



Australian Government

**Rural Industries Research and
Development Corporation**

Cross-sectoral industry research, development, and extension

Decision support guidance on when and how to collaborate

by Dr John H Howard

July 2015

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Foreword

This Guide has been developed to address the questions:

- In what circumstances should Research, Development and Extension (RD&E) collaboration be considered?
- What sort of decision support information can be developed to help Rural Research and Development Corporations (RDCs) and respective levy advisory committees make decisions regarding collaborating with others?

The Guide identifies types of RD&E collaboration activities and develops categories of RD&E multi-industry collaboration in terms of:

- Their key purpose, activities, and other key requirements for each category.
- Institutional and governance arrangements required for the different RD&E multi-industry collaborations.
- Resources (financial, skills, tools, IT and other) required for the facilitation of the different collaborations.
- Lessons from previous collaborations.
- Impediments to effective collaboration and what can be done to overcome these impediments.
- Guidance on systems or approaches that could be set up to help make multi-industry RD&E collaborations more efficient and effective.

In this Guide, collaboration means working together across industry and/or multiple industries. Specifically, the Guide aims to assist in facilitating collaborations between levy paying primary industries.

Collaboration has the potential to deliver benefits from working together. Benefits are expected to be greater than if participants acted independently or unilaterally. Benefits may not of course be evenly distributed among participants, particularly when participants are of unequal size, are geographically spread and service different markets.

To assist in thinking about collaboration, the issues involved, and what collaboration requires in management, resource, and other commitments, a ‘checklist’ has been developed to provide a guide for considering the formation and operation of collaboration arrangements. These follow from the more detailed guidance contained in this document.

The checklist is presented as a separate document, *Checklist for considering formation and operation of multi-industry collaboration arrangements*.

This report is an addition to RIRDC’s diverse range of over 2000 research publications and it forms part of our (fill in relevant program) R&D program, which aims to (fill in program’s objective – available from the AOP).

Most of RIRDC’s publications are available for viewing, free downloading or purchasing online at www.rirdc.gov.au. Purchases can also be made by phoning 1300 634 313.

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About the Author

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John's professional knowledge, skills and experience in the fields of management consultancy and public policy analysis provides a unique combination of capability that has been applied in an extensive portfolio of successful commissions and assignments for government, business, universities and the non-government (NGO) sector over a 25 year period. Clients have included the Commonwealth, NSW, Victorian, Queensland, and ACT Governments, private sector organisations, and industry associations.

John has provided advice to Ministers, Ministerial staff, CEOs and senior management teams on policy, strategy, organisation structure, program performance improvement, communication, and innovation. Advice is built around detailed situation analysis, stakeholder consultation, literature review, case profiles, and evidence based material on contemporary management practice. Advice is provided in a context of practicality, feasibility, and cost of implementation.

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Executive summary

This Guide and accompanying Checklist tool have been developed to assist the Rural Industries Research and Development Corporations (RIRDC) in thinking about, entering into, and participating in cross-sectoral rural research, development and extension (RD&E) collaborations.

There are many types of collaborations that occur in RD&E, including:

- Within and across research institutions
- Across different academic disciplines
- Action research bringing researchers together with target users
- Bringing different geographic locations together
- Across different primary industries.

The Guide provides a blueprint to inform government, industry, and others on what an effective collaboration looks like, and situations and circumstances where a collaborative approach might be appropriate.

The Guide identifies and addresses issues concerning RD&E multi-industry collaboration in terms of:

- Reasons to collaborate – purpose and intention of working together
- Collaboration for results - expected outcomes and achievements
- Building and sustaining collaborations - systems and procedures that help make collaborations more efficient and effective
- Collaboration governance – the structures and relationships between collaborating parties
- Resource requirements for collaboration - financial, skills, tools, IT and other assets required for the facilitation of the different collaborations
- Validating collaboration design
- Managing collaborations
- Impediments to effective collaboration - and what can be done to overcome these impediments

The Guide provides a basis for the development of formal arrangements for working together. The need for some element of formality is often overlooked in the haste and enthusiasm to start working together. But the absence of clear ground rules and governance arrangements are often the root cause of collaboration failure.

There is, of course, no one model for collaboration. The Guide seeks to tease out different approaches and the key considerations and mechanisms required to enable the collaboration to occur effectively.

Introduction

Collaboration is a critically important vehicle to address the challenges of innovation, productivity improvement, and international competitiveness. There is a growing recognition that a single RDC does not have all of the connections and capabilities that are required to address these sort of challenges.

Collaboration can address the demand for expanded capacity that is required of research projects that have extended scope and complexity across industry sectors. Some research questions can only be addressed in this manner. Breakthroughs are often more likely to come from collaboration between RDCs than by adherence to a single RDC funding approach.

Collaboration can:

- Facilitate conducting research with a larger scope
- Involve experts from diverse yet relevant industries, industry sectors and professional disciplines
- Handle a larger number of study subjects in a broader program
- Permit research to be supported at disparate locations either at a national or international level

Collaborations enhance ability to share and exchange resources. Benefits also flow from cost savings and the potential to facilitate scientific progress. They provide opportunities for project managers to learn how approaches in one industry may be applied to existing problems, and lead to the development of innovative solutions in another.

Collaboration may be viewed as a strategy for the risk management of a research project. While most research may entail some risk or hazard, the degree of risk and its concomitant costs will depend on the nature of the research conducted. Research activities that may knowingly or unknowingly expose project managers, investigators, participants (human or animal), or the public to some degree of danger, cannot be conducted unless the risks are abated or eliminated.

Cross-sectoral collaboration can also be useful in establishing innovative alliances between research teams from academic, government, and private industry. These alliances can result in long term research relationships benefiting industry, the research community and broad-based economic and social interests. Both science and society are best served by collegiality and open collaboration.

Collaboration can be beneficial when RDCs invite the participation of investigators having more experience in a desirable area of research. This experience could include insightful and innovative approaches to problem solving, and significant publications in the field.

