Australian Government
Department of Agriculture and Water Resources

This project is supported by funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit program.

Stimulating private sector extension in Australian agriculture to increase returns from R&D

Research Report E:
The professional development needs of farm advisers and the evaluation of agricultural extension on-line learning modules

June 2018

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Faculty of Veterinary & Agricultural Sciences
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To cite this report: Nettle, R., La, N., Smith, E., 2018., Research Report E: The professional development needs of farm advisers. Prepared for: *'Stimulating private sector extension in Australian agriculture to increase returns from R&D'*. (June, 2018). A project of the Department of Agriculture and Water Resources (DAWR) Rural R&D for profit program, University of Melbourne, Melbourne, Australia

About the project

Stimulating private sector extension in Australian agriculture to increase returns from R&D is a 3-year project to research, develop and test models to build the capacity of the commercial and private sector in delivering R&D extension services to Australian producers.

Led by Dairy Australia, the project is a collaboration involving nine partner organisations including six Research and Development Corporations (RDCs): Dairy Australia, Meat & Livestock Australia, Cotton Research & Development Corporation, Sugar Research Australia, Australian Pork Limited, Horticulture Innovation Australia; as well as the Victorian and NSW governments, and the University of Melbourne.

The project is funded by the partners and the Australian Government's Department of Agriculture and Water Resources as part of the Australian Government's Rural Research and Development for Profit program.

The project is in response to the trend towards increasing roles for industry and private services in delivering agricultural extension. This represents a shift away from traditional, government-funded extension services over the past 20 years. Currently the extent of private sector involvement in extension varies across industries, depending on product markets, policy settings, regional issues and industry demographics.

The private sector is now a well-used information source for producers, however there is scope to enhance the capability of the private sector in delivering extension. Improving the capacity of private extension service providers will contribute to on-farm productivity gains and profitability.

Companion reports

This report provides a summary of findings from adviser forums a survey of farm advisers, including details of Professional Development undertaken and self-identified needs for professional development. It is one in a series of research reports from national surveys of farmers and advisers prepared for the project *Stimulating private sector extension in Australian agriculture to increase returns from R&D*.

- Report A: Farmer demand for agricultural extension services
- Report B: Supply of farm advisory and extension services
- Report C: The advisory and extension system in Australia
- Report D: Farmer and adviser networks
- Report E: The professional development needs of farm advisers and the evaluation of agricultural extension on-line learning modules (this document)
- Report F: Research data tables, focus groups and surveys of farmers and advisers (additional information).
- Report G: Trial 1: The Processor Trial
- Report H: Trial 2: The Precision Agriculture Trial
- Report I: Trial 3: The Advisory Pathways Trial
- Report J: Trial 4: The Knowledge Trial
- Report K: The private advisory sector engagement trials: the co-innovation framework and cross-trial results.

Background: Australia's evolving agricultural extension system

Over time, the means and mechanisms by which Australian farmers access and receive their information, advice and support has changed markedly. This is largely because there has been:

- Changes to the role of government and their investment in and coordination of agricultural extension services in each State of Australia.
- Variation in the way Australia's rural Research and Development Corporations have invested in and positioned extension functions.
- Variation in the extent to which a range of private providers have engaged in extension functions and the business models of agricultural service firms.
- Technological change in society, particularly, information and communication technologies.

Terminology

The term 'advisory and extension system' or 'advisory services' refers to the set of organisations and people that enable farmers to develop farm-level solutions by establishing service relationships to produce knowledge and enhance skills (Birner, et al, 2009. The need for co-ordination and collaboration amongst different advisory services and organisations in improving the impact from R&D investment is well recognised internationally.

Executive Summary

This report provides an overview of the professional development undertaken by farm advisers in Australia and their future needs for professional development. The report draws on adviser self-assessments of capacity at regional forums; responses to a national survey of advisers about the information, advice and support they provide to Australian farmers (see reports A-C). The results provide a base-line for monitoring the professional development trends related to advisory services and whether the provision of new professional development offerings improves advisory system capacity.

In the survey (n=655):

- 87% of advisory organisation owners/leads reported that agricultural extension and advisory functions were extremely important (57%) or moderately important (30%) to their organisation and assessed their organisational capability to provide extension as strong (46%) or moderate (40%).
- 50% of advisers had undertaken professional development (PD) or training related to agricultural extension in the past 12 months. Actual participation rates in PD in the past 12 months varied across service groups, being highest among industry advisers and lowest with sole operators.
- Professional development and training was predominately sourced **in house** (43%) or from industry RD&E organisations (40%) rather than through formal institutions such as Universities (24%).
- Advisory organisation owners/leads identified key capabilities to be developed including targeting different farm types and the design of extension and training programs that support adoption.
- 84% of employees and sole operators said they would be seeking professional development or training in the future to assist their work role (n=365), however this was predominantly in technical areas such as farm management.

There is low membership of professional association and accreditation of advisers, particularly related to extension skills. Advisers indicated strong demand for training in technical areas, however many received this development from within their own organisation.

The low level of cross-sectoral and cross organisational professional development limits the opportunity for learning and engagement in RD&E. Whilst the private sector may be able to meet demand, they do not have a remit to help the system work or necessarily change services without strong signals to do so. Further, the needs of a new graduate who has had minimal experience applying their discipline specific knowledge and skills will differ considerably from the needs of an experienced practitioner.

Drawing on these results and after conducting an analysis of current offerings in agricultural extension (APEN), 9 module topics were developed into on-line learning modules of which 4 related to 'advisory and extension practice' (modules 1-4 and 9) and 5 related to the design, delivery and evaluation of agricultural extension efforts (Modules 5-8). Modules were piloted with 80 advisers from the engagement trials (reports G-K), with participant numbers varying between 1-12/module and some participants completing more than 1 module.

Module number	Title
1	Social media in agricultural innovation
2	Targeting farmers? Segmentation and adjusting advisory approaches.
3	Facilitating farm practice change – (1) – understanding why people change
4	Working your network: brokering adviser networks in agricultural innovation
5	Facilitating farm practice change (2) – mixing delivery approaches to enhance adoption and change across a population
6	Knowledge management: methods for linking research and advisory services.

Module number	Title
7	Evaluating impact in agricultural innovation and adoption
8	Analyzing the whole farm system to position advisory services (including AgTech investment cases)
9	Principles and practices of conflict resolution and negotiation in agricultural innovation

Results from participant evaluations suggest that in general, modules supported participants to apply new principles and techniques to their professional roles. A common suggestion for improvement of the modules was to provide more written material, in addition to the video resources. An independent review of the modules has provided recommended improvements to each module, feedback for greater alignment to the AQF and strategic initiatives to build professional development system for agricultural RD&E.

The findings from the business case development, survey results, module delivery and independent module review reflect a need for major changes to the current system by which industry and government support the capacity of the private sector advisory and extension profession. This involves coordinated, high quality and targeted cross-sectoral programs that supports the diversity of advisers, the pathways of new entrants into different business contexts and to consider areas of new knowledge and services whereby involving private sector advisers in PD can not only enhance knowledge and skills, but engage them in addressing challenging problems in Australian agriculture.

Organisations seeking to engage a range of advisory services in RD&E could consider:

- Methods to support PD for sole operators
- Formalise extension training for the range of advisory organisations.
- Encouraging advisers into membership of professional associations and support those organisations in extension capability to reach a wider range of advisors.

Some guiding principles for defining the core skills to focus on include;

- Focus on skills relevant to the business models of target groups
- Ensure a resourcing model that is cognisant of each groups business model and therefore their capacity to pay

Proactively invest in the design, management and evaluation skills and capacity required which is not a core element of private sector business models but will be required by industries

In conclusion, the project has identified key changes required in the professional development system to support the capacity of private sector advisory and extension professionals in Australia. The professional development modules developed as part of the project are a solid foundation for further adaptive, on-line, short-format delivery of accredited or non-accredited professional development on topics that address current gaps, whilst allowing formal qualifications to be attained by close mapping of offerings to the Australian qualifications framework for tertiary education. Continued development of the system for professional development in Australian agricultural extension is warranted. Overall professional development modules were well received.

Introduction

The capacity and capability of a diverse private sector to fulfil agricultural extension functions and engage in agricultural RD&E is increasingly recognised as an important area of governance in the agricultural advisory and extension system (Nettle et al., 2017). In this context, calls for increased capability in the private-sector to fulfil extension functions need to be considerate of the *current* system of private sector professional development and training and the advisory context. This report provides an overview of the current system of private sector professional development drawing from adviser forums and a national adviser survey (n=655) conducted as part of the project.

The term ***professional development*** *(PD)* refers to efforts to improve professional knowledge, competence, skill, and effectiveness of farm advisory and extension practices as they relate to agricultural research, development and extension contexts in Australia.

Research questions

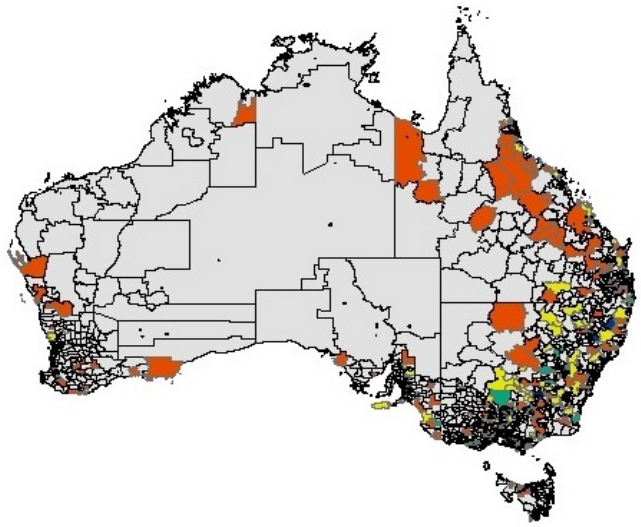
This report addresses the following research questions as part of the project Stimulating private sector extension in Australian agriculture to increase returns from R&D.

RQ6 How (if at all) are private providers preparing for increased engagement in the RD&E system? [e.g. professional development and capacity building of staff; engagement with industry; skills and capacity aligned to industry needs]

Research methods

The findings reported here are drawn from adviser forums and a national survey of advisers (655 responses) conducted in between 15 December 2016 and 17 February 2017. The adviser survey employed both on-line (non-random) and telephone interview (random) methods. The survey questions were designed by the University of Melbourne authors and the survey administered by Quantum Market Research.

The survey questions were formulated to allow for comparison with previous Australian studies on these topics (e.g. RIRDC, 2009; Stone, 2011; Wilkinson et al, 2011; AFI, 2014). In addition, where qualitative information was available in the survey responses, qualitative data analysis techniques (Gibbs, 2004) were applied with the assistance of nvivo-10™ software to generate themes and response counts by categories (for instance, related to advisory professional development needs). See Summary Report B supply of advisory and extension services.



Adviser survey participants by states

States	N	States	N
NSW	190	WA	29
VIC	185	TAS	12
QLD	99	ACT	2
SA	89	NT	2
		International office	2

Figure 1: Location of adviser respondents in national survey (n=655)

Of advisers responding to the survey, 36% were associated with private consulting organisations (Figure 2).

