the relevant aspects will be developed for particular properties and catchments.

Seven groups are identified with an interest in property-level planning and management systems, as shown in Figure 1. These groups have their own specific interests and emphases, there are overlaps and gaps and no one group has an exclusive mandate over any or all activities related to PLMS. This makes the planning process difficult and negotiation at an individual and institutional level is needed. Hagmann *et al.* (2002) from their similar experience within complex, dynamic livelihood systems in Zimbabwe and South Africa suggested ìsustainability in development and in natural resource management is a continual, value-dependent, political and social negotiation process that cannot be determined by outsiders for the insidersî. Thus, landholders are central in the decision-making process about sustainable livelihoods on their properties and in the broader local context.

Figure 1. Interest groups currently involved in PLMS activities and their primary emphases or roles

The roles of each group are not clear cut, with various groups having the same primary focus. Table 3 outlines a hierarchy of steps towards sustainability and aligns them with the focus of the various interest groups. The steps outlined in the left hand column of Table 3 (in order from top to bottom), indicate a logical progression of the steps that contribute to overall sustainability of a property and a region. The table also shows which groups have a leading role in each of these steps. The steps begin with access to assets and their use which is a common element for regional NRM bodies in maintaining and enhancing regional NRM assets.

The logical basis of this hierarchy is that assets are used to provide livelihoods for people. How they are accessed and used is based on beliefs, interests and legislation. Together with science, knowledge and capability and the institutional processes, these assets and rights are maintained and hopefully enhanced. Using recommended practice options and sustainable farm business activities aligned with regional and farm strategies, plans and targets will achieve sustainable livelihoods and the sustainability outcomes as decided by the community. This table provides a means of ensuring the links between the different groups, the purpose of activities and the developments, and in so doing can minimise duplication, address the gaps and achieve sustainable outcomes.

The overlapping roles in this table create confusion and anger for landholders. This is largely due to the lack of clear outlines on the specific roles of the various groups and thus an adversarial position is often adopted. Recommendations on dealing with this issue are given in Section 10.

Table 3. Linkages between groups involved in PLMS and steps towards sustainability

Steps towards sustainability	Groups with an interest in property-level planning and management						
	Land-holders	NRM bodies	Providers/consult-ants	State and Cíwealth govts	Industry organis-ations	Auditors	Local govern-ment
Assets: human, social, natural, physical and financial	✓	✓	○	○	○		✓
Beliefs, legislation and policy	○	○		✓	○	○	✓
Rights, access and claims	✓	○		✓	○		✓
Science, knowledge and capability	✓	✓	○	✓	✓		
Institutions, processes, accreditation and compliance	○	○	○	✓	○	○	✓
Assets maintained or enhanced	✓	○	○	✓	○		✓
Recommended practice options	✓	✓	○	✓	✓	✓	✓
Farm business activities	✓	○	○	○	✓	○	○
Strategies, plans and targets met, risks managed	○	✓	○	✓	○	○	✓
Profitable and sustainable livelihoods	✓	○	○	✓	○		○
Sustainability outcomes	○	✓	○	✓	○	○	✓

✓   Leading or major role
○   Contributing role

4.3   A guide to users – steps in the framework

The guide to users consists of six action steps built around the adaptive management cycle. The six action steps can be entered and followed in any order although for first time planning, or those revising existing plans, following the numerical order 1 to 6 is most useful. Figure 2 illustrates the relationship of the action steps (represented by the numbers 1 to 6) to the adaptive management cycle and the concepts of the framework.
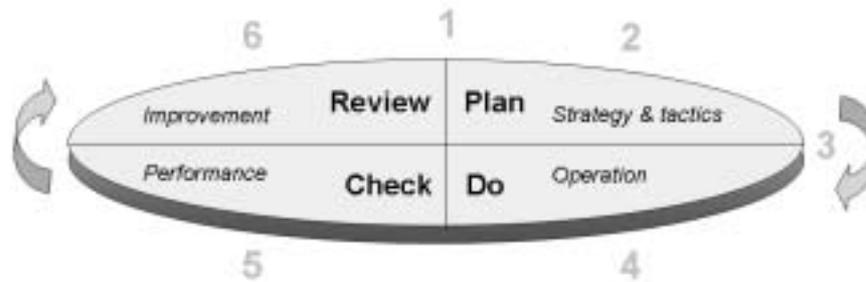
Figure 2. Relationship between the frameworkís action steps and the adaptive management cycle

Details of the action steps are shown in Figure 3. These actions allow a holistic property-level management system to be developed, implemented and reviewed, or various individual components addressed as required.

Figure 3. The six action steps in the guide to users

The action steps

A series of guides for the six action steps in Figure 3 are provided in the framework (Section 5). The guides are numbered to correspond with the action step being considered (that is, Guide 1 supports action step 1, and so on). The guides incorporate aspects of current approaches and programs where these are available.

Guide 1.   **An inventory** of the propertyís natural resources, assets and infrastructure. This usually consists of a series of maps and overlays of the property including sensitive areas.

Guide 2.   **Setting directions** ñ strategic planning for the property and enterprise. This is not well covered in the PLMS approaches reviewed and an outline of the key components recommended is provided in the framework (see Table 4).

Guide 3.   **Setting targets** ñ tactical planning for the property and enterprise. This worksheet includes identifying viable options and multiple-objective decision-making to focus on the most appropriate development approaches. Providers offer a number of these services (see Table 5).

Guide 4.   **Setting actions and activities** ñ operational planning for the property and enterprise. This is generally well addressed in existing property planning approaches and workbooks and is therefore not duplicated in this framework. Information resource i2 compares the commonly available industry approaches and some of the tools available (see Table 7).

Guide 5.   **Certification and monitoring** ñ action planning to achieve certification and implement monitoring and performance methods.

Guide 6.   **Review and adjustment ñ** An adaptive management approach ensures that progress and outcomes are reviewed from time to time to ensure the original intentions are being met and to account for unforeseen situations and uncertainty in the original plans.

Information resources – how the approaches and tools can be used

Two key information resources are provided along with the guides as shown in Figure 4. Both are based on achieving one or more of the ten sustainability outcomes through business activities and recommended practice options. A comparison of the commonly available approaches, tools and guides to recommended practice options is also given in the information resources.
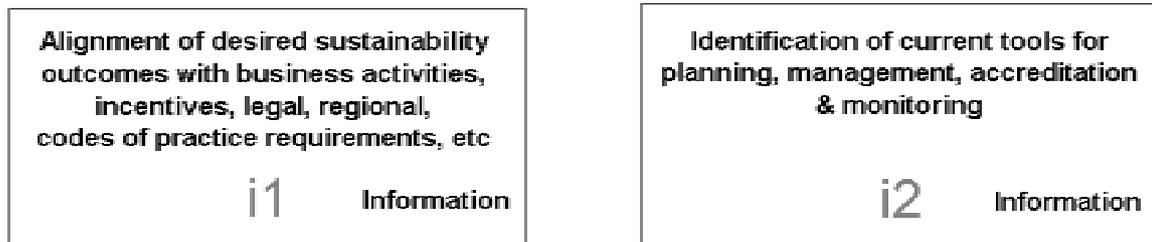
Figure 4. Key information resources to support the six action steps of the framework

<div style="margin-left:2em">

Resource i1. **Alignment of desired sustainability outcomes** with business activities and available incentives, requirements of legislation, policy, regional plans and codes of practice (see Table 6).

Resource i2. **Identification of current tools** for planning, management, certification and improvement review. These are considered for business activities and recommended practice options. The Queensland Government's OnePlan regulatory property-level planning requirements (at the date of writing) are incorporated (see Table 7).

</div>

Part B: The use of the framework guides and flexible access

5.   The guides and information resources

The six guides and two information resources that support the framework are outlined below. Specific details are given in Tables 4 to 7 which follow.

5.1. User guides

Guide 1.   **An inventory** of the propertyís natural resources, assets and infrastructure. This usually consists of a series of maps and overlays of the property including sensitive areas. There is no detailed guide included here in this framework since the approaches from various providers offer a range of suitable options. Agreement on minimum standards is required as outlined in the recommendations in Section 10. Suggested minimum requirements would be a base property map (photomosaic or satellite map) and a property sale description document as a property inventory. The property map should be of an age and resolution appropriate for the land use and legislative requirements with appropriate overlays relevant to the business activities on the property. It should also be compatible with the minimum mapping requirements being established under the Queensland Governmentís OnePlan as the common standard for legislative purposes.

Guide 2.   **Setting directions** ñ strategic planning for the property and enterprise. This is not well covered in the approaches reviewed and an outline of the key components recommended is provided in Guide 2 (see Table 4).

Guide 3.   **Setting targets** ñ tactical planning for the property and enterprise. An outline of steps is provided since key elements are not commonly available. This guide includes identifying viable options and multiple-objective decision-making to focus on the most appropriate development approaches. Providers offer a number of these services. The key elements of the overall framework guide are given as part of Guide 3. One important aspect in selecting the tactical approach is to ensure it is consistent with the various requirements and legislation. Information resource i1 identifies the important aspects to be considered in developing targets (see Table 5).

Guide 4. **Setting actions and activities** ñ operational planning for the property and enterprise. This is generally well addressed in existing property planning approaches and workbooks and is therefore not duplicated here in this framework. Information resource i2 compares the commonly available industry approaches, the legislative requirements and some of the tools available (see Table 7).

Guide 5. **Certification and monitoring** ñ action planning to achieve certification and implement monitoring and performance methods. This is provided by several existing programs (information resource i2, see Table 7) and is not duplicated by this framework.

Guide 6. **Review and adjustment** ñ An adaptive management approach ensures that progress and outcomes are reviewed at planned periods to ensure the original intentions are being met and to account for unforeseen situations and uncertainty in the original plan. This aspect is not well covered in the commonly available approaches and a generic guide could be developed by industry and adjusted for various situations.

5.2 Information resources

Resource i1. **Alignment of desired sustainability outcomes** with business activities and available incentives, requirements of legislation, policy, regional plans and codes of practice. Regional NRM bodies would be the most appropriate to coordinate the completion of this resource. The guide can be considered from several aspects, for example: (i) sustainability outcomes and sustainability components required (of direct relevance to a regional NRM body and also to catchment planning groups and landholders); or (ii) business activities (of direct relevance to landholders, industry groups, local government and service providers) to consider gaps and overlaps and also legislative requirements.

Resource i2. **Identification of current tools** for planning, management, certification and improvement review. These are considered for business activities and recommended practice options as outlined for information resource i1 above but with the addition of recommended practice options. The Queensland Governmentís OnePlan regulatory property-level planning requirements at the date of writing of this report are incorporated. The OnePlan project

is working to harmonise the regulatory planning requirements of some of the Acts across the Departments of NRMW, DPIF and EPA. The tools and approaches in this information resource are classified according to the categories below. The resource is a snapshot and will change over time. The assessments of the tools and modules have not been validated with all proponents and thus are simply a guide to what is covered, and the content and applicability needs to be confirmed with the program promoting them. Information resource i2 is a snapshot of what is available and a means for selection of appropriate modules for further investigation as well as a process to allow gaps and overlaps to be evaluated as discussed in the recommendations, Section 10.