The remainder of this Report sets out in more detail the reasons for collaboration, the results that should be expected, how collaborations should be designed and managed. The Report also identifies some barriers to collaboration and makes suggestions about how these can be avoided.

1 Reasons to collaborate

In the RDC&E environment, collaboration addresses a need to:

- Capture *opportunities* arising from scientific discoveries and technological inventions. These may be new industry methods and processes, or specific industry engagement and commercialisation prospects.
- Address *problems* that are common across industry and society. These may be responses to national disease emergencies, or broad based policy issues.

These two reasons are not, of course, mutually exclusive. But they help define the focus of attention in a collaboration arrangement.

Identification of collaboration opportunities or problems are *necessary* but not *sufficient* conditions for successful collaboration. *Sufficient* conditions relate to the range of other factors that would bring participants together. In other words, the existence of a collaboration opportunity or problem does not necessarily mean that collaboration should, or will, take place. Other considerations come into play. These are addressed in the remaining Sections of the Guide.

Recent reviews and policy statements have pointed to the importance of collaboration. These include the reviews of the Cooperative Research Centres Program, *Collaborating to a Purpose* (O'Kane 2008), *Growth Through Innovation and Collaboration* (Miles 2015), the *Industry Innovation and Competitiveness Agenda* (Australia. Minister for Industry and Science 2014), and the RIRDC report *Improved agricultural productivity through enhanced collaboration and information sharing among G20 countries* (RIRDC 2015). From this material the following reasons for collaborating can be identified:

1. To achieve critical mass
2. To bring together a range of perspectives, experience, and knowledge
3. To fast track the development of new technologies
4. To capture 'spillover' benefits
5. To encourage skills and knowledge transfer, including end user participation and engagement
6. To promote mutual understandings
7. To manage risks
8. To develop and implement coordinated response plans to emergencies and challenges
9. To develop policy frameworks.

Each of these areas is further outlined in Box 1.

Box 1: Reasons for collaboration

1. To achieve 'critical mass'

Economists argue that increasing size and commitment of resources allows for greater specialisation of task and division of function. Collaboration allows for the aggregation of specialisations and into a much broader capability thereby giving a research project greater viability.

'Critical mass' may mean having more than one RDC addressing a particular problem or issue, with a multi-faceted division of tasks around specialised knowledge, capabilities, and skills. Critical mass is appropriate to large-scale research projects.

Several RDCs may collaborate to address a common issue in identification or animal health, for example, that impacts both the wool and the meat and livestock industries. By coming together RDCs can achieve critical mass through economies of scale to design a viable and worthwhile project.

Moreover, more extensive access to, and use of, expensive and sophisticated research equipment and facilities can also deliver scale economies through reduced unit costs and extended benefits. Many research projects are appropriately undertaken on a large scale, over an extended time period.

2. To bring together a range of perspectives, experience, and knowledge

Collaboration between RDCs can be directed towards assembling complementary capabilities, knowledge, and experience in order to address opportunities and challenges that cross industry boundaries. These opportunities and challenges may revolve around trade, international market access, and regulatory frameworks.

3. To fast track the development of new technologies

An RDC may wish to collaborate with another RDC to fast track the development of a new technology or practice that has applications across several industries. Greater resource commitment can speed the technology development effort.

4. To capture ‘spill-over’ benefits of research

A ‘spill-over’ benefit could result from work supported by one RDC benefitting another, which has not been party to the project. Formal involvement in the project would ensure that benefits are formally and legitimately captured.

For example, research undertaken through the grains RDC might be of benefit to rice growers (who come under the auspices of RIRC). Collaboration between GRDC and RIRDC could ensure that research benefits a broader collective interest.

There is also an argument that research results from larger projects could be provided to the smaller industries at a lower, or ‘marginal’ cost.

5. To promote mutual understandings

Collaborations build teamwork between RDCs and support the development of understandings about how different RDCs work, their constituencies and expectations. This can assist in the design and implementation of over the horizon projects.

6. To encourage skills and knowledge transfer

RDCs may collaborate to facilitate end user participation and engagement in technology development and application. This would be the case where end users are in different industries but the same agricultural business.

Collaborations have the potential to engage end users at an early stage. Users become part of the product development journey.

7. To manage risks

Big projects have big risks. Collaborations between RDCs can help share risk across a broader base of participants.

8. To develop and implement coordinated response plans to emergencies and challenges

Collaboration between RDCs and research organisations has occurred in response to national emergencies, or potential emergencies. Coordinated responses have been developed to address Hendra Virus, as well as more broadly in response to natural disasters.

Collaborations may also be required to prepare coordinated responses and action plans in relation to major disruptions in markets, technology, and the physical environment.

9. To develop policy frameworks

There is an emerging view that primary industries research should be increasingly cross-sectoral in approach and addressing broad policy and strategic issues relating to all primary industries. These are reflected in the eight current cross-sectoral strategies in the National Primary Industries RD&E Framework (National Primary Industries Research and Development Framework 2009).

The articulation of an opportunity for collaboration, or a problem requiring a coordinated response, does not, of itself, build a case for collaboration. There is a need to build a *business case* for collaboration as a foundation for committing resources to deliver increased performance across industry sectors, reflected in increased on farm profitability, enhanced productivity, and contributions to international competitiveness including greater participation in global supply chains and penetration of global markets. These matters are addressed in terms of *achieving results* in Section 2.

2 Collaboration for results

Collaboration is a term that is being used increasingly in business, government and the research community. In practical usage the term is multifaceted, with a number of dimensions:

- Communication and knowledge sharing through networks, including ‘knowledge networks’
- Cooperation and creation of mutual understandings through associations
- Coordination of activities and actions through strategic alliances
- Integration of effort and commitment through formalized joint ventures

True collaboration is much more than communicating and sharing knowledge and information as part of an ongoing conversation. Whilst this can be important, collaboration is generally understood to involve a commitment to work together to achieve a defined purpose or end result. This may be in relation to a designated project, or a longer-term program of activity and action. In this context, collaboration arrangements between RDCs can be categorised as strategic or tactical. Collaborations may also have a strong collaborative research component.

