



CRC for the Sustainable Development of Tropical Savannas

5TH YEAR REVIEW

STAGE 2

12–14 SEPTEMBER 2000



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EXECUTIVE SUMMARY

Background Information

The CRC for the Sustainable Development of Tropical Savannas, which was established as a fourth round CRC, formally commenced activities under the Commonwealth Agreement on 22 August, 1995. The Centre's area of responsibility is the 30 per cent of Australia which is open woodland and grassland with a dominant summer rainfall and a distinct wet and dry seasonal pattern. It contains several distinct bioregions within these general parameters. The defining features of the Australian savanna include: a large number of Aboriginal language group areas; a complex mix of land tenures; a mix of land users (mining, pastoral, Aboriginal, defence, conservation and tourism); a distinctly higher intensity of grazing use in some parts of Queensland than elsewhere; fire as a dominant impact on the landscape processes; a decline in biodiversity, demonstrated in granivorous birds; tree clearing in central Queensland; and institutional aspects including research groups that are relatively few in number and widely separated with small numbers in any discipline and none in some; plus a north-south partition of legislative and management responsibilities cutting across the east-west savanna regions.

The Mission of the Centre is 'To achieve sustainable use and conservation of Australia's tropical savannas through excellence in collaborative research, communication and education.' The program activities are conducted under four Themes:

- North Australian Landscape—descriptions, definitions, health status
- Landscape Processes—interaction of resources
- Ecosystem Management —social, economic and ecological impacts of interventions
- Human Capability Development—enhancing knowledge and skills of stakeholders

The CRC operates as a unincorporated joint venture with geographic nodes in Darwin, Townsville and Kununurra and has the following membership:

- Western Australian Departments: Conservation and Land Management (CALM) and Agriculture Western Australia (AgWest)
- CSIRO (Divisions: Land and Water; Tropical Agriculture/Wildlife and Ecology)
- Environment Australia, Biodiversity Group (EA)
- James Cook University (JCU)
- Northern Territory Departments of: Land, Planning and Environment; Primary Industries and Fisheries; Power and Water; and Parks and Wildlife Commission of the Northern Territory (NT Govt)
- Northern Territory University (NTU)
- Queensland Departments of: Natural Resources; Primary Industries; and Parks and Wildlife Service

Australian National University (ANU) ceased its participation at the end of year 5.

Summary of resources

Projected Total Resources	\$71.96 million
Projected Total In-kind contribution (participants)	\$52.63 million
Projected Total Cash contribution (participants)	\$0.36 million
CRC Program Funding (over 7 years)	\$16.2 million
CRC funds Leverage (99/00) ¹	3.86:1
CRC Program Funding (99/00)	\$2.63 million
Number of Staff (99/00) cash & in-kind	92.18 (person years)
Total Number of Students	22 PhDs, 3 Masters, 13 Honours
User % Projected Total Resources ²	41%

1. Leverage defined as ratio of total contributed resources from participants and other activities versus the CRC program funds.
2. Users = CALM, AgWest, State of Qld, NT of Aust, and Environment Australia

Review Findings

This is predominantly a public good CRC, which nevertheless addresses economic activities that contribute approximately \$7.5 billion per annum to Australia's economy.

TS-CRC's performance in meeting objectives

This CRC was established in the context of a near absence of a mechanism for east-west integration of research into tropical savannas and the application of that research in northern Australia. The progress of the CRC in the five years of its existence has been impressive given the long history of limited collaboration of research and management agencies across the region.

The mission, vision and objectives of the CRC are appropriate for northern Australia. They are soundly based on the recognition of 1) the prevailing problems in the region, and 2) the holistic and integrated approaches that will be necessary to achieve ecological, social and economic sustainability.

In terms of the social structures and processes, as well as the biophysical understanding necessary to achieve the major objectives of the CRC, considerable progress has been achieved. The application of this understanding of biophysical processes and social structures of necessity takes time. A clear demonstration of achievement of outcomes will take at least five to 10 years.

Stage 1 Review

The Stage 2 Review panel supports the findings and recommendations of the Stage 1 Review. The research is of high quality. Mobilisation of research carried out by others and by the TS-CRC has led to the strong commitment of the stakeholders to applying the outputs of the research and to carrying out in a participatory manner further relevant research. While this Panel supports the recommendation that increased attention be given to social science, we believe that particular emphasis should be on practical application of such science with the explicit aim of achieving the objectives of the TS-CRC. Such work can be carried out by scientists and others who are not trained formally in the social sciences but who can identify those approaches that have been shown to be effective and those that have failed.