A comparison is made in resource i2 of the different approaches and tools based on whether the following aspects are explicitly included in the approach or module beyond a general statement:

- A   Auditing and evaluation of the plans and implementation procedures is provided for
- C   Compliance with legislative requirements in Queensland. This means that the approach is compatible with current legislative requirements and lists what is relevant
- D   Development of action plans for a property
- I   Incentives available are identified
- K   Information and knowledge resources are identified within the approach
- M   Monitoring and indicators including benchmarks are provided
- R   Recommended management practice guidelines (best management practices or codes of practice) are included
- S   Scale applicability and integration with catchment and regional plans and strategies is explicitly included
- W   Self-assessment workbook is provided to assess activities on a property.

Table 7 also includes an indication, by shading, if the approaches and tools are considered comprehensive and able to be broadly applied other industries or commodities.

Table 4. Suggested worksheet for user guide 2 ñ setting directions

This is the suggested strategic directions component, with each column identifying a summary of content that would be beneficial. It is possible to organise this guide to have a progressive worksheet summary column on the top as shown below together with a page or more of detail underneath it that provides the background and working details. Working comments and decisions are also written underneath and only the summary written in the visible columns. Progress of the stages is from left to right. Writing of the outcomes enhances understanding between all members of the property management team. Draft lists for some of the columns are available on request.

Personal vision	Personal values priority	Personal lifestyle priorities	Team lifestyle convergence	Team lifestyle divergence	Action initiatives from SWOT*	Sustainable outcomes sought	Scenario implications
Chosen from a selection of words provided with any additions to provide a motivating vision	*The top 5 and the lowest 5 chosen from a supplied list that can be added to as required*	*Choose the rank order from a supplied list with additions as required*	*Points where the management team converge (not necessarily in consensus) on vision and directions for the property*	*Points where the management team have different goals and priorities that need consideration in vision, goals and planning for the property*	*Includes a statement of the core enterprise activities as well as a risk analysis to the enterprise and activities ñ* • *identification* • *estimation and* • *evaluation.* *This section addresses enhancement of strengths and balances risk with opportunities and how they may be captured* **SWOT: stands for strengths, weaknesses, opportunities and threats analysis*	*Outcomes identified for enterprise, lifestyle and catchment*	*The vision, outcomes sought and SWOT analysis are considered alongside a ëwhat ifí scenario analysis for the enterprise and the landholder/manager considering a series of good, average and poor years.* *Initiatives are then considered in the light of the following:* • *Go ahead* • *More info required* • *Unsure* • *Rejected* • *To research* • *Training and skills required*
Enterprise vision *Chosen from a selection of words provided with any additions to provide a motivating vision*	Enterprise values *The top 5 and the lowest 5 chosen from a supplied list that can be added to as required*	Enterprise priorities *Choose the rank order from a supplied list with additions as required*					

Table 5. Suggested worksheet for user guide 3 ñ setting targets

This is the tactical component of the planning, with each column listing the important aspects to be considered. Each column can have a page or more underneath it that provides the background and working details including decisions that were made with their reasons. Only the summary is written in the visible columns. Progress of the stages is from left to right.

Scenario implications (from worksheet in Table 4)	Tactical plan 1st draft	Tactical plan 2nd draft	Criteria to assess proposed plan options	Relative score of options	Chosen option and targets	Priorities for operational plan (for Guide 4)	Monitoring and accreditation required (for Guides 5 and 6)
Go ahead More info required Unsure Rejected To research Training and skills required	Includes goals and objectives and targets based on scenarios and SWOT analysis	Targets modified if required following consideration of information resource i1 and other relevant information	Landholders identify the criteria on which to assess the viability and future actions on the plans. Criteria can be chosen from a list provided or landholders can use their own	For complex issues and interactions or where there are competing priorities or outcomes, a multi-objective decision approach is preferred to allow the influence of factors to be evaluated. Assistance and public domain software is available and can be considered if required	On outline of what is chosen and why with broad targets. Appropriate tools, programs and assistance can be considered from information resource i2	This allows for staged implementation over a number of years	Key items are captured and listed here and then developed further as required

Table 6. Resource i1 ñ Suggested worksheet for identifying relevant details for incentives and compliance requirements

Sustainability outcomes and their components are aligned with business activities, incentives, legislation, compliance, regional initiatives and industry priorities. This information resource may comprise a range of relevant supporting material with only the summary and necessary information recorded here on the worksheet. Responsibility for collation of the various columns is suggested in the recommendations in Section 10.

Sustainability outcome	Sustainability component	Sub-components	Business activities	Incen-tives	Legis-lation	Compliance and codes	Regional NRM plan	Regional growth strategy	Regional initiative e.g. GBR	Local govern-ment	Industry / sector
1. Landscape health	Soils	Soil capability, soil structure, fertility	Cropping, horticulture, pasture, nursery, organic farming								
	Water	Surface and groundwater quantity and quality	Water storage, irrigation, drainage								
	Floodplains	Wetlands and riparian areas	Riparian areas and wetlands, aquaculture, roads and stock routes								
	Vegetation	Remnant areas	Forestry, grasslands, feedlots, breeding								
	Animals	Animal type/s, animal health	Grazing, dairying, feedlots, breeding, aquaculture, intensive animal industries								
2. Coastal and marine health	Wetlands and estuaries		Tourism								
	Coastal stability		Tourism								
	Fisheries		Aquaculture, fisheries								
3. Biodiversity	Native and remnant vegetation		Eco-tourism								

Sustainability outcome	Sustainability component	Sub-components	Business activities	Incen-tives	Legis-lation	Compliance and codes	Regional NRM plan	Regional growth strategy	Regional initiative e.g. GBR	Local govern-ment	Industry / sector
	Wildlife breeding and corridors										
	Heritage areas and parks										
	Fire										
	Farming impacts										
4. Air quality, climate	Climate		Managing for climate variability, weather prediction								
	Greenhouse		Energy use efficiency								
	Particulates, dust										
	Odour and noise		Intensive industries								
	Ozone depletion		Energy use and chemicals								
5. Ecosystem productivity and services	Asset protection and conservation		Whole farm planning								
	Sustainable utilisation		Sustainability, ecological and economic values for ecosystems and ìdownstream usersî of resources as a basis for trading options, including ìwho pays the costsî								
	Exhaustive use		Compensation or trading								
	Flood and drought mitigation		Risk management, landscape restoration								
	Energy use		Energy efficiency								

Sustainability outcome	Sustainability component	Sub-components	Business activities	Incen-tives	Legis-lation	Compliance and codes	Regional NRM plan	Regional growth strategy	Regional initiative e.g. GBR	Local govern-ment	Industry / sector
	Wildlife management										
	Resilience	Environmental, social and economic resilience at ecosystem and regional levels	Managing within the resilience of the systems and not precipitating change to less desirable states; managing for undesirable conse-quences of pressures and interventions on systems								
	Existence value										
6. Enterprise viability and productivity	Farm layout and potential		Whole farm planning								
	Food processing										
	Product processing										
	Markets										
	Cost benefit analysis										
	Skills and capability		Capacity building								
	Resources management		Whole farm								
	Infrastructure										
	People management										
	Financial management										
	Strategic planning										
	Succession planning										

Sustainability outcome	Sustainability component	Sub-components	Business activities	Incen-tives	Legis-lation	Compliance and codes	Regional NRM plan	Regional growth strategy	Regional initiative e.g. GBR	Local govern-ment	Industry / sector
	Risk planning and management										
	E-commerce										
	Record keeping										
7. Waste, hazard and risk	Off-site impacts		Risk management strategies								
	Biosecurity		Minimisation of opportunities for infections and invasions of the property								
	Chemicals and hazardous substances		Handling, storage, use and disposal								
	Waste recycling and management, composting										
	Emergency planning and response										
	Fuels and lubricants										
	Workplace health and safety		Maintenance of a safe and healthy work environment								
8. Quality of life	Life goals and priorities										
	Family										
	Cultural										
	Indigenous										
	Holistic management										

Sustainability outcome	Sustainability component	Sub-components	Business activities	Incen-tives	Legis-lation	Compliance and codes	Regional NRM plan	Regional growth strategy	Regional initiative e.g. GBR	Local govern-ment	Industry / sector
9. Quality Assurance	Food and product quality and safety										
	Monitoring										
	Indicators and benchmarks										
	Accreditations										
	Compliance										
	Liability										
10. Governance	Adaptive management										
	Enterprise										
	Catchment, community and regional relationships										
	Environmental justice										
	Multi-objective decision-making										
	Resource use tradeoffs										

Table 7. Resource i2 ñ Commonly available tools and programs for PLMS, assessed and mapped against sustainability outcomes and business activities

Suitability of tools for planning and management of business activities, recommended practice options and plans required for access to natural resources. The worksheet provides a snapshot comparison of the range of tool and programs commonly available, assessed according to the criteria identified in the footnote to the table (page 47). The assessments in this table are from reading the printed material only and before use would need to be verified for each plan, particularly for monitoring and audit aspects. There are many commercial programs and software tools and services available that are not incorporated into this resource.

Sustainability		Business activities		Commonly available tools and programs																		
Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better ñ better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
1. Landscape health	Soils	Cropping, horticulture and fresh produce, pasture, nursery, organic farming	Tillage, stubble, planting, harvesting and rotation	DKW	DKRW		KR		KR[2]		DK		ADK MR	W			AC DM W		DI			
			Nutrients, acidity and fertiliser management	DKW	DKRW	DK MR W	KR		KR[2]					W			AC DM W					
			Water balance management		CDK R W	DK MR W			KR[2]				DK	W			AC DM W		DI			
			Integrated pest animal and weed management	DKW	CDK R W	DKR W	KR	D	KR[2]	DK				W	D				DI			
			Declared weed, animal and plague pests					CDK MR W		DK					DK				DI			
			Land capability ñ restoration and management (health)			KW			KR[2]						DK		AC DM W	CIK RS	DI	CKR S	AI	
			Roads and stock routes																			

Sustainability		Business activities		Commonly available tools and programs																		
Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
	Water	Water storage, irrigation, drainage	Farm water design and environmental flows		CDK R W*				KR[2]		DK			W			AC DM W		DI			I
			Irrigation scheduling and efficiency	DKW	CDK R W	DK MR W	KR							W			AC DM W		DI			
			Land forming										DK						DI	CKR S		
			Drainage and runoff	DKW	CDK R W		KR		KR[2]								AC DM W		DI	CKR S		
	Flood-plains	Riparian areas and wetlands, aquaculture, roads and stock routes	Nutrient and sediment management		CDK R W	DK W	KR		KR[2]								AC DM W					
			Flooding and waterway management		CDK R W				KR[2]						DKM		AC DM W		DI	CKR S		
			Roads and stock routes			KW														CKR S		
			Riparian zone management	DKW	DKR W	DKR W			KR[2]			DK		W	DKM		AC DM W	CIK RS	DI	CKR S		
	Vegetation	Forestry, grasslands, feedlots, breeding	Agro-forestry and plantation management						KR[2]										DI			
			Native vegetation management and retention		CDK R W	KW	KR		KR[2]	DK	DK			W	DK			CIK RS				