- **Strategic collaborations.** Interactions that involve setting direction, deciding what to do (and what not to do) and committing to a substantial investment of time, effort, and money. There is a strong focus on planning, resource allocation, achievement, results and accountability. For example, ‘we are going work together to eliminate all risks of FMD’.

Strategic collaborations may take a longer time to set up, and involve a greater commitment to manage and maintain. Their formation may be dictated by circumstance, such as the availability of a new technology, a breakthrough discovery, or a major emergency.

- **Tactical collaborations.** Interactions of a transactional nature, with a strong commitment to process. Actions are often identified in terms such as ‘coordinate’, ‘facilitate’, ‘support’, ‘improve’, ‘develop’, and ‘assist’. For example, ‘we are going to work together to improve productivity by making producers aware that ...’. Resource availability for tactical collaborations might be quite small.

Tactical collaborations should be easy to set up, with limited time and resource commitment. However, tactical collaborations can be important as forerunners of more strategic relationships as specific projects become clearly identified and participants see benefit in working together more closely.

In determining collaboration purpose, and whether they would be strategic or tactical, some questions to address include:

- Can collaboration purpose be specified and documented?
- Can outcome and expected results be clearly defined?
- Can specific ‘investible’ projects be identified?
- What are the potential benefits? Can these be specified?
- What would be the costs – particularly transactions costs?
- Can capabilities be ‘leveraged’ across industries?
- What would be the alternatives – building internal capability, crowd sourcing, etc.?
- What are the potential risks?

Within the two broad categories a number of collaboration arrangements can be identified. These are itemized below.

Strategic collaborations

For the purposes of illustration, four broad areas of strategic collaboration can be identified:

To make, build, or buy an asset or capability

RDCs may decide that collaboration will provide a more cost efficient means to acquire and manage an asset or capability – particularly if the resource is expensive or in short supply. Once acquired, collaboration will involve establishing arrangements for multi-party access and utilisation.

To develop and extend applicable knowledge

Collaborations can be established to invest in research projects that develop and extend knowledge that has potential application and use across industries. This form of collaboration may begin with arrangements to share knowledge through knowledge networks through to the implementation of collaborative research projects.

To manage technology development and commercialisation

Collaborations may be formed to invest in translational research to guide wider adoption, application, and use of research outputs and outcomes. These collaborations may involve the commercialisation of research through creation of marketable products and sale and distribution through service platforms.

Collaboration arrangements should clearly identify matters concerning ownership of IP created through the collaboration, access to and licensing of discoveries and inventions, negotiating of licensing agreements, and distribution of revenues from IP licensing and sale.

There are a number of intermediary organisations that facilitate adoption and implementation by connecting research providers and users.

To develop markets and secure international market access

RDCs may also collaborate in product and service marketing and negotiating market access. Horticulture Innovation Australia, for example, has worked with small industries to merchandise products in international markets.

To eliminate a specific risk or threat

Collaborations may be established as a way of sharing or distributing risk in research and commercialisation of research.

Tactical collaborations

On the basis of discussions and observations among RDCs, four broad areas of tactical collaborations can be identified.

To share and transfer knowledge

Collaborations can be established to encourage and facilitate knowledge transfer among research organisations and between research organisations and industry. Collaborations can take the form of conferences, events, exhibitions, and, web enabled knowledge networks.

Developments in social media are providing an increasingly diverse way of sharing knowledge among researchers, and between researchers and industry.

To build industry capacity

Industry capacity building is generally associated with building the knowledge, capabilities and competencies of people who work in the industry.

Capacity building can range from the development of be-spoke masters and PhD programs in collaborations between RDCs and universities (nationally and internationally) to the award of scholarships, prizes, and short duration training programs. Smaller RDCs may benefit by collaborating with larger RDCs that are developing these programs.

RDCs currently collaborate in offering a number of prizes, awards, and scholarships, including:

- Horizon Scholarship
- Rural Women's Award
- ABARE's Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry

To connect, communicate, and engage

RDCs communicate, connect and engage with industry through a range of channels. They tend to do this within their own organisational and management structures.

There are opportunities for greater communication in the way messaging is prepared, distributed, and received. With reductions in the cost of accessing communication channels, there is a tendency for communication volumes to increase, with a potential for greater 'noise' to be introduced into the system.

Collaboration could be considered in relation to:

- The distribution and exchange of information relating to current trends and developments in agriculture through a Knowledge Network.
- Providing commentary on contemporary issues relating to rural industries through blogs and other social media platforms
- The marketing and sale of tangible products, services, and 'solutions' developed through research. Many RDCs have supported the development of tools for their industry, which could be relevant to other industries.
- Delivery of training and professional development materials particularly where there are interactions with several RDCs.
- Engagement, or two-way communication, between RDCs and industry to build broad *trust based relationships* and ongoing collaborations between the RDCs, research organisations and industry.

To prepare funding applications that require a collaboration element

RDCs recently collaborated to secure funds under the Government's Rural Research and Development for Profit Program. It would be expected that the successful collaborations would be implemented to secure strategically significant outcomes.

Research collaborations

Strategic and tactical collaborations will have a research and/or extension focus relating to the creation, dissemination, adoption, application and use of knowledge that has cross industry application. Inevitably collaborations involve not only developing and strengthening interactions and relationships among RDCs, but also between RDCs and research organisations.

In addressing the purpose of cross-sectoral research collaboration and commitment, it is useful to identify four distinct dimensions of research direction and focus.

Box 2 - Four research dimensions

Adoption

Current industry policy agendas are placing an increasing emphasis on the commercialisation of publicly funded research (Australia. Minister for Industry and Science 2014, Australian Government 2014).