Key outputs and outcomes

The TS–CRC has made significant progress towards defining the states of health of the various parts of the tropical savannas of northern Australia and the land-use regimes that are related to those states of health. It has made this information widely available to stakeholders of all kinds and has emphasised the development of methods of information transfer that are suitable for particular stakeholder groups. The effectiveness of this process is being demonstrated through the enthusiastic uptake of research findings by stakeholder groups and increased participation by those groups in the design, conduct and interpretation of research.

The major challenge for this CRC and any successor arrangement will be the continuation of integrated research, education and training and the application of research necessary to achieve sustainable use of the tropical savannas.

Education and training

The CRC should be commended for the development and application of an education and training program that is explicitly suited to the physical and social circumstances prevailing in the tropical savannas region of Australia. While the number of PhD students (22) has been appropriate in relation to their future employment in this field, there has been considerable undergraduate, graduate and masters education that is particularly suitable for application in the social contexts of northern Australia. These education programs have been complemented by appropriate training and communication programs targeted on specific stakeholder groups.

Centre Management and Governance

The TS–CRC has a simple management structure that has been demonstrably effective. The Board, which has a majority of research users and consists of both parties and stakeholder representatives, has developed appropriate strategies and priorities. TS–CRC management has been effective and particular mention should be made of the Consultative Committee and the Scientific Program Advisory and Evaluation Group (SPAEG) which contribute significantly to good management and to the adoption of priorities and projects that are germane to meeting the TS–CRC's objectives.

No weaknesses in Centre management and governance were identified. Commonwealth funding should continue at the agreed level.

Collaboration

The level of industry/user participation and cooperation between the participants and across programs has been most impressive, particularly in the light of the limited cooperation before the establishment of this CRC.

The CRC has developed a perpetuation strategy to ensure that major elements of the existing CRC program will continue whether or not their application in the 2000 Selection Round for a new CRC is successful. This strategy is a model for other CRCs to follow.

Recommendations

That:

1. The CRC significantly increase its attention to quantifying the benefits of its programs to Australia, preferably in dollar terms.
2. In the final two years of this Centre, even more attention should be given to promoting the flow of information and sustainable technologies and management practices to end-users.
3. The CRC consider options to maintain an intake of new PhD students throughout the life of the CRC. Such options might include a modest re-allocation of CRC funds for this purpose.
4. The participatory approaches in research that have been successfully developed by the CRC, and the benefits that flow from them be widely publicised to stakeholder groups in appropriate forms.
5. The production of videos for communication with print averse stakeholders should be undertaken.
6. During the remaining life of the CRC, links with the Batchelor Institute of Indigenous Tertiary Education and the CRC for Aboriginal and Tropical Health should be strengthened in order to increase information transfer and create research synergies.
7. The CRC Program funding continue for the life of the CRC

Review Procedures

Stage 1 of the Fifth Year Review of the Sustainable Development of Tropical Savannas was a scientific and technical review of the Centre conducted on 13-14 July 2000 inclusive. The Panel comprised: Dr Roy Green (Chair), Chair of National Land and Water Audit; Dr Bob Scholes, a rangeland ecologist from CSIR South Africa; and Associate Professor Jeff Coutts, Director, Rural Extension Centre, University of Queensland. The CRC Visitor, Dr John Vercoe, attended as a resource to the Panel. The Centre board of management responded to matters raised in the Stage 1 Report on 31 July 2000.

The Stage 2 Review was undertaken at the Novotel in Darwin on 12-14 August 2000. The Stage 2 Panel comprised Mr Graeme Kelleher (Chair), Co-Chair of the Life Sciences Panel; Professor Henry Nix, Centre for Resource and Environmental Studies at the Australian National University; Dr Bob Clements, Director ACIAR; and the Centre's Visitor, Dr John Vercoe, with CRC Program support from Ms Michelle Leggo and Mrs Heather Carswell.

Stage 2 commenced with a brief overview by the CEO, Mr John Childs, on the Centre's performance against its objectives, followed by presentations from the Theme Leaders, Dr John Ludwig and Dr Paul Novelly and project leader, Dr Jeremy Russell-Smith on the Centre's research program. Mr Childs responded to the Stage 1 report. Professor Greg Hill presented the Education and Training session, and the CEO and Dr Jacklyn presented the session on the application of research results, including an overview of the web-based "Clearing House". Mr Childs led the discussion on collaborative arrangements, with the final session on management structure presented jointly by the CEO and Ms Susanna Martin the Business Manager.

The next day, the Panel held discussions with the Board and a session with the Chairman of the Board. The Consultative Committee met with the Panel for an hour followed by a session with staff and a session with several of the CRC's students. A discussion with the CEO completed the interviews.