31

Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better 'n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
	Animals	Grazing, dairying, feedlots, breeding, aquaculture, intensive animal industries	Pasture and grassland management						KR[2]	DK	DK			W	DKM				DI			
			Nutrient and effluent management			DK MR W													DI			
			Feed production and utilisation			DK MR W			KR[2]	DK	DK			W	DKM							
			Animal breeding and health						KR[2]		DK											
			Feedlots and intensive animal industries			DK MR W													DI			
2. Coastal and marine health	Wetlands and estuaries	Tourism	Water, sediment and effluent management, environmental flows													AC DM						
	Coastal stability	Tourism	Vegetation management																			
	Fisheries	Aquaculture, fisheries	Nutrient and effluent management																DI			
3. Biodiversity	Native and remnant vegetation	Eco-tourism	Integrated pest animal and weed management, multiple use management		DKR W	KW	KR		KR[2]	DK		DK		W	DKM			CIK RS	DI			

Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
	Wildlife breeding and corridors		Integrated pest animal and weed management, conservation			KW	KR	DKM RW					DK	W	DKM			CIK RS				
	Heritage areas and parks		Integrated pest animal and weed management						KR[2]						K							
	Fire		Fire management							DK				W								
	Farming impacts		Integrated pesticide management				KR															
4. Air quality, climate	Climate	Managing for climate variability, weather prediction	Managing for climate						KR[2]	DK	DK											
			Wind breaks				KR															
	Green-house	Energy use efficiency	Energy use efficiency			KW								W								
	Particulates and dust		Dust management			KW	KR															
	Odour and noise	Intensive industries	Odour management, noise management			KW	KR															
	Ozone depletion	Energy use and chemicals	Energy and chemical management																			

Sustainability		Business activities		Commonly available tools and programs																			
Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better ǹ better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. (2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
5. Ecosystem productivity and services	Asset protection and con-servation	Whole farm planning	Revegetation, degradation rehabilitation, enhancing natural capital															CIK RS		CKR S		
	Sustainable utilisation	Sustainability, ecological and economic values for ecosystems and users of resources for trading options, including ìwho pays the costsî	Managing within the capacity and resilience of the ecosystem							DK												I
	Exhaustive use	Compensation or trading	Trading in ecological credits, tradeable rights for natural capital																			
	Flood and drought mitigation	Risk management, landscape restoration	Risk management, landscape restoration, water storage														AC DM W		DI	CKR S		I
	Energy use	Energy efficiency	Energy efficiency		KW																	

Sustainability		Business activities		Commonly available tools and programs																		
Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
	Wildlife manage-ment		Maintain effective habitats and restore degraded habitats, in-stream flows and enhancement		AKR W								DK		DK							
			Runoff and water quality management										DK									
			Fencing																DI			
	Resilience	Managing within the resilience of the systems and not precipi-tating change to less desirable states; managing for undesirable consequences of pressures and interventions on systems	Implementation of recommended practices to maintain the resilience of systems																			
			Adoption of trigger values for actions to minimise adverse change or arrest decline																			

Sustainability		Business activities		Commonly available tools and programs																		
Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
	Existence value		Community networks, regional and local social infrastructure						KR[2]													
6. Enterprise viability and productivity	Farm layout and potential	Whole farm planning									DK		DK	W			DM W	CIK RS	DIW	CKR S		
	Food processing		Health guidelines																			
	Product processing													W					DIW			
	Markets										DK			W								
	Cost benefit analysis										DK								DI			
	Skills and capability	Capacity building	Science and experiential knowledge underpin management decisions																			
			Ongoing training on enterprise and ecosystem functioning, tools and technologies						KR[2]													
	Resources manage-ment	Whole farm									DK		DK			DKM						

Sustainability		Business activities		Commonly available tools and programs																		
Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
	Infra-structure										DK			W					DI	CKRS	AI	I
	People manage-ment								KR[2]		DK								DI			
	Financial manage-ment								KR[2]		DK		DK	W					DI			
	Strategic planning										DK								DI			
	Succession planning										DK								DI			
	Risk planning and manage-ment				DKRW			DKM			DK	DK			DK	ACDKMW	ACDW		DI			
	E-commerce																					
	Record keeping			DKW					KR[2]		DK		DK	W		ACDKMW						
7. Waste, hazard and risk	Off-site impacts	Risk management strategies	Pollution		CDKRW	DKW	KR															

Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
	Biosecurity	Minimise opportunities for infections and invasions of the property			DKRW			DMSW						W								
	Chemicals and hazardous substances	Handling, storage, use and disposal	Actions to minimise accidents and health issues	DKMW	ACDKRW	KW								W								
			Chemical application, spray drift	DKMW	ACDKRW									W								
			Avoiding contamination of soils, water etc.	DKMW	ACDKRW		KR		KR[2]					W			ACDMW					
	Waste recycling and manage-ment, composting		Waste recycling strategy		ACDKRW*	KW								W								
	Emergency planning and response				ACDKRW*									W								
	Fuels and lubricants		Contamination minimisation		ACDKRW		KR							W			ACDMRW					

38

Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better 'n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
	Workplace health and safety	Maintenance of a safe and healthy work environment	Actions to minimise accidents and health issues		ACD K RW*				KR[2]					W								
8. Quality of life	Life goals and priorities										DK											
	Family								KR[2]													
	Cultural								KR[2]													
	Indigenous																					
	Holistic management																					
9. Quality Assurance	Food and product quality and safety								KR[2]													
	Monitoring								KR[2]		DK		DK	W		ACD KMW						
	Indicators and benchmarks						KR		KR[2]		DK					ACD KMW						
	Accreditations															ACD KMW						
	Compliance															ACD KMW						
	Liability							IM								ACD KMW						

39

Sustainability		Business activities		Commonly available tools and programs																		
Sustainability outcome	Sustainability component	Business activity	Specific activities where recommended practice options are preferred or required	Compass sugar[1] (Azzopardi 2001)	Cotton BMP (Australian Cotton Industry 2004)	Dairying better n better (QDFO 2005)	Farm-care (QFVG 1998)	Property pest management	Landmark (Clifton et al. 2004)	GLM (MLA 2003)	Futureprofit (QDPI 1997; Stewart 2000)	LandPlus! (Maroochy Landcare Group 2005)	CTF Solutions[3] (Yule pers comm.)	Grains EMS (Tinning & Carruthers 2002)	PRMP (Caltabiano 2003, 2005)	ALMS (Crawford 2003)	LWMP (NR&M 2004, 2005a,b)	Veg PVMP PMAV[4]	QRAA (QRAA 2004)	Soil Con Act SC Plan[5]	Income Tax LMP	GABSI[6]
10. Govern-ance	Adaptive manage-ment										DK	DK	DK									
	Enterprise										DK											
	Catchment, community and regional relationships		Effective governance processes to fashion common goals and minimise impediments for sustainable regional growth						KR[2]													
			Community participation						KR[2]													
	Environ-mental justice																					
	Multi-objective decision-making																					
	Resource use tradeoffs																					

Footnotes to Table 7

[1]   The name for the tool or approach is given here in the footnote or is referenced to an entry in the references in Section 12. Note also that Farm Management Systems (FMS),

     a Queensland Farmersí Federation initiative with the Queensland Government, will encompass the sugar, cotton, dairy, chicken meat, Growcom and nursery industries.

[2]   Information on recommended practice options is very brief.

[3]   Controlled Traffic Farming Solutions: given as an example of one private sector approach. There are many others available.

[4]   Property Vegetation Management Plans (PVMP) and Property Maps of Assessable Vegetation (PMAV); see <http://www.nrm.qld.gov.au/vegetation/index.html>

[5]   Property Soil Conservation Plans see <http://www.nrm.qld.gov.au/planning/plans/property_soil_conservaton_plans.html>

[6]   Great Artesian Basin Sustainability Initiative (GABSI); see <http://www.nrm.qld.gov.au/factsheets/pdf/water/w69.pdf>

*   Applies predominantly to agrichemicals

Codes

- A   Auditing and evaluation of the plans and implementation procedures is provided
- C   Compliance with legislative requirements. This means that the approach is compatible with current legislative requirements and lists what is relevant
- D   Development of action plans for a property
- I   Incentives available are identified
- K   Information and knowledge resources are identified within the approach
- M   Monitoring and indicators including benchmarks are provided
- R   Recommended management practice guidelines (best management practices or codes of practice) are included
- S   Scale applicability and integration with catchment and regional plans and strategies is explicitly included
- W   Self-assessment workbook is provided to assess activities on a property.

  Shading indicates that the planning tool is comprehensive and can be used for other industries as well as the target industry. The planning tool may also include software

tools or more detailed packages of information or tools. The planning tools may not be equally applicable across differing climatic zones. A convergence in the use of the

tools is necessary particularly for multiple-commodity farming enterprises.

6. Multiple and flexible entry options

The framework is designed to be modular and flexible so that while a holistic plan is proposed, only those elements of relevance to a particular property need to be done. The following illustrates how the framework can be used for various purposes. Access to the relevant aspects of the framework is considered from the requirements of two broad groups. The first is for landholders and industry groups and the second for regional NRM bodies or their equivalent who have a responsibility for regional sustainability, maintaining regional assets and meeting management action targets for regional assets. A condensed version of this section has been published as Shaw *et al.* (2005a).

6.1 Landholders and industry groups

Seven options are suggested in Table 8 as ways to enter the common framework that allow diverse interests and needs to be targeted efficiently.

Table 8. Options for accessing the framework according to diverse interests and needs

Option	Why	Focus
1. I have already done some property planning	I donít want to duplicate what I have already done	Building on current or past work
2. Quick start	I want to get a feel for the process	Show me what is required
3. Outcomes	These are the outcomes I want	Outcomes aligned with my motivations
4. Specific task	I know what I want to do ñ where do I start?	Practical on-farm actions
5. Business activity	These are the business activities I want to look at	Improved profitability and management
6. Recommended practice options (RPOs)	These specific RPOs are the ones I want to look at	Accreditation and improvement
7. Legislative requirements	What are the legislative requirements that I have to meet?	Checking compliance

If none of the above seems to fit, work through options 1 and 2 in Table 8 to understand what may be required.

Option 1 – I have already done some property planning

Property management planning programs and modules have been around for many years and many people have already done modules relevant to their enterprise. This option directs landholders to relevant action steps based on their previous activities using a self-assessment tool. To evaluate what has already been done alongside what is currently relevant, Table 9 lists the components of a holistic plan where past work and requirements can be considered and the relevant new material identified.

