

Business Concept Case: Selection Criterion 1

“The outcomes will contribute substantially to Australia’s industrial, commercial and economic growth.”

1. Present your business concept case in relation to the selection criterion in no more than 3 pages, including the tabulated descriptive information (parts 2 and 3). New from existing applicants should complete part 4 in no more than one additional page. Guidance notes are at paragraph 3.2.2 of the guidelines.

1.1 Industry Opportunities and Needs

The Future Farm Industries CRC is a unique co-investment between the three major Australian agricultural R&D investors, the largest agribusiness company, and the combined research power of six State agencies, five CSIRO Divisions and four universities. This partnership will transform dryland agriculture in southern Australia through innovative research, education and commercialisation; delivering at least \$1.1 billion of added value through agricultural productivity growth and new industries. It signals a new era in the major broad-acre industries cooperating with science to achieve common goals.

The key to the new CRC’s goal of industry transformation is Profitable Perennials™, the application of perennial plant technologies:

- **To intensification and productivity growth in existing industries through the development and adoption of innovative new farming systems; and**
- **To new regional industries through development of and investment in woody crop production on farms.**

Australia’s \$27 billion agricultural industry must go through another period of rapid productivity growth through innovation and intensification to remain internationally competitive. The Productivity Commission¹ valued the contribution of productivity growth to the performance of Australia’s agriculture sector at an additional \$170 billion over 30 years to 2003-04. It identified intensification as an important strategy for farmers to improve productivity. It also analysed the dual nature of the farm economy – the largest 30% of farms growing on par with the rest of the economy and 70% lagging behind and adjusting where they can through dependence on off-farm income. The CRC will give profitable farmers the opportunity for better returns, while new economic opportunities are created for the remaining farmers.

At the same time, natural resource degradation is a significant cost to the agricultural industry, and consumer responses to off-farm adverse environmental impacts threaten its market share. For dryland salinity in Western Australia, in 2006 the estimated price for protecting a high priority subset of natural resource assets is \$950 million over 30 years; the additional costs of maintaining at-risk road and rail is \$2.1 billion over 30 years and the cost to agricultural land will rise from \$35 million per year to between \$170 and \$260 million per year². For the Murray-Darling Basin the salinity costs to water, infrastructure and land are \$305 million per year³.

The investment of Meat & Livestock Australia (MLA), the Grains Research and Development Corporation (GRDC) and Australian Wool Innovation Ltd (AWI) will take the CRC in a new direction for natural resource management – substantial profitability and productivity growth creating more commercial and more sustainable business opportunities, and through this achieving salinity management, improved water quality, biodiversity conservation and long term sustainability. The R&D corporations will use their CRC participation to meet the recent Australian Government directive to work collaboratively on natural resource management. Key government agencies across southern Australia expect this CRC to create more profitable and resilient land uses with measured and assured outcomes for conservation of natural resources, and for these land uses to be adoptable at large scale.

Industry and R&D providers share with the new CRC a priority for innovation in education and training to build better capacity in the commercial and extension services. Recent studies have identified a looming shortage of scientists in agriculture⁴, declining State agency extension staff and a high turnover in extension professionals generally⁵. New organisations such as catchment management authorities and producer networks are more prominent in knowledge generation and distribution. This CRC will improve the effectiveness of paths to adoption in agriculture and natural resource management.

1.2 Expected Key Outcomes

The expected key outcomes of the Future Farm Industries CRC are defined in section 2.

¹ Productivity Commission 2005, *Trends in Australian Agriculture*, Research Paper, Canberra.

² Sparks T, George R, Wallace K, Pannell D, Burnside D and Stelfox L 2006, *Salinity Investment Framework Phase II*, Western Australia, Department of Environment, Report No. SLUI34.

³ Wilson SM 2004, *Determining the Full Costs of Dryland Salinity Across the Murray Darling Basin*, Final Report to The Murray Darling Basin Commission, Canberra.

⁴ Productivity Commission 2005, as above.

⁵ Roberts K, Paine M, Nettle R and Ho E 2005, *Mapping Rural Industry Service Providers*, Cooperative Venture for Capacity Building, RIRDC, Canberra.

1.3 Contribution to Industrial, Commercial and Economic Growth

The estimated **\$1.1 billion** net present value to be generated by the Future Farm Industries CRC⁶ is additional to the benefits of the existing CRC Salinity and is made up of:

- **\$470 million** net present value derived from productivity growth in existing farm industries and from additional returns to off-farm investors in new processes and services, such as wood processing. The new CRC is estimated to increase or accelerate the adoption of new perennial plant-based farming systems on 7.4 million hectares (m ha) of agricultural land. This is 12% of the 60 m ha sown to crops and pastures in the target zone of the CRC.
- **\$310 million** net present value from the commercial gains due to salinity containment. It is assumed conservatively that 1.6 m ha of agricultural land will have the onset of salinity delayed or prevented, which is 25-30% of the likely salt-affected area under a 'business as usual' scenario.
- **\$320 million** net present value from better informed policy and investment of public funds. Work of the CRC with governments, catchment management organisations and regional natural resource management groups will bring up-to-date science and decision tools to better targeting and adoption of land use options, to achieve greater efficiency of investment of public and private funds.

