

Research Report

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Pathways for Australian primary industries climate research strategy

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Pathways for Australian primary industries climate research strategy

Executive summary

This project assesses the effectiveness and impact of the Climate Research Strategy for Primary Industries (CRSPI) program over its decade-long life span with a focus on performance against the most recent (2017-20) strategic plan.

This assessment provides the CRSPI partners and stakeholders with information and recommendations for effective coordination of climate research, development and extension (RD&E) in primary industries. To meet this purpose, the past performance, effectiveness and indeed the need for the CRSPI collaboration model has been cast forward in the context of a rapidly changing RD&E environment.

Collaboration has always been the key value proposition of the partnership. While this collaboration has taken different forms throughout the partnership's iterations, the opportunity to share knowledge, ask questions, pool resources and discuss concerns has been consistently valued by participants.

Sometimes this collaboration has resulted in production of joint research projects; however, even when no tangible output has resulted, the collaborative process itself has proven worthwhile to those participating directly in the CRSPI process.

In general, the collaboration has **worked well** when:

- Partners are *invested* in the strategy (via financial and human capital)
- The strategy is operating in a supportive macro environment
- The strategy is focused on SMART goals

The collaboration has **struggled** when:

- Partners lack trust in governance or confidence in the common goals
- Partner representatives allocated to CRSPI lack decision-making authority
- Representatives are changed frequently, disrupting continuity and undermining trust
- The strategy is operating in a hostile macro environment
- The strategy lacks resources or authority to direct research goals

The management and decision-making structures related to collaboration are a key factor in success of the partnership, both past and present. Additionally, the importance of interpersonal trust as an enabler of effective collaboration is difficult to overstate.

The need for an overarching climate research strategy for Australia's primary (agricultural) industries is still strong. Political attention is returning to the **urgency of the climate impacts** on agricultural production. The business community has a keen interest in research which enables both adaptation and mitigation to protect shareholder value.

Research which can provide multisector outputs is vital, and collaboration helps make best use of research resources for the greatest collective benefit.

While CRSPI has been effective in *developing a strategy* for research, there is now a greater need for the *delivery of research* informed by CRSPI strategy as well as strategy development. Partners and stakeholders should thus seek to maximise the benefit of this resilient entity by directing its outputs through a purpose made vehicle for collaborative research investment.

In the current climate of political attention on improving cross-sectoral collaborative research output, a Joint Investment Vehicle (JIV) would provide an unencumbered pathway for CRSPI directed climate research. A JIV would not be limited to climate research but would act as the enabling mechanism for multiple cross sectoral research issues informed by Issue-Focused Initiatives (such as CRSPI).

Without significant changes to the mechanism of enabling cross-sectoral research, CRSPI will remain as a useful but underutilised and unappreciated collaborative forum with minimal ability to translate its outputs into impact. Changes must be made to enable the transition of CRSPI from a coordinating body only to one which continues to coordinate but also has an enhanced and expanded role in directing research investment.

1. Overview – historic

CRSPI is a vehicle for collaboration between organisations that invest in climate RD&E for Australia's primary industries. This strategic partnership has been in operation since 2008 with varying levels of engagement from the primary partners, who are the rural Research and Development Corporations (RDCs); State, Northern Territory and Federal Government agriculture agencies and the CSIRO.

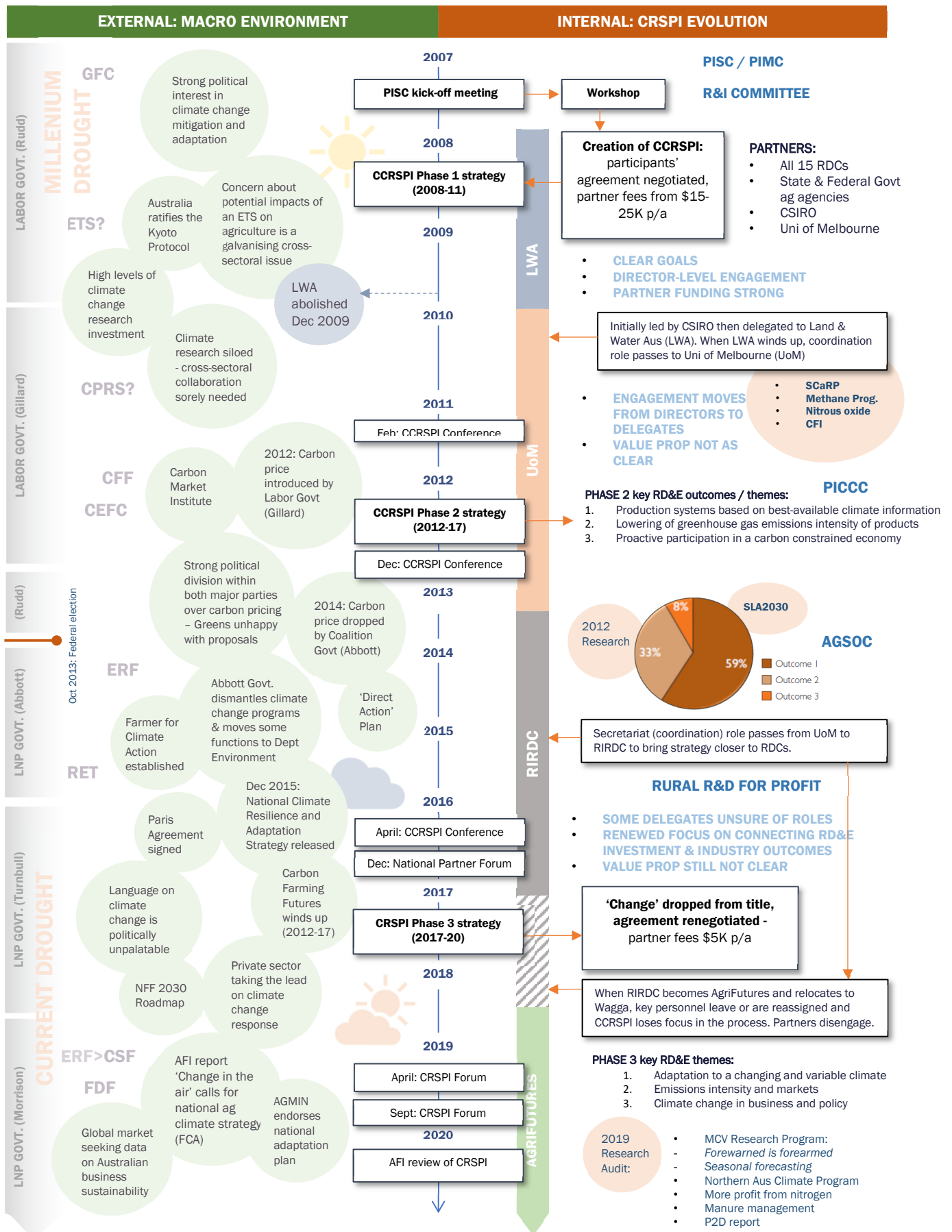
The program operates through a Partnership Agreement governed by a Coordinating Group of partner representatives and is currently administered by AgriFutures Australia as the managing agent, which also hosts the Secretariat.