Table 9. Assessment of past planning activities against various needs and requirements

Elements of holistic plan	How well was it done previously 0 (not) to 5 (well)	How relevant is it currently 0 (not) to 5 (very)	Current condition of the enterprise 0 (low) to 5 (high)	Proposed actions to take	Comments	Go to guide number or information resource number
Property map and inventory						1
Vision ñ personal and enterprise						2
Values ñ personal and enterprise						2
Lifestyle priorities ñ personal and team						2
Opportunities, threats and risks						2
Strategic directions, future scenario analysis						2
Goals and objectives						2
Evaluation of possible property options, including uniqueness						2, i1
Recommended practice options for current or proposed business activities						4, i2
Strategies under the following sustain-ability outcomes • Landscape health						4, i2
• Coastal and marine health						4, i2
• Biodiversity						4, i2
• Air quality and climate						4, i2
• Ecosystem productivity and services						4, i2
• Enterprise viability and productivity						4, i2
• Waste, hazard and risk						4, i2
• Quality of life						4, i2
• Quality assurance						5, i2
• Governance						4, i2
An action plan						4, i2

Option 2 – Quick start – I want to get a feel for the process

This option is suitable for those interested in quickly getting an overall understanding of the framework. It is a scan of the steps necessary for a holistic farm plan. Each step can be done superficially (or in some depth) and important aspects targeted for completion at a later date. The process would take around three hours.

Option 3 – Outcomes – What I want to achieve

This option is assisted by the use of a simple tool (Figure 5) allowing landholders to review and record their perceptions of relevant beliefs, values, motivations and goals. It is aligned to the broad areas of important beliefs and values of landholders as identified in surveys of Australian farmer value orientations by Robinson *et al.* (2003) and Frost (2000). These values along with some others have been arranged into a diagram of value outcomes. By placing an interest score from 1 to 10 along each of the eight radius lines on the diagram in Figure 5, a profile is derived that indicates broad emphases that could be followed through the common framework.

The eight outcomes are:

1. **Profitability ñ** Increased profitability of the enterprise
     Greater market access through product quality, eco-labelling etc.
     Diversified or expanded business
2. **Sustaining an income ñ** Sustaining a satisfactory income
3. **Financial assistance ñ** Realising the goals
     Obtain finance and maintain repayments
     Gain financial assistance for restructuring or development
4. **Access to natural resources / preservation of environmental quality ñ** Access natural resources *e.g. water*
     Efficient use of natural resources, chemicals etc.
     Accredited plans for access to resources
     Improve the environmental quality of the property and region
5. **Recognition and accreditation ñ** Recognition and accreditation for doing the right thing; pride of ownership
     Personal qualification or recognition for doing a property management planning process and submitting the plan
     Implement an EMS, ISO or product quality accreditation scheme
     Defence against accusations of poor environmental management

6. **Personal satisfaction ñ** Personal satisfaction of a well managed property and enterprise

    Doing a worthwhile job

    Reputation of being caring, progressive and up-to-date

    Benchmark productivity with others

7. **Quality of life ñ** High quality of life and a balanced lifestyle

    Meeting the challenge and achieving the objectives in an independent manner

    Balancing work with family and personal needs

8. **Sustainability process ñ** Improving the sustainability of the enterprise and region

    Joining with a catchment community all moving to improve catchment management

    Implement adaptive management and continuous improvement

    Proactive management of opportunities and threats

    Maintaining or improving sustainability of the property for future generations
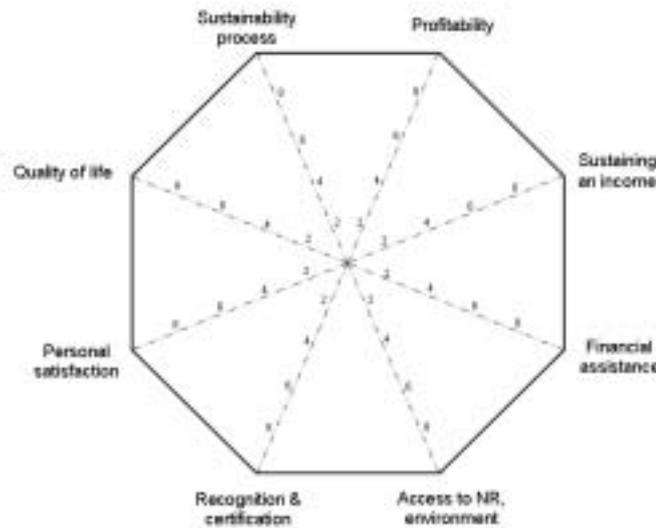
**Figure 5. Simple tool for assessing priority outcomes
required for the property planning process**

The profile created by self assessment on each of the eight radius lines in Figure 5 directs users to appropriate components of the framework.

To obtain a profile:

- Mark a point along each of the eight radius lines based on how much you feel you can align with the outcome described at the points of the octagonó 0 (low) in the centre and 10 (high) at the outside.

- Joint the marked points along each axis line to obtain an octagonal diagram of your major motivations.

- Using the eight points of the octagon, or the emphasis in the headings outside the octagon, choose the steps to start as outlined in Table 10.

Table 10. Alignment of values and goal motivations, sustainability outcomes and action steps in the framework

Value or goal outcome (Figure 5)	Primary sustainability outcome (Table 1)	Start with action step number/s and user guides (Section 5.1 and Figure 3)	Consult information resource number/s (Tables 6 and 7)
Profitability	6. Enterprise viability and productivity	3 for targets and 4 for operation	i2
Sustaining an income	6. Enterprise viability and productivity	3 for targets and 4 for operation	i2
Financial assistance	Will depend on focus business activity/ies for which assistance is sought	3 for targets and 4 for operation and identifying focus business activity	i1 and i2
Access to natural resources, environmental goals	1 Landscape health, 3 Biodiversity, 2 Coastal and marine or 5 Ecosystem productivity	3 for targets and 4 for operation	i1 and i2
Recognition and certification	9 Quality assurance, 7 Waste, hazard and risk	3 for targets and 4 for operation	i1 and i2
Personal satisfaction	8 Quality of life, 10 Governance	2 for strategy, 3 for targets and 4 for operation	i2
Quality of life	8 Quality of life	2 for strategy, 3 for targets and 4 for operation	i2
Sustainability process	10 Governance	2 for strategy, 3 for targets and 4 for operation	i2

Option 4 – Specific task – I think I know what I want to do

This option is for landholders who are fairly certain of the actions they wish to implement. Table 11 offers a number of typical specific tasks, each with a direct link to the appropriate action step number or information resource. This table can

be used as a checklist. It is advisable to have completed entry option 1 first (ëI have already done some property planningí) (see Table 8) before working through this option, to confirm what might be required before focussing on just one or two components.

Table 11. Checklist for identifying priority tasks required and the appropriate action steps or information resource to commence the planning process

Priority (No. of ticks)	What I want to do	Start at step no. / info. resource no. (Figure 3 and Section 5.1)
	Compile a property resource inventory	1
	Do a holistic, whole-farm plan	1
	Plan new directions and options or rethink enterprise activities following a change in management or ownership	1
	Make decisions on best options to progress and implement	2
	Carry out succession planning	2
	Upgrade knowledge and skills in specific areas	3 and i2
	Meet new statutory and non-statutory compliance requirements, regional strategies and plans, and/or adopt latest codes of practice and/or recommended practice options	3 and 4, i2
	Ensure security of operation by complying with duty of care obligations	2 and 5, i2
	Access incentives for improved productivity and sustainability	3
	Increase profitability	3 and 4
	Access resources e.g. water (LWMP) and/or ensure efficient use and management of natural resources including necessary permits and licences	3 and 5, i2
	Undertake operational planning for management actions and activities	4, i2
	Integrate and optimise existing business activities on a mixed-commodity enterprise	3 and 4
	Develop a risk management and response plan (including hazards and wastes)	2 and 4, i2
	Undertake steps for quality assurance or accreditation of outputs for markets	5, i2
	Implement an environmental management system (EMS)	5, i2
	Implement performance monitoring with suitable performance indicators, benchmarks and interpretations	5
	Meet audit, accreditation and quality assurance requirements	5, i2
	Review monitoring and performance and adjust strategy and operation	6

Option 5 – Select a business activity

Option 5 directs landholders interested in specific business activities directly to Guide 4 which lists business activities and links them to sustainability goals. Choosing only relevant business activities, landholders are encouraged to consider the suitability of tools and resources for evaluating current versus recommended practice options in the guide and in information resource i2. This then allows the relevant modules and tools from existing programs and systems to be selected and an action plan created.

Option 6 – Select recommended practice options

Similarly, Option 6 begins with the selection of relevant business activities listed in information resource i2, but links landholders to appropriate recommended practice options associated with each business activity. The landholder can then preview the tools and resources available (information resources i1 and i2) in relation to local and catchment issues and priorities and specific industry approaches. Where there is no suitable module or tools listed or where the property is a multi-commodity enterprise, a more generically applicable module could be adapted as highlighted in information resource i2.

Option 7 – Legislative requirements

Option 7 provides an information resource for those landholders interested specifically in compliance with existing legislation. A summary of the legislative requirements for the major Queensland Acts that require some form of property planning have been compiled in Table 12. These arrangements are current at November 2005, and will be simplified when the Queensland OnePlan initiative is implemented. Other legislation requires permits rather than plans. The user must always check the relevance of the information in this report with the latest legislative requirements.

Table 12. Legislative requirements for property planning (compiled by Sarah Bill, Department of Natural Resources, Mines and Water)

Act	Legislative provision	Required	Plan requirements	Offences

Water Act 2000	Section 73 outlines the requirements for a land and water management plan (LWMP). The LWMP must be prepared in accordance with the guidelines published by the department. Guidelines have been prepared for the state as a whole as well as for various regions.	The *Water Act* requires an approved LWMP before water can be used for irrigation when:
		• A new water allocation or new interim water allocation is obtained
		• A resource operations plan (ROP) specifies a LWMP is necessary for water licences
		• An irrigator intends to use a seasonal assignment of water on the same land in two consecutive years or two years out of three consecutive years
		• A LWMP is required under a water use plan
		• An irrigator moves some or all of their existing water allocation from one ROP zone to another ROP zone
			Generally an LWMP needs to include the following information:
			• Property description and ownership
			• Permits, notices and existing approvals
			• Base map
			• Landscape considerations
			• Farm resource information
			  o Land
			    ▪ Soils
			    ▪ Topography
			    ▪ Natural landscape features
			  o Water
			    ▪ Sources
			    ▪ Quantity
			    ▪ Quality
			• Current land use and infrastructure
			• Proposed land use and infrastructure
			• Irrigation system
			• Pumping, storage and distribution
			• Field layout and erosion control
			• Storm water, drainage and farm runoff
			• Flood risk management
			• Crop water requirements, soil and erosion management
			• Irrigation application and system performance
			• Chemical and fuel management
			• Riparian zone management
			• Monitoring and reporting
				Section 73(5) makes it an offence to use water from a water allocation, interim water allocation or water permit for irrigation unless the user has prepared an approved LWMP.
				
				Chapter 5 Part 3 of the Act contains the offence provisions. Section 808 makes it an offence to take, supply or interfere with water unless authorised under the Act and s810 makes it an offence to use water contrary to an approved LWMP for an area.