Collaborative RDC investments might involve supporting cross-sectoral and cross institutional prototyping, scale up, market development, and the crafting of strategies for new products and services to enter global value chains.

Performance

RDCs have an interest in investing in programs that lift research performance in areas that are important to Australian primary industries. Creating depth in knowledge within *specific research fields and disciplines* that have cross-sectoral application can lead to discoveries and inventions that can have a substantial impact on productivity and competitiveness.

It is important, however, that investments are made in Australia's top researchers, with global reputations, and potential for breakthrough discoveries, rather than support 'science as usual' programs that operate across the research sector.

Integration

Research integration involves bringing together knowledge from diverse fields and disciplines to provide new understandings and insights with potential for broader application in industry contexts. Industry solutions rarely rely in outcomes from one research field or discipline.

Integrative research is best equipped to respond to contemporary problems at a cross-sectoral industry and societal level because it moves beyond disciplinary silos to build interdisciplinary partnerships with capacity to respond to multi-focal, complex problems.

Competitive funding programs that encourage genuine cross-disciplinary collaboration are not strongly supported by the ARC. RDCs working together provide a potentially important opportunity to fund this form of research. In this way RDCs can be supportive of collaborative, integrated partnerships and teams as a way to generate cross-sectoral industry knowledge and new approaches to productivity improvement and enhancing international competitiveness.

Dissemination and extension

It is important that the results of research are translated, packed and presented in ways that have meaning for farmers and other end users in the primary industries sector. There is potential for collaboration across RDCs in this important area.

Collaboration to develop better ways to create awareness and change attitudes and behaviours on a cross-sectoral basis offers substantial benefits for industry and rural and regional communities.

It is important to not only identify why collaboration might be a good idea, and the purposes and outcomes that collaboration can deliver, but also understand the way that collaborations can be established, maintained and sustained. This is addressed in Section 3.

3 Building and sustaining collaborations

Having made the business and research case for collaboration, it is important to address the issue of *who* will be collaborating and *how* they will be engaged. Specific issues relate to:

- Developing a compelling narrative
- Demonstrating value
- Identifying participants
- Shaping the relationship
- Building trust
- Establishing communication channels
- Recognising and endorsing the relationship
- Exit and termination

Considerations in each of these areas are:

- **A compelling narrative**

A collaboration should be based on a persuasive narrative - that is, why the collaboration should come into being, the assumptions shape the way the collaboration will work, dictate decisions about what it will do, and not do, and define what the collaboration considers to be meaningful results.

These assumptions are about end users, participants, and their values and behaviour, technology and its dynamics, about the collaboration's strengths and weaknesses. They are about what the collaboration is "there to do and achieve"

Assumptions will be reflected in collaboration strategies, structures, and staffing arrangements as well as in the policies, processes, and procedures that guide the operations of the collaboration. But before these corporate instruments are put in place, it is important that they relate to why the collaboration has been established and what it is intended to achieve.

Applied incorrectly or without context, many corporate instruments can stand in the way of innovation, flexibility, and responsiveness to address the very opportunities and challenges that instigated the collaboration arrangement.

- **Demonstrate value**

Collaboration proponents should demonstrate collaboration value. It is particularly important to quantify how collaboration costs will generate benefits. The timeframe for expected return should also be identified.

If the collaboration is not intended to create a monetary value, this should be recognised specifically.

- **Participants**

Participants in collaboration should be identified in terms of the contribution they can be expected to make and the value of that contribution from a strategic or tactical perspective.

A large collaboration base may be desirable from the perspective of inclusiveness, but large numbers make planning, priority setting, and implementation difficult. Smaller collaborations suffer from the opposite problem in terms of being criticised for detachment and exclusivity.

- **The relationship**

Collaboration must be nurtured and cultivated. People must be willing participants, and they must see that they have something to contribute as well as something to gain.

In building the relationship it is important to establish points of contact and appoint an executive officer with knowledge of the subject matter capabilities in team building and leadership. Command/control styles of management do not work.

As part of the relationship building process, the collaboration should work towards creating a reputation for reliability, integrity, and commitment among participants.

- **Trust**

Trust is foundational to collaboration. Without trust, collaboration efforts are unlikely to survive. Deficiency of trust can undermine the best-intentioned efforts; participants struggle to find a shared vision and governance model, disagree on how investment and rewards are allocated, and worry about the ‘free rider’ problem.

In the corporate world, there is a maxim that “People do business with people they trust.” Trust underpins formal, legal, and contractual obligations (Maister, Green, and Galford 2000). Without trust, most collaboration efforts are unlikely to survive, however noble the cause and worthy the participants (Nidumolu et al. 2014). Trust takes time to develop, but can be dissipated very quickly. Governing Boards, CEOs and project managers all have a clear responsibility to build trust.

- **Communication**

Collaboration success rides on effective communication – knowing what and how to convey thoughts and opinions. Communication builds social capital and there are many channels to build and strengthen communication. These should be open and transparent. In addition to modern electronic and web-based channels, the importance of face-to-face communication should not be overlooked.

- **Recognition and endorsement**

Collaboration relationships require some form of recognition and endorsement among organisations involved. These can range from the casual and informal to the formal and legalistic. They can involve a simple sign off by a CEO (or a General Manager under delegation), the preparation of a deed of agreement, or formation of a separate corporate entity.

It is likely that the greater the degree of resource commitment, and the greater extent of independence required, the greater will be the requirement for formality.

- **Exit and termination**

Collaboration arrangements should include provisions for exit of parties no longer committed, and termination of the arrangement.

These matters all relate to ‘collaboration governance’, which is covered in Section 4.

4 Collaboration governance

Governance refers to the structures, rules, relationships, policies, systems, and processes under which collaboration within and between organisations is exercised and maintained.