These estimates have been conducted according to the principles in Schedule F of the Selection Round Guidelines. Sensitivity analyses based on different assumptions for adoption and on different discount rates are reported in Selection Criterion 4.

The new CRC focuses its outcomes explicitly on the CRC Programme objective of industrial, commercial and economic growth ("ICE"):

- Industrial growth
 - Growth in the meat, grains and wool industries, across southern temperate Australia driven by greater productivity and profitability. For example, each percentage point increase in pasture utilisation, a key focus of the CRC, generates \$90 m net return to the sheep industry⁷. This benefit will be realised in the medium to long term, starting within the life of the new CRC.
 - Establishing the new woody biomass base for regional manufacturing and processing industries. The global demand for engineered wood products, a target market for the new CRC, has grown 7% per annum since 1995⁸. Woody biomass grown on wheatbelt farms can be landed at regional sites at a price highly competitive with conventional sources of feedstock for engineered wood products⁹. This benefit will begin in the short term with value added in the long term, beyond the life of the CRC.
- Commercial growth
 - Business growth, particularly in the agricultural service industries, coming from demands associated with productivity growth. Every \$100 of farm activity draws on \$19 of input services¹⁰. This input ratio is rising and the CRC's commercialisation activities will add to it.
 - New enterprises around new commercial products, and export of technologies and services. This benefit will occur in the short to medium term, within the CRC's life.
- Economic growth
 - Added growth to the Australian economy and its exports based on the industrial and commercial growth described above. This benefit will occur from the short to the long term, within and beyond the life of the CRC.

1.4 Impact of the Outcomes for End-users

Targeted outcomes will be realised through productivity growth in existing industries, profitable new industries and triple bottom line benefits:

1.4.1 Productivity growth in existing industries

- Meat/wool industry – The CRC will increase the productivity and range of livestock production through applying innovative grazing systems to a new perennial pasture and forage base. There is scope for significant improvement in plant production and water use, better adapted to a wider range of agro-ecological zones, through breeding, selection and management. There is the prospect of more stable production from native plants better adapted to climatic variability.
- Grain industry – The CRC will directly address a challenging sustainability issue – crop farmers continuing to be viable in the face of ever-declining terms of trade, salinity and other threats and the need for production systems to be better adapted to soil and climatic constraints. Productivity of mixed farms has increased more rapidly than for specialist cropping farms in recent years¹¹. This provides an opportunity to

⁶ Pannell D 2006, "Benefit-cost Analysis of Proposed CRC for Future Farm Industries", The University of Western Australia (under independent review by Allen Consulting Group).

⁷ Meat & Livestock Australia 2005, Strategic Plan, Sydney.

⁸ Davidson A and Hanna D 2004, *Engineered wood products: prospects for Australia*, ABARE e-Report 04.14, Canberra.

⁹ ENECON 2001, *Integrated tree processing of mallee eucalypts*, RIRDC publication 01/160, Canberra.

¹⁰ Productivity Commission 2005, as above.

¹¹ Australian Bureau of Agricultural and Resource Economics 2004, *Australian Sheep Industry Productivity*, Canberra.

diversify into more perennial-based farming systems and to optimise financial performance through rotations that are more resilient and use natural resources more efficiently.

1.4.2 Profitable new industries

- **Woody biomass industry** – The CRC will develop alternative supplies for panel board, charcoal, bio-energy and carbon sequestration. Some companies recognise the looming shortage of woody biomass from current sources and their participation in feasibility studies and business case development will determine the best opportunities. This longer term component of the CRC is higher risk but potentially very high payoff; scoping studies are already showing strong industry interest in project development. Success will mean new options for sustainability in farming and resource-based industries, regions and Australia's natural resource base.

1.4.3 Triple bottom line benefits

- **Better adapted land use changes** – The CRC will develop innovative farming systems and changes in land uses that are better adapted to subsoil constraints and climatic variability; do not significantly trade off other important values e.g. biodiversity and water resources; and minimise unintended outcomes particularly from new weeds and genetic pollution from introduced native species.
- **Reduced salinity damage** – The CRC will prevent future salinity in some areas and significantly delay its onset in others, through high water-using farming systems, salt-adapted grazing and cropping systems and integrated management of earth works.
- **Enhanced biodiversity** – By placing perennial systems on the farm, often with native species, the more diversified landscapes will provide additional habitat as well as other ecosystem process benefits. The CRC will quantify these to build a more robust approach to developing markets for ecosystem services. There is potential for a much better informed public policy outcome through this approach and application of the decision tools developed by the CRC.
- **Developing human resources** – The CRC will apply its education and training resources to early career development and new skills for professionals in agribusiness and service roles. The focus is building capacity for commercial growth of agribusiness, taking advantage of the strong relationship between productivity growth and demand for farm input services, and also to foster the next generation of professionals in the new CRC's partner organisations.

2 Outline the expected outcomes of the CRC in the table.

2.1 Productivity Growth in Existing Industries – Additional business and industry growth from higher annual rate of productivity improvement in meat, grain and wool industries – estimated at \$470 million net present value.