The climate research environment has significantly shifted and changed since CRSPI was established. Private investment through natural capital markets and impact investing is introducing a sense of urgency into the delivery of climate RD&E. The political landscape around climate research for agriculture has also changed. When CRSPI was first established, the Millennium Drought was in full swing and political support for the initiative (and associated funding) was readily available. As drought conditions alleviated, this support disappeared during CRSPI's second phase and has only recently come back into play. With the current drought hitting primary industries hard, the AGMIN forum has agreed in 2019 to adopt a national framework to address the impact of climate change on the sector and climate research is back on the agenda.

As the operating RD&E environment has changed and support for climate-focused R&D has waxed and waned, CRSPI has evolved through a series of iterations to its current state. This section charts the history of CRSPI in relation its operating environment and describes how that environment has changed and continues to change.

This information was collated via a review of the industry priorities and rationale that led to the RD&E framework which supported the development of CRSPI and the available documentation of the partnership's strategy and outcomes. Interviews were conducted with CRSPI managers, partners and stakeholders both past and present for context and to fill gaps in the documented timeline.

Some unifying themes noted throughout the discovery process include: the importance of collaborative effort on climate research for primary industries; the need for a clear value proposition and accountability to ensure success in a partnership; the value of effective leadership, and the significance of a supportive macro environment to a cohesive collaboration.



5 Figure 1: Charting the CRSPI timeline 2007-20

1.1 Evolution

CRSPI was established in 2008 (as CCRSPI – the Climate *Change* Research Strategy for Primary Industries) under a mandate from the former Primary Industry Ministerial Council (PIMC) and the Primary Industry Standing Committee (PISC) as an unincorporated collaborative network to develop the first of the cross-sectoral strategies under the National Primary Industries RD&E Framework.

Since 2005 the Framework has been developed jointly between the Commonwealth, the States and Northern Territory, Rural R&D Corporations, CSIRO and universities to promote collaboration, under the guidance of the standing RD&E Committee. The ministerial council system was streamlined in 2014, with the Agricultural Senior Officials Committee (AGSOC) introduced as the principle coordinating body to replace PISC. Recognising the Framework's significance, AGSOC agreed that the Committee should continue as one of only two standing committees, which was renamed from RD&E to Research & Innovation (R&I) (R&I Committee, 2015).

Throughout these changes (see Figure 1: Charting the CRSPI timeline 2007-20), CRSPI has retained its group of founding partners: the 15 agricultural RDCs¹, State and Federal Government agriculture or primary industry agencies, the CSIRO and (at times) the University of Melbourne (UoM) – albeit with varying levels of investment and, arguably, interest.

The partnership's operation has been executed in three phases:

1. 2008-11
2. 2012-17
3. 2017-20

Phase 1 (2008-11): A burning platform

The initiation of CRSPI was characterised by shared concerns across primary industries about impact of the Millennium Drought and the ramifications of a proposed Emissions Trading Scheme² (ETS) for agriculture.

Industry decision-makers had serious qualms about the future role of the farm sector in the national emissions trading scheme and the role of climate change in drought, and were keen to pool resources to tackle mutual problems.

Established in 2008 as a collaborative partnership focused on the identification, coordination and communication of key climate change related research needs and priorities, then-CCRSPI delivered the first National Climate Change Research Strategy for Primary Industries. The scope of this Strategy was broad, covering cross-sectoral issues that related to climate change impacts, adaptation and mitigation. The 2008 Strategy also included a preliminary assessment of all current climate change and primary industries research activity, and used this as a basis to assist with the identification of gaps in knowledge and resources (Montagu et al., 2012).

¹ **Commonwealth statutory RDCs:** Wine Australia, Cotton RDC, Fisheries RDC, Grains RDC, Rural Industries RDC (trading as AgriFutures Australia); **Industry-owned companies (IOCs):** Australian Egg Corporation Ltd, Australian Livestock Export Corporation Ltd (LiveCorp), Australian Meat Processor Corporation, Australian Pork Ltd, Australian Wool Innovation Ltd, Dairy Australia Ltd, Forest and Wood Products Australia, Horticulture Innovation Australia Ltd, Meat and Livestock Australia, Sugar Research Australia Ltd.

² The Australian Government had proposed in 2008 to introduce a national greenhouse emissions trading scheme, due to commence in July 2010.