In the area of management practice it is well understood that in order to achieve results, by bringing people, knowledge, and materials together, some form of governance framework, organisational structure, management responsibility/accountability system, and resource allocation framework (starting with a plan and budget) is required.

Governance attributes of collaboration are shaped by a variety of factors such as a constitution, policies, and laws, regulations, participant expectations. For formally constituted organisations, a governing board, board of directors, or management committee/council plays a pivotal role in influencing collaboration governance.

Framework

Drawing on previous research, analysis, and publication, it is possible to develop a framework for collaboration governance (Howard 2009, 2011, 2013) around two distinct areas of interest:

- The focus – whether it is strategic (long term, big picture) with a strong focus on outcomes, or tactical (short term, one off, procedural) with a focus on process.
- The basis – whether it is project based (relating to one or perhaps two specific initiatives with a formation over a relatively short or finite time frame), or program based (relating to a portfolio of initiatives expected to occur over a medium or long term time frame).

This gives rise to a framework of four collaboration governance models, represented in Figure 1 below.

Figure 1: Framework for collaboration governance

Focus	Outcomes Orientation	Strategic Alliance Joint action Strong commitment Clear statements of purpose Strong Board/CEO/CFO interest Coordination, alignment focus Agreed Business Plan Significant cost, moderate risk Formal agreements and obligations	Joint Venture Directive action (employer-employee) Enforceable commitment Clear statements of purpose Diligent Board/CEO/CFO interest Corporate, integration focus Legal Entity High cost, high risk Incorporation, legislation, deed
	Process Orientation	Network Shared interest (inclusion) Loose commitment General statements of purpose Limited Board/CEO interest Communication, knowledge sharing focus 'Gentleman's' agreement Minimal or nil cost, minimal risk Informal e.g. exchange of letters	Association Collective action (membership) Weak commitment General statements of purpose Casual Board/CEO/VC interest Cooperation, consensus focus Statements of Intent Low cost, low risk Memoranda of Understanding
		Project (Action) Based	Program (Theme) based
		Basis	

Source: Developed by John H Howard from Howard Partners' work relating to collaborations.

The collaboration governance models identified in Figure 1 are not intended to be mutually exclusive. The intention is to draw attention to the different ways people and organisations work together. The framework applies to all current and potential forms of interaction between RDCs.

The characteristics of each collaboration arrangement are outlined in Box 3.

Box 3: Collaboration governance arrangements

Networks

Networks are informal forms of collaboration that involve the exchange of information of mutual interest, such as through conferences and meetings, formation of ‘communities of practice’ and knowledge networks. They are generally accommodated within existing organisational responsibilities and accountabilities of participant organisations.

Network members may commit to a strategic initiative, or set of initiatives – but without necessarily pledging resources or supporting a management infrastructure. A ‘coordinator’, ‘facilitator’, or project officer, without executive responsibilities, may be assigned to take a leadership role.

The governance and management model is typically informally constituted in the form of committees and advisory councils. The decision making approach is consensual rather than directive.

The success of networked collaborations is often measured in terms of participants being able to exchange and test ideas, resolve a problem, and being informed about what others are doing. In extended networks, reference is often made to the *wisdom of crowds*, particularly those enabled by social media (Deemertzis 2009, Surowiecki 2004).

Significant problems arise when networks are used to manage and implement strategic projects that involve the commitment of significant resources and have clearly defined outcomes and results.

Associations

An association has an aim to build continuing relationships for interaction around common themes and fields of interest. People and organisations pool their interests, and sometimes resources, to work towards an end result that has only been loosely defined or articulated. The focus is on exchanging information and directing activities *to achieve a common or collective purpose*.

Commitment to coordination is often reflected in non-binding *Memoranda of Understanding*, or multilateral *Statement of Intent*. It expresses a convergence of will between the parties, indicating envisioned common lines of action. They may have a very strong ‘feel good’ quality and are essentially *consensus* documents.

A MoU is often used in cases where parties either do not want to make a legally enforceable commitment or agreement. It is a more formal alternative to a gentlemen's agreement, and has less commitment than a strategic alliance or joint venture. Success in an Association is often traced to the commitment of an influential and dedicated ‘process owner’.

A *Statement of Intent*, supports the National Primary Industries RD&E Framework (National Primary Industries Research and Development Framework 2009). The Statement sets out a structure of committees and guidelines for the development and implementation of strategies, but does not preclude variations. In their Evaluation of the Framework in 2012, the Allen Consulting Group noted:

. . . during consultations concerns were raised about the lack of mechanisms under the RD&E Framework to ensure all Parties are contributing to the Strategies and the overall RD&E Framework, as agreed. It was suggested that the RD&E Framework lacks any mechanism to discipline those Parties, which are performing poorly and this results in poor accountability. . . . It was suggested that there is no way to ensure all Parties continue to work under the RD&E Framework as agreed as they are not bound to it very strongly (Allen Consulting Group 2012).

A MoU can be a platform for the articulation of focussed and strategically oriented projects that will be expected to deliver tangible outcomes and results. Projects require, at the very least, a commitment to organisation, project management, and an obligation to invest in resources.

MOUs can be vitally important for building relationships, understandings, and trust between participants. But the MoU framework cannot be expected, of itself, to deliver project outcomes.

Strategic alliances

A strategic alliance is an agreement between two or more parties to pursue a set of agreed upon objectives, while remaining independent organizations. The essential characteristics of a strategic alliance can be summarised as follows:

- Two or more organisations come together to pursue an agreed upon set of goals, but remaining independent subsequent to the formation of the alliance
- The collaborating organisations share the benefits of the alliance and control over the performance of assigned tasks – a characteristic that tends to make alliances difficult to manage
- The collaborating organisations contribute on a continuing basis on one or more the key strategic areas: technology, products, people, etc (Yoshino and Rangan 1995)

It is the strength of alliance strategies as well as internal processes and collaborator interactions that establish the decisive role in shaping eventual outcomes. Companies such as Xerox, Boeing, Honda, and Corning, among others, provide examples of successful (and unsuccessful) alliances. Successful alliances require constant attention and maintenance (Doz and Hamel 1998).