2.2 Profitable New Regional Industries – New on-farm and regional manufacturing, and sales and exports of services and technologies – estimated net present value is included in 'productivity of existing industries'.

2.3 Salinity Damage Reduced – Reduced impacts of dryland salinity on land, biodiversity, water resources and other community values – estimated at \$310 million net present value.

2.4 Other Environmental Benefits – Land use changes that contribute to ecosystem services including biodiversity conservation, water resources protection, and adaptability to subsoil constraints and climate variability.

2.5 Capacity Building – Improved capacity for research collaboration and service delivery in commercial and public sector agricultural and natural resource management organisations.

3. Outline any key contributions of the outcomes to specific National Research Priority Goals in the table.

| <i>National Research Priority Goal</i> | <i>Contribution</i> |
|--|--|
| 3.1.1 Transforming existing industries (Environmentally Sustainable Australia) | To achieve productivity and new industry outcomes through more profitable farming systems based on perennial plants, including new production from native plants, requires innovation, new investment and risk management. Enterprises in the existing agricultural industries will be more intensive and fundamentally different. New companies will enter agriculture and commercial service providers will gain new business opportunities. |
| 3.1.2 Promoting an innovation culture and economy (Frontier Technologies for Building and Transforming Australian Industries) | |
| 3.2 Other priority goals <ul style="list-style-type: none"> • Overcoming soil loss, salinity and acidity • Sustainable use of Australia's biodiversity • Water – a critical resource (Environmentally Sustainable Australia) | The proposed research will fully integrate with economic drivers for change with sustainability principles and a systems approach. New farming systems and industries will be developed and promoted for adoption where they meet standards for conservation of biodiversity, water and land elements of an environmentally sustainable Australia. |

'New from Existing' Applicants must complete this section in one page.

4. Provide a description of how, and to what extent, the outcomes are substantially different from, or additional to, those that the existing CRC should have achieved.

The vision of the Future Farm Industries CRC is:

Innovative farming systems delivering wealthy and diverse rural landscapes

Its core business is the integration and adoption of technologies into innovative farming systems and new enterprises, and their adoption to produce substantial additional contributions to economic, industrial and commercial growth. Through this added growth triple bottom line benefits will be achieved. The modelling done as part of the benefit-cost analysis for the CRC predicts how the new farming systems and industries benefits will build more quickly than the current focus on salinity containment. All perennial plant technologies, farming systems and potential industries will be assessed rigorously for their contribution to reduced salinity damage, enhanced biodiversity and better adaptation of land uses, to gain maximum value from this economic dividend for rural Australia.

In contrast, the CRC Salinity developed individual technologies and farming systems with the objective of containing and reducing salinity impacts. The new CRC provides the economic capacity to meet this objective.

The following example, for livestock production, illustrates this contrast and explains how creative thinking and experience gained within the existing CRC has informed the new CRC's vision for innovative farming systems.

The CRC Salinity showed that new perennial plant technologies and farming systems must be significantly more profitable with manageable risks, if farmers are to be attracted to adopt them. It has set a benchmark for the new CRC with a key project called *EverGraze (More livestock from perennial\$)* whose price/performance objective is set to produce a 50% increase in farm profit and 50% reduced leakage to groundwater, before investment in the R&D phase. Success with this farming system will demand a wide range of inputs and services, from improved livestock genetics to animal husbandry. Modelling will be extended to evaluate the effects of new systems on industry development, biodiversity conservation and water resource management. Farming systems will be developed that transform productivity and natural resources conservation rather than merely achieve incremental improvements.

The new CRC will build on the success of the existing CRC, such as recent developments of new technologies and farming systems that have reached the proof of concept stage. The participating industry R&D corporations have identified research projects they want to expand and develop for other production zones, including from *Enrich* (a potential new forage-based grazing system for drier rainfall zones). The new and different forage plants under consideration will be tested for nutritive value and presence of beneficial secondary compounds. The livestock management system will be innovative with implications for managerial input and commercial services.

The distinguishing characteristics of the Future Farm Industries CRC are:

- Mainstream business goals of the meat, grain and wool industries reflected in this new collaboration and increased investment.
- New farming systems and industries extended into new climatic and geographic zones.
- Development of solutions that integrate perennial plants with engineering works for direct intervention on salt-affected land or where land is at immediate risk.
- The new industry activity building on the interests of individual companies in forestry and in processing from woody biomass resource; a project-by-project test of the commercial opportunity, economic return and regional scale benefits.
- Biodiversity conservation, water resource protection and other ecosystem services arising from effective application of decision tools and risk management to the adoption of new systems of Profitable Perennials™.
- New social science skills used to strengthen industry adoption paths and consolidate the partnership with Landmark as a forerunner to involvement of other commercial partners in traditional public sector activity.
- Innovation in education and career development for postgraduates, providing new opportunities for universities, and a new role for training that builds commercial capacity to more effectively support agricultural innovation and industry growth.

Business Concept Case: Selection Criterion 2

“The path to adoption (commercialisation/utilisation) will achieve the identified outcomes.”

1. Present your business concept case in relation to the selection criterion in no more than 2 pages. Guidance notes are at paragraph 3.2.3 of the guidelines.