The partnership was initially led by CSIRO, then soon delegated to Land and Water Australia (LWA). LWA was abolished in a surprise move in December 2009, leaving the nascent CCRSPI somewhat adrift. To improve academic engagement with the partnership the coordination role was passed to the University of Melbourne (UoM), where it remained until 2013.

During this time, the Department of Agriculture, Fisheries and Forestry's \$46.2 million Climate Change Research Program (CCRP) funded more than 50 large-scale collaborative projects. The CCRP projects (which received funding and in-kind support from a wide range of partners³) focused on four priority areas:

1. Reducing livestock methane emissions
2. Reducing soil nitrous oxide emissions
3. Improving soil management and building soil carbon
4. Developing adaptation management

CCRSPI played a key role in coordinating partner responses to the initial CCRP funding call, resulting in the development of two major research initiatives: *Reducing Emissions from Livestock Research Program* (managed by Meat & Livestock Australia) and the *Nitrous Oxide Research Program* (managed by GRDC).

The 2008 CCRSPI Strategy also informed several concurrent and parallel initiatives (Montagu et al., 2012), for example: the 2007 COAG Climate Change Adaptation Initiative led to the establishment of the CSIRO Climate Adaptation Flagship and the National Climate Change Adaptation Research Facility (NCCARF), which in turn established eight adaptation research networks including the Primary Industries Adaptation Research Network (PIARN). The National Adaptation Research Plan for primary industries developed by NCCARF was closely aligned to, and consistent with, the 2008 CCRSPI Strategy.

Phase 2 (2012-17): Losing momentum

As CCRSPI entered its second phase, commitment from the partners was still strong and the value provided by programs such as the ongoing methane and nitrous oxide projects was clear. However, without the galvanising issue of ETS threats – and with the immediate spectre of drought fading from political view as soon as the first rains fell – the impetus to direct resources to collaboration slowed. Combined with change of political heart in the macro environment, partners began to incrementally disengage from CCRSPI.

Following up on the initial audit conducted in 2008 at the commencement of CCRSPI, a second audit in 2012 sought to identify and quantify existing projects, resources and capacity in primary industries climate change research. The authors commented on the significant changes in the climate change policy and institutional environment over this short time, which included:

- transition from a climate-focused Rudd-led government, which had established a new ministry specifically dealing with climate change and a plethora of climate change investment programs such as NCCARF, to a carbon-focused Gillard-led government supporting a range of climate change program initiatives supplementing a new carbon taxation arrangement;

³ including CSIRO, State departments, universities, CRCs, catchment management authorities, producer-owned companies and private industry

- advancement across rural industries in the understanding of the nature of climate change, its industry specific impacts and the potential to address these impacts;
- the restructuring of the CSIRO Climate Change Flagship to the CSIRO Climate Adaptation Flagship; and
- election of new State Governments and a subsequent clear shift in priorities from addressing climate change to increasing industry production and/or productivity (Kiri-ganai, 2012).

The managing agent role changed again in this second phase. When still hosted by UoM, CCRSPI undertook to revise and update the initial strategy developed to guide primary industry climate research in 2008. Due to the collaborative nature of this process, development of the 2012 strategy was time-consuming and drew both focus and resources from other work.

In 2013, hosting of CCRSPI passed from UoM to the Rural Industries Research and Development Corporation (RIRDC). In this period, partners were debating whether CCRSPI should be a research funder or coordinator, and funding was taken out of the partner agreement.

At the same time, the major collaborative programs in the CCRP were gaining traction, blurring the value proposition of CCRSPI to partners and stakeholders. Momentum was undoubtedly lost in this phase, as a perhaps inevitable result of ‘post-honeymoon blues’ and in response to the changing winds of policy trends. Despite that waning investment of funds, time and energy, it is notable that Phase 2 continued to deliver research outcomes and collaborative opportunities to the industry.

Collaboration was still a core value for CCRSPI, and the 2012 audit found that of the 589 projects identified, 228 were collaborative (i.e. involving at least two non-research performing investors or at least two research performing organisations). MLA and GRDC played significant roles in managing several collaborative programs including the *Nitrous Oxide Research Program*, *Lowering Emissions in Livestock Research Program*, *Soil Carbon Research Program* and the *Managing Climate Variability Program*. The 589 projects had a life-of-project value of \$549 million, and of these, CCRSPI partners supported 483 projects with a life-of-project value of around \$491 million (Kiri-ganai, 2012).

Phase 3 (2017-20): Rejuvenation

By the time CCRSPI was entering its third phase, the managing agent was undergoing significant change of its own. In 2017, RIRDC rebranded to AgriFutures and relocated from Canberra to Wagga Wagga in regional NSW, under the then-Government’s decentralisation policy. With these moves requiring intensive attention within the RDC, focus on managing the CCRSPI partnership was correspondingly diluted.

This led to an unintentional hiatus in the early stages of Phase 3; however, support was still evident and partners continued to participate. In a June 2017 submission to the Australian Government on their 2030 Strategic Plan, the National Farmers’ Federation called for:

“... the CCRSPI [to] be recognised as the key strategic partnership for prioritising and coordinating climate research for primary industries. Funding to support the priorities identified by CCRSPI will enable the delivery of meaningful research, development and extension to build our resilience to a changing climate and to enable the farm sector to contribution to our national emissions reduction goals (NFF, 2017).”

The three-year operational plan agreed for Phase 3 proposed that the key activities for the period included:

- 2017-20 strategy approval and launch
- Evaluation of the three-year partnership and the 2017-20 strategy
- Annual face-to-face partner forums, where each Partner must report on its progress on climate change research development and extension activities relevant to primary industries
- Organising a national CRSPI Conference in late 2018
- Reviewing the CRSPI database and gap analysis of RD&E

In Phase 3, partners also agreed to drop “change” from the title, in part because ‘climate change’ was still a politically contentious phrase. In this iteration, CRSPI does not invest in research directly, but focuses on bringing partners together to discuss their RD&E activities and to identify priorities for future investment and collaboration. CRSPI still sits under the National Framework for Research, Development and Extension.