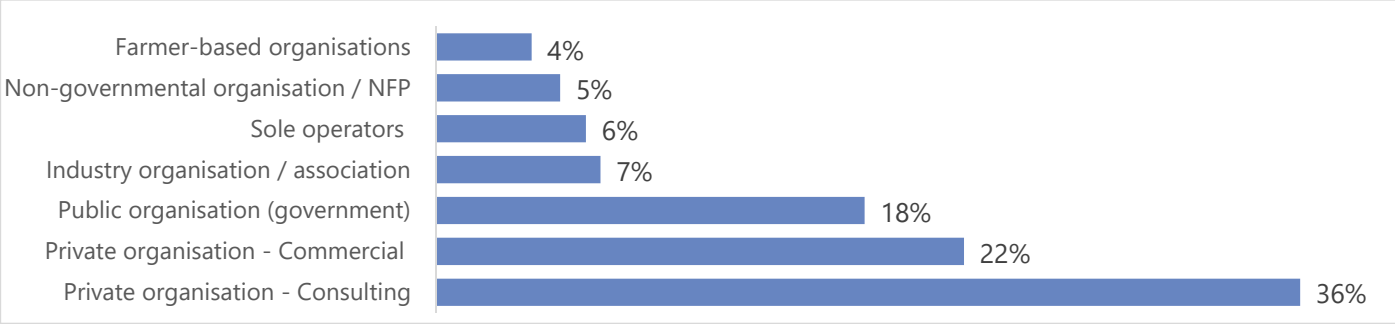


Figure 2: Type of advisory service providers responding to the survey (n=655)

Advisers surveyed targeted a range of different farm types representing a good spread of sectors represented in survey responses (Figure 3).

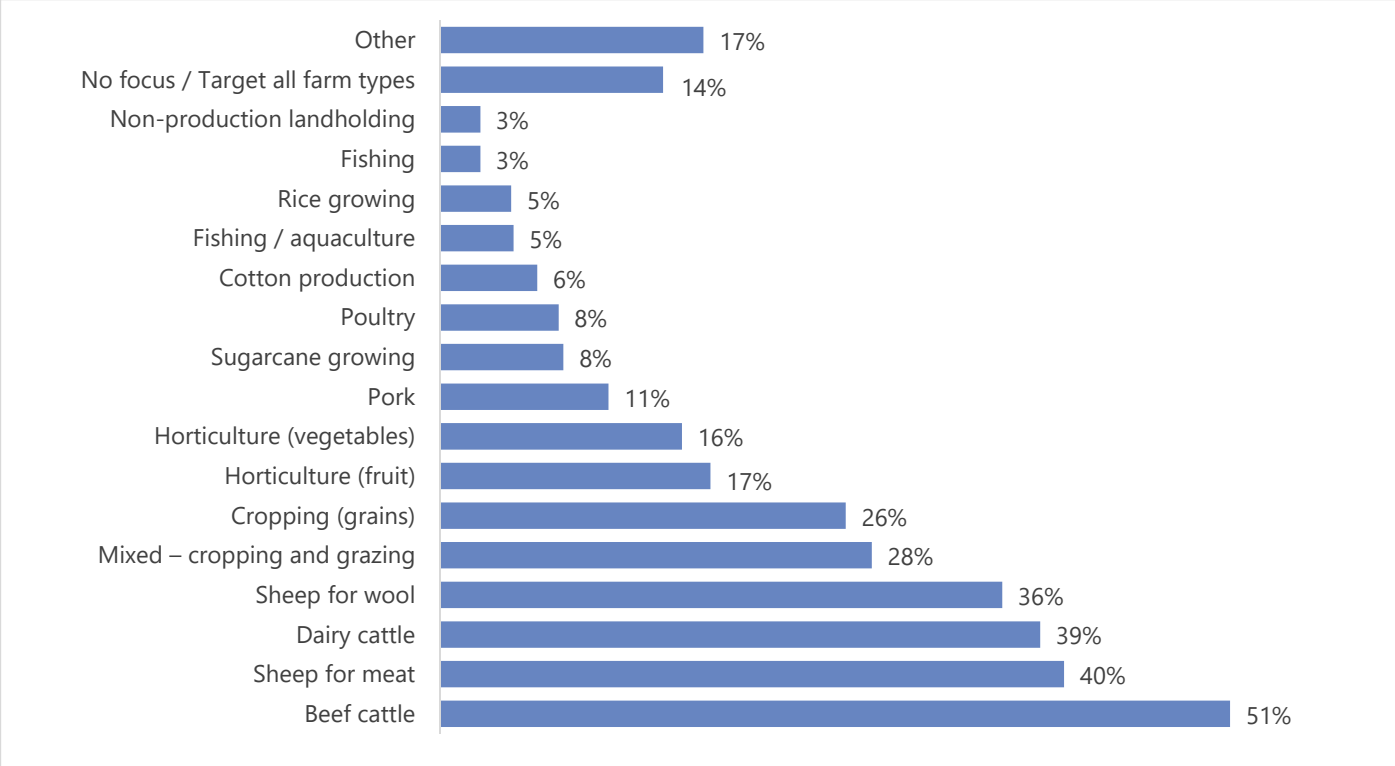


Figure 3: Farming clients serviced by advisers/advisory organisations (n=655)

Advisers surveyed tended to be university educated in a field relevant to their work (Figure 4). In addition to being well educated, they were also well experienced, having had an average of 17 years' experience in the industry. Younger advisers were more likely to hold a Bachelor degree in agriculture/agronomy.

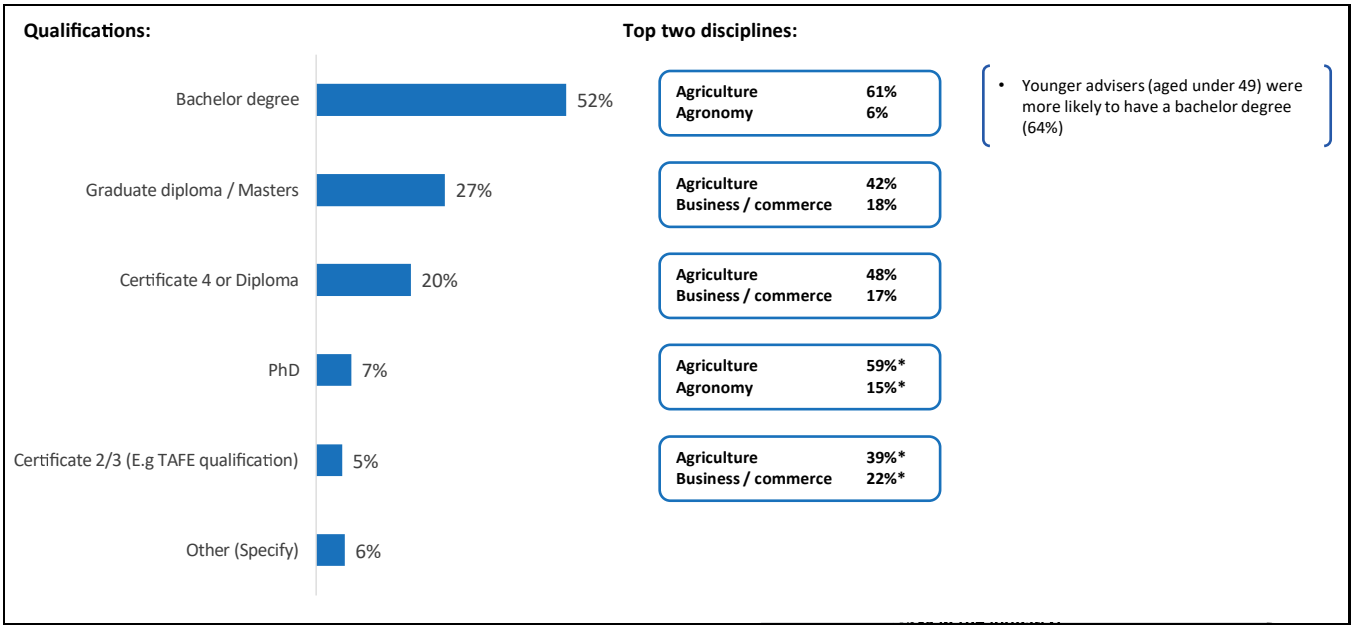


Figure 4: Qualifications of advisers (all employee advisers and sole operators: n=365)

The choice of professional development topics for the on-line learning modules for this project were based on the analysis of adviser self-assessments at regional forums; survey results and areas of 'gap' in the map of current offerings for accredited or non-accredited extension education across Australia available from APEN (www.apen.org.au).

Results

The survey findings relating to the current system of capacity building for private sector extension are reported against the following headings:

1. The importance of agricultural extension functions to advisory organisations
2. Adviser's self-assessment of current capability to provide extension services
3. Adviser's professional development undertaken and sources of professional development activities
4. Adviser's planned professional development
5. Adviser's membership of professional associations

The importance of agricultural extension functions to advisory organisations

Overall, advisory business owners or leads responding to the survey reported agricultural extension as an important function in their business (Figure 5)

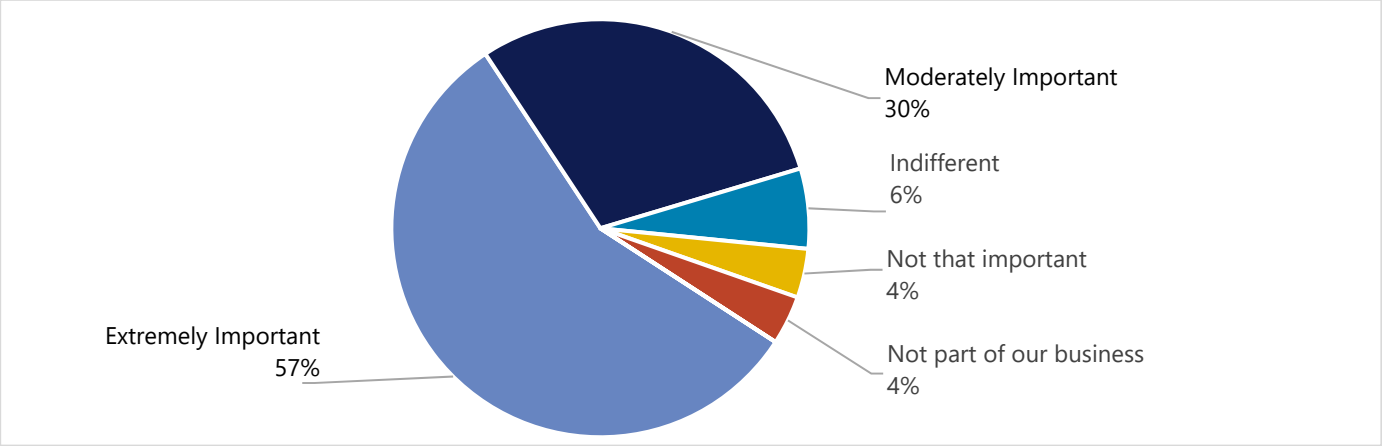


Figure 5: Survey responses of advisory business owner/leads to the importance of extension, education and training for farmers/landholders to their businesses. Base: All Owner / Leads (n=290)

Adviser's self-assessment of current capability to provide extension services

Business owner / leads responding to the survey widely saw their business as capable of providing extension services

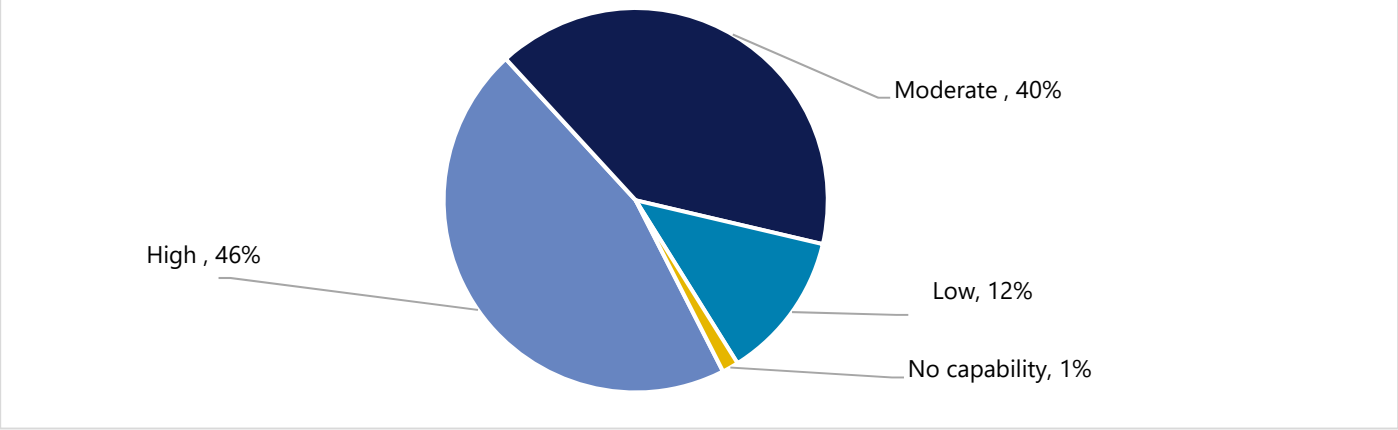


Figure 6: Business owner's opinion of their organisations' capability to provide extension services (Base: All Owner / Leads (n=290)

Business owners and leads reported group discussion and learning as their main strength (16% reporting being strong/moderately strong in this capacity) (Figure 7).