At the most straightforward level a strategic alliance may be formed through agreement and commitment to a *business plan* together with a *budget* that sets out financial obligations. Animal Health Australia collaborative projects are instituted in this way.

A strategic alliance may be formalised through a formal contract or deed of agreement that sets out obligations and commitments, including financial contributions. In the research community strategic alliances are most often reflected in formal research agreements, contained in contracts, particularly where there is significant allocation of funding involved.

A binding agreement relies on the presence of well-defined law of contract elements covering offer and acceptance, consideration, and the intention to be legally bound. In the research environment, creating new deeds of agreement for alliances can be time consuming and expensive. There is often a preference to use standardised procurement contracts.

External funding organisations supporting collaborations generally require a formal agreement. Government funding of research centres of excellence, which operate as strategic alliances, often require nomination of a ‘lead’ organisation.

Joint venture organisations

Collaboration, under this definition, would be covered under formally established corporate arrangements that cover governance, management, and accountability protocols. They may require formation of a corporate entity (as with the CRC program).

Separate entities may be established where there is a requirement for independence and autonomy in planning, operations and delivery. Creation of separate, and often temporary, ‘joint venture’ organisations to deliver a specific project (e.g. a building, an aircraft, a movie) is increasingly commonplace in the corporate sector.

CRCs are, in effect, strategic partnerships, reflected in the creation of a new corporate identity and supporting agreements. CRCs established as non-incorporated joint venture arrangements ran into problems associated with governance, management, and accountability.

The recent review of the CRC Program recommends that each new CRC should be established as an incorporated company, limited by guarantee. The review also recommended that the CRC Programme model should be used and funded by other Australian Government portfolios to achieve their policy objectives (Miles 2015).

The model could possibly apply to strategically oriented program collaborations in Primary Industries Research.

Every collaboration needs a ‘structure’

A collaborative project needs a ‘structure’ just as any biological organism beyond the amoeba needs structure. (Drucker 1999). Loosely formed networks and informal relationships do not work when there is a clear job to be done and result to be achieved.

It follows that in order to achieve tangible results in collaboration some form of organisation and project management structure is required. These are clearly reflected in formally ‘strategic alliances’ and ‘joint venture’ arrangements relating to collaborative projects.

It is, of course, relatively easy to establish networks and form associations that bring like-minded people and organisations together. These can be useful for exchanging ideas, views, opinions and sharing knowledge. Networks and associations tend to create lots of reports and papers, arrange

informative conferences and events, but results are often difficult to discern. Results are often associated with an injection of resources for specific projects.

Achievement in an association model can sometimes be traced to the work of a strong and energetic secretariat and an active and influential chief executive – and a willingness on the part of participants to cede influence to a centralised management unit. This can work where there are high levels of trust and continuity. However, where there is a clear job to be done, or agenda to be pursued, and where ‘unity is strength’, associations tend to morph into joint ventures that operate on a corporate basis.

Without a commitment to an end result (purpose), an allocation of tasks and responsibilities, and a commitment of resources, network and association models of collaboration are unlikely to achieve significant results.

These considerations lead into consideration of resource requirements for effective collaboration in Section 5.

5 Resources for collaboration

Whilst it is easy to make the case for collaborations (as canvassed in Section 2 above), building effective collaborations and achieving collaboration outcomes has proved to be particularly challenging. Effective collaborations require securing and allocating resources in the following areas:

- Management and leadership capability
- Project management
- Technology and Intellectual Property
- Social capital
- Time
- Finance

These are considered briefly below.

Management and leadership capability

Effective collaborations require strong management and leadership capability. This applies not only to formally constituted partnerships, but also to associations, joint ventures, and networks if they are expected to have impact. Moreover, the style of management and leadership must be appropriate to the collaboration model in place.

In collaborations management issues relate to:

- The size, membership, and role of the governance body (whether a board of directors, a management committee, a coordination team, or reference group).
- The roles, responsibilities, and accountabilities of an executive officer (whether designated as a general manager, a senior coordinator, or a chief facilitator).
- Selection of executives, managers, and team leaders who are *both task and relationship oriented*.
- Inclusion of people who are genuinely committed to the collaboration, and can make the time available.
- Arrangements for monitoring and reporting on resource use, milestones, achievements, and results (performance) and taking remedial action where appropriate.

Collaboration management must be capable of developing and implementing plans and strategies that are capable of addressing the diverse requirements and expectations of stakeholders and multiple accountability points. In network and association models these requirements may be relatively straight forward, but in strategic alliances and joint ventures management capability is central to achieving success.

There is sometimes a tendency to dismiss management as an overhead and an incursion into the resources available for core activities. However, much collaboration fails because of inappropriate, poorly structured, or ineffective management arrangements.

Project management

Collaborations generally require independent project management expertise. Project managers should be capable of building trust, being seen as independent/neutral, and committed to solutions. They must be *team leaders* and *team players*.

Specific project management capabilities cover:

- Approaching decision-making around consensus *and* expert judgment. Achieving consensus is important, but it should not be simply the ‘lowest point’ of agreement. Knowledge, expertise, and evidence must play an important part on decision-making.
- Engaging participants at *all levels* in the organisations involved in the collaboration. Working through hierarchies creates excessive process and slows decision-making.
- Fostering continuous communication. Communication is the glue that forms the bond between leaders and teams, and holds teams together. Actions are stronger than words. Credibility is a required base.
- Creating learning experiences. The best learning opportunities are experience and sharing knowledge about success and how this was achieved. Learning from mistakes is also important.

Technology and Intellectual Property

Collaborations should have access to up to date technology and equipment that can be shared across research providers. Collaborations should support new investments in technology where appropriate.