2.1 Potential End-users and Opportunities for the New CRC

The Future Farm Industries CRC will create opportunities for greater agribusiness income from technical advice, sales of inputs and commissions on throughput; greater consulting income from policy, planning and investment advice; and more capable staff receiving education and training. Specifically, both private and public sector organisations will be better geared to achieve their adoption objectives, through application of the CRC's social science outputs in education and training, and commercialisation and knowledge utilisation activities. The CRC will develop the technologies, farming systems and new industries and will work with its immediate participants to improve the effectiveness of their adoption.

Through a direct relationship with end-users, the CRC will pursue opportunities for a variety of paths to adoption through the following market segments:

- Established agribusiness and natural resource consulting companies wishing to grow their business and have more effective commercial relationships with farmers.
- Industry R&D corporations, farm productivity groups, and influential farmers seeking innovation and industry growth; through more effective knowledge exchange, communication, education and training, and client participation.
- Timber, manufacturing, resource processing and energy companies needing to diversify and develop new woody biomass resources. They will contribute their own technologies to joint projects with the new CRC and will evaluate prospects for farm-grown products (quality, supply and cost), and build confidence in production systems and logistics of supply.
- Catchment management organisations, natural resource management agencies and other regional bodies requiring knowledge, planning/decision tools, education and training to support regional strategies and plans to improve the effectiveness of their advisory, technical and facilitation services in times of change.

2.2 Strategies for Commercialisation/Utilisation

The CRC's strategy for commercialisation/utilisation builds on understanding the above markets with opportunities pursued through three types of partnerships. It is based on close consultation with industry and understanding the agricultural adoption process.

2.2.1 Commercialisation for private sector delivery – This involves commercialisation of new products and services for innovative farming systems through direct engagement of companies in agribusiness, natural resource consulting, and perhaps overseas development. There will be partnerships in development of technologies and farming systems packages for clients, based on licensed products.

Landmark is Australia's largest agribusiness company with 300 field agronomists backed by a range of commercial services that support increased rates of adoption of profitable farming systems. Landmark will convert knowledge generated by the CRC into saleable products that improve the profitability of farmer clients and the Company itself. There will be an immediate opportunity to develop and market test a perennial pasture/grazing system package whose elements include technical advice, product sales and finance.

Another commercial arrangement will be with individual companies investing directly in projects that develop new farm products and production systems that can supply a new woody biomass resource for manufacturing, metallurgy, and bio-energy processing or carbon sequestration. For example, Lignor Ltd has indicated its strong interest in a joint project to evaluate tree species, on-farm design, and forestry harvesting and handling systems for alternative supply of woody biomass to new stranded panel board production.

2.2.2 Improved delivery through partner organisations – Agreements with industry R&D corporations and extension services will improve paths to adoption through social research, program evaluation, technology and process development, and adaptive management. For example, MLA, AWI and GRDC want to strengthen their programs based on landholder participation in R&D, in demonstration of new technologies and in influencing landholders generally to adopt new farming systems. Likewise the CRC has a priority for more effective adoption strategies, and will apply its social and economic research expertise to testing new models for more effective delivery under these agreements. There will be opportunity for new roles in public sector organisations, particularly in education and training, and for new approaches to commercialisation and adoption on an industry-wide scale.

2.2.3 New knowledge partners – The CRC will have a third level of participation from associate members – the next generation of knowledge brokers from catchment management organisations, regional natural resource management bodies, farmer groups and leading farmers. Their members are highly educated with good training opportunities, experienced with new information technology, and familiar with commercial

services. For example, the North Central Catchment Management Authority (Victoria) and the South Coast Regional Initiative Planning Team (Western Australia) have joined the CRC Salinity to develop next generation decision investment tools for catchment management. Whereas the current generation of knowledge users is most familiar with industry consultative arrangements with R&D investors and providers, the new generation will be more effective through direct investment and participation in the conduct of research and utilisation activities. The new CRC will pilot and evaluate these arrangements, backed up by education and training.

Additional commercialisation/utilisation partners will be recruited in the lead up to the stage 2 application. This is a necessary and realistic additional strategy given the dynamic nature of the agricultural sector and the opportunities presented by perennial plant technologies. Specifically, there is a priority to recruit partners that express an interest in investing in projects, with exclusivity and non-disclosure arrangements as required. An additional income stream has been factored into planning the final business case, more fully described in Selection Criterion 4. There are strong signals for potential investment by a number of interested parties, which will be agreed by stage 2. The CRC's governance model will accommodate more partners joining at a later stage with engagement mechanisms to suit business needs.

These strategies are most appropriate because they are based on a thorough understanding of the diversity of agricultural end-users and the contemporary adoption process for agricultural and forestry industries, and farm production, drawing on the work of the Cooperative Venture for Capacity Building (CVCB).

2.3 Intellectual Property Management

The CRC Programme requires that all new CRCs have a *Commercialisation and Utilisation Plan* in place at the start of their operations. The Future Farm Industries' Plan will take two paths to realising benefits from effective intellectual property management:

- Working with private sector companies to develop trademarked, copyrighted or patented technologies and packages that will be licensed for commercialisation; and
- Working with public sector agencies to develop knowledge in the public domain for speedy adoption to improve the competitiveness of major Australian export industries.