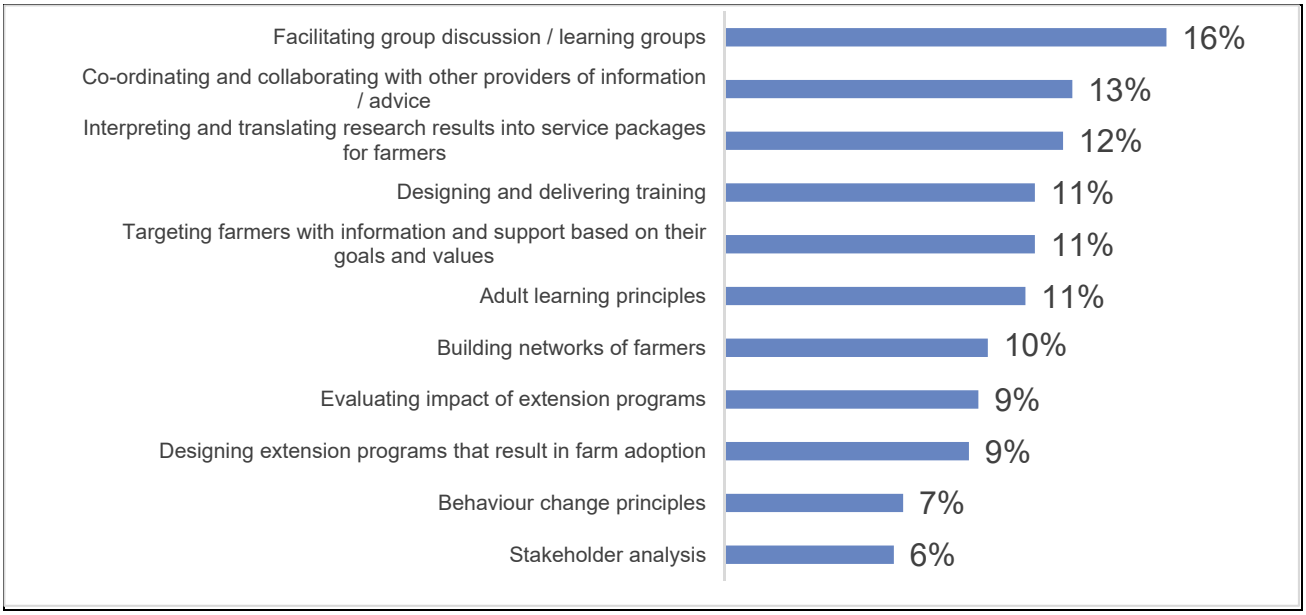


Figure 7: Business owner's/leads opinion of their extension capability being strong/moderately strong (n=290)

Further, in regional forums, advisers completing capability self-assessment reports indicated extension design, delivery and evaluation as well as coaching and mentoring and social media as key areas for improvement and interest. (Figure 8.)

Importance and room for improvement (RFI) in the four broad skill areas

	Importance (ave score out of 5)	RFI (ave score out of 5)	Imp + RFI (sum score)
Extension delivery	4.58	3.00	7.58
Generic / other	4.37	2.79	7.16
Technical	4.38	2.48	6.86
Design and evaluation	4.11	2.42	6.53

Perceived room for improvement in specific skill areas measured as standard deviation from mean (only higher scores reported)

Extension delivery	SD of Average
Coaching and mentoring	2.0
Social media	1.4
Evaluation of impact and process	1.0
Mentoring	0.8
Collaboration and partnerships	0.6
Internet based communication	0.6
Data collection and analysis	0.5

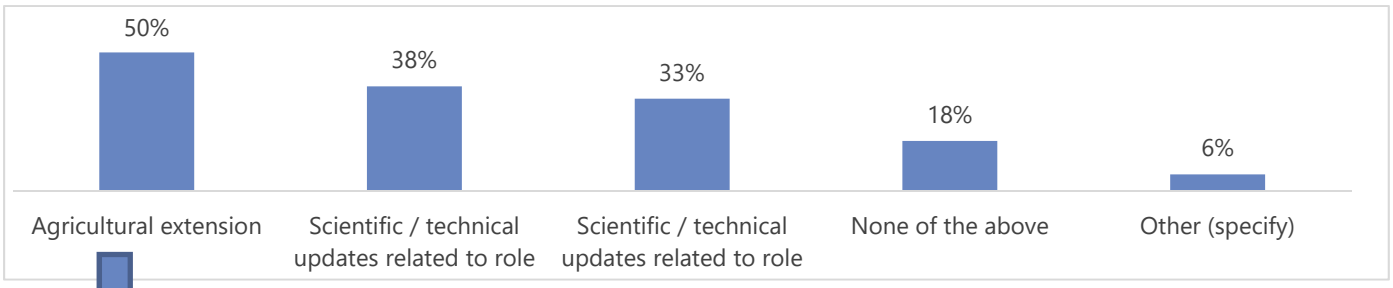
Generic / Other	SD of Average
Stakeholder negotiation	1.5
Ethical extension practice	1.5
Risk management	1.3

Figure 8: responses to regional forum surveys highlighting key areas of interest and room for improvement in extension capability (self reports)

Adviser's professional development undertaken and sources of professional development activities

Advisers seek professional development (PD) related to their role. While 80% of advisers said, it was very important to keep up to date with the latest research in agriculture, the actual participation rates in professional development and training was lower. 50% of advisers had undertaken professional development (PD) or training related to agricultural extension in the past 12 months. Actual participation rates in PD in the past 12 months varied across service groups, being highest among industry advisers and lowest with sole operators (Figure 9):

- Industry advisers (73%).
- Private commercial (53%).
- Private-consulting (48%).
- Sole operators (27%).



Industry organisation / association	Non-governmental organisation / not for profit	Private organisation - Commercial	Public organisation (government)	Private organisation - Consulting	Farmer-based organisation	Sole Operator	Total
73%	59%	53%	48%	48%	43%	27%	50%

Figure 9: Advisers completing professional development related to agricultural extension in the past 12 months (n=655) (red arrow indicates statistically significant difference).

Topics for this training or professional development received were related predominantly to technical skills and capabilities with 93% of advisers completing PD in the past 12 months (figure 9) citing this focus (Figure 10).

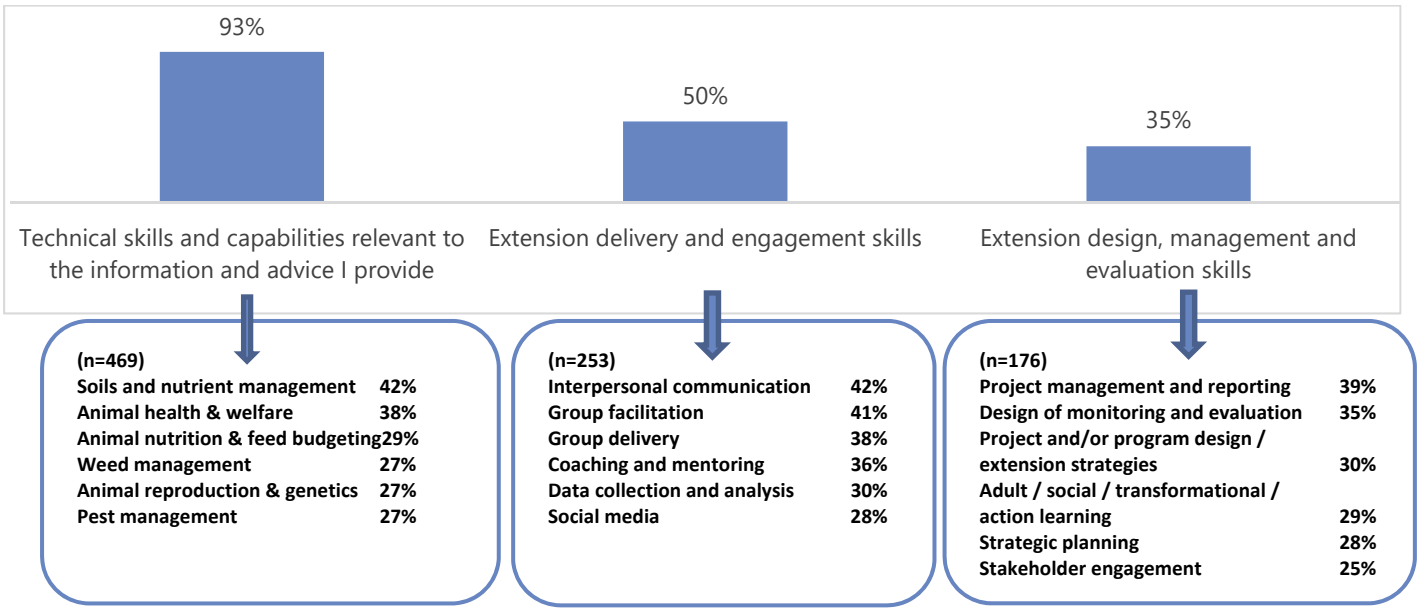


Figure 10: the top 6 reported topics covered in professional development received (Base: Respondents who had undertaken training - n=507)

The detail of professional development undertaken by topic area across technical and extension capacities are outlines in figures 11, 12 and 13.