To reinvigorate the network, partners agreed to co-fund a part-time manager at the start of 2019. While stakeholders interviewed for this project unanimously agreed that the installation of a dedicated manager has been of great benefit to the network, most also think that it is not a role which can be effectively carried out in just two days a week and supported improved resourcing.

The principles underpinning the strategy for Phase 3 have been:

1. A focus on industry adoption and application of current and new research outcomes that build industry preparedness;
2. Research will demonstrate relevance to industry and policy;
3. Collaboration will leverage national and international science capability and enable the most effective application of limited resources;
4. Communication and information will be shared among partners on industry, government policy and research developments;
5. Collaborative funding opportunities will be proactively identified and communicated to partners;
6. New knowledge will be interpreted in the business context of primary industries; and
7. CRSPI will be streamlined, managed efficiently and will meet partner needs.

2. Impact – then & now

Evaluation of the partnership requires a review of the external environment (canvassed in Section 1) along with organisational capacity, motivation and performance (Figure 2). This section investigates stakeholder views on the motivation and capacity of CRSPI, which reflect on its overall effectiveness. These anecdotal insights should not be underestimated in evaluation. Partnerships such as CRSPI are simply organised networks of people, and the attitudes and behaviour of those people will invariably make or break the organisation. Behavioural science holds that a combination of factors must inform an understanding of the genuine motivators of behaviour, rather than the assumed ‘rational’ motivators (Gino, 2017). The theories of behavioural science recognise that systematic biases can – and often do – influence seemingly irrational decisions (BETA, 2019a), which should be considered when seeking to understand the disparity between what partners have aimed to achieve via CRSPI and what it has become.



Figure 2: Evaluating organisational effectiveness

2.1 Stakeholder views

To understand what has been delivered under CRSPI, what is valued and where the obstacles to success lie, interviews were held with past and present CRSPI staff, reporting managers, delegated partner representatives and other key stakeholders⁴ from November 2019 to January 2020. These interviews uncovered a diversity of opinion on CRSPI’s value and effectiveness.

Some common themes which emerged from this process were: the importance of **knowledge capital** within the partnership, underpinned by **continuity of representation**; the significance of **interpersonal and organisational trust**; and the need for more **effective communication** of CRSPI’s mandate beyond the group.

The following notes are paraphrased from these interviews.

“People make the difference”

Interviewees universally remarked that having the ‘right’ people involved can make or break a partnership like CRSPI.

With a heterogeneous group of partners juggling sometimes competing interests while seeking common goals, strong leadership is a necessity. To support this leadership, partner organisations need to provide representation with a degree of decision-making autonomy. When representatives are relatively junior within their organisation, they can struggle to find the right channels to communicate CRSPI goals and activities to those with authority.

Several interviewees remarked that the fluidity of the core group through the years has in part provided fresh perspectives but has overall been detrimental to the partnership’s knowledge capital. Loss of long-term organisational knowledge has made it more difficult for the partnership to build on or extend past success. The constant change in the core group has also hindered the development of trust, undermined commitment and stymied progress.

⁴ A list of interviewees is presented in the Appendix

Reflecting this state of flux, changes in the macro (political) environment in turn have at times eroded support for the partnership. As commitment to CRSPI waned, those tasked with holding the partnership together found it increasingly difficult to manage the disparate partner goals.

However, interviewees also noted that the partnership has survived some difficult years thanks to the dedicated and passionate people both leading and supporting the group over its 12-year tenure.

“Collaboration matters”

The first strategy produced by the partnership clarified both the need for investment in climate research for primary industries and the areas for collaboration.

The importance of CRSPI as a platform for collaboration was consistently expressed. The general understanding of purpose was that CRSPI is a platform for “collaboration and sharing information” amongst the partners.

However, the practicalities of delivering outputs from collaborative efforts can be difficult. Collaboration can also be constraining unless the collaborating organisation is enabled with a governance structure that allows or enables autonomy.

Interviewees said that from the start, the partnership has offered opportunity to talk about climate change topics outside the specific scope of an individual’s (sometimes limited) role or capacity, and to identify research synergies. Bringing together individuals within organisations that have a professional interest in climate research leads to strong collaboration around shared interest.

In addition, state agencies are limited in their interaction with industry, so having a collaborating body has been important to build these connections. While the CRSPI conference was most often referred to as a valuable opportunity to share ideas and create or improve networks over the years, some interviewees queried whether this value was still relevant in the current ‘crowded landscape’ of agricultural policy-focused events.

Some respondents also noted that while CRSPI was unique in this regard in 2008, many other avenues for collaboration now exist and the value of this particular platform for collaboration was less clear. Other initiatives can provide comparable, equivalent or better connections.

“Who owns CRSPI?”

While the dynamic and nebulous nature of the partnership has provided some resilience in a changing landscape, it has also created some confusion about the governance and management structure. The ‘ownership’ of CRSPI has not been clear to all partners for some time.

While interviewees were always aware of the managing agent (LWA, UoM, RIRDC or AgriFutures), it was unclear to most how the managing agent relationship impacts the authority or decision-making of the partnership. In fact, the majority of respondents had very little visibility on or understanding of the value of this relationship, resourcing arrangements or the source of CRSPI’s authority. Many also commented that the current iteration of CRSPI appeared to have no authority due to the dispersed nature of decision-making amongst partners.