Act	Legislative provision	Required	Plan requirements	Offences

Vegetation Management Act 1999 (VMA)	The clearing of vegetation is classed as assessable development under the *Integrated Planning Act 1997* (IPA) and therefore requires a permit to clear in certain circumstances. The broad requirements of a property vegetation management plan (PVMP) are outlined in s5 of the *Vegetation Management Regulations 2000*.	A permit will be required where the proposed clearing area on freehold land includes vegetation that has been identified as remnant vegetation. Any clearing on State land (including leases, roads and reserves) requires a permit irrespective of whether there is any remnant vegetation present.
		
		Section 21 of the VMA requires a PVMP to be prepared where the chief executive is:
		• The assessment manager
		• A concurrence agency.
			Section 3 of the regulations requires:
			• A description of the location and extent of the area proposed to be cleared
			• A statement declaring the purpose of the application
			• Details of the way the proposed clearing meets the requirements of the regional vegetation management code for the area
			• A supporting map showing the boundaries of the area and five verifiable fixed features.
			
			There are 24 regional vegetation management codes against which clearing permit applications are assessed. Each code is specific to the region, however some generic criteria to be considered include:
			• Regional ecosystems and biodiversity
			• Preventing land degradation
			   ○ Bank stability, erosion and slumping
			   ○ Water quality, sedimentation, nutrient and other pollution
			   ○ Maintenance of aquatic habitat and ecosystems
			   ○ Maintenance of wildlife habitats
			   ○ Salinity and waterlogging
			   ○ Acid sulfate soil and associated metal contaminants
			   ○ Conservation of remnant ecosystems and the natural floristic composition and range of densities of the regional ecosystem in the locality
				The IPA also enables enforcement notices to be issued by an assessing authority where it is reasonably believed that an offence has or is being committed. Unlawfully clearing vegetation is a development offence under the IPA.
				
				Chapter 4 part 3 of the IPA contains the offence provision. Specifically section 4.3.1 prohibits carrying out assessable development without a permit. Other relevant offences include not complying with a code when carrying out certain assessable developments (s4.3.2A), contravening a development approval or a condition of a development approval (s4.3.3).

Act	Legislative provision	Required	Plan requirements	Offences
Soil Conservation Act 1986 (SCA)	Part 3 of the SCA provides for the preparation and approval of property plans. A plan may be prepared over the whole of the property or just part of it.	Soil conservation plans are voluntary, but once approved by the Director-General of NRMW the plan attaches to the land and must be adhered to by all subsequent owners.	As soil conservation plans are concerned with the control of erosion on cropping lands, they contain the following information: - A map delineating the property boundaries - Specifications for the soil conservation structures and practices necessary to control erosion - Detail of floodplain/flood risk areas - Pipelines etc. and surrounding public infrastructure (roads, rail lines, tram lines) - The permission of neighbouring landholders where they will be affected by the implementation of the property plan.	
Aboriginal Cultural Heritage Act 2003 (ACH Act)	Part 7 of the ACH Act outlines the requirements for when a cultural heritage plan (CHMP) needs to be prepared and what information needs to be addressed in the plan. Generally the plan is a four-month process involving negotiation and agreement between the landholder(s), NRMW, the Aboriginal Heritage body or Aboriginal party who is a native title body.	CHMPs are required for certain high-level impact activities, generally where an environmental impact statement is required or as a licence/lease etc. condition; however they may be voluntarily prepared as support for meeting the duty of care.	The Act contains no requirements for a CHMP; this is to be decided by the parties involved, but allows guidelines to be prepared to assist in developing a suitable plan. Some issues the plan should address include: - The parties, project and area covered - The process and management practices agreed to by the parties - Management of land-use activities in or around the heritage area - Contingency plans for future heritage finds and dispute resolution, delays etc. - Cultural awareness programs and employee inductions	

Act	Legislative provision	Required	Plan requirements	Offences

Income Tax Assessments Acts 1936 and 1997 (ITAA)	Tax incentives are provided by the Commonwealth Government under the ITAA.	These Acts require the preparation of a land management plan (LMP). The LMP is to be approved and provided on application for a tax incentive benefit.	The plan must describe:
			• The different land classes
			   o Land characteristic
			   o Soil type
			   o Geology
			   o Slope
			• The type of fences to be erected
			• Explanation of how the plan will prevent land degradation.	

Rural and Regional Adjustment Act 1994 (RRA Act)	Under section 10 of the RRA Act assistance schemes may be established under a regulation. This is a recent amendment (late 2005), altering the previous arrangement where schemes were administered through the use of guidelines. As a transitional arrangement the guidelines will remain in force for two years, unless a regulation is enforced earlier.	Currently, when applying for assistance under the Act and under the Resource Management Program (previously Landcare schemes), an application must be accompanied by a property management plan certified/approved by NRMW and/or DPIF. Arrangements are in transition through 2006 and prospective applicants should contact the Queensland Rural Adjustment Authority (QRAA, see <www.qraa.qld.gov.au>) for the latest information. QRAA administers a number of programs offering assistance to rural producers, fishers and small business for increasing productivity or overall profitability or for addressing specific needs or challenges.	Generally the plans should include information relevant to the loan application on:
			• The land characteristics
			   o Type/classes
			   o Condition (including areas that need rehabilitation)
			   o Soil types/classes/condition
			   o Land use
			• How the irrigation system meets crop requirements
			• Water sources/bodies and condition
			• Soil erosion and salinity control measures
			• Water reuse/recycle processes of wastewater
			• Pest and biodiversity issues
			• Current and proposed infrastructure (including buildings, fences, roads, pipelines, water sources etc.)
			• The different management strategies in place and proposed
			• Monitoring and notification requirements	

6.2   Regional NRM bodies

It is envisaged that landholders themselves will not be the primary direct users of the framework and that the role of linking landholders with the appropriate property planning activities, information and providers on a catchment basis is currently undertaken mostly by regional bodies. Also, given that regional NRM bodies need to address management action targets, the framework provides options both for selection of planning and management approaches and in the roll-out of the appropriate systems.

Option 1 – Selection of appropriate property planning and management approaches

Requirements to meet some of the agreed sustainability outcomes and management action targets in regional NRM plans involve property management plans associated with a subcatchment or catchment plan. For some catchments, the diversity of enterprises and mixed commodities add to the difficulties of using common approaches across industry sectors.

A suggested process for NRM bodies to choose the most appropriate tools and approaches to implement property planning and management is:

- For a selected catchment area, construct a matrix of the sustainability outcomes, regional assets and management action targets against business activities, industry sectors and recommended practices to map the requirements (see Table 13).

- Choose the tools or modules and approaches from information resource i2 (Table 7) that are most appropriate together with additional modules from other sources that might supplement the chosen activity to cover the management action targets required.

- Draw up guidelines for providers of property planning and management systems services so that landholders can have confidence that the services they request and are supplied with meet the legislative and the regional requirements as well as landholder requirements. This is to minimise misunderstandings and false expectations.

- Offer suitable incentives for completion of certain stages or activities.

Table 13. Matrix to identify appropriate approaches and tools to meet management action targets for a catchment that will be achieved through property planning or management

Business activity	Industry sector		Sustainability outcome Regional asset			Sustainability outcome Regional asset			Sustainability outcome Regional asset		
			MAT	MAT	MAT	MAT	MAT	MAT	MAT	MAT	MAT
		RPO									
		tool									
		RPO									
		tool									
		RPO									
		tool									

MAT = management action target
RPO = recommended practice option

Option 2 – Implementing property planning and management systems

A staged implementation approach is proposed that allows individual landholders and subcatchment groups to begin the process and come to a common level of understanding.

Stage 1

- Base property map (photomosaic or satellite map) and a property inventory as a property sale description document. The property map should be of an age and resolution appropriate for the land use and legislative requirements with appropriate overlays relevant to the business activities on the property. (The property map should be compatible with the minimum mapping requirements being established under OnePlan as the common standard for legislative purposes.)

- A simple SWOT (strengths, weaknesses, opportunities and threats) analysis of the property and enterprise.

- Rather than just a risk analysis, a simple risk and opportunity assessment in conjunction with the SWOT analysis to identify modules to work through, risks to manage and opportunities and incentives to capture.

Stage 2

- Work through the relevant modules and planning activities that are highlighted from the analysis in stage 1 as part of an adaptive management cycle (action steps 2 and 3. see Figure 3).

- This may be done individually or in groups and the common framework provides the road map of how all the components fit together.

Stage 3

- Completion of the modules and identification of appropriate monitoring and accreditation or audit processes to allow the full adaptive management cycle to be implemented (action steps 4 and 5, see Figure 3).

Stage 4

- Review of progress and results at an identified time (action step 6, see Figure 3).

7.   Application of the common framework

Wide consultation in Queensland was conducted in developing the common framework. These consultations included: several regional NRM bodies, the Queensland Regional Groups Collective, Queensland Farmersí Federation, AgForce, Department of Natural Resources and Mines (now NRMW), Department of Primary Industries and Fisheries, Environmental Protection Agency, CSIRO staff working with regional NRM bodies on regional plan evaluation criteria, and the sugar, Cotton Australia and Growcom intensive agricultural industry bodies.

The framework has also been formally presented to various groups and individuals including the Queensland Working Group for Property-level Management Systems. There are ongoing complementary developments such as the Farm Management Systems initiative being championed by Queensland Farmersí Federation (QFF, 2005a,b) as well as the Queensland Governmentís OnePlan initiative. The Fitzroy Basin Association is evaluating aspects of the framework in practical application.

8.   Overcoming barriers and addressing issues

The framework addresses a number of concerns raised about planning and management during the consultations and discussions. These are outlined in Table 14, along with suggested ways the common framework is addressing these issues.

Table 14. Some issues identified in the application of PLMS and how they are addressed by the framework

Identified issue	Addressing the issue
Many landholders are fearful and distrustful of government intervention and requirements. They resent the complexity and time required for compliance.	The framework focuses on sustainable livelihoods putting emphasis on opportunities and doesnít concentrate on risks and compliance. It seeks to provide a roadmap through the many existing systems for property management clarifying requirements and available resources.
There is a major communication issue with respect to the range of property planning systems currently offered or demanded by industry bodies and government agencies.	The framework assists by providing a common and consistent guide to facilitate communication about property-level management systems. For many situations one-on-one discussions with facilitators and others (now employed mostly through regional bodies) are seen as the only way to break down some of the barriers to maximise sustainability and profitability of the whole enterprise.
Landholders resent being told how to manage their properties and feel undue criticism from various sources of their efforts when they are attempting to follow best practice.	The framework has been designed to take the big picture view and allow focus on the aspects that landholders feel they need to address. However, stewardship of the nationís natural resources is a responsibility that requires time and effort to demonstrate responsible management. A staged implementation approach has been recommended as one option with some incentives from regional NRM bodies to provide landholders with immediate benefits.
Detailed record keeping by landholders is thought by many to be a cumbersome task with very minimal benefit. Environmental and product quality systems in particular are often seen as having insufficient benefit to warrant the effort required.	The benefits to landholders of following a particular strategic approach will be more easily seen as the framework is livelihoods-focussed. Landholders need to do a strategic analysis and then make a judgement on the worth of such activities now or in the future. The framework facilitates this and links landholders to the appropriate systems that are offered by industry or government.
There are many providers of services advertising and seeking business and it is hard to confirm that the products and services are comprehensive and/or meet legislative or regional requirements.	The framework provides consistent, independent advice on the various requirements. Regional NRM bodies are in a position to provide a guideline to landholders requiring potential providers of services to certify that the services being provided comply with regional and legislative requirements. This will minimise false expectations.
There are many parallel and competing developments currently underway for property planning and management systems. The necessity for a common framework has been highlighted by all stakeholders.	Many of the developments to date have been industry-specific or technology-specific, although the roles of each group overlap in property planning and management. The framework has been designed to be as flexible and modular as possible and key information resources incorporated to minimise unnecessary effort. Ongoing linkage through working groups (such as the current Working Group on Property-level Management Systems) is critical to ensure knowledge of developments is shared.