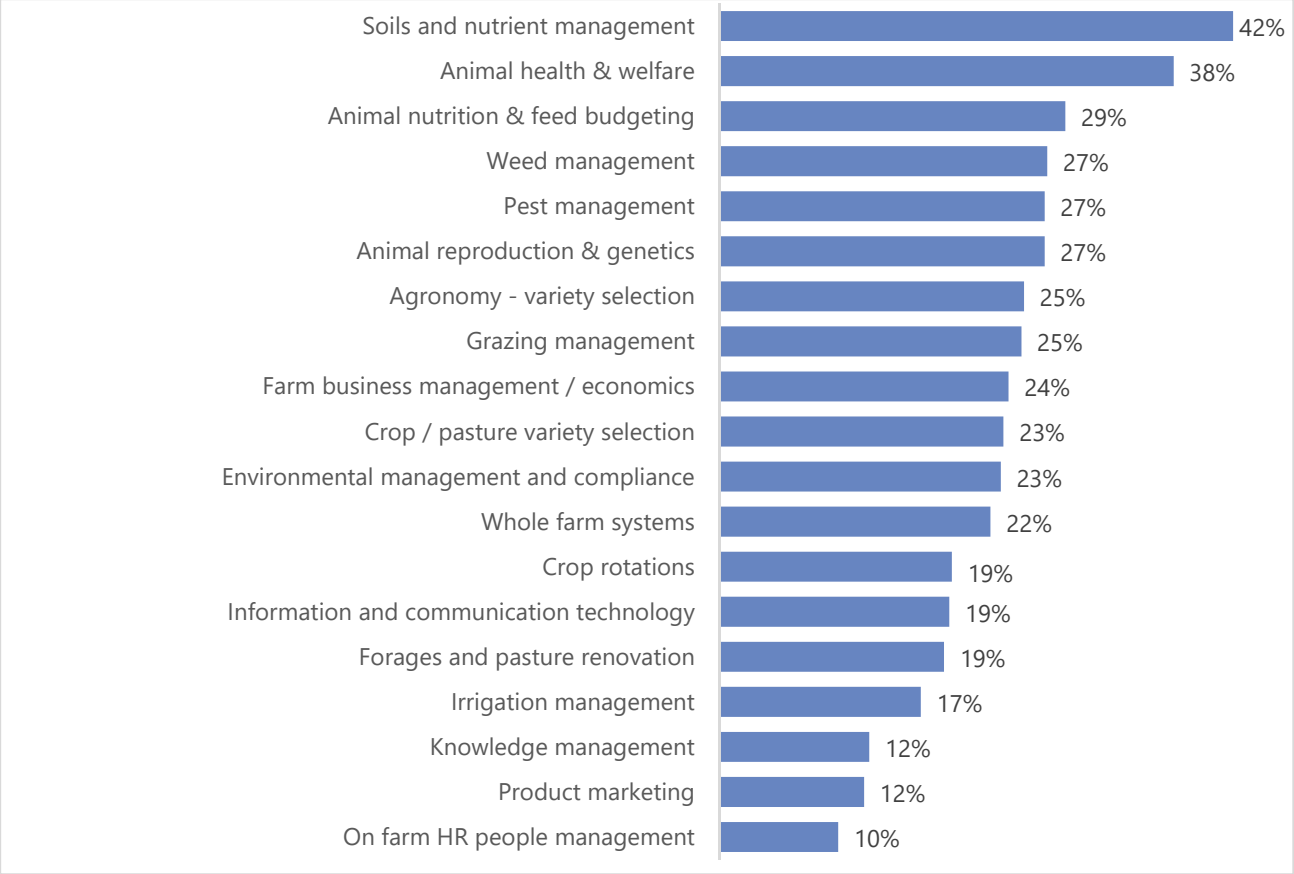


Figure 11: Professional development undertaken in technical skills and capabilities (n=469)

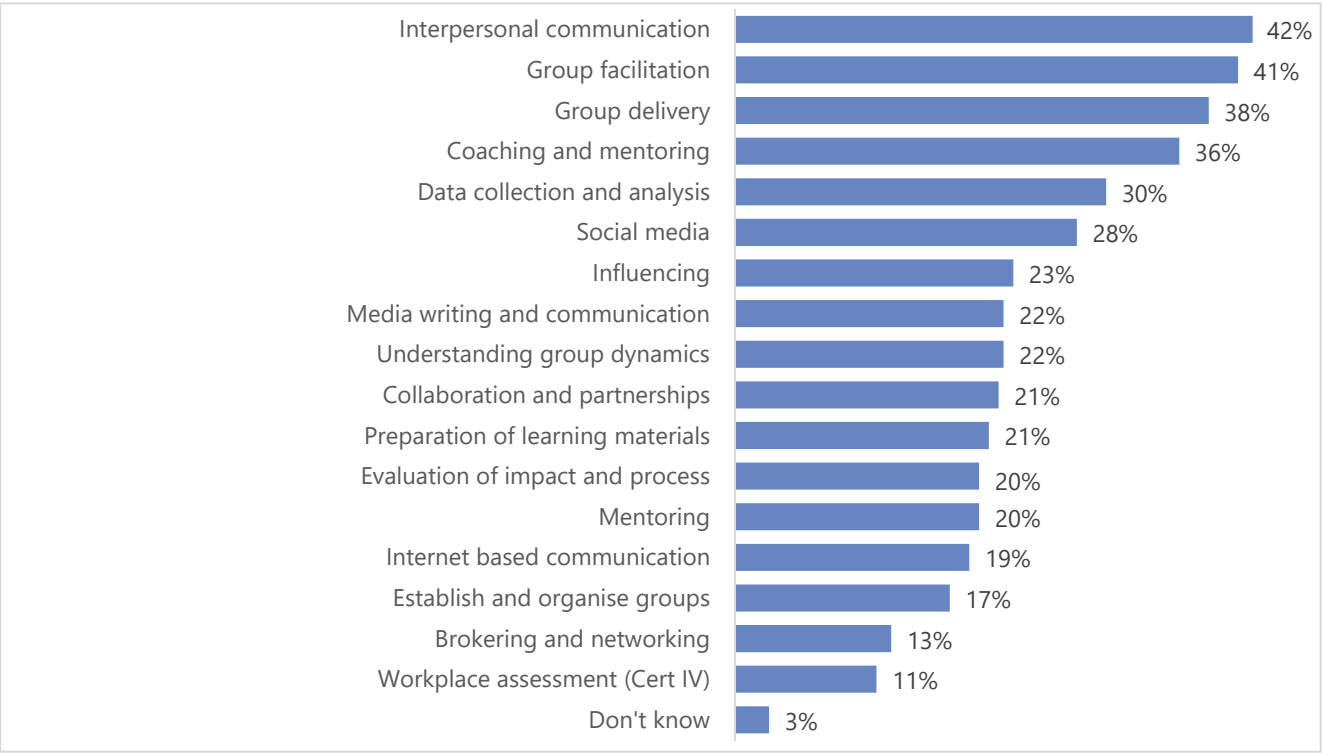


Figure 12: Professional development undertaken relating to extension delivery and engagement skills (n=253)

Figure 13: Professional development topics covered relating to extension design, management and evaluation skills what topics have been covered? (Base: Training in extension design and evaluation skills (n=176)

Source of PD activities

Most of the agricultural extension related PD and training was provided 'in-house' (43%), rather than through formal education institutions such as Universities (24%). Industry RD&E organisations were an important provider (40%) (Figure 14).

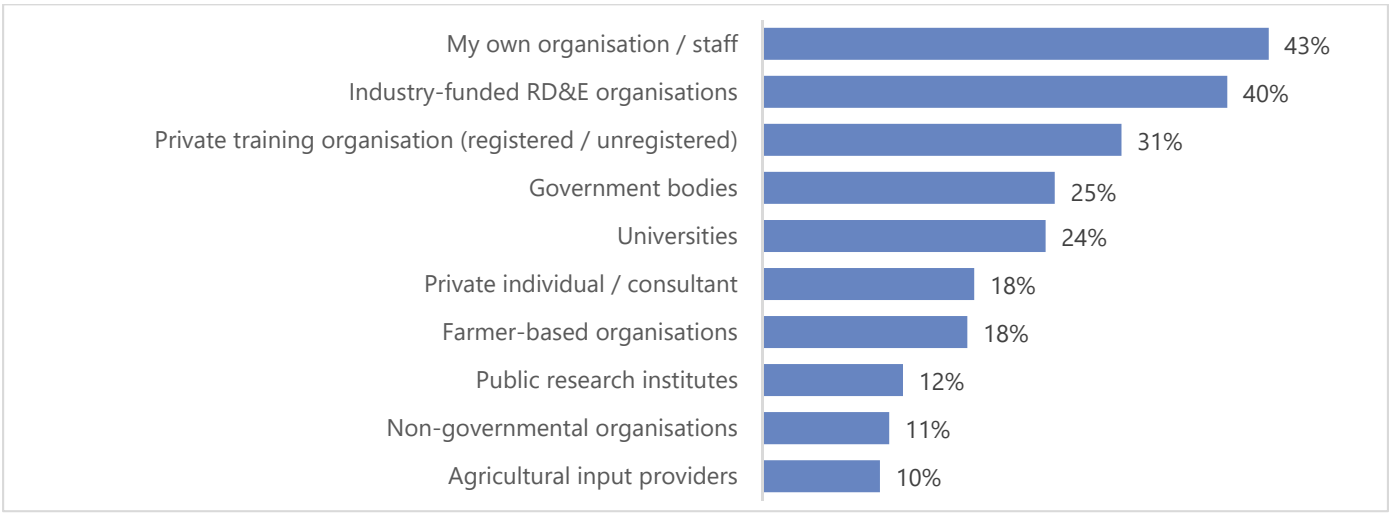


Figure 14: The source of professional development received (n=507)

Adviser's planned professional development

84% of employees and sole operators said they would be seeking professional development or training in the future to assist their work role (n=365).

- Business owners/leads identified future capabilities needed were: targeting different farm types and designing training and extension programs to support adoption (figure 15).
- Advisers (employees or sole operators) identified technical areas of interest in future professional development such as farm management and livestock management and health were the most commonly cited topics (Figure 16).