Several questions were raised about CRSPI’s ability to speak on behalf of the partners (e.g. in a parliamentary submission process) and the degree to which information is or can be shared within and outside the partnership. Many interviewees commented on the aforementioned lack of authority and felt that CRSPI could only guide change rather than lead it. While some felt this suited

CRSPI's mandate to "coordinate and communicate", many felt that the partnership requires a structural option to be much more proactive in delivering outputs.

"The right time for change"

The interviewees displayed different levels of confidence in CRSPI's ability to deliver collaboration and coordination of climate RD&E for primary industries, covering the spectrum from dubious to certain. However, most agreed that the time is ripe for a revitalisation of the partnership to better serve the increasing climate research needs of Australia's agricultural sector. Respondents noted that:

- CRSPI could offer an opportunity to fund a nationally coordinated research program
- RDCs should take charge on communicating the science on climate change for primary industries and could use CRSPI as a vehicle for this
- CRSPI should be the 'go-to group' for primary industries climate change research for policy-makers but it has dropped off the radar
- There is a huge opportunity and need for coordination and a strategic approach to climate research for agriculture right now
- Everyone is looking for climate metrics to quantify climate change risk – CRSPI should be on top of this issue
- In the current political mood around agricultural RD&E, it would be prudent to leverage an existing research partnership rather than create something from scratch

Due to its representative nature, CRSPI has been an effective coordinating mechanism across the primary industries sector and has helped to establish an RD&E agenda for primary industries in Australia. While the lack of significant resources and external communication has precluded it playing a significant role in implementation, respondents were largely confident that the partnership still provides value and – with revision to the operating model – could play a significant role in future research delivery.

2.2 Value of the collaboration

Enduring collaborative partnerships can result in commonality of purpose and consistency in outputs across disparate and diverse organisations. In an environment where policy direction is fluid (and sometimes contradictory), collaboration can provide a 'sense-check' and rational perspective on priorities.

An EY report released in 2019 noted that the effectiveness and efficiency of Australian agricultural innovation is often undermined by poor cross-industry and cross-sectoral collaboration (Ernst & Young, 2019), and that national frameworks and priorities do not drive investment decisions. The siloed nature of the existing organisational structure means strategic priorities and direction are set independently by system participants, making systemic change difficult. Similarly, the AFI's *Change in the air* report noted that while several major projects, research initiatives and strategies have focused on the agricultural sector's climate actions, little to no collaboration has recently been apparent between sectors (McRobert et al., 2019). The Australian agricultural innovations review report (Ernst & Young, 2019) also noted that agricultural RD&E needs to draw on other industry and sector knowledge to address the shared challenge of climate change.

The lack of cross-sector co-investment and collaboration is not a new problem for Australian agriculture. Although there have been notable collaboration examples, such as the Climate Variability in Agriculture Program established in 1992, improvement is needed to effectively combat complex issues which significantly impact all sectors (Finney, 2018), of which climate change is a clear priority.

R&D is key to improving farmers' productivity while reducing emissions and improving NRM outcomes (Climate Change Authority, 2018). Cohesive focus on agricultural RD&E under a national climate change strategy could encourage cross-sector and cross-industry collaboration and provide the certainty which attracts private research investment. To fast-track the necessary RD&E solutions for agriculture's climate crisis, this collaboration and resourcing is key.

Stakeholders reported that **collaboration** has always been the key value proposition of the CRSPI partnership. While this collaboration has taken different forms throughout the partnership's iterations, the opportunity to share knowledge, ask questions, pool resources and discuss concerns has been consistently valued by participants.

Sometimes this collaboration has resulted in production of joint research projects, such as those on methane reduction and the role of nitrous oxide in climate mitigation. However, even when no tangible output has resulted, the collaborative process itself has proven worthwhile to CRSPI participants.

In general, the collaboration has **worked well** when:

- Partners are *invested* in the strategy (via financial and human capital)
- The strategy is operating in a supportive macro environment
- The strategy is focused on SMART goals⁵

The collaboration has **struggled** when:

- Partners lack trust in governance or confidence in the common goals
- Partner representatives allocated to CRSPI lack decision-making authority
- Representatives are changed frequently, disrupting continuity and undermining trust
- The strategy is operating in a hostile macro environment
- The strategy lacks resources or authority to direct research goals

The management and decision-making structures related to collaboration are a key factor in success of the partnership, both past and present. Additionally, the importance of interpersonal trust as an enabler of effective collaboration is difficult to overstate (Bozeman et al., 2016). Collaborative research evidentially requires the establishment of meaningful, credible relationships (Harmsworth, 2001). These relationships, which can take a long time to build, are critical to successful collaborative research and should not be underestimated.

Arenas for interactions and adequate time for effective communication should be structurally supported in collaborative partnerships to ensure trust and understanding are developed. These factors are often overlooked when designing, performing and evaluating interdisciplinary, collaborative and partnership research (Nyström et al., 2018).

⁵ SMART is an acronym for Specific, Measurable, Achievable, Realistic, and Timely goals

Collaborative structures which share expertise and information have been shown to increase innovation (Barnes et al., 2000). For 'wicked' problems such as climate change, innovation is an integral component of overcoming complex challenges. This is where a collaborative research structure such as CRSPI can be beneficial, if the model is embraced by participants.

Combining the strengths and characteristics of researchers through collaboration has also been shown to increase epistemic authority (Beaver, 2004). This highlights the potential for research outputs from collaboratives to be perceived as a high-level of knowledge quality, indicating their value. However, participants in the collaboration must also understand this value and see the partnership as a priority.

Numerous management factors which contribute to the success of collaborations have been identified in literature. A successful structure of a collaborative partnership must ensure no single interest is disproportionality served (Bozeman & Boardman, 2013) as well as incorporate principles such as open and frequent communication, participative decision-making, and complementary resources and skills (Majumdar, 2006).