Business Concept Case: Selection Criterion 3

“The collaboration has the capability to achieve the intended results.”

1. Present your business concept case in relation to the selection criterion in no more than 3 pages, including the tabulated descriptive information (parts 2, 3 and 4). New from existing applicants should complete parts 5 and 6 in one additional page. Guidance notes are at paragraph 3.2.4 of the guidelines.

In this CRC collaboration are the major industry investors (MLA, GRDC, AWI) across the mix of meat, grains and wool enterprises of any given farm. It enables them to integrate R&D and knowledge output for farm businesses and regions in line with a key recommendation in the recent Corish report¹². With both Landmark agronomists and government extension services collaborating, R&D will be conducted in partnership with services that make contact with nearly 100% of farmers, based on a study by CVCB¹³. It will evaluate where gaps in paths to adoption are occurring and develop more innovative paths for commercialisation through private sector practice supported by knowledge in the public domain.

Other commercial investors and end-users of new technologies (e.g. consulting companies) will commit to the collaboration. They will help to shape planning of the research activities down to project level in the lead up to stage 2.

The R&D providers committed to this proposal are the dominant players in agricultural and natural resources management research across southern Australia. Their personnel are the leaders in the key industry sectors relevant to the new CRC. The record of successful collaboration of many of the participants in the existing CRC Salinity is a good foundation.

The collaborative model for the new CRC is designed to deliver strong industry focus, emphasis on commercialisation, and the incorporated structure. The elements of this collaboration to achieve the CRC's objectives are:

- The research program structure, leadership and management will foster **active involvement of the major livestock, grains and forestry sectors** to focus research outputs on outcomes and maximise adoption rates. Industry R&D corporations and individual companies will be key stakeholders in these industry-oriented programs, and through their active participation will attract and benefit from research leaders of national and international reputation.
- **Innovative education and training, and commercialisation and adoption approaches** will call on the latest theories and practice to support improved adoption of new products and technologies. The new CRC has important social research and specialist skills that can be applied to continuous improvement of adoption pathways. Specific agreements to deliver expertise and services to private sector, industry and public sector participants will be in place.
- The successful node management arrangements of the existing CRC will be retained so that outputs can be **coordinated with regional delivery**. This will continue to provide more meaningful access to the regional and district knowledge brokers, including catchment management authorities, natural resource management boards and farmer groups.

2 Describe the proposed collaboration (including the track record of any previous collaborations) and list the key participants and their role(s) in the research; commercialisation; and education and training programmes.

The collaborative model will be formed under a research company limited by guarantee based on the CRC Association/Australian Institute of Commercialisation template to focus on effective commercialisation. A governing council will be formed to represent members' interests in the appointment of a skills-based board and determining the strategic plan for the company. There will be a chief executive officer, a chief scientist/research director and a chief operating officer/business manager. Four high level industry program managers will join a senior executive and be responsible for industry engagement, integrating output and achieving milestones. Governance arrangements will include a formal process for industry engagement in project development and management. This will be the foundation of a close, two-way link between industry and the conduct of R&D, education and training, and commercialisation and adoption.

This collaboration is built on the strengths of the key participants and their roles:

1. Major industry investors in R&D and paths to adoption – the livestock and grain industries participating through their R&D corporations, strategically investing in the new CRC.
2. Commercial investors and end-users of technologies and services – companies investing in R&D and commercialisation with specific end uses in mind, typically creating or expanding business opportunities.
3. R&D providers – major organisations including five CSIRO Divisions, universities, and State primary industry and natural resource agencies across southern temperate Australia.
4. Existing and emerging players in paths to adoption – private and public sector participants with substantial agribusiness and extension services in rural Australia, combined with new players in commercialisation

¹² Agriculture and Food Policy Reference Group 2006, *Creating Our Future*, Department of Agriculture, Fisheries and Forestry, Canberra.

¹³ Stone G 2005, *Agribusiness role in extension, education and training: a case study*, RIRDC publication 05/086, Canberra.

and adoption, such as catchment and regional natural resource management organisations, farm productivity groups, and leading farmers.

3 Describe the Research Programme.

The research program combines farming systems development with high probability outcomes with re-introduction of woody perennials as a resource for prospective new industries. The longer term threats and risks to agriculture and the associated environment justify inclusion of woody crop development as a higher reward/risk path to sustainability, in balance with the more assured 'future farm industries'.

The program is structured to produce outputs relevant to the needs of major industries (livestock production, cropping systems) and new industries (woody crops and products), while addressing salinity as a sustainability issue. It will include:

- four industry-oriented programs focused on the CRC's outcomes;
- two cross-cutting programs focused on necessary projects to deliver triple bottom line benefits through the industry programs; and
- three programs delivering commercialisation and adoption, education and training, and communication effectively.

The research program will challenge current thinking in farming systems development. Profitable Perennials™ offer a potential breakthrough in the intensification and adaptation of farm production and land use to Australian conditions. The scope of the R&D collaboration includes:

- systems thinking applied to the development of new perennial options and their assessment for profitability, water use, biodiversity and other environmental benefits;
- a wide range of relevant bio-physical and social science disciplines working to common industry outcomes;
- commercial participation and a strong market focus to R&D for potential products, services and industries;
- scaling up the evaluation of research outputs from farm level to outcomes for landscapes, regions and catchments;
- advancing the science of ecosystem services, biodiversity conservation and water resource management, through new modelling and measurement.