9.   Benefits

The framework and guide to users provides an outcome focus for developing sustainable livelihoods in which the property is considered in a holistic manner. The framework does not duplicate existing approaches, tools, codes of practice or policies. It provides a comparative analysis of the capabilities of commonly available planning tools and approaches to property planning and management systems. It also identifies the stages and steps for the most complete property management planning process, with flexibility to enter and leave at any point as required. It provides links to legislation, national and regional initiatives and strategies, codes of practice and planning guidelines.

The benefits of such a framework are:

- A consistent overarching framework that provides links between NRM bodies and regional assets, legislative and industry initiatives
- A new consistency in purpose so that all activities and programs can be developed in a modular fashion and fit together with minimal duplication of roles leading to clear directions with minimal confusion
- A comparative evaluation of available tools to allow a considered choice of tools and approaches to achieve the outcomes required
- A focus for providers and consultants to achieve a more integrated approach with others
- Gaps in tools and approaches have been identified and opportunities for capturing opportunities can be realised
- Flexibility to upgrade content when various modules are revised ensuring consistency
- Flexibility to choose appropriate tools and programs in subcatchment and catchment planning across mixed commodity enterprises
- NRM bodies can choose the most appropriate approaches and modules to suit their region and address their targets.

10 Recommendations

A number of recommendations are outlined below which will assist in overcoming some of the obstacles to the effective implementation of property-level management systems (PLMS) in Queensland. These recommendations are based on the findings of the project, the development of the framework and also on extensive consultation, including multi-stakeholder workshops held in 2004 and 2005. The recommendations are as follows.

1. A strategic PLMS coordination group be established to seek alignment of the many existing activities developing and promoting various forms of PLMS and to broker common agreement between the Farm Management Systems (FMS) initiative, other industry and government initiatives and regional NRM body activities. This group could be based on the current PLMS working group with a revised charter and membership. Information-sharing workshops be held twice a year to allow interested parties to understand current developments.

2. The seven (or more) groups with an interest or role in PLMS negotiate their roles and responsibilities through their peak bodies or otherwise to seek common directions, minimise gaps and reduce overlaps and duplication. This could be facilitated by the strategic PLMS coordination group.

3. A scoping, options and recommendations position paper on incentives and the need to demonstrate stewardship of natural resources for PLMS be developed that increases transparency and minimises fears and concerns expressed by landholders and other groups about government processes and requirements. This could be led by government in association with industry and NRM bodies.

4. The PLMS framework and planning and management systems be implemented on government-owned land (or leasehold land), in consultation with private landholders in catchments adjacent to these holdings to demonstrate the support of PLMS and stewardship by state and local governments and their corporations.

5. Industry and NRM bodies continue to focus on coordinating their programs to deal with all farming and grazing enterprises and to address the gaps and overlaps as identified through this project. This will allow a targeted, modular approach to adoption of various tools and programs for specific purposes that minimises the confusion and misconceptions surrounding the many existing systems.

6. Frameworks be developed to effectively integrate tools and approaches across industry sectors for multi-commodity enterprises and catchment planning. This is best led by the industry bodies in association with regional NRM groups.

7. Commonality in information access across all the developing initiatives be actively pursued through the promotion of draft protocols for information access (through Information Queensland). This can be achieved through collaboratively drafting standards for required information to support applications for natural resource access and use through the Queensland Government's OnePlan, and to ensure consistency across the government agency partners. The process to also include effective access by landholders.

8. NRM bodies, industry bodies, Information Queensland and other stakeholders agree on a consistent process for data collection, access and sharing, including how information can be accessed by landholders.

9. The one inclusive name used to cover property planning and management activities be 'property-level management systems' (PLMS) to minimise confusion, and a standard set of agreed terms related to PLMS be used, initially based on Appendix 1 of this report.

10. Guidelines be developed for use by landholders and providers of PLMS services so that providers can state how their services align with regional NRM body, industry and legislative requirements. This will minimise confusion and false expectations. The development could be led by regional NRM bodies in collaboration with the other parties including providers.

11. Some common agreed standard for describing recommended practice options be determined to allow ease of consideration and reporting across industry, mixed commodity enterprises and catchments.

12. The risk management approach be clarified. In the strict sense of the Australian Standard AS/NZS 4360:2004, risk management is considered directly applicable to any change that affects the objectives, not just negative change. Proactive management within an adaptive management cycle that accounts for both capturing opportunities and managing risk is a more acceptable alternative that needs further development. Also, the coincidence of multiple risks is not well treated in current risk assessment approaches.

13. Several modules that are currently not well developed such as biodiversity, ecosystem productivity and services, profitability, floodplain management, roads and stock routes, revegetation and fire and wildlife management, could be considered as generic modules created jointly with potential for adaptation for each industry sector or climatic region as appropriate.

11. Acknowledgments

12. References

Alario, M. and Bŗn, M. (2001) ëUncertainty and controversy in the science and ethics of environmental policy makingí, *Theory and Science* vol. 2,1, viewed 15 March 2005, <http://theoryandscience.icaap.org/content/vol002.001/02alariobrun.html>.

Alcamo, Joseph *et al*. (2003) *Ecosystems and human well-being: a framework for assessment*, Millennium Ecosystem Assessment, Island Press, Washington, viewed 16 March 2005, <http://www.millenniumassessment.org/en/Products.EHWB.aspx>.

Australian Cotton Industry (2004) *Best management practices manual*, second edition, including updates to September 2004, Cotton Australia, Surry Hills, NSW.

Azzopardi, M. (2001) *COMPASS: a self-assessment workbook*, Bureau of sugar Experiment Stations, Indooroopilly, Queensland.

Caltabiano, Tony (2003) *Property resource management planning: guidelines for landholders*, QNRM03093, Department of Natural Resources and Mines, Brisbane.

Caltabiano, Tony (2005) *Manual for preparing a property resource management plan*, draft March 2005, Department of Natural Resources and Mines, Brisbane.

Canada Forest Services (2000) *An introductory guide to adaptive management*, Forest Practices Branch, CFS, viewed 14 June 2002, <http://www.for.gov.bc.ca/hfp/amhome/INTROGD/preface.htm>.

Chambers, Robert & Conway, Gordon (1991) *Sustainable rural livelihoods: practical concepts for the 21st century*, discussion paper 296, Institute of Development Studies, Sussex, United Kingdom, viewed 16 March 2005, <http://www.livelihoods.org/static/rchambers_NN13.html>.

Clifton, Craig, McGregor, Camille, Standen, Roger & Fritsch, Simon (2004) *Current recommended practice: a directory for broadacre dryland agriculture*, Murray Darling Basin Commission, Canberra Publication 01/04.

Commonwealth of Australia (1995) *Managing for the future: report to the Land Management Task Force*, Commonwealth of Australia, Canberra.

Crawford, Peter (ed.) (2003) *The Australian EMS manual: a guide to developing and implementing a catchment-linked EMS for Australian land managers*, first edition, Greenridge Press, Toowoomba.

ESD (Ecologically Sustainable Development) Steering Committee (1992) *National strategy for ecologically sustainable development*, viewed 14 June 2002, <http://www.deh.gov.au/esd/national/nsesd/strategy/index.html>.

FAO (Food and Agriculture Organisation) (no date) *Sustainable livelihoods*, Sustainable Development Department, FAO, viewed 16 March 2005, <http://www.fao.org/sd/PE4_en.htm>.

Farrington, John, Ramasut, Tamsin & Walker, Julian (2002) *Sustainable livelihoods approaches in urban areas: general lessons with illustrations from Indian cases*, working paper 162, Overseas Development Institute, London.

Friedmann, J. (1987) *Planning in the public domain: from knowledge to action*, Princeton University Press, Princeton, New Jersey, cited in Randolph 2004.

Frost, F.M. (2000) ìValue orientations: impact and implications in the extension of complex farming systemsí, *Australian Journal of Experimental Agriculture*, vol. 40, pp. 511ñ17.

Goldies, Jenny, Douglas, Bob & Furnass, Bryan (2005) *In search of sustainability*, CSIRO Publishing, Collingwood.

Hagmann, J.R., Chuma, E., Murwira, K., Connolly, M. & Ficarelli, P. (2002) ìSuccess factors in integrated natural resource management R&D: lessons from practiceí, *Conservation Ecology*, vol. 5, p. 29, viewed 16 March 2005, <http://www.consecol.org/vol5/iss2/art29/>.

Hussein, Karim (2002) *Livelihoods approaches compared: A multi-agency review of current practice*, UK Department of International Development, Overseas Development Institute, viewed 16 March 2005, <http://www.livelihoods.org/info/docs/LAC.pdf>.

Lane, Bernard (2005) ìMBAs lack in sustainabilityí, *The Australian*, 29 June 2005, page 32.

Lumley, Sarah & Armstrong, Patrick (2004) ìSome of the nineteenth century origins of the sustainability conceptí, *Environment, Development and Sustainability*, vol. 6, pp. 367ñ8.

Maroochy Landcare Group (2005) LandPlus! program, version 2.1, available through NRMSEQ, Brisbane.

Meadows, Donella H. (1999) ìChicken Little, Cassandra and the real wolf ñ So many ways to think about the futureí, *Whole Earth*, vol. 96, pp. 106ñ11.

MLA (Meat and Livestock Australia) (2003) *Grazing land management*, Burdekin workshop notes, Meat and Livestock Australia.

NFF (National Farmersí Federation) (1999) *Taking control: farmers talk about property management planning*, edited Mark Grimson, NFF Barton, ACT.

NR&M (Department of Natural Resources & Mines) (2004a) *Guidelines for land and water management plans: State guidelines*, draft, November 2004, QNRM04279, NR&M, Brisbane.

NR&M (Department of Natural Resources & Mines) (2004b) *Property pest management planning: A kit to assist in the management of weeds, animals and plague pests at the property level*, draft, November 2004, NR&M, Brisbane.