However, external factors such as field characteristics, commerce and institutional relations can also impact the success of collaboratives (Bozeman et al., 2016). Several externalities were noted in Figure 1 that have had significant impact on the operations and success of CRSPI throughout its life. Although this adds a layer of complexity in the navigation of collaboratives, it is crucial to consider internal management as well as external macro environment factors when assessing the value of the partnership.

There are several examples of collaborative partnerships in both a research and funding combination throughout Australia. Three examples are briefly outlined below to showcase the value of successful collaboration:

P2D

The ***Accelerating Precision to Decision Agriculture (P2D) project*** was a collaborative research effort started in 2016 through the Commonwealth funded Rural Research and Development for Profit program. All 15 Research Development Corporations (RDCs) were investors in the initiative with several research providers used including University New England, CSIRO, Data61, The Data to Decisions CRC and the Australian Farm Institute (AFI, 2020).

The P2D project was the first, and remains the only project to be jointly funded by all 15 RDCs. Continual engagement with the RDCs and the Australian Government through a central management committee ensured that all project investors were able to provide collaborative input into project progress.

Tangible project outputs included modelling of the benefit of adoption of digital agriculture and recommendations to remove barriers to that benefit being realised. The National Farmers' Federation has recently released an Australian Farm Data Code, one of the recommendations emanating from the P2D project (National Farmers' Federation, 2020).

PdCCRS

The ***Priority-driven Collaborative Cancer Research Scheme (PdCCRS)*** was established by Cancer Australia, a federal government initiative, to foster collaboration between government and other funding bodies to fund Australian cancer research. The scheme works in conjunction with the National Health and Medical Research Council (NHMRC) who conduct initial assessments of the grants on scientific merit (Cancer Australia, 2013).

Through pooling funding resources and utilising the knowledge and expertise of the NHMRC in awarding the funding, this scheme has the potential to have a larger impact in the cancer space than if the funding bodies were to carry out the work individually.

PBRI

The Plant Biosecurity Research Initiative (PBRI) is a partnership between the RDCs working collaboratively with Plant Health Australia (PHA), the Department of Agriculture, Water and the Environment (DAWE) and industry, as well as State and Federal biosecurity stakeholders, to support cross-sectoral research development and extension.

Other interested parties are encouraged to participate by developing cross-sectoral research projects through the PBRI, committing cash and in-kind contributions.

Implementation of the plant biosecurity RD&E strategy is overseen by a committee, which includes representatives from the DAWE, State and Territory departments with plant biosecurity responsibility, horticulture, grains and wine rural RDCs, the Council of Rural RDCs, and the Plant Biosecurity CRC. Cross-sectoral research priorities from the Implementation Committee are then submitted to the PBRI for consideration.

While RDCs and Government already invest significantly in plant biosecurity, the PBRI brings additional value to RD&E strategic goals by directly involving members who have a high degree of understanding of what their organisations will consider in the future. Projects are developed through the regular tabling of cross-sectoral biosecurity research needs through the PBRI, which draws out areas for greater co-investment.

3. Future state

A key task of this review is to recommend whether there is a need for CRSPI to continue, and if so, in what form.

The impact of climate change on Australian agriculture will continue to be one of the most significant factors determining the long-term success of the industry (McRobert et al., 2019). In this context, ongoing coordinated cross-sectoral strategy for climate research is vital and should be a high priority for the industry. Given that the purpose of CRSPI is to develop such strategy and that it has been mostly successful in doing so, there is a logical case for continuation.

However, developing collaborative strategy is only part of the task that is required. Translating strategy into impact is essential if the goal of minimising the consequences of climate change for Australian agriculture is to be realised. The case for the continuation of CRSPI must focus on research deliverables, recognising that this is not regarded as a strength of the current structure. A future state for CRSPI must also anticipate the evolving RD&E landscape, particularly as some of the drivers for change to the landscape relate to effectiveness of collaborative effort.

3.1 Macro view for continuation

Recent reviews and political commentary have directed attention towards perceived lack of collaborative and commercial impact emanating from the Australian agricultural RD&E sector (Department of Agriculture, 2019; Ernst & Young, 2019). Commentary has concentrated on cross sectoral issues such as climate change and innovation. Efficiency of research investment has also

been a focus of discussion with the number of RD&E organisations delivering similar research outputs questioned.

CRSPI is an initiative tasked with cross sectoral climate change research and is a collaboration between existing bodies rather than a stand-alone organisation duplicating functional capabilities of partner organisations. It addresses many of the perceived inadequacies currently driving the discussion around the RD&E system and should be put forward as an example of the sort of collaborative model that is thought to be lacking in the RD&E community.

Individual stakeholder participants do in fact promote CRSPI as a successful collaborative model. However, it is clear that this appreciation of the collaborative success of CRSPI has not elevated the initiative to be front of mind within the participating organisations more broadly, particularly at senior management level. Even now, when there is a new urgency amongst CRSPI partners to invest in climate research, CRSPI does not appear to be the first port of call for scoping, developing or allocating such an investment.

There is a danger that this is interpreted as a lack of confidence in the ability of the CRSPI process to deliver a desired outcome. It is more likely that the apparent unwillingness to engage with CRSPI as a first port of call to deliver climate research is symptomatic of broader issues related to enabling collaborative research within the RD&E community.

3.2 New collaborative model

Contrary to some commentary, collaborating on ideas has generally been a strength of the RD&E system in Australian agriculture. The process of translating collaborative ideas into funded research to deliver impact is where barriers emerge and where some of the failings of the RD&E system are highlighted. There are few collaborative initiatives which have been established for which research funders are confident to both contribute funds for research and cede some authority to the collaborative entity over how those funds are invested.