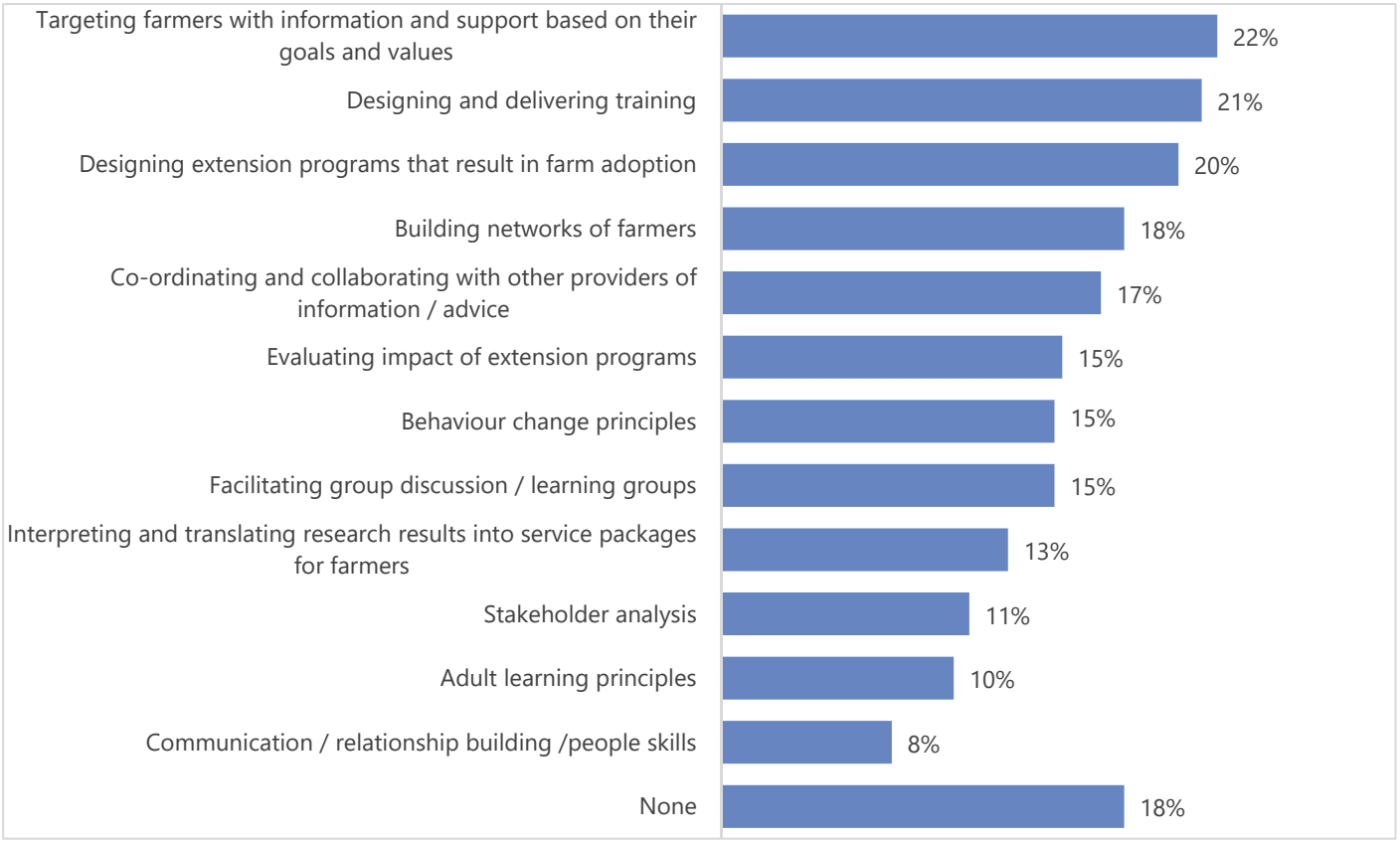


Figure 15: Capabilities sought by agricultural advisers related to agricultural extension (Owner / Leads) (n=290)

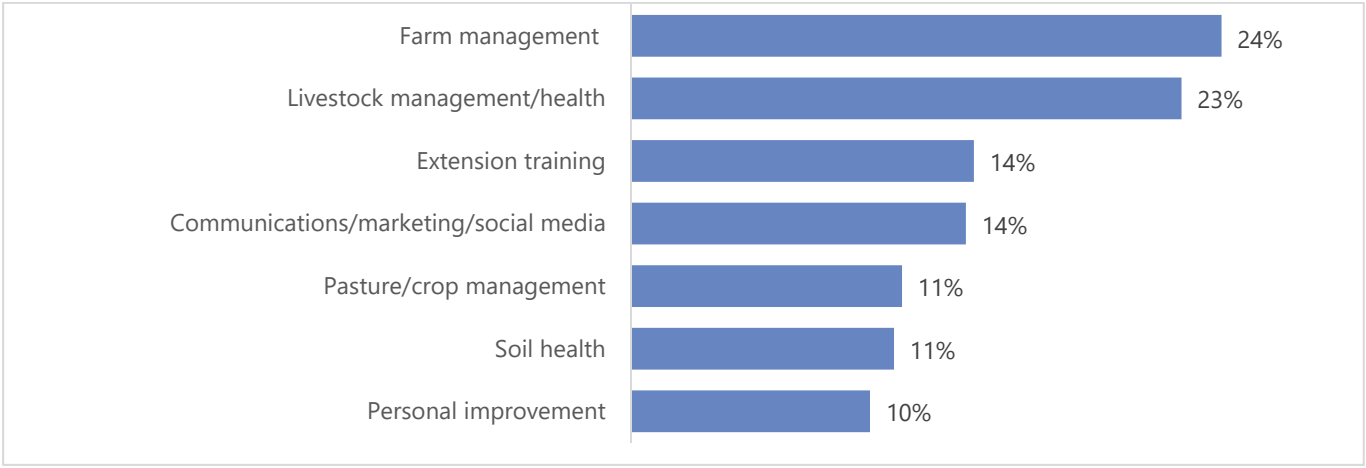


Figure 16: Areas of professional development and training to be sought (employees and sole operators) n=306)

Membership of professional associations

Overall, the adviser survey indicated low membership of professional associations with 58% of advisers reporting no membership. (Figure 17).

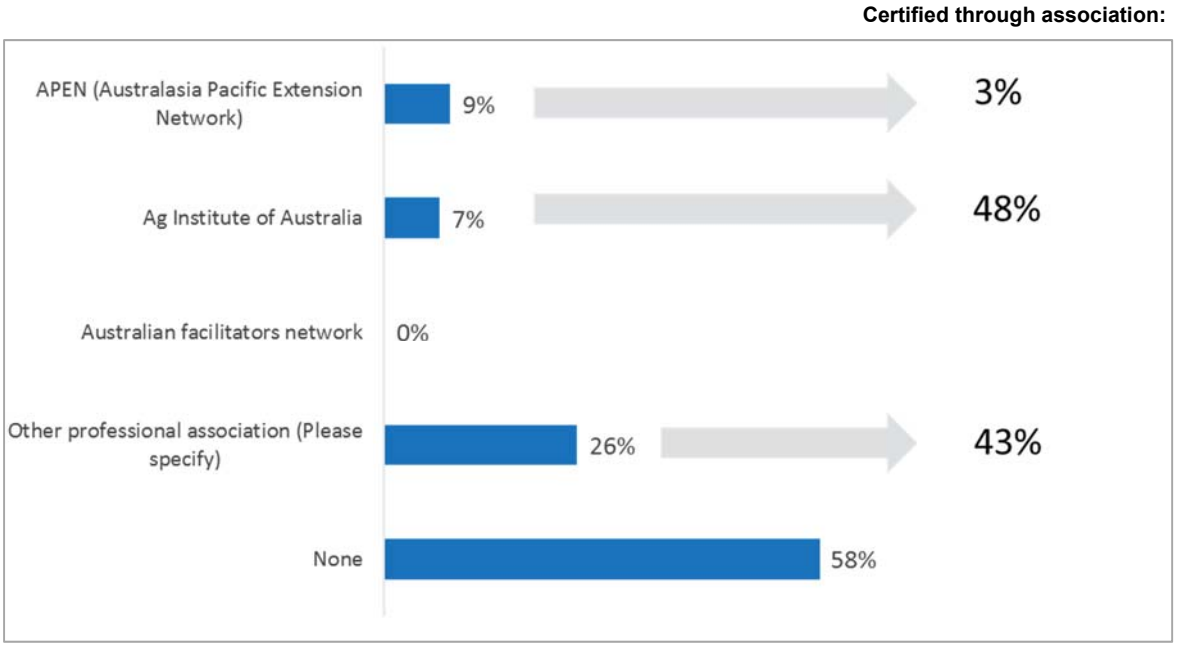


Figure 17: Membership of professional association for their work role (All Employees and Sole Operators (n=365)

The low level of professional membership coupled with high levels of internal organisation or sectoral-based professional development activity is a concern for the development of cross sectoral linkages and the development of early and middle career networks in advisory capacity development.

The next section of the report introduces the professional development on-line learning modules in agricultural extension developed and delivered as a pilot PD program for the project. These modules were developed from the analysis of the survey results and input from adviser self-assessment reports conducted via regional forums (2016). In addition, the current accredited and on accredited professional development and formal education offerings in agricultural extension in Australia were reviewed (apen.org.au) with the modules targeted at current gaps and to meet the needs of early career or mid-career refresher level. The modules were independently reviewed in 2018, with a summary reported here.

Meeting capability needs – the professional development modules in agricultural extension

A critical component of PD is to align needs and preferences of the private sector with the needs of industry to develop specific skills and capacity. Also required is for training and professional development to align with appropriate accreditation frameworks to ensure consistency, standards and accountability.

A key consideration for the delivery of pilot PD and training is how to execute the following process to deliver on private sector needs:

- Align adviser perceptions of need with relevant pre-existing content areas
- Consolidate content into an appropriate training package, addressing associated accreditation requirements
- Deliver training in a format and location that increases the likelihood of both learning and referral to peers and colleagues
- Convert piloted training into a model of delivery which can be easily replicated and scaled up.

The business case

In 2015, Rural Consulting Group undertook a business case development for the project relating to professional development needs in the private farm advisory sector. Drawing on insights from adviser self-assessment; the survey results and a review of current offerings and private sector needs, an assessment of the likely market size and mode of delivery was established (Rural Consulting Group, 2015). Taking into account audience, skills focus, training models/ methodologies and associated costs, along with feedback from previous attempts to accredit and associated costs, three broad types of professional development and training were envisioned:

Core technical skill areas with a focus on links to latest research

- Starting point is an industry skills development plan
- User defined professional development plans built with relevant organisations in each industry
- A tailored approach developed for independent consultants
- Central tennet is to link with to latest research and hone technical proficiency
- Mixed model of delivery, anchored in on-line approaches.
- Tailored resourcing model for each organisation
- Focus on agribusiness and factory/processor staff

Influencing change - Extension delivery skills

- Key ‘units’ in communication for change and engagement built upon core skill areas outlined above
- Draw on existing pool of resources and units with a focus on innovation, systems and knowledge management.
- Subsidised program targeting consultants and factory/processor staff in the first instance
- Seminar/webinar/symposium type approach to delivery
- Expand to include industry delivery staff and VET practitioners
- Modulised approach (is: as per Vet training) linked to an opt in accreditation framework

Training in design, management and evaluation

- Key ‘units’ developed in extension design, management and evaluation
- Industries to target individuals for bursaries each year in the first instance to develop the base and set standards
- Deliver via intensives/short courses with opt in accreditation
- Develop an alumni across all industries which forms the pool of providers across all industries
- Move to a user pays model over time

Segmenting the possible needs and approaches preferred by different private sector groups, an analysis of the market size for PD was conducted (Table 1).

Table 1: A market analysis of different segments of private sector advisory groups and meeting professional development needs.

Segment	Key focus area	Delivery Method	Accreditation	Estimated market	Total Cost to reach 50% of market
Factory/processor	Technical & Communication & engagement	Seminar/ Webinars	Opt in	175	$20,125 per seminar $2,625 per webinar
VET	Communication & engagement	Seminar/ Webinars	Opt in	200?	$23,000 $3000
Industry	Technical, communication & engagement & design	Seminar/ Webinars	Opt in	100	$11,500 $1500
Consultants	Technical & communication & engagement	Seminar/ Webinars	Opt in	350	$40,250 $5250
Agribusiness (productivity & profit oriented)	Technical	Seminar/ Webinars	No	1000	$115,000 $15,000
Banking/finance	Technical	Seminar/ Webinars	No	500	$57,500 $7500
		Totals		2325	$267,375 per seminar $34,875 per webinar

Source Rural Consulting Group (2015) Milestone 3.5 Business case for advisory capacity development

There is limited evidence as to what type of training budget typically allocated by private providers. It seems reasonable to assume that the larger groups would have more formal and diverse professional development options. Some of the options we are aware of include sponsored or subsidised conference or course attendance, 'in house' training and awareness updates often tied to annual or biennial meetings, study tours, on-the-job mentoring, reading, on-line updating and attending industry events. Discussions with RDC representatives generally suggested that private providers don't see particular value in accredited training. The problems faced in providing this type of training include the perceived relevance of continuing education to extension providers, and the relatively small pool of these providers that therefore prevent economy of scale to be applied to any product developed.