The Panel then proceeded to prepare the draft report.

Details of the agenda of the Review, containing the names of all participants, are given in the Appendix.

Objectives of the CRC

This CRC was established in the context of a near absence of a mechanism for east-west integration of research into tropical savannas and the application of that research in northern Australia. The progress of the CRC in the 5 years of its existence has been impressive given the long history of limited collaboration of research and management agencies across the region.

The mission, vision and objectives of the CRC are appropriate for northern Australia. They are soundly based on the recognition of 1) the prevailing problems in the region, and 2) the holistic and integrated approaches that will be necessary to achieve ecological, social and economic sustainability. The present economic contribution of these areas to Australia is estimated to be in the order of \$7.5 billion per annum.

In terms of the social structures and processes, as well as the biophysical understanding necessary to achieve the major objectives of the CRC, considerable progress has been achieved. The application of this understanding of biophysical processes and social structures of necessity takes time. A clear demonstration of achievement of outcomes will take at least five to 10 years.

Quality and Relevance of the Research Program

The Stage 2 Review Panel supports the findings and recommendations of the stage 1 review. The research is of high quality. Mobilisation of research carried out by others and by the CRC has led to the strong commitment of the stakeholders to applying the outputs of the research and to carrying out in a participatory manner further relevant research. While this Panel supports the recommendation that increased attention be given to social science, we believe that the particular emphasis should be on practical application of such science with the explicit aim of achieving the objectives of the CRC. Such work can be carried out by scientists and others who are not trained formally in the social sciences but who can identify those approaches that have been shown to be effective and those that have failed.

Most, if not all, CRCs in their first phase must focus on delivery of partner-derived outcomes. This drives much of the initial activity towards the development end of the R&D continuum. This CRC is no exception. While each of the four research themes has a research component, they differ significantly with respect to their position on the R&D continuum. This is not a criticism, but a necessary statement of context within which assessments are made.

The early evolutionary stage of CRC development in what is, for the most part, a public good area is evidenced by the high level of outreach activity (eg conference papers, reports, media presentations) relative to refereed journal publications. These latter are the primary measure of research quality but the former may be a better indicator of research relevance. On both counts the CRC rates well above average.

The refereed journal papers are not all in international journals of high standing, but a significant number are, again, rather more than might be expected. Fundamental research on tropical savanna function by Eamus and colleagues, on landscape level processes by Ludwig et al, on remote sensing by Ahmad and associates, and vertebrate biogeography by Woinarski and colleagues are but a few that rate highly.

While much, if not all of the referred journal material may, ultimately, be relevant to the CRC's objectives it is clear that some of the research was initiated pre-CRC and that some simply fits within the geographic limits of the CRC. Again, this is not a criticism, but it would be a useful exercise to map the relevance of this research output to each of the four main themes, both direct and indirect.

Some of the research that has most direct relevance to the four main themes has, as yet, appeared only in conference and workshop papers and presentations as well as in the 'grey' literature of consultancy reports. This is normal and simply reflects the short life of the CRC to date. Among the useful research outputs has been the articulation by aboriginal communities, for the first time, of some of their biophysical research priorities in tropical savannas.

Strategy for Utilisation and Commercialisation of Research Outputs

This CRC is very clearly in the public good category and must be assessed accordingly. One key question is whether the CRC can contribute to the achievement of public good outcomes more efficiently than the disparate State and Territory agencies acting individually. Early indications are that it most certainly can, by creating a critical mass of disciplinary expertise with a strong systems and bioregion focus.

While not yet fully developed, it is clear that many products of the CRC, such as CD-ROM based data, information and knowledge packages are ultimately marketable. However, fine judgement needs to be exercised here between public good outcomes and potential CRC income. It would be a mistake to attempt to obtain minor funds from the sale of such products at the expense of their widest possible dissemination and application in Australia.

It is recommended that the CRC significantly increase its attention to quantifying the benefits of its programs to Australia, preferably in dollar terms.

The CRC is well placed to produce attractive, interactive CD-ROMS and print packages that educate, titillate and intrigue tourists. Very few of our top tourist attractions are served by soundly based, well-researched information sources. These could cover not only locations, but key elements (eg trees, birds, ants, fire, pastoral management) and historical/longitudinal sequences (cyclones, floods, wildfires, tick fever etc.)

The CRC has been very careful to target its communication procedures and products to specific stakeholder groups. This approach has been very successful and is commended.

In the final two years of this Centre, even more attention should be given to promoting the flow of information and sustainable technologies and management practices to end-users.