NR&M (Department of Natural Resources & Mines) (2005a) *Land and water management plan workbook*, viewed 16 November 2005, <www.nrm.qld.gov.au/land/management/pdf/lwmp_workbook.pdf>.

NR&M (Department of Natural Resources & Mines) (2005b) *Guidelines for land and water management plans: State guidelines*, QNRM05285, viewed 16 November 2005, <http://www.nrm.qld.gov.au/land/management/lwmp.html>.

QDFO (Queensland Dairy Farmersí Organisation) (2005) *Dairying better ñ better for tomorrow: a program and package of tools*, available through Queensland Dairy Farmersí Organisation, Brisbane.

QDPI (Queensland Department of Primary Industries) (1997) *Future*profit *planning for your business*, facilitatorís handbook, QDPI, Brisbane.

QFF (Queensland Farmersí Federation) (2005a) *Draft farm management systems framework*, FMS01, March 2005, QFF, Brisbane, viewed 1 July 2005, <http://www.qff.org.au>.

QFF (Queensland Farmersí Federation) (2005b) *Farm management systems programs: draft guide to the common elements*, FMS02, March 2005, QFF, Brisbane, viewed 1 July 2005, <http://www.qff.org.au>.

QFVG (Queensland Fruit and Vegetable Growers) (1998) *Farmcare: cultivating a better future ñ code of practice for sustainable fruit and vegetable production in Queensland*, QFVG (now Growcom), Brisbane.

QRAA (Queensland Rural Adjustment Authority) (2004) *Property management plan outline: business planning guide*, QRAA, Brisbane, viewed 10 October 2005, <http://www.qraa.qld.gov.au/newsitem.jsp?product=364andnews=270>.

Randolph, John 2004, *Environmental land use planning and management*, Ireland Press, Washington.

Robinson, Brett, Freebairn, David, Bell, Kerry & Huda, Samsul (2003) ëFarmersí goals and values are knowable, but not simple. And why farmers and researchers are like the odd coupleí, *Proceedings of the 11th Australian agronomy conference: ëSolutions for a better environmentí*, Australian Society of Agronomy, the Regional Institute Limited, viewed 16 March 2005, <http://www.regional.org.au/au/asa/2003/c/19/robinson.htm#TopOfPage>.

Shaw, Roger, Fearon, Rob, MacKenzie, Rachel, Bent, Michael, Bill, Sarah, Rodgers, Claire & Dawson, Diana (2005) ëUsing sustainable property-level management systemsí, *Proceedings of the ninth national conference SEGRA 2005: ëSustainable economic growth for regional Australiaí*, 5ñ7 September 2005, Management Solutions Qld, Brisbane.

Shaw, Roger, Fearon, Rob, Mackenzie, Rachel, Bent, Michael, Bill, Sarah, Capelin, Mick & Rodgers, Claire (2005b) *A common framework for property-level planning and management systems: A road map of requirements, resources and tools*, final report (this report), <http://www.coastal.crc.org.au/plms/index.html>.

Standards Australia (2004a), *Risk management*, AS/NZS 4360.2004, Standards Australia International Ltd, Sydney.

Standards Australia (2004b) *HB436 risk management guidelines ñ companion to AS/NZS 4360.2004*, Standards Australia International Ltd, Sydney.

Stewart, Leath (2000) *Evaluation of Future*profit *performance and outcomes 1996ñ2000*, QI 00084, Department of Primary Industries Queensland, Brisbane.

Tansley, A.G. (1935) ëThe use and abuse of vegetational concepts and termsí, *Ecology*, vol. 16, pp. 284ñ307.

Tilbury, D., Crawley, C. & Berry, F. (2005) *Education about and for sustainability in Australian business schools*, report prepared by the Australian Research Institute in Education for Sustainability (ARIES) and Arup Sustainability for the Australian Government Department of the Environment and Heritage, viewed 29 June 2005, <http://www.aries.mq.edu.au/pdf/MBA_Report.pdf>.

Tinning, Gavin & Carruthurs, Genevieve (2002) *Environmental self assessment guide for grain farms in the northern grain region*, NSW Agriculture, Sydney.

UNDP (United Nations Development Program) (1999) ëGlobal programme on sustainable livelihoodsí, viewed 16 March 2005, <http://www.undp.org/sl/Documents/documents.htm>.

US Environmental Protection Agency (2004) ëAgricultural topicsí, National Agriculture Compliance Assistance Center, viewed 19 November 2004, <http://www.epa.gov/agriculture/topics.html>.

Worsley, Alison, & Gardner, Mark (2000) *Rural benchmarking programs ñ a review*, RIRDC short report no. 74, 16 pp., Rural Industries Research and Development Corporation, Canberra.

Appendix 1.   Terminology

Some terms used in the framework have a variety of uses. Their meanings for the framework are outlined below. Where alternative definitions are available, only a preferred definition is given. A list of acronyms used is also given.

Acronyms

ACH	*Aboriginal Cultural Heritage Act 2003*
BMP	Best management practice (see definitions)
CHMP	Cultural heritage management plan
DPIF	Queensland Department of Primary Industries and Fisheries
EIS	Environmental impact statement
EMS	Environmental management system (see definitions)
ESD	Ecologically sustainable development (see definitions)
FMS	Farm management system (see definitions)
IPA	*Integrated Planning Act 1997*
ISO	International Standards Organisation
ITAA	*Income Tax Assessments Acts 1936 and 1997*
LMP	Land management plan
LWMP	Land and water management plan
MAT	Management action target
NRM	Natural resource management
NRMW	Department of Natural Resources, Mines and Water (previously NR&M)
NR&M	Department of Natural Resources and Mines
PLMS	Property-level management system (see definitions)
PMP	Property management plan (see definitions)
PVMP	Property vegetation management plan
QRAA	Queensland Rural Adjustment Authority
RE	Regional ecosystems
ROP	Resource operations plan
RPO	Recommended practice option (see definitions)
RRA	*Rural and Regional Adjustment Act 1994*
SCA	*Soil Conservation Act 1986*
SWOT	Strengths, weaknesses, opportunities and threats analysis
VMA	*Vegetation Management Act 1999*

Definitions

Adaptive managementó A systematic process for continually improving management policies and practices by learning from the outcomes of operational programs (modified from Canada Forest Service, <http://www.for.gov.bc.ca/hfp/amhome/introgd/intro.htm> Adaptive management has been widely used and documented. It involves synthesising existing knowledge, exploring alternative scenarios and making forecasts about outcomes, implementing plans and monitoring and reviewing progress.

Benchmarkingó The practice of comparing the performance of an enterprise in a variety of different management and production fields with that of other enterprises (modified from Macquarie Dictionary, revised third edition). A definition and goal for benchmarking programs across Australiaís rural industries was recommended by Worsley and Gardner (2000) as ìA process of effective decision-making that results in continuous improvement of management ëpracticesí and operating ëprocessesí within the businessî. The authors identified 66 benchmarking programs across Australian rural industries but noted a deficiency in interpretation and decision-making on the results of the benchmarking.

Best management practiceó A practice that, while not required by a regulation, order, rule or other requirement, has been defined by industry or adopted as a better-than-normal way an operation or business would be performed or managed (modified from <www.llnl.gov/es_and_h/hsm/doc_5.01/doc5-01.html>). See ërecommended practice optioní as a preferred term.

Biodiversityó The variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within and among species and diversity within and among ecosystems (Millennium Ecosystem Assessment definition, see Alcamo *et al*. 2003).

Business activityó A group of activities or processes undertaken by an organisation to produce a product and/or service and/or in pursuit of a common goal (<www.thebci.org/Glossary.pdf>).

A **code of practice**ó presents a consistent set of operational standards or collection of rules or procedures to enable an industry to develop in an economically and environmentally sustainable manner (modified from DPIF, <http://www2.dpi.qld.gov.au/environment/1235.html>).

Codes of practice may be developed and authorised to deal with a general duty of care under given legislation such as the ëgeneral environmental dutyí under the *Environmental Protection Act 1994*. Compliance with these codes is not mandatory but under a legal challenge, a person could use as a defence, a demonstration that all reasonable care and practicable measures have been taken to prevent or minimise harm. The courts may use an established code of practice as a measure for assessment.

Continuous improvementó The ongoing improvement of processes, products, programs and services through incremental (progressive small steps) and breakthrough (giant step) actions (<www.altekcompany.com/electronics/commitment/practices.html>)

Duty of careó ìThe legal obligation to avoid causing harm to another person, especially through negligence, which only arises where it is reasonably foreseeable that in a particular situation other person would be harmed by oneís action unless one exercises reasonable care. It is one of the elements in the tort of negligence. A person who breaches a duty of care owed to another will be liable to pay damages if the other person is injured as a result of the breachî (<www.csu.edu.au/faculty/arts/humss/artslaw/gloss1.htm>).

An environmental duty of care is probably more complicated and is in a state of flux due to changing expectations of society. Duties in relation to property can take several forms. The common law establishes a duty to take reasonable steps to avoid causing foreseeable harm to another personís property or their use and enjoyment of that property. Many common law duties with regard to land have now been embodied in or overtaken by statutory obligations.

Accepting the concept of duty of care means proactively advising where duty of care or compliance is unlikely to be met and the contributing circumstances. In some courts in the United States (and also in Australia), an additional obligation has been added for companies and company directors called a 'duty of good faith'. This requires directors to 'inform themselves, prior to making a decision, of all material information reasonably available to them' and to 'act with requisite care in the discharge of their duties' (<http://articles.corporate.findlaw.com/articles/file/0070/009201>).

Ecological integrity— A concept that expresses the degree to which the physical, chemical and biological components (including composition, structure and process) of an ecosystem and their relationships are present, functioning and capable of self-renewal (<http://science.nature.nps.gov/im/monitor/Glossary.cfm>).

Ecologically sustainable development— 'Using, conserving and enhancing the community's resources so that ecological processes on which life depends are maintained and the total quality of life, now and in the future, can be increased' (ESD Steering Committee 1992).

Ecosystem— A dynamic complex of plant, animal, and micro-organism communities and the non-living environment interacting as a functional unit. (Millennium Ecological Assessment, see Alcamo *et al.* 2003). 'The concept of ecosystem first introduced by Tansley (1935) refers to specific holistic and integrative systems embodying a dynamic equilibrium maintained among organisms and the physical environment' (Alario & Bŗn 2001).

Ecosystem approach— A strategy for the integrated management of land, water, vegetation and other resources that promotes conservation and sustainable use in an equitable way. An ecosystem approach is based on the application of appropriate scientific methodologies on levels of biological organisation, which encompass the essential structure, functions and interactions among organisms and their environment. It recognises that humans, with their cultural diversity, are an integral component of many ecosystems (Millennium Ecological Assessment definition, see Alcamo, *et al.* 2003).

Ecosystem assessment— A social process through which the findings of science concerning causes of ecosystem change, their consequences for human well-being, and policy options are brought to bear on the needs of decision-makers (Millennium Ecological Assessment definition, see Alcamo *et al*. 2003).