Approvals for project funding decisions made by collaborative entities often must also progress through the internal funding structures of the partner organisations to ensure alignment with organisational strategy and compliance to governance procedures. Large initiatives such as CRCs or some Rural R&D for Profit programs are exceptions, where funding contributions have been made on the basis that the program meets the strategic objectives and governance requirements of the funding organisation. Despite being set up for this purpose, CRSPI does not yet fit into this category.

There are some genuine functional constraints to CRSPI acting as a research administrator. CRSPI is not constituted to be able to invest in research directly. The managing agent relationship (currently with AgriFutures) is necessary to provide the contracting and project administration functionality that CRSPI lacks. Even with the best intentions of all participants, this type of structure is prone to creating tension between partner organisations. Tensions can be derived from perceptions that the managing agent has the potential to unduly direct or block the activities of the collaborative organisation, or that research programs proposed by the partnership could 'cannibalise' funding for partner projects.

The reviewers wish to make it clear that these observations are not a criticism of AgriFutures as the managing agent. The same tension has existed during previous CRSPI stages with different managing agents and is symptomatic of a general lack of will to cede authority from one organisation to

another within the RD&E community. It is likely that whichever organisation acted as the managing agent (if they were also a partner to CRSPI) the same tension would exist.

Competitive positioning and a lack of trust between CRSPI partner organisations has contributed to the recent political focus on the apparent lack of collaborative output (not just in the area of climate research) from Australian agricultural RD&E. The failure to elevate CRSPI to the obvious vehicle for cross-sectoral climate research is an obvious case in point.

There is currently great pressure on the RD&E community to demonstrably improve collaborative output, particularly in relation to significant cross-sectoral issues such as climate research. This pressure is most evident from Government in the context of the need to improve efficiency of public expenditure. The continuation of CRSPI provides an opportunity to develop a collaborative research model that will be fit for purpose, not just for climate research but for all cross-sectoral research priorities.

The value of a collaborative strategic partnership lies in enabling participants to co-invest in a comprehensive RD&E agenda across sectoral and jurisdictional boundaries, maximising the value of collective investment and capturing the issues which cannot be addressed in isolation. An entity to coordinate and lead this collaborative effort must be enabled via a **robust, practical governance structure and sufficient resourcing** in order to drive a cohesive agenda focused on specific research outputs (funded and directed by the entity). The entity must have committed representation and buy-in from government agencies, private industry and various research bodies (not just universities), as well as RDCs.

The current iteration of CRSPI acts as a coordinating body for interested partners, with little to no ability to action research to operationalise a climate research strategy for Australia's primary industries. Participating partners need to **invest funds and trust** into the entity in order to enable action. A possible model that would enable delivery of research through a trusted collaborative partnership and investment pathway is illustrated in Figure 3.

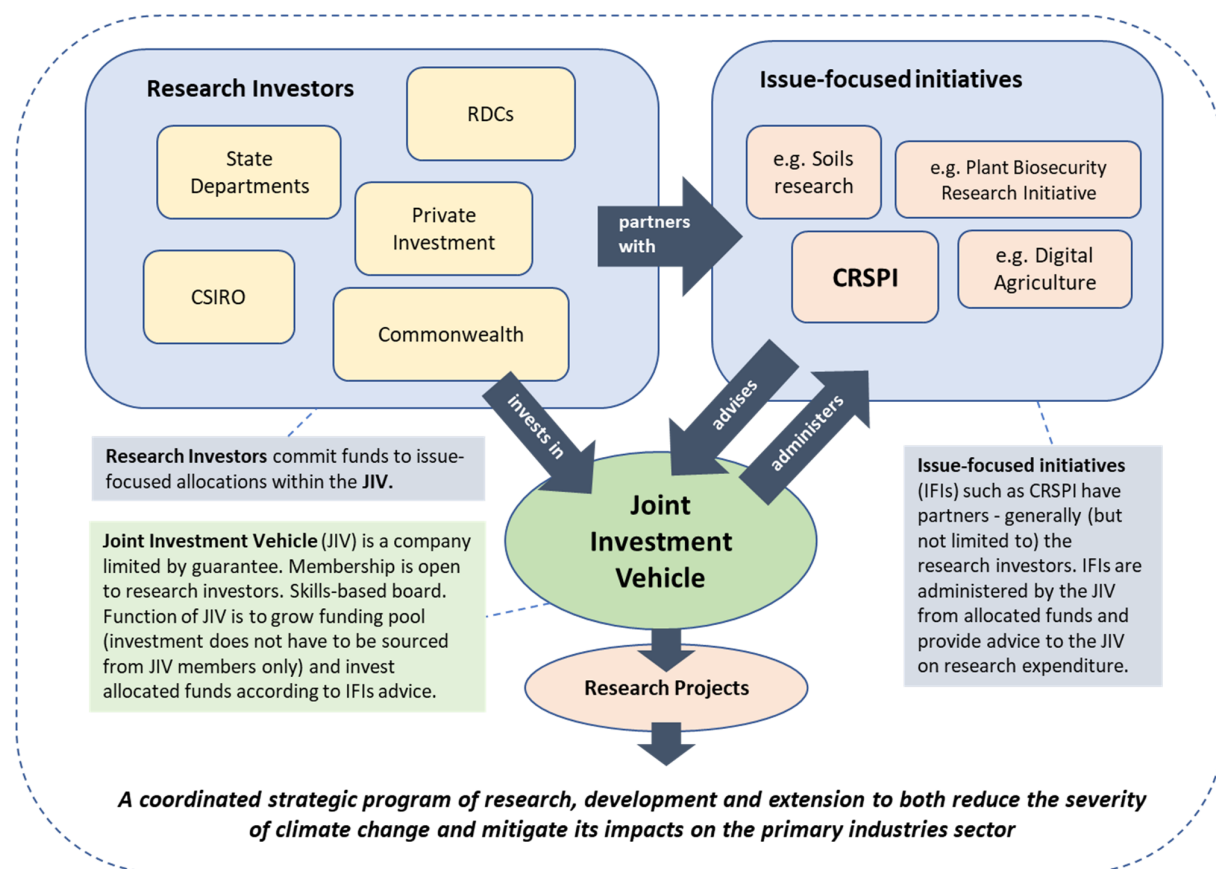


Figure 3: Joint Investment Vehicle for delivery of cross sectoral research

A **Joint Investment Vehicle (JIV)** that is funded by organisations within the Australian agricultural RD&E community and is advised by **Issues-focused initiatives (IFIs)** such as CRSPI will provide a pathway for collaborative investment into cross sectoral research, unconstrained by competitive tensions between participating organisations.