This scope of R&D means it intersects with and draws on other research programs, some with other CRCs. These intersections have been identified and consultations held. Effective relationship management is a priority for the new CRC.

Research projects will be developed in close consultation with industry, including the R&D corporations, to foster effective commercialisation and adoption of research outputs. Some new participants will bring expectations for participative research and action learning arrangements directly involving the ultimate end-users – farmers and other companies.

3.1 Describe the key research questions to be addressed by the CRC in the table.

3.1.1 Future Livestock Production

What new high performance livestock systems take full advantage of the perennial plant feed base, integrate well with specialist cropping farms, and are adapted to diverse regions and climate variability?

What new plant characteristics and management systems are required to deliver high livestock performance with natural resource management benefits?

3.1.2 Future Cropping Systems

What rotational systems add value to grain profitability and minimise off-farm impacts?

What is the commercial potential for new grain crops to overcome constraints to dryland production, including tolerance to waterlogging and salinity?

3.1.3 New Woody Crop Industries

What wood products, product combinations and integrated processing technologies have the best potential to support new commercially viable regional industries?

3.1.4 Farming Saline Landscapes

How can the adoption of profitable grazing systems on salt-affected land be maximised and in doing so:

- continuously improve net return and reliability?
- adapt to land classes of waterlogging and salinity?
- quantify the environmental benefits?

What is the commercial potential for these approaches, associated decision tools and technologies in the hands of commercial service providers here and overseas?

3.1.5 Biodiversity and Water

Does planting perennial vegetation in a mosaic of land uses enhance biodiversity and water quality, and mitigate threatening processes, while improving productivity and profitability? What is the scale and where in

the landscape do we operate?

3.1.6 Economic, Social and Policy Analysis

How can rates of adoption of innovative farming systems be maximised, given our knowledge of demographic change and of the diversity of economic and social drivers among landholders?

4 Describe the Education and Training Programme

The new CRC's Education and Training program is comprehensive and adapted to emerging industry needs. In summary it has the following elements:

- Training and capacity building: Training, action learning and possible accreditation for professional development in partner organisations and capacity building in wider client networks including leading farmers.
- Postgraduate education: Scholarships, relevant projects and professional development for postgraduate training at partner universities to produce industry-ready graduates.

The new CRC's planning of education and training recognises that agriculture is in a period of change with government agency provision of services declining while private, regional and community sectors are expanding. It will extend the CRC Salinity's highly successful postgraduate and professional development program to career development of younger professionals with partner organisations. The emerging market for commercial products and services will guide training and field experience for Landmark agronomists and consultants with other partners. The CRC Salinity's relationship with the CVCB – a collaborative program among R&D corporations, will inform a new comprehensive and innovative approach to building capacity for improving adoption. The Rural Industries Research and Development Corporation, which administers CVCB has confirmed in writing its strong interest in shared activity with the new CRC.

The estimated number of PhD students to be trained over the life of the CRC is 50. The CRC Salinity exceeded its target of 60 in Year 5 and demonstrated a capacity to attract and support high quality students supported by an effective professional development program. The new CRC will strengthen this approach and extend it into two areas – industry internships and a new interdisciplinary qualification. The CRC Salinity has successfully trialled placement of postgraduates in the Commonwealth Department of Agriculture, Fisheries and Forestry to gain policy experience. Potential private sector partners will make placements available; the CRC has a target of 30 internships.

Partner universities have agreed to scope, evaluate and potentially develop the new inter-disciplinary graduate education program to better prepare postgraduates for careers in research collaboration. This initiative is a radical departure from conventional research training, requiring a cultural change for faculties and a likely professional postgraduate qualification better suited for the challenges of careers in the agricultural and natural resource management research. The new CRC's contribution will be the initial scoping of the concept and, depending on the outcome, conduct of a pilot program.

4.1 Estimate the number of PhD students to be trained during the life of the CRC.

PhD: 50

'New from Existing' Applicants must complete this section in one page.

5 Outline the key achievements of the existing CRC.

The CRC for Plant-based Management of Dryland Salinity ('CRC Salinity') has developed key farming systems focused on salinity management and ready for adoption, demonstrating its capacity to build profitability for farming enterprises based on better natural resource management:

- Lucerne in grazing and cropping systems has the capacity to reduce the 'leakage' of rainfall to groundwater (a major cause of salinity) by 50% across 33 m ha. The current adoption is 3.3 m ha and the existing CRC work could achieve an additional 89,000 ha on current technology with increased production and profit contributing to a net present value attributed to the CRC of \$24 million. The CRC has isolated genetic material showing acid tolerance in lucerne, which if developed could extend its suitability to much of the target zone.
- Saltland grazing systems, in conjunction with an Australia-wide producer network, will be profitable on a potential 500,000 ha of salt-affected land; and yield a net present value of the CRC's work of \$22 million.
- Some farming systems, such as *EverGraze*, are in early developmental phase with a target to improve profitability by 50% and reduce recharge by 50%. The estimated net present value of this early work, attributed to the CRC, is \$38 million.
- Five improved varieties of perennial pasture legumes will be commercially released by the CRC Salinity and advanced selections of another 15 legume and grass cultivars are planned for release following further field evaluation. Adoption of production systems attributable to this work will realise a net present value of \$106 million.
- The *FloraSearch* project has identified a short list of native perennials highly attractive for commercial production as woody crops. Market assessment and benefit-cost analysis for prospective enterprises processing the new source of woody biomass, indicate a net return of \$157 million in net present value terms.