Education and Training

The CRC should be commended for the development and application of an education and training program that is explicitly suited to the physical and social circumstances prevailing in the tropical savannas region of Australia. While the number of PhD students (22) has been appropriate in relation to their future employment in this field, there has been considerable undergraduate, graduate and masters education that is particularly suitable for application in the social contexts of northern Australia. These education programs have been complemented by appropriate training and communication programs targeted on specific stakeholder groups. Continuation of the effort to increase the access to scientific information by all stakeholders is desirable.

Given limitations in the amount of supervisory capacity available at NTU and JCU, within the tropical savanna region, the CRC has supported a credible postgraduate program. Greater use of supervisory capacity external to the region (eg University of Queensland Gatton campus, University of Western Australia, Notre Dame University Broome campus and the Australian National University) could have expanded the program. All the students interviewed valued their involvement in this CRC.

The innovative Graduate Diploma and Master of Tropical Environmental Management are unique products that have considerable potential to attract both Australian and international students and deserve continuing support. Some of the units developed such as: Flora and Fauna Survey Techniques; Rangelands; Land and Sea Managers: Indigenous Peoples and Australian Tropical Environments, are likely to have wide application beyond the region.

The extension programs, viz weed management, fire management, grazing management, biodiversity and conservation, are active outreach and vocational education offerings that auger well for future sustainability. The range of key agencies involved and their willingness to accept responsibility for delivery of products is a major plus, but the CRC has a role here in the delivery of integrated natural resource products.

Recognising the important contribution that PhD students can make to Australia, the Panel is concerned at the cessation of intake of PhD students at the end of 1999. With some renegotiation of in-kind contributions and perhaps some re-prioritising of research activities, it should be possible to re-allocate some CRC funds to maintain a modest intake of PhD students until the end of the seven-year CRC agreement. This would require negotiation with the CRC Program to carry over some funds beyond the life of the CRC.

The Panel recommends that the CRC consider options to maintain an intake of new PhD students throughout the life of the CRC. Such options might include a modest re-allocation of CRC funds for this purpose.

Collaborative Arrangements

Collaborative arrangements linking the participating research groups and Australian stakeholders are generally adequate and, in some cases, excellent. The strong and growing degree of collaboration between research groups is one of the Centre's most notable achievements.

With the exception of the Australian National University (which has recently withdrawn from the CRC), the participating research organisations have demonstrated an ongoing and increased commitment of resources. The in-kind contributions of several participants (CSIRO, Environment Australia/Parks North and the State of Queensland) have greatly exceeded in relative terms the amounts originally promised, and the contributions of most participants have risen by an amount at least equal to inflation. Overall, the cumulative in-kind investment to date by the participating research organisations exceeds the originally agreed investment by 24 per cent. This is a very significant vote of confidence in the CRC by the participating parties.

The Panel was advised that all research projects involve more than one participating research organisation. More than half of the refereed journal papers in the draft 1999/2000 Annual Report have authors from more than one organisation.

A feature of the CRC is the strong effort that has been made to involve aboriginal communities in participatory research. Five aboriginal community groups have been involved in this way, and another two have been linked to the CRC through exchange of information. At least another 25 groups from the pastoral, tourism, mining and conservation sectors have been linked to CRC projects.

It is recommended that the participatory approaches in research that have been successfully developed by the CRC, and the benefits that flow from them be widely publicised to stakeholder groups in appropriate forms.

The CRC has made good use of email services and teleconferencing to promote communication between researchers and stakeholders. More use of video-conferencing facilities could be encouraged.

It is recommended that production of videos for communication with print averse stakeholders should be undertaken.

Modest linkages to the Batchelor Institute of Indigenous Tertiary Education and to the CRC for Aboriginal and Tropical Health have been established. It is recognised that these two organisations represent a significant part of the Aboriginal research and training capability in northern Australia.

It is recommended that during the remaining life of the CRC, links with the Batchelor Institute of Indigenous Tertiary Education and the CRC for Aboriginal and Tropical Health should be strengthened in order to increase information transfer and create research synergies.

Resources and Budget

The resources available to the Centre are appropriate for the objectives, recognising that the activities of the Centre represent only a fraction of the total Australian research investment on management of tropical savannas.

Tropical Savannas CRC Stage 2 Review

The Centre management has successfully addressed all of the issues concerning resources and budget raised in the Stage 2 report of the Third Year Review. The TS–CRC’s strategy in meeting these demands has been responsible and well managed. The Centre is to be commended on the way it has been able to re-negotiate the in-kind budget and finance the developments planned for years 5 to 7 and beyond the current grant period.