Research investors, guided by their individual investment priorities and strategies, would allocate funds to the JIV to be invested in cross sectoral research projects aligned with a specific area of interest and informed by the associated IFI. Governance of the JIV would focus on the most efficient and commercially relevant pathway for delivering impact from research investments but would not challenge the areas of research to be invested in defined in the strategies and recommendations delivered by the IFIs.

A model that invests in collaborative cross sectoral research through a JIV under advice from IFIs has several advantages:

- The governance and focus of the JIV can be entirely on innovative project delivery and commercial partnerships where relevant.
- Once an IFI has made a recommendation on a funding priority and there are funds allocated in the JIV, there is no need to revert to partner organisations for funding approval.
- Research investors maintain the ability to guide investments to match strategic priorities through partnership with IFIs (CRSPI).
- The JIV is not constrained to working with existing research investors. The JIV could work to attract private investment or impact capital.

- The JIV could act as a facilitator connecting research investors (public and private), Government, universities, research providers and technology developers.
- There are numerous existing strategies and initiatives that could be developed to be IFI's under this model. From CRSPI to the R&I National Frameworks to the Plant Biosecurity Research Initiative.

A Joint Investment Vehicle model for the continuation of CRSPI ensures that the successful elements of CRSPI are retained while providing a new pathway to address failings.

The collaborative strategy setting and community built around defining the need for climate research is retained through the role of CRSPI as the IFI informing climate research investment from the JIV. The IFI role will enhance CRSPI's long-term security, as funding will be derived from the allocated funds within the JIV and eliminate the risk of ongoing changes in managing agents.

The major failing of CRSPI to this point (i.e. the inability to translate strategy into impact) will be addressed by the capability that CRSPI will have in directing allocated funds contained within the JIV.

A dedicated investment vehicle will also provide the opportunity to grow the total funding pool and increase private sector investment into agricultural RD&E with the goal of improved and more diverse research outcomes. Although Australia's private investment in agriculture is growing, it lags behind international benchmarks (Ernst & Young, 2019).

While collaboration in agriculture between public and private enterprises has not always been a positive experience (Keogh et al., 2017), some partnerships between RDCs and private enterprises - such as the \$45 million partnership between GRDC and Bayer in tackling the issue of herbicide-resistant weeds (Goucher & McKeon, 2018) - stand as examples for private/public collaboration on climate solutions.

3.3 Recommendations

There is a clear need for a continuing entity to address climate research for primary industries. While CRSPI has been effective in *developing a strategy* for research, there is now a greater need for the *delivery of research* informed by CRSPI strategy as well as strategy development.

This evolution is necessary as the strategic direction and collaborative goodwill provided to the primary industry sector by CRSPI is currently underutilised. A lack of awareness of and trust in the potential of CRSPI from its partners is evident. Rather than seek new collaborative ventures for the discussion of agricultural climate research, partners and stakeholders should seek to maximise the benefit of an extant and resilient entity by directing its outputs through a purpose made vehicle for collaborative research investment.

The following changes are necessary to enable the transition of CRSPI from a coordinating body only to one which continues to coordinate but also has an enhanced and expanded role in directing research investment:

- **Change of name** to emphasis focus on delivery and signify renewed purpose
- **Restructuring of the managing agent relationship** to one which extends CRSPI outputs through a Joint Investment Vehicle (as the current arrangement limits autonomy and thus effectiveness)

- Partners must empower CRSPI with **greater autonomy** via investment of both trust (through allowing CRSPI to direct investment outcomes from the JIV) and resources (by investing in a JIV) to increase impact
- CRSPI should seek **expanded membership** (e.g. private R&D, industry partners) to ensure committed representation and buy-in from a broad range of stakeholders

Research which can provide multisector outputs is vital, and collaboration helps make best use of research resources for the greatest collective benefit. Without the changes recommended here - and the acceptance and promotion of CRSPI as the appropriate vehicle for collaborative research, enabled by a new enabling mechanism for research investment – it is likely that the future application of funding to multi sector climate research initiatives will be disjointed and inefficient.

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Appendix

Acronyms

AGSOC	Agriculture Senior Officials' Committee
CCRSPI	Climate Change Research Strategy for Primary Industries
CRSPI	Climate Research Strategy for Primary Industries
CEFC	Clean Energy Finance Corporation
CFF	Carbon Farming Futures
CFI	Carbon Farming Initiative
CPRS	Carbon Pollution Reduction Scheme
CSF	Climate Solutions Fund
ERF	Emissions Reduction Fund
ETS	Emissions Trading Scheme
FDF	Future Drought Fund
GFC	Global Financial Crisis
LNP	Liberal-National Party
MCV	Managing Climate Variability
PIARN	Primary Industries Adaptation Research Network
PICCC	Primary Industries Climate Challenges Centre
PIMC	Primary Industries Ministerial Council
PISC	Primary Industries Standing Committee
R&I	Research & Innovation
RD&E	Research, Development & Extension
RDC	Research Development Corporation
RET	Renewable Energy Target
SCaRP	Soil Carbon Research Program
SLA	Southern Livestock Adaptation 2030

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