Collaborations should set out quite clearly approaches to recognition of incoming IP, ownership of any IP created in the collaboration (patents, plant breeder rights, copyright – including copyright in software created).

IP issues can be a break point in building effective collaborations.

Social capital

Collaborations require a strong element of what is often referred to as ‘social capital’. It refers specifically to the the networks, norms, and the *trust*, that facilitates co-ordination and co-operation for mutual benefit’(Fountain 1998). Social capital can be thought of as the ‘glue’ that allows physical capital and human capital to work together effectively.

The need to build trust between collaborating parties has been referred to in earlier parts of the Guide. But without adequate investment in social capital the available physical capital and human capital can be insufficiently exploited because there is insufficient trust and shared expectations to overcome the inherent risks in knowledge based interactions (Howard Partners 2001).

Time

Time is often regarded as the most perishable of resources. Time issues relate to both the time frame of the collaboration as well as the time available of collaboration participants. Specific time issues relate to:

- The time frame of the collaboration effort, and when tangible and measurable results will be expected.
- Time that will be allocated to formal meetings.
- The time and cost involved in preparing reports, papers, budgets, management reports, and corporate/statutory returns.
- The amount of time a nominated researcher is able to commit to the collaboration project, and whether budgeted amounts (e.g. 10% of a FTE) looks plausible and realistic.

Financial

Long term, strategically oriented, collaborations require funding. Funds can be redirected from existing purposes or sourced externally from public sector grants and research investment programs. The level of funding should reflect expected Return on Investment (ROI).

In an ideal world, funding should not be the driver of collaboration. It should reflect the investment necessary to achieve results identified in a fully developed strategy. But in reality, funds are often limited. It follows that plans, budgets, and projects are developed in a way that reflects the funds available. To do otherwise invites failure as it becomes impossible to achieve outcomes with the resources that are available.

6 Managing collaborations

The management of collaborations requires attention to:

- Resource planning, management and reporting
- Scale of activity
- Procures and protocols
- Developing a team culture

Resource planning, management, and reporting

Resources that fall under the responsibility and control of collaborations must be accounted for. This involves consideration of the following issues:

- The formulation of plans, budgets, and systems for reporting on performance, and how these will be presented
- Agreement and sign off to annual expenditure budgets across collaboration participants
- Estimation of the ‘fractional’ time commitment of participants (anything less than a 20 per cent time allocation is not meaningful)
- Agreement to delegations to incur expenditure and appoint staff
- Ways to remove under-performing staff
- Paying the costs of administration to a ‘host’ organisation for resource management, including accounting and payroll systems, and preparation of management reports and financial statements.

Building scale

It might be desirable to start collaborations with a small, committed group. This can prevent hold-ups arising from conflicting goals among participating organisations. The initial group develops the project vision and selectively invites subsequent tiers of participants.

Parties to a collaboration welcome visible and immediate results. Initial investments and incremental added value provide proof to other colleagues that investments have been worthwhile.

Establishing procedures and protocols

Collaborations require ‘rules for engagement’. Business and administrative processes can be ‘borrowed’ from a host organisation rather than trying to reconcile numerous different systems (or create new ones).

Collaborations must be able to cut through the bureaucratic processes and procedures of host organisations.

Building a collaborative team culture

As indicated earlier in the report, collaborations require staff with skills, qualifications, and experience relevant to the collaboration, have the time available to commit, and a willingness to work in a team-based environment. This also includes a willingness to communicate, informally, as well as formally, about activities, progress, and milestones.

People working in collaboration teams must be able to work with the sometimes-inconsistent requirements for role clarity and task ambiguity. The analogy of playing in a ‘jazz combo’ has been (Drucker 1994) advanced as working in a team environment.

7 Impediments to effective collaboration

It is possible to identify a number of impediments to successful cross-sectoral collaboration. Acknowledging impediments goes a long way to overcoming them. The major areas of collaboration failure are canvassed below.

Poor focus on outcomes and results

It is possible to spend a lot of time trying to foster collaboration by means such as initiating personal contacts, suggesting regular meetings, and making use of the latest technology (e.g. databases, websites and social media). But collaboration opportunities will falter unless the problem or opportunity is clearly defined and agreed, the challenges are appropriately framed, and *people are motivated and inspired to come together*.

Ignoring structure and processes

People like to collaborate, and extol the virtues of it – but collaboration requires an element of structure that defines responsibilities and accountabilities and a method to regularly report on results and achievements. People will not commit time and resources to collaborations where purpose and outcome is not clear.

Designing *how* objectives will be achieved is a critical element in collaboration success. It is sometimes attractive to think in terms of networks and organic structures, and these arrangements are good for communication, management and some element formal organisation are generally required to initiate meaningful collaborations.

Senior managers and executives across the RDC sector like to know what they will be doing in collaboration; they rarely have time for open-ended meetings, get togethers, ‘meet and greets’, and “search” discussions.

Of course, structure and process can be overdone, with bureaucratic rules and procedures getting in the way of effective collaboration, particularly in collaboration intended to deliver innovation outcomes.

Unnecessary haste

It is important to spend time engaging with potential collaborators, building relationships, exploring options, establishing trust, and designing the collaboration model.

It takes time to establish long-term collaborative relationships. Sponsors may lose patience and give up on collaborations if outcomes are not readily apparent. It is therefore important to manage expectations and produce some ‘early wins’.

Insufficient resources

Collaboration requires resources. Collaborations that look good in terms of their focus on outcomes and results, with robust structures and processes, can fail without a commitment of necessary resources. Insufficient resources are often an indication of lack of priority and commitment by collaborating organisations. T

Quite often collaboration will only proceed if there is additional, third party, funding available. This may be sourced from additional government funding, such as through the Rural R&D for Profit Program, or a cross industry levy.

Larger RDCs have indicated some willingness to earmark some levy funding for cross sectoral collaboration. Levy payers can be supportive where they see the benefits.