The cumulative investment by the participant research organisations to date (\$38.76 million) exceeds the cumulative CRC grant by the Commonwealth to date (\$11.70 million) by a ratio of 3:1. From the Commonwealth’s point of view, this represents an excellent leverage on its investment.

The CRC has secured a modest amount of funding (\$1.67 million to date) from other sources, mainly research funding bodies.

Financial management systems appear to be adequate. The Panel notes that, with one minor qualification, the auditors have endorsed the Centre’s most recent financial statement.

Although the contribution of researchers’ time by participating organisations is adequate overall, there are many researchers contributing small amounts (10 per cent or less) of their time. The Panel was assured that these small time commitments were nevertheless valuable. A matter of concern to both the CRC and this Panel is the relatively small contribution (20–30 per cent) of three of the four theme leaders.

It is recommended that the CRC Program funding continue for the life of the CRC.

Management Structure

The CRC has a simple management structure, which has been demonstrably effective. The Board, which has a majority of research users and consists of both parties and stakeholder representatives, has developed appropriate strategies and priorities. CRC management has been effective and particular mention should be made of the Consultative Committee and SPAEG which contribute significantly to good management and to the adoption of priorities and projects that are germane to meeting the CRC’s objectives.

The Centre has a most experienced, competent and enthusiastic independent chair in the Hon John Kerin. The CEO, Mr John Childs, has been most effective in overcoming the problems that this Centre encountered in early years and he is to be commended for the very strong corporate spirit that is evident throughout the Centre. Leadership and management are considered to be very effective.

The resources, budget and financial management are appropriate to the objectives of this Centre. It is noted that it would have been naive to expect any organisation to have developed and applied research and other programs to achieve sustainable use of the tropical savannas in a period of seven years.

The CRC has developed a perpetuation strategy to ensure that major elements of the existing CRC program will continue whether or not their application in the 2000 Selection Round for a new CRC is successful. This strategy is a model for other CRCs to follow.

No weaknesses in Centre management and governance have been identified.

Performance Evaluation

The Centre's procedures for evaluating its own research performance are sound. The establishment of the SPAEG has provided both quality control and accountability. The CEO's regular (6-monthly) assessment of research projects against milestones provides additional rigour. Progress towards 14 targets within the four key result areas is documented in the annual report. The Centre monitors the success of its students in finding jobs.

The Centre's award-winning web page is a notable achievement, and is attracting 20,000 – 40,000 'hits' per month. The Centre is considering an analysis of the nature of this readership, and we support this idea. Such an analysis would add value to the Centre's performance evaluation.

The Centre has reached a stage where outputs from the research are flowing to the end users. During the next year an *ex ante* benefit-cost analysis of the research should be conducted. This would not only strengthen the confidence of stakeholders and research organisations in the value of the research, but would reveal constraints both to the flow of information to end-users and to the adoption of technologies and sustainable management practices. These constraints could then be addressed vigorously in the final year, adding value to the work of the Centre and strengthening its impact.

The Centre would benefit from an independent survey of its stakeholders' perceptions of its performance. Such a survey would also provide guidance to those managing a new CRC for tropical savannas should the bid be successful.

Acknowledgements

The Panel and the CRC Program would like to thank the CEO and Centre staff for their efforts in producing documentation for the review and for their generous hospitality during the review.

List of CRC Staff and Students attending the review

Board

Charles Webb
Michele Bowe
Greg Robbins
Peter Cooke
Darryl Pearce
John Kerin
Neil Burrows
Rick Murray
Steve Morton
Tom Stockwell
David Murray for Peter Wellings
Tony Milnes
Mike Burgess

Consultative Committee

Tom Mann
Paul Jenkins
Kirsten Blair
David Epworth
Sonia Tidemann
Laurie Corbett
Ross Brunckhorst
Darryl Pearce

Management Group

Greg Hill
Paul Novelly
Peter Jacklyn
Richard Fell
Susanna Martin
Greg Leach
Peter Whitehead
John Ludwig
Alan Andersen
John Childs
Rod Applegate

Staff

Tony Start
Kate O'Donnell
Kathryn Thorburn
Dick Williams
Michael Storrs
Allan Arnott
Julie Bolch
Cheryl Arnott
Alaric Fisher
Greg Connors
Samantha Settefield
Robert Eeager
John Ludwig
Ivan McManus
Alan Andersen
Andy Chapman
Lyn Lowe
Sam Setterfield
Garry Rabbett
Tracy Dawes-Gromadski
John Woinarski
Lindsay Hutley

Students

Grant Whiteman
Wendy Hillman
Ben Sharp
Matthew Fegan
Georgina Kelley
Anthea Dee
Khwaja Hayder
Yue Zhang