Objective analysis of track record is well advanced with benefit-cost analyses of these and other key projects indicating a total of \$1.16 billion net present value. Other large benefits will come from salinity containment and better informed policy. The analyses were conducted according to principles in Schedule F of the Selection Round guidelines and have been independently reviewed and confirmed for quality, accuracy and rigour.

The CRC has supported these developments with science of international standing, proof of concept for new perennial plant-based farming systems and woody crops, farm business and catchment management decision tools, and credible advice on improving the effectiveness of salinity management policy and programs.

6 Identify any elements of the proposed research programme that are effectively extensions of existing projects and justify their inclusion in the 'New from Existing' CRC.

| Programme element | Justification |
|---|--|
| 6.1 <i>EverGraze</i> Profitable livestock production off perennial pastures in recharge areas | Industry wants to take advantage of the R&D collaborative structure in place to expand <i>EverGraze</i> to additional rainfall zones and geographic regions. |
| 6.2 <i>Enrich</i> New forages for livestock production in low rainfall environments | This is one of several highly innovative projects initiated in the latter stages of the existing CRC and concept development is complete. Commercialisation of production systems will be done by the new CRC. |
| 6.3 <i>PastureSearch</i> New perennial pasture species and cultivars adapted to a wider range of climate and soils | This is a key project in national pasture development which will continue to produce new cultivars from perennial species in existing use. The new CRC will commercialise a range of new species that have been identified as prospective for agriculture. |
| 6.4 Waterlogging and salt-tolerant wheat | The concept has been proved by the existing CRC. First stage commercialisation of cultivars will take 5 years. |
| 6.5 Sustainable Grazing on Saline Lands Profitable livestock production from salt tolerant pastures | Opportunity for new technologies to drive down costs, expand the land area and build a commercial service sector. |

Business Concept Case: Selection Criterion 4

“The funding sought will generate a return and represents good value for the taxpayer.”

1 Present your business concept case in relation to the selection criterion in no more than 2 pages. Guidance notes are at paragraph 3.2.5 of the guidelines. Note: All financial resources should be cited as GST exclusive amounts.

A seven-year investment of \$34 million is sought from the CRC Programme to operate the Future Farm Industries CRC. The CRC will manage a planned total resource of 910 FTEs over seven years.

1.1 Return on investment

Preliminary benefit cost analysis estimates that the net present value (NPV) generated from the proposed CRC will be **\$1.1 billion (real discount rate 5%)¹⁴** or 8.5 times the full cost of the proposed CRC at stage 1 of its development. This ‘most likely’ estimate is consistent with the principles in Schedule F of the Selection Round guidelines. A range of NPV estimates and discount rates follow:

| Alternative Real Discount Rates | Estimates | | |
|---------------------------------|--------------|-----------------|------------|
| | Conservative | Most-likely | Optimistic |
| 7.5% | \$410m | \$690m | \$1,040m |
| 5.0% | \$680m | \$1,097m | \$1,640m |
| 2.5% | \$1,170m | \$1,860m | \$2,780m |

The key areas of return on investment in the ‘most likely’ NPV estimates are:

- **\$470 million** for returns from productivity growth in existing farm industries and to off-farm investors from new industries
- **\$310 million** for commercial gains from salinity containment
- **\$320 million** from better policy and investment of public funds

The attribution of outcomes to the CRC is high. The CRC’s investors are highly committed and regard the CRC as a professional, well-managed organisation that will achieve its planned outcomes. The potential to achieve these benefits is significantly increased by the CRC’s planned structure, which directly involves and engages key industry investors, agribusiness, new knowledge brokers and research, education and training providers. The returns on investment are expected to increase in line with the CRC’s strategy to increase the level of investment and total resources in the stage 2 application, accelerate the commercialisation and adoption of its research outputs, and achieve greater outcomes.

Net adoption costs for our markets and end-users will be minimised by focusing research activities on maximising profit outcomes for landholders and giving priority to developing commercial services. Adoption risks will be minimised by engagement of industry and end-users in project development, and by participation of farmers and other end-users in field research. CRC investors are confident that the CRC’s adoption and commercialisation strategies will ensure a better return on investment than alternative uses of funds, exceeding Government bond rate benchmarks.

1.2 Justification of Commonwealth funding sought

This business case seeks \$34 million of Commonwealth investment which will contribute approximately 18% of the planned total resources budget. The growth in industry support for the new CRC ensures that the Commonwealth’s investment will leverage approximately 1:1 cash resources, and more than four times researcher and infrastructure in-kind resources.