Ecosystem management— 'Ecosystem management and watershed management have emerged as holistic approaches to integrate the wide range of objectives and perspectives in environmental land planning and management. These two approaches share some common themes. They both aim to:
- integrate science and politics
- consider variable scales, telescoping into larger landscapes and zooming in to smaller sites
- have a long-term time perspective in terms of both process and outcomes
- be scientifically based, using both initial 'best science' assessment and long-term scientific learning
- focus on ecological integrity and incorporate social and economic objectives
- consider a wide range of regulatory and non-regulatory solutions and integrate them into a comprehensive strategy
- engage stakeholders to tap scientific and local knowledge, perceptions and values
- use monitoring and adaptive management to learn from implementation and fine tune strategies.'

'Ecosystem management is an integrative, interdisciplinary, adaptive and collaborative approach to policy making, planning and management, grounded in the best scientific information available, recognising uncertainties and the understanding that human activity and ecosystems are inextricably linked. The goal of ecosystem management is to sustain and/or restore ecosystem integrity and biological diversity at all spatial and temporal scales through scientific understanding and collaborative decision-making' (Randolph 2004, pages 244ñ246).

Environmentó The complex set of physical, geographic, biological, social, cultural and political conditions that surround an individual or organism and that ultimately determine its form and the nature of its survival (<www.worldbank.org/html/schools/glossary.htm>).

Environmental management system (EMS)ó A system designed to integrate management of environmental issues with the companyís other management functions (<english.forestindustries.fi/glossary/E.html>).

Farm Management System (FMS)ó A voluntary, systematic approach that can be used by producers to identify and manage risks that may occur as a result of their farming operation. FMS aims to achieve continuous improvement by focussing attention on implementing recommended practices then reviewing progress made against set targets. FMS can help draw diverse on-farm management issues together under a common flexible ësystemsí approach (taken from the draft ëProgressing sustainable agriculture farm management systems framework for Queenslandís intensive agricultural industriesí, see QFF 2005a).

Frameworkó A construct that provides a representation of the linkages of various components in a system and their interactions. It describes the concepts, principles and important steps and options to arrive at an integrated management plan.

Goalsó General statements of anticipated project outcomes; usually more global in scope than objectives and not expected to be measurable; if used, goals should be supported by well-stated, measurable objectives (<www.unlv.edu/depts/cas/glossary.htm>).

Governanceó comprises the traditions, institutions and processes that determine how power is exercised, how citizens are given a voice and how decisions are made on issues of public concern (<http://www.phac-aspc.gc.ca/vs-sb/glossary_e.html>).

The concept originally was used by specialists in medieval English society, which was characterised by cooperation between the different sources of power (church, nobility, merchants, peasants etc.). At the heart of discussions about governance are terms such as responsibility, information, transparency and the rule of law. Governance does not refer to political power in the strict sense. It is not the art of administration at a given level of power, but the art of coordinating administration between different levels (<www.solagral.org/publications/pedago/mondialisation_1999/version_gb/glossary.htm>).

Holisticó Looking at the whole system rather than just concentrating on individual components. The overall sum can be greater than a simple totalling of the individual parts, because the ësystemí adds something in addition. Another term with a similar meaning is ësystems thinkingí (<ag.arizona.edu/futures/home/glossary.html>).

Integratedó United into a larger unit; brought together to form a satisfactory and working whole (<www.projectauditors.com/Dictionary/I.html>).

Landscapeó An area of land of sufficient scale where basic ecological functions, biodiversity and human cultural values are sustainably derived from the interaction of people and nature.

Operational planning (setting management actions and activities)ó The activities or actions that give effect to predetermined strategic and tactical directions. It includes the process of setting work or enterprise standards and the resource allocation and schedules necessary to implement the objectives and meet accreditation or compliance requirements. Monitoring to assess progress towards achievement of the objectives is also included (modified from <http://highered.mcgraw-hill.com/sites/0070894345/student_view0/chapter8/key_terms___glossary.html>).

Objectivesó Statements of specific, measurable steps toward attaining a goal. Objectives permit appraisal of progress toward achieving that goal (<www.srtc.org/glossary.htm>).

Outcomesó The results, benefits, impacts or consequences of actions by an organisation, usually expressed as the ones the organisation wishes to achieve (modified from <http://www.aph.gov.au/DPS/publications/anrep2005/Glossary.pdf>).

Planningó ìÖ Is figuring out what needs to be done and how to do ití. It is the process of ìapplying knowledge to actioní or basic problem-solving. It requires determining ìends and meansí relationshipsî (Friedmann 1987). Simply, planning involves setting objectives, gathering and analysing information and formulating and evaluating alternative policies, projects or designs to meet the objectives (Randolph 2004).

Proactive managementó Acting in anticipation of future problems, needs or changes (<www.projectauditors.com/Dictionary/P.html>).

Property-level management system (PLMS)ó A term that encompasses the activities of property-level planning, implementation, ongoing management, monitoring and review of implementation and outcomes. The preferred term to be used, to minimise confusion and facilitate shared understanding.

Property management planningó ìA whole systems approach to planning and management needs to be accepted as best practice in Australian agriculture and should be applied universally in the design of workshops, other learning activities for producers and in the communication of the approach to and among producersî (Commonwealth of Australia 1995).

The federal report on ìManaging for the Futureí went on to define the *process* of property management planning as: ìan ongoing process for the total management of a farm business which assists producers to improve their profitability and achieve more sustainable natural resource use. It is regarded as a whole systems process whereby producers identify their personal objectives in the context of broader community aspirations. Then, by applying skills in business management, quality assurance, risk management, natural resource management including nature conservation, financial planning and control, marketing management, agricultural technology management and personal and staff management, they develop plans to fulfil those objectivesÖ The outcome of the property management planning process is not a static plan, but an integrated and ongoing approach for managing the business in the short, medium and long terms to achieve personal objectivesî (Commonwealth of Australia 1995).

Property management plan (PMP)ó A voluntary plan for a property that is developed and used by producers to assist in enhancing the profitability, environmental integrity and quality of life for the enterprise and those involved in it. The plan is flexible and adaptable as new knowledge is obtained and responsive to monitoring and external markets and forces.

The plan is a reference document that outlines a range of options considered for a property and the impacts on the viability of the property and the local and regional areas. The plan will demonstrate clearly to the enterprise, regulators and others:

- What the owners and managers are trying to achieve and how they are going about it
- A process of setting personal and farm business goals, and then reviewing them in relation to existing resources and developing plans for the future
- Compliance with necessary regulations, strategies, policies and codes of practice and quality assurance measures that recommended practice is being implemented
- Monitoring results to demonstrate how well the plan is progressing
- Revising the plan, adjusting directions and management on the basis of new information and changed circumstancesó the cyclical nature of good planning (NFF 1999).

Property resource management plan (PRMP)ó That component of a property-level plan which deals with natural resource management. It can be undertaken on its own, or in conjunction with other components of property-level planning (Caltabiano 2003).

Property rightsó An institution that gives someone possession rights to use things and to prevent others from using them; includes private, collective, common, public and state property rights (*Millennium Ecological Assessment definition, see Alcamo *et al.* 2003).

Recommended Practice Option (RPO)– A term that equates broadly to the commonly used BMP (best management practice). The use of 'recommended' is strongly proposed because so many of our past practices are transitory and have turned out to be less desirable based on further research and experiential knowledge so that 'best' is not timelessly appropriate. BMPs will also change with regional landscapes, external requirements and with lifestyle, industry, technology and market developments. 'Options' is incorporated because the spatial and regional nature of natural resources and climates means there will never be one recommended practice but rather a range of recommended practice options. This follows the broad direction in the Murray Darling Basin Commission's Landmark project (Clifton *et al.* 2004). 'Options' is also used because the real measure is not the adoption of an input such as a practice but how well a practice meets a goal, target or an outcome. There needs to be flexibility to combine or modify practices to achieve the required goals.

Resilience– The capacity of an ecosystem (social, economic and environmental aspects) to tolerate disturbance without collapsing into a less desirable state. A resilient ecosystem can withstand shocks and rebuild itself. Resilience in social and economic systems includes the capacity of humans to anticipate and plan for the future.

Risk– The potential harm that may arise from some present process or from some future event. It is often mapped to the probability of some event which is seen as undesirable. Usually the probability of that event and some assessment of its expected harm must be combined into a believable scenario (an outcome) which combines the set of risk, regret and reward probabilities into an expected value for that outcome. There are many informal methods which are used to assess (or to 'measure' although it is not usually possible to directly measure) risk and (for some applications) there are also formal methods such as 'value at risk' (from Wikipedia, <http://en.wikipedia.org/wiki/Risk>). This is the preferred definition as used in this document.

Standards Australia, in AS/NZS 4360.2004, defines risk as "the chance of something happening that will have an impact on objectives" and offers the following notes on the definition:
- A risk is often specified in terms of an event or circumstance and the consequences that might flow from it.
- Risk is measured in terms of a combination of the consequences of an event and their likelihood.
- Risk may have a positive or negative effect (Standards Australia 2004a).

Risk management– The culture, processes and structures that are directed towards realising potential opportunities while managing adverse effects (Standards Australia 2004b).

Risk management process– The systematic application of management policies, procedures and practices to the tasks of communicating, establishing the context, identifying, analysing, evaluating, treating, monitoring and reviewing risk (Standards Australia 2004b).

Stewardship– The concept of responsible caretaking; based on the premise that we do not own resources, but are managers and are responsible to future generations for their condition (modified from <www.jcpsky.net/Departments/EnvironmentalEd/blackacre/glossary.html>).

Strategic planning (setting directions)– The process by which an organisation envisions its future and develops strategies, goals, objectives and priorities to achieve that future (modified from <http://www.asq.org/glossary/s.html>).

Strategic planning requires broadscale information-gathering, an exploration of alternatives and an emphasis on the future implications of present decisions. It can facilitate communication and participation, accommodate divergent interests and values and foster orderly decision-making and successful implementation (<mapp.naccho.org/MAPP_Glossary.asp>).

Sustainable livelihoods— ìConsist of the capabilities, assets— both material and social resources— and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, and provide net benefits to other livelihoods locally and more widely, both now and in the future, while not undermining the natural resource baseî (FAO Sustainable Development dimensions,(www.fao.org/sd/pe4_en.htm) based on Chambers & Conway 1991).

Sustainability— A characteristic or state where the needs of the present and local population can be met without compromising the ability of future generations or populations in other locations to meet their needs (Millennium Ecological Assessment definition, see Alcamo *et al.* 2003).

System— A group of independent but interrelated elements comprising a unified whole (<www.cogsci.princeton.edu/cgi-bin/webwn>).

Systems approach— A logical process for effectively and efficiently planning which considers all elements of a system (<www.adtdl.army.mil/cgi-bin/atdl.dll/tc/25-10/Gloss.htm>).

Tactical planning (setting targets)— The process of developing detailed, short-term decisions about what is to be done, who is to do it and how it is to be done with available resources (modified from <highered.mcgraw-hill.com/sites/0070894345/student_view0/chapter8/key_terms___glossary.html>).