In recent years accreditation achieved by undertaking award certificates has failed to gain traction in the agricultural adviser industry (Stuart Kemp, Ag Institute, pers comm). The award courses are no longer offered with the industry view being that they were too long, too hard and too expensive.

With this being the seemingly entrenched view of the industry, the high costs of developing and delivering award courses seems to be unwarranted. Instead the best option for the delivery of further training would seem to rest with short seminar style face to face deliveries and online webinar formats. The online webinar seems to be the ideal type of delivery as it can be undertaken in the evenings and does not require travel expenses for any participants. The webinar form could be ideal for allowing delivery of the latest research topics, industry challenges and also allow direct feedback to a researcher/industry expert who delivers the presentation. They also could be delivered as a cohesive series that link together in a systematic way.

Indicative costs of service delivery

The following costs have been developed in conjunction with the University of Melbourne Commercialisation team and represent an indicative costing for service delivery through the key models available:

1. **Graduate Certificate**— course development approx. $80K-$100K with delivery running at $50K -$60K per annum
2. **Face to Face Seminar** -- approx. $5k per day for 40 participants (includes venue hire, catering) but does not cover presenter airfares/accommodation. $7500 as an estimate if these costs are included.
3. **Webinar** - approx. $1K per hour regardless of numbers

Based on these indicative costs, the following break even and revenue raising (20% margin) fee structures per participant have been assumed:

- Grad Certificate - $4000 per person/per year (upfront costs recouped over 5 years). $4800 incl margin
- Seminars - $190 per person per day (40 people). $230 including margin
- Webinars - $25 per person (40 people). $30 including margin

It should be acknowledged that these 'margins' are indicative also and not consistent across providers. As such the cost is likely to be higher than this.

Estimates of likely demand for the business case were tested with Rural Development Corporations. (Table 2).

Table 2: Estimated demand over 10 years for PD relating to extension

	Now	10 years	Confidence in numbers – High, Medium, low
State Government (productivity & profit oriented)	150	40	H
Industry	50	100	H
VET	200?	200?	?
Consultants	300	350	M
Agribusiness (productivity & profit oriented)	800	1000	L
Factory/processor	150	175	H
Banking/finance	500	500	M

Combining this information with the map of accredited and non-accredited professional development and training options in extension (www.apen.org.au), the next section describes the professional development modules that were designed, developed, delivered and evaluated in a pilot format for the project.

The modules

The following modules (Table 3) were developed and delivered in 2017-2018.

- Modules were delivered fully on-line through the University of Melbourne custom education platform SOLE (Student On-line Learning Environment). Modules included a group discussion forum for participants to meet and share resources and insights. For some modules input in the discussion forum formed part of the assessment.

- The learning outcomes and content of each module was developed by University of Melbourne Rural Innovation Research group staff with input from private sector adviser practice experts. The content of each module included: an introductory video explaining the focus, content and navigation of the module tasks; pre-and post-participation questionnaires and evaluation; video lectures of theory and practice; case study video interviews with private sector advisers; readings/resources. Resources were sourced from the agri-futures extension knowledge hub; research reports from Australian extension studies; private sector tools and techniques. Private sector providers of video content or resources were paid for their contribution.

- Assessments, for receipt of a mark and certificate of completion, consisted of participation in the discussion forum and written reports relating to the application of the module content to a professional situation.
- Each module was open for 8 weeks to allow time for completion of sessions.
- Overall, the modules were pitched at early-career professionals or a refresher/extender to mid-career professionals not experts.

Table 3: The on-line learning modules delivered as part of the project

Module number	Title	Learning outcomes
1.	**Social media in agricultural innovation**	1. An understanding of the purpose of social media in agricultural communication for innovation 2. An awareness of social media modes (Blogs, Facebook groups, twitter and WhatsApp) and increased knowledge of their strengths and weaknesses for supporting agricultural innovation 3. Knowledge of the key elements of a digital communication strategy and an ability to complete a digital communication plan 4. An ability to evaluate your social media presence and impact
2.	**Targeting farmers? Segmentation and adjusting advisory approaches**.	1. Be familiar with the main segmentation methods applicable to agricultural contexts and their strengths and weaknesses 2. Have an ability to determine when and how to apply segmentation in different advisory contexts 3. Apply a segmentation analysis to a farming population to define and justify a target audience and plan different approaches to target 2 or more segments. 4. Consider systems for implementing segmentation in client servicing
3.	**Facilitating farm practice change – (1) – understanding why people change**	1. Awareness of principles from psychology and sociology related to practice change 2. Understanding of different theories of change in agriculture: • Adoption/diffusion • Consultancy • Collaborative inquiry and learning 3. Ability to apply an appropriate theory of change to a practical practice change challenge 4. Ability to identify your role amongst others in supporting change
4.	**Working your network: brokering adviser networks in agricultural innovation**	1. Be familiar with the role of different types of networks in agricultural innovation (community of practice, community of interest, community of place) 2. Have an ability to assess the strength of current networks for innovation 3. Understand different innovation intermediary roles including innovation brokering and be able to define and identify your role in a particular network important to innovation 4. Be familiar with the role of social network analysis in evaluating the strengths and weaknesses of networks.
5.	**Facilitating farm practice change (2) – mixing delivery approaches to enhance adoption and change across a population**	1. Knowledge of the key strategies that support adoption and change across a target farming population and their strengths and weaknesses. 2. Ability to plan a practice change approach with a high likelihood of success
6.	**Knowledge management: managing knowledge assets in your business.**	1. Understand the purpose of knowledge management in agricultural innovation. 2. Awareness of current approaches to knowledge management in agriculture and other contexts 3. Familiarity with techniques for • Farmer and extension involvement in priority setting for research • Development-led innovation

Module number	Title	Learning outcomes
		• Translating science-based knowledge for: a. advisory work and new services b. 'industry' knowledge resources 4. Ability to prepare adviser and farmer-friendly resources based on the latest research for practical application 5. Develop a personal knowledge management plan to 'keep up to date' in your field.
7.	**Evaluating impact in agricultural innovation and adoption**	1. Understand the purpose of evaluation in agricultural innovation projects 2. Knowledge of common evaluation frameworks and their strengths and weaknesses 3. Knowledge of common evaluation methods and metrics in agriculture 4. Ability to develop an evaluation plan for an activity or project and implement it in an agricultural context. 5. Ability to analyse and review evaluation reports 6. Understand different requirements from funding bodies for evaluation.
8.	**Analyzing the whole farm system to position advisory services**	1. Understand the purpose of whole farm system thinking and analysis in an advisory and extension context. 2. Knowledge of the fundamentals of whole farm system analysis (approaches, key farm performance indicators, techniques and tools for analysis and interpretation) 3. Be able to apply whole farm system thinking and analysis to a farm situation.
9.	**Conflict resolution and negotiation**	1. Ability to identify the early warning signs for conflict 2. Knowledge of the main strategies to avoid and deal with conflict situations 3. Apply the ORID method to support discussion and negotiation in conflict situations

The advisers involved in the four trials of private sector engagement in the project were utilised as *'test markets'* for professional development and training designed to meet adviser capability needs. Trial participants were offered one or more modules to provide feedback on content and delivery. Pilot participant numbers in each module varied between 2 and 12/module with overall participation of 80, with some completing more than 1 module.

Completion of the post-module surveys and evaluations were low (as low as 2 out of 9 completions for some of the modules). This made objective analysis of the feedback difficult, but subjective comments were useful, and quite consistent, from both positive and negative aspects. Across all modules however, participants reported that on completion of the modules, they were likely to apply principles and techniques to their professional roles (see Table 2 as an example). A common suggestion for improvement of the modules was to provide more written material, in addition to the video resources. Also, some participants felt that if the modules were to become part of a tertiary qualification, while the subject matter should, overall be incorporated into that qualification, the academic level of the content may need to be higher.

Table 4: Example of before and after feedback from module 1: social media in agricultural innovation

Before module completion **Pre-module survey: what seeking to learn from the module**	**After module completion** **Post module survey: plans and changes made from participation in the module**
• *Like a better understanding on the full capabilities of each of the social media platforms and how to utilise them within my role.* • *I would like to know that I am making a positive impact on our business and that what I am posting reflects the professionalism of our organisation. I would also like to gain confidence in using social media, particularly LinkedIn.* • *Better use of social media to help me in my role and know better ways to evaluate its successfulness* • *communicate effectively and understand the relevance and capabilities of other platforms*	• *A more structured approach to social media rather than an ad-hoc when there is time. More use of tags and using the community to help get your message out there* • *This module has increased my knowledge on how and what to post and effective ways in doing so. It has also increased my confidence as stated in studies through the 90-9-1 quote on engagement.* • *The examples of on social media has also provided more ideas on what aspects to include including using current industry members to portray a message, so I will do this.* • *The course has also helped me to be able to evaluate my presence in social media so I can see the effectiveness.*

Before module completion Pre-module survey: what seeking to learn from the module	After module completion Post module survey: plans and changes made from participation in the module
• *implement an effective communication strategy for our business unit and have a social media presence.* • *Better knowledge of the role of social media in the business world and how it can help me in my role* • *Learn more about theory-based social media applications* • *I would I'd like to improve in my knowledge through theoretical strategies to be able to be efficient and relevant in the information that I provide to industry members*	• *I will also increase the amount of posts I do on the ABA Facebook account as currently it is nowhere near twice a week as it should be."* • *I'll use this digital communication plan with a current project I am involved in.* • *I think in the settings which I use social media for, Twitter isn't as effective as some of the others. I will investigate WhatsApp.* • *I am looking at starting a Facebook group with our discussion groups if this is allowed by company policy*

Feedback from the evaluation and post-module surveys suggest an increase in the academic level for some modules, improvement in some of the video resources and the provision of written material or transcripts as an alternative to the video options.

Attrition rates were high in the pilot, despite the promise of recognition of prior learning for participants who completed modules. It appeared that lack of time outside of work hours, or sickness contributed to some of these drop outs, but not all non-completing participants indicated what the reason was. It must be assumed that in the future, if a student enrolled in a graduate course, their motivation to complete would be higher than the volunteers recruited in the pilot, and the attrition rate not so high. However, there are indications that a flexible completion date could assist with compliance. The price point for the course suggested by participant feedback fell mostly in the $150-$300 range, per module offered (Coombe and Nettle, 2018)

Independent review of modules

The Rural Consulting Group was contracted to manage and report on a review of the professional development modules in agricultural extension developed as part of the project 'Stimulating private sector extension to increase returns from R&D' (Rural Consulting Group, 2018). The objectives for the review were to:

1. Review content quality and appropriateness for module outcomes,
2. Review utility and relevance of professional development modules for different audiences
3. Assess the appropriateness of the delivery model and its sustainability over time,
4. Review the alignment of modules to the AQF level 9 framework, and
5. Describe any improvements across content, target audience, delivery model and business model for delivery.

The review had three main elements:

- a module by module review,
- a review of the Professional Development 'package' as an AQF level 9 product, and
- a strategic review of the overall program.

The approach taken for the review was for teams of 2 reviewers to review the structure and content of the modules using either a strategic review template or module review template in order to address key terms of reference. For the module review, learning outcomes, session structure, session resources and assessments were assessed with teams each reviewing two modules each. For the strategic review, reviewers assessed the modules for suitability by audience and level of skills acquisition, as well as exploring the delivery mechanism and business model for sustainable delivery. A parallel review was conducted to examine the programs alignment with the AQF level 9 framework and suggest options for further development. Data was entered into templates and review findings shared by teleconference. The lead reviewers then collated these insights.