Detailed planning has been carried out in developing this stage 1 proposal. Program outputs and products have been identified to address the key research questions and deliver the outcomes identified in Selection Criterion 1. The resources required to achieve program outputs have been estimated, using the existing CRC Salinity’s activities as a benchmark. The planning and resources estimate will be further developed in the lead up to stage 2. The preliminary estimate is that at least 130 FTEs per annum will be needed to effectively carry out the planned activities of the CRC.

Research and development geared towards new industries, particularly in new woody crops and commercialisation, will require a higher cash:FTE ratio than normally applies to traditional agricultural and natural resource management R&D. The level of funding sought will enable the CRC to partner the best industry expertise with public sector researchers in collaborative research programs that deliver significant commercial benefit.

1.3 Strategy to obtain additional participants and resources

The Future Farm Industries CRC has locked in a core group of investors, with confirmed stage 1 support of \$20.25 million cash and 449 in-kind FTEs. Based on current negotiations, the stage 2 bid will deliver an additional \$9.2 million cash and 84 FTEs from industry and public sector investors. The CRC’s growth strategy has two elements: the first element secures additional funding prior to stage 2, the second element is

¹⁴ Pannell D 2006, “Benefit-cost Analysis of Proposed CRC for Future Farm Industries”, The University of Western Australia.

a longer term strategy that projects an additional \$5 million income from public and private sector sources based on business performance. The business performance strategy builds on the existing CRC's track record in securing additional research investment, and matched with an enhanced commercialisation capacity, is a key to securing a revenue stream that will support the CRC's activities at the end of a second term, independent of CRC Program investment.

| FFI CRC Cash Resources | Stage 1 (CRC committed, CRC Program bid) | Stage 2 (cumulative, includes additional investment) | Business Performance (additional revenue – post 1 July 2007) | 7 Year Target (Total Stage 2 and Business Performance) |
|---------------------------|--|--|---|--|
| Industry | \$14.35m | \$19.705m | \$1.05m | \$20.75m |
| Public | \$5.9m | \$7.175m | \$3.95m | \$11.125m |
| CRC Program | \$34.125m | \$34.125m | \$0 | \$34.125m |

The CRC's strategy to increase its resource base will accelerate the planned timelines for delivering program outputs. The stage 1 application includes two supporting participants – the Universities of Adelaide and Melbourne, who have signed intentions to participate confirming their strong commitment. Two prospective supporting participants – Lignor Ltd and the RIRDC, have provided letters expressing strong interest to enter into project partnerships. Another prospective supporting participant – the Victorian Department of Sustainability and Environment, has been directly involved in developing the stage 1 application. The Western Australian Government has offered an incentive package to locate the new CRC's headquarters in that State and to match a level of funding secured by the CRC.

The resourcing strategy is matched to the strategy for commercialisation and utilisation in Selection Criterion 2. It comprises:

- Consolidating investment into the major CRC programs by the key industry R&D corporations – adding to the core participant resources;
- Attracting additional private sector companies into commercialisation of business opportunities, products and services – typically bilateral research contracts with the research company, some involving non-disclosure agreements;
- Earning revenue from services provided, where these activities are highly compatible with achieving the outcomes;
- Additional investment by catchment management authorities, natural resource management bodies and farmer groups to applied R&D projects, and commercialisation and adoption activities – projects and activities that will often be regional in scope; and
- Drawing additional public sector R&D providers in New South Wales and Queensland to the collaboration, to ensure the best expertise in the agro-ecological zones relevant to the new CRC and those States.

1.4 Resources to operate the CRC

Compared to the CRC Salinity, the new CRC will commence with higher industry funding (\$14.35 million committed in writing at stage 1). This reflects growing commitment to pushing the boundaries of productivity growth within strategic natural resource management objectives. The confidence to deliver this is built upon the development of core expertise from the existing CRC. Industry funders are providing 5 times the level of cash to research providers, an increase from 3 times the level in the current CRC. State agency participants will play a dual role through involvement as research users in industry extension activities and as research providers. They will contribute \$2.8m million in cash and 37% of total resources. Universities and CSIRO will also make substantial contributions accounting for 28% of total resources.

The planning for this CRC has sought to maximise the potential for adoption of new products and technologies by increasing the allocation of resources to commercialisation and communication. 80% of the CRC's resources will be directed to integrated and industry-aligned research and commercialisation programs. 11% of resources will be allocated to education and training and communications in support of uptake and knowledge diffusion. Administration and management costs will be limited to 9%. The proposed program leaders will be cash funded by the CRC in order to ensure 80% time commitments and maximise delivery of milestones. In support of 533 contributed FTEs the CRC will purchase 377 FTEs.

It is acknowledged that the CRC Programme will value staff in-kind resource at nominal values to ensure matching resources are provided. However, the core participants' contributions will be valued at market rates for purposes of determining equity in the research company. The non-staff in-kind contributions in the resources estimates table have been valued at a nominal rate for stage 1, equal to the CRC Programme's nominal rate for staff in-kind contributions. This removes from industry and research provider in-kind FTEs salary related on-costs and retains the imputed cost of rent and the value of specialist equipment, as well as operating and support costs according to Program guidelines.