Brand erosion

Larger RDCs may be reluctant to work with small RDCs due to concerns about the loss of their brand position.

Absence of effective project management and facilitation

Many collaboration efforts suffer from a lack of independent project management capability. Collaborations may fail where the management role is defined as coordination and facilitation rather than execution. It is therefore important that collaboration has a clearly defined project management role and capability that is regularly reviewed and updated.

8 A final check: validating collaboration design

Having addressed the issues concerning the formation and operation of a collaboration it is important to step back and ask:

- Will it work and deliver results, a return on investment?
- Do the potential benefits outweigh the costs?
- Are we really comfortable committing time and money to this”?

The best outcomes of a cross-sectoral RDC collaboration will lie at the intersection of “desirability, feasibility, and viability”. These are fundamental decision criteria for project investment. Addressing these factors provides a ‘reality check’ on a collaboration proposal. They are questions that would be addressed by a CEO or governing board of a potential collaborating organisation.

The strength of the intersection will also have implications for the governance arrangements addressed in Section 4 above.

Desirability (attractiveness)

Establishing whether a RDC collaboration is desirable from both a research and industry point of view would involve considering the extent to which collaboration will:

- Contribute to achieving combined RDC objectives at an acceptable cost, risk and return.
- Address an opportunity or need that one RDC cannot do on its own
- Fit within the overall RDC investment priorities and current expenditure commitments.
- Require shifting resources from other (perhaps higher priority) projects and programs.
- Enable generating and sharing of knowledge, skills and resources to achieve a broader outcome across industry sectors.

An assessment that collaboration is desirable may not be enough for collaboration to proceed.

Feasibility (practicality)

Addressing feasibility involves addressing the extent to which:

- All potential collaborators across RDCs can be brought together, having regard to their different missions and constituencies.
- There is willingness among all collaborators to make it work.
- There are resources available that can be committed to the collaboration.

This latter consideration generally means that collaborating RDCs have to be convinced that the investment will generate valuable returns for their industry through the returns from the cross sectoral collaboration. Otherwise, collaboration will not be seen as feasible in terms of convincing levy payers, through their committees, to divert resources for the broader collective benefit.

Collaboration may not proceed unless additional funding is made available by government or other parties to underwrite collaboration arrangement. In other words, the perceived collective benefit, or even the national benefit, is considered by government to be higher than the expected outcomes of industry levy payers going alone.

There is an emerging view among some RDCs that allocating resources to broader cross-sectoral programs will deliver an industry wide collective benefit. Some RDCs have indicated support for broad-based levies to support sector wide initiatives.

Viability (sustainability)

Viability and sustainability in collaboration involves both research and business perspectives. Addressing viability involves considering the extent to which:

- Combined RDC resources (people, technology, funding, etc.) will be available for investment and sufficient to achieve expected outcomes.
- A longer-term commitment can actually be made – having regard to the interests of shareholders, levy payers and other stakeholders.

References

- Allen Consulting Group. 2012. Evaluation of the National Primary Industries R&D Framework. In *Report to the Department of Primary Industries Victoria*. Melbourne.
- Australia. Minister for Industry and Science. 2014. Industry Innovation and Competitiveness Agenda. In *An action plan for a stronger Australia*.
- Australian Government. 2014. Boosting the commercial returns from research. edited by Department of Education and Department of Industry. Canberra: Commonwealth of Australia.
- Deemertzis, Maria. 2009. "Title." DNB Working Paper, Amsterdam.
- Doz, Yves L., and Gary Hamel. 1998. *Alliance Advantage: The Art of Creating Value Through Partnering*. First Edition ed: Harvard Business Press.
- Drucker, Peter F. 1994. *Management - Tasks, Responsibilities, Practices*: Butterworthheinemann.
- Drucker, Peter F. 1999. *Management Challenges for the 21st Century*. New York: Harper Collins.
- Fountain, Jane E. 1998. "Social Capital: A Key Enabler of Innovation." In *Investing in Innovation: Creating a Research and Innovation Policy that Works*, edited by Lewis Branscomb and James H Keller. Cambridge, MA.: MIT Press.
- Howard, John H. 2009. "From Transactions to Partnerships in National Innovation Systems: A Triple Helix Perspective." *Triple Helix VII*, Glasgow.
- Howard, John H. 2011. "Great Expectations: Developing "Instruments for Engagement" in University, Business, Government and Community Relations." Conference on Innovation Systems and the New Role of Universities, Bristol.
- Howard, John H. 2013. "International Collaborative Research and Manufacturing in the Asian Century." *The ISPIM Magazine* (5/203):3.
- Howard Partners. 2001. *Mapping the Nature and Extent of Business-University Interaction in Australia*. Canberra: Australian Research Council.
- Maister, David H, Charles H Green, and Robert M Galford. 2000. *The Trusted Adviser*. New York: The Free Press.
- Miles, David. 2015. Growth Through Innovation and Collaboration: A Review of the CRC Program. In *A Review of the Cooperative Research Centres Programme*. Canberra: Department of Industry and Science.
- National Primary Industries Research and Development Framework. 2009. Statement of Intent. Canberra.
- Nidumolu, Ram, Jib Ellison, John Whalen, and Erin Billman. 2014. "The Collaboration Imperative." *Harvard Business Review* 92 (4):77-84.
- O'Kane, Mary. 2008. Collaborating to a purpose: review of the CRC Program. Canberra: Department of Innovation, Industry, Science and Research.
- RIRDC. 2015. Improved agricultural productivity through enhanced collaboration and information sharing among G20 countries. In *RRDC Publication No 15/023*. Canberra: RIRDC.
- Surowiecki, James. 2004. *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*: Doubleday.
- Yoshino, Michael Y., and U. Srinivasa Rangan. 1995. *Strategic Alliances: An Entrepreneurial Approach to Globalization*. First Edition ed: Harvard Business Press.