1. Review content quality and appropriateness for module outcomes

All modules were reviewed for 1) The relevance of learning outcomes to the overall module outcome, 2) The relevance of sessions in addressing each learning outcome, 3) The relevance and quality of instructional resources, readings and references, case studies, and assessments to each of the sessions, and 4) The relevance of the assessment to the module outcome. Detailed changes for each module are described in the summary of objective 5 in this executive summary. Overall:

1. Learning outcomes were viewed as relevant to the overall outcome of the module with a small number of exceptions.
2. Sessions were broadly aligned with learning outcomes with the small number of exceptions.
3. The relevance and quality of resources was generally viewed as high. One common insight was the need to better balance theory with practical examples to ensure greater alignment with the target audience, along with broadening the pool of case studies to ensure wider appeal and greater use of cross sectoral projects.
4. Assessments were broadly seen as appropriate for the module with a small number of exceptions whereby small changes would ensure greater application of knowledge gained via the module.

2. Review utility and relevance of professional development modules for different audiences

Modules were seen as highly suited to segments traditionally aligned with extension delivery, namely industry organisations, government, not for profits and sole traders doing contract work for RDC's/government. Whilst elements of the modules (in particular modules 1, 4, 6 and 8) would or could be suitable to the private sector, greater commercial context and a clear value proposition from participation of this group would be needed to engage these segments. Reviewers also found that with the exception of the farmer segmentation module, all modules were suited to levels 1 to 3 (novice to competent) with them being deemed less suitable to levels 4 and 5. The segmentation module was the reverse, with this being seen as needing a level of practical experience in order to be engaged with effectively. These findings are to be expected considering the nature of the PD program (bounded components, focused learning outcomes, structured content, assessment based) and the nature of proficiency and expertise in practice (situational, holistic and intuitive). This has implications for the delivery mechanism of the program if the aim is to engage more experienced practitioners. Action learning would be central to any approach targeting experienced practitioners. Recommended actions speak to the need to enable action learning approaches amongst proficient and expert practitioners if these are to be targeted via the program. They also acknowledge the need for greater engagement of end users in the oversight of the program as a whole.

3. Assess the appropriateness of the delivery model and its sustainability over time,

Reviewers concluded that the appeal of the delivery mechanism is less dictated by the type of organisation targeted or engaged, rather more about geographic location, the organisations attitude to professional development and the preferred learning style of the participant. All options included in the review could appeal across the spectrum to varying degrees, with the highest impact, lowest cost model likely to be preferred. This will vary from organisation to organisation, and depend on perceived need and importance. A key recommendation to enabling this relates to developing and implementing an effective evaluation process which enables rapid adjustment of the delivery mechanism to end user needs.

Reviewers identified **three elements to sustainable governance and funding of the program over time:**

1. the program needs a champion or a sponsor who takes the lead in promoting and overseeing the program.
2. the program needs a home, which is effectively the infrastructure necessary to house program content and enable participants to interface with it.
3. the program needs money to make it work. Such funding relates to two distinct components of the program.
    a. funding necessary to maintain the infrastructure and ensure the program content speaks to contemporary needs.

    b. funding necessary to pay for participation. The first is seen as the responsibility of RDC's and the federal government, whilst the second is a mix of user pays, subsidised and cost sharing arrangements.

4. Review the alignment of modules to the AQF level 9 framework

The package consists of 9 modules with each module covering 3 to 5 session topics. The delivery system is described as online and self-paced although there are time constraints / deadlines associated with some of the module participation, assessment and evaluation requirements. The schedules for the separate modules indicate that the combined PD activity can be completed within a 12 month time frame. Each module extends over an 8 week period and includes a 2 week forum discussion. The modules are each marked to a total of 50 marks. The time commitment for learning tasks and assessment components is designed to equate to 50% of that associated with a standard UoM 12.5 credit point subject or 6.25 credit points of study. In this sense a package of 8 subjects is designed to equate to 4 standard UoM subjects or 50% of one full time year of study. The review highlighted that it is not clear whether there is sequencing requirement or preferred module combinations, and there is no overriding statement of learning outcome for the package of modules. Within the AQF framework Learning Outcomes (Los) differentiate knowledge, skills and application elements as per AQF elements. As an overall package it is not critical that each subject covers all three requirements, however it is noted that M1 and M4 lack emphasis on application and M5 lacks emphasis on both skills and application. Some LOs need development for clarity / meaning including LOs which use words such as 'awareness', 'insights', 'be familiar with'. LOs would benefit from format consistency as well as consideration of some of the terms in a recognised taxonomy (Bloom or Anderson and Krathwohl). Learning outcomes which need more clarity include M1-Lo2, M2-Lo1, M3-Lo1,2&3, M4-Lo1, M5-Lo2, , M8-Lo4. Assessment tasks are consistent with a benchmark such as UoM assessment guideline for a postgraduate subject.

5. Recommended actions arising from the review

The strategic review actions are coded to align with the 4 key terms of reference for this review element:

Strategic review actions

S1.1 – Establish a steering group for the program consisting of representatives of each segment being targeted through the modules. Establish terms of reference for this group around content development and maintenance and delivery mechanisms.

S1.2 – Seek funding to pilot a 'case management' approach to module delivery which seeks to codevelop the value proposition around professional development with commercial agribusiness.

S2.1 – Clarify the target audience for the modules with regards to levels of experience/skill development. This is a key role of the group recommended in S1.1.

S2.2 – Seek funding to explore an action learning pilot targeting proficient and expert practitioners, aligned with recommendation S1.2.

S3.1 – In conjunction with recommendations from S1 and S2, establish an evaluation process that enables effective and timely feedback from both participants and partner organisations which enables rapid adaptation of delivery mechanisms based on end user preferences.

S4.1 – Responsibility for the ongoing leadership and oversight of the PD program to reside with APEN.

S4.2 – University of Melbourne to continue as custodian of module resources and content

S4.3 – Funding for S4.1 and 4.2 to be provided by the federal government and RDC's

S4.4 – Funding for participation in modules to be a mix of

a. user pays for private sector segments contingent on the development of strong value propositions as per recommendations S1;

b. fully subsidised for industry and government agency employees by their organisations as part of a broader approach to staff PD and;

c. cost share in situations where RDC's wish to engage private, non-government and farmer based organisations/individuals in the delivery of extension projects.

AQF review actions

AQF 1 – The proposed steering group from S1.1 review the 5 options for development outlined in this report along with eligible pathway programs with a view to establishing credit recognition for studies undertaken under one or all of the above options.

Specific recommendations for improvement of each module will be addressed by the University of Melbourne.

Discussion and conclusion

Professional development of private sector advisory organisations and their advisers that specifically aligns with the capacity and capability needs in the RD&E system in Australia will require a collaborative focus by RDC's and government. This is required in order to foster cross-sectoral learning; the development of new entrants into the advisory profession and to meet the needs of diverse advisory organisations for their professional development that also aligns with RD&E needs.

Given much professional development is provided within an adviser's own organisation, rather than via professional associations or formal education, the current system does not support cross sectoral learning. Further, the low membership of professional association and accreditation of advisors, particularly related to extension skills, is a concern, with advisers indicating strongest demand for PD in technical areas. Sole operators have the lowest level of professional development tin the system, yet play an important role in provision of advice and support to farmers.

Previous research has indicated that advisers need to envision how new knowledge could improve or add to services and if there is any risk involved related to the acceptance of services by farmers or to changes in their professional identity (Nettle et al, 2018). This means that training and professional development cannot be seen in isolation from the context of adviser's professional lives and their organisational or business context.

This reflects a need for major changes to the current system by which industry and government support the capacity of the private sector advisory and extension profession. This involves coordinated, high quality and targeted cross-sectoral programs that supports the diversity of advisers, the pathways of new entrants into different business contexts and to consider areas of new knowledge and services whereby involving private sector advisers in PD can not only enhance knowledge and skills, but engage them in addressing challenging problems in Australian agriculture.

Organisations seeking to engage a range of advisory services in RD&E could consider:

- Methods to support PD for sole operators
- Formalise extension training for the range of advisory organisations.
- Encouraging advisers into membership of professional associations and support those organisations in extension capability to reach a wider range of advisors.

Some guiding principles for defining the core skills to focus on include:

- Focus on skills relevant to the business models of target groups
- Ensure a resourcing model that is cognisant of each groups business model and therefore their capacity to pay
- Proactively invest in the design, management and evaluation skills and capacity required which is not a core element of private sector business models but will be required by industries.

In conclusion, the project has identified key changes required in the professional development system to support the capacity of private sector advisory and extension professionals in Australia. The professional development modules developed as part of the project are a solid foundation for further adaptive, on-line, short-format delivery of accredited or non-accredited professional development on topics that address current gaps, whilst allowing formal qualifications to be attained by close mapping of offerings to the Australian qualifications framework for tertiary education. Continued development of the system for professional development in Australian agricultural extension is warranted.

References

AFI, 2014, The Public and Private Sector Grain Advisory Systems in Australia (part 1) and Optimizing future extension systems in the Australian grains industry (Part 2), Australian Farm Institute September, 2014. ISBN 978-1-921808-34-0

APEN (2015) Extension Education and Training – Undergraduate and Postgraduate Courses (www.apen.org.au)

Birner, R., K. Davis, J. Pender, E. Nkonya, P. Anandajayasekeram, J. Ekboir, A. Mbabu, et al. 2009, From Best Practice to Best Fit: A Framework for Designing and Analyzing Pluralistic Agricultural Advisory Services Worldwide. *The Journal of Agricultural Education and Extension 15 (4): 341–355*

Coutts J & Roberts K (2003) Extension Models and Best Practice, APEN Extension Conference, Hobart November 2003

Coutts J (2005) Evaluating Success in Achieving Adoption of New Technologies, NSW DPI and Beef CRC Conference "Moving from Research to Adoption" Quality Nautilus Resort, Coffs Harbour NSW 3-5th May 2005

Coombe, J and Nettle, R. (2018) Milestone 5 – Final report, Activity 6 – Capacity Building offering to build private sector capability, KPI 5.5 –Report on overall development of course units and student demand (enrolment) and feedback completed. Final report Prepared for the project: Stimulating private sector extension in Australian agriculture to increase returns from R&D, Rural Innovation Research Group, Faculty of Veterinary & Agricultural Sciences, University of Melbourne, Melbourne, Australia

Cross R, Ampt P., King B., and Nettle R. (2015). An overview of Tertiary Extension Education in Australia. Presentation at the 2015 APEN conference, Adelaide.

Gibbs, G.R. 2004. Searching for Text, In: Seale, C. (ed.) *Social Research Methods- A reader*, Routledge, London, pg 301-311.

Kenny S. (2012) Identifying skill and capability gaps with agronomists. A report for the Grains Diagnostic Agronomy Project, DEPI.

Nettle R. (2014). International literature review for the Red Meat industry extension blueprint. Review prepared for Meat and Livestock Australia and the red meat co-investment committee

RIRDC, 2009, Maximising the Connection between RD&E Providers and Agribusiness - Establishing and testing a Management System that will facilitate the transfer of RD&E through agribusiness to growers. A report for the Cooperative Venture For Capacity Building RIRDC Publication No 08/180 by Gordon Stone & Associates (Project No GSA -2A).

Rural Consulting Group (2016), Milestone 2.6 Progress related to Output 6(b) - develop and evaluate the delivery of eight pilots based on accredited professional development modules for extension operatives in conjunction with the Rural Innovation Research Group, 16 May 2016. Report prepared for the project: Stimulating private sector extension in Australian agriculture to increase returns from R&D, Rural Innovation Research Group, Faculty of Veterinary & Agricultural Sciences, University of Melbourne, Melbourne, Australia

Rural Consulting Group (2018), Professional Development in Agricultural Extension: Professional Development Modules Review Final Report. Report prepared for the project: Stimulating private sector extension in Australian agriculture to increase returns from R&D.

State Extension Leaders Network (SELN) (2006). 'Extension - enabling change', online resource: www.seln.org.au

Stone, G., 2011, National RD&E Survey Australian RDC and CRC organisations.

Wilkinson, R., Barr, N., and Hollier, C. (2011) Segmenting Victoria's farmers, Department of Primary Industry, State of Victoria.

Limitations

The study has some limitations in that whilst there is confidence in the breadth and depth of adviser responses, it is difficult to establish the size and nature of the total advisory and extension service population. Therefore the full range of private sector professional development needs and interests relating to extension functions is difficult to confirm.

Project publications

1. Nettle, R. (2017) Workshop Paper: Farmers Adopting and farmers benefitting from R&D – where are we now? Paper prepared for the Annual Forum: "Stimulating private-sector extension in Australian agriculture to increase returns from R&D", Metropolis, Melbourne, held on 17th May, 2017. (http://rirg.fvas.unimelb.edu.au/ag-extension
2. Nettle, R., Klerkx, L., Faure, G., Koustouris, A., 2017, Governance dynamics and the quest for coordination in pluralistic agricultural advisory systems, *The Journal of Agricultural Education and Extension* 23:3, 189-195, DOI: 10.1080/1389224X.2017.1320638
3. Nettle, R., La, N., Smith, E., & Quantum Market Research (2017), Milestone 3 (Activity 3 and 4): Private sector engagement in RD&E. Prepared for the project: Stimulating private sector extension in Australian agriculture to increase returns from R&D, Rural Innovation Research Group, Faculty of Veterinary & Agricultural Sciences, University of Melbourne, Melbourne, Australia Nettle, R., La, N., Smith, E.: Milestone Report 3, University of Melbourne.
4. Paschen, J. A., Reichelt, N. King, B. Nettle, R., 2017, Enrolling advisers in governing privatised agricultural extension in Australia: challenges and opportunities for the research, development and extension system, *Journal of agricultural education and extension 23:3* http://dx.doi.org/10.1080/1389224X.2017.1320642
5. Quantum Market Research (2017), National Adviser Survey on Extension Services, Prepared for the University of Melbourne, February 2017 (JN: 16057)

Appendix A: Respondent sample for adviser survey

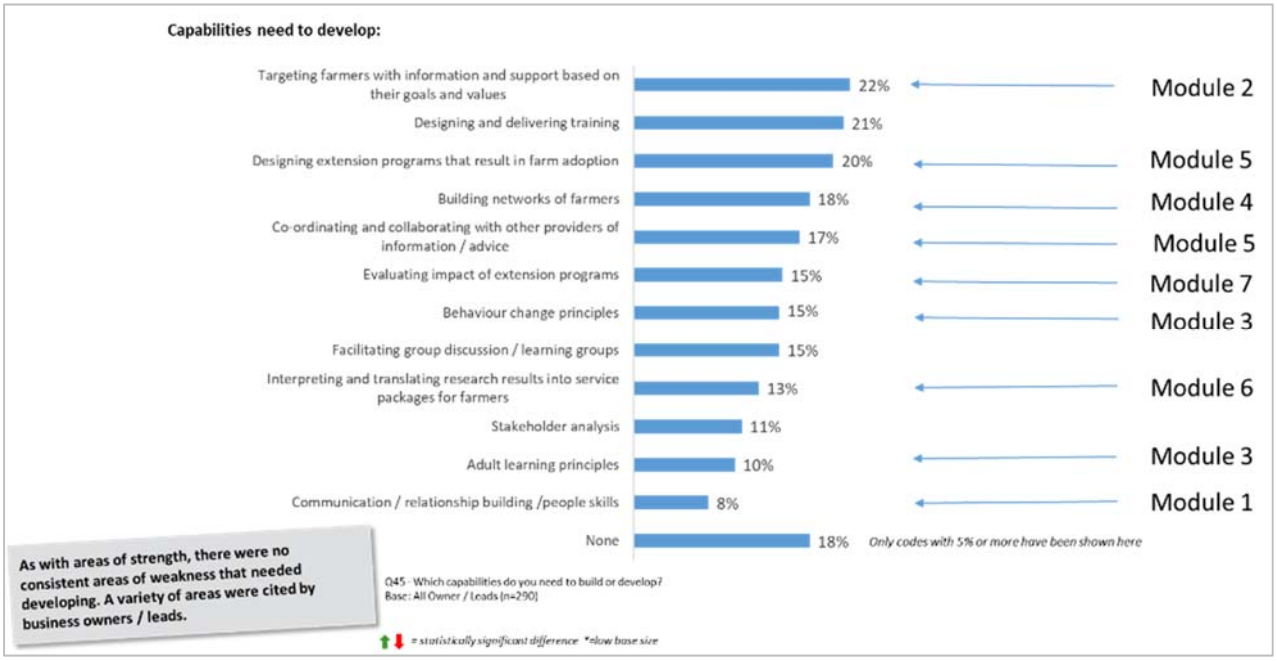
Organisation role	***N =655***	***%***
The Principal, Owner or Manager	290	44
An Employee	324	49
A Sole Operator	41	6
Role(s) in Organisation – Base: Employees	***N=324***	***%***
Extension Officer	126	39
Other	68	21
Technical Support	65	20
Agronomist	63	19
Technical Specialist (livestock)	47	15
Farm Management Consultant	43	13
Technical Specialist – Crops	40	12
Development officer	39	12
Research officer	34	10
Producer / grower services	32	10
Vet	24	7
Farm input sales	18	6
Livestock marketing / sales	9	3
Crops/crop products marketing sales	8	2
Agent / broker	4	1
Partner	3	1

Qualification – Employees and Sole operators	***N=365***	***%***
Bachelor degree	190	23
Graduate diploma / Masters	98	52
Certificate 4 or Diploma	72	27
PhD	27	7
Certificate 2/3 (E.g TAFE qualification)	20	6
Other (Specify)	22	6%
Age	***N=655***	***%***
18 – 29	46	7
30 – 39	96	15
40 – 49	190	29

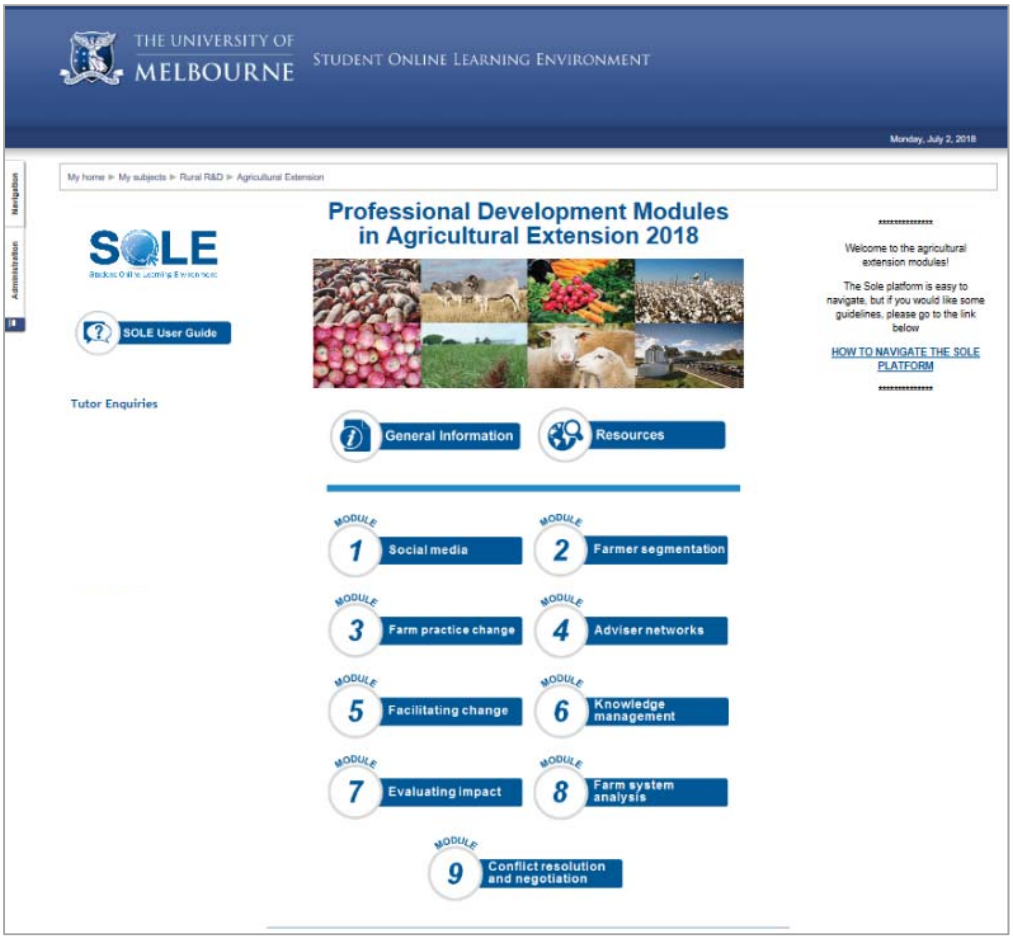
50 – 59	175	27
60 – 69	123	19
70 or older	24	4
Refused	1	0
Gender	***N=655***	***%***
Male	478	73
Female	177	27

Appendix B: Professional Development Modules

Mapping of modules to capability areas needing development (adviser survey)



Home page



Module page


THE UNIVERSITY OF MELBOURNE
STUDENT ONLINE LEARNING ENVIRONMENT
Module 1: Social media in agricultural innovation
This module covers the role of social media in supporting awareness, practice change and adoption in agriculture. It covers different purposes of social media, key elements of a digital communication strategy in supporting change; 4 different social media modes (Blogs, Facebook groups, Twitter and WhatsApp) and evaluating your social media presence and impact as an individual or in projects.
To commence this module please click on the Introduction tab below.
Introduction
Module Outline
Learning Outcomes
Resources
Case Studies
Assessments
Discussion Forum
Survey
Why is social media important in agricultural innovation?
Why should agricultural advisers consider social media in their role?
The main approaches to use of social media
&
Social media platform choices (i.e. Blogs; Facebook groups; Twitter; WhatsApp)
Preparing a digital communication strategy
Application to practice & assessment
Survey
Evaluation
Welcome to the Social media in agricultural extension module!
The Sole platform is easy to navigate, but if you would like some guidelines, please go to the link below
HOW TO NAVIGATE THE SOLE PLATFORM
Another useful tab to get you started is
HOW TO COMPLETE THE MODULE
IMPORTANT DATES:
All the dates for various aspects of the module are located in the Schedule below. The first date you should be aware of is October 30th; this is when the discussion forum opens
Schedule
QUERIES:
Please email queries about the module to Jo Coombe or Ruth Nettle (email addresses are located on the left of the Home page)
SURVEYS:
It is vitally important that you complete the surveys, to enable us to understand how successful the piloting of the modules has been. There are 3 surveys: pre-module, post-module and evaluation surveys. Please take a few minutes at the relevant time to complete them.

Session page