Final report

National Coordination of the Managing Climate Variability Program

Project code: B.CCH.2106

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Date published: 28 May 2021

PUBLISHED BY
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Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

Abstract

The Managing Climate Variability Phase 5 (MCV 5) project has run for five years from 2016-17 to June 2021. It had a focus on research, development and extension products to improve climate forecasts over a timeframe of two weeks to months ahead. The National Co-ordinator role worked to help ensure a high standard of delivery and reported to MLA's Program Manager - Sustainability Innovation.

The focus of the National Coordinator role was on the ongoing oversight of the Forewarned is Forearmed project (its largest investment), coordination of the Project Management Committee and identification and contracting of relevant research, development and extension opportunities.

Towards the end of the project, a review of the business case for further MCV investment was undertaken. It was noted that the 'climate' space had become quite complex given the emergence of Agricultural Innovation Australia and the associated 'Climate Initiative' and the Commonwealth Governments 'Future Drought Fund'.
Three options for 'next steps' for MCV were provided. At its May 2021 meeting the MCV Project Management Committee decided not to progress with a twelve-month extension of MCV and that a transition process of any assets (such as remaining funds, CliMate App, Climate Kelpie website) be enacted.

Executive summary

Background

The Managing Climate Variability Program Phase five (MCV 5) is managed by Meat and Livestock Australia (MLA) on behalf of partner Rural Development Corporations (RDC's). MCV is a long-term partnership across Rural Research & Development Corporations. Investors in MCV5 were Meat & Livestock Australia (MLA), Grains Research and Development Corporation (GRDC), Sugar Research Australia (SRA), Cotton Research and Development Corporation (CRDC) and AgriFutures Australia formerly known as the Rural Industries Research & Development Corporation (RIRDC). Each of the RDC's holds a place on the MCV Program Management Committee (PMC) with an independent Chair. This partnership is governed by an overarching agreement between these parties. Research partners have historically included the Bureau of Meteorology (BoM), Commonwealth Scientific and Industrial Research Organisation (CSIRO), State Departments of Agriculture and Universities.

Objectives

The overall aim of the National Coordinator's role (who is also the National Coordinator of the Forewarned is Forearmed (FWFA) project, of which MCV is a substantial investor) was on:

- the ongoing oversight of the FWFA project;
- coordination of the PMC;
- oversight of communication activities; and
- identification and contracting of relevant RD&E opportunities for the benefit of MCV partners and their stakeholders.

Specific objectives and the achievement of these are listed within the body of this final report.

MCV's largest investment was the FWFA project, with several other research, development, extension, communication and market research projects undertaken.

Overall, the objectives of the National Coordinator role were achieved although identification of new research opportunities and obtaining additional external funding was less than desired.

Methodology

A methodology for the project is not particularly relevant as it was a national coordination role, rather than an experimental project.

Results/key findings

The MCV 5 project has run for 5 years from 2016-17 through to June 2021. It had a focus on research, development and extension (RD&E) products to improve climate forecasts over a timeframe of two weeks to months ahead. The National Co-ordinator role commenced in January 2017 and worked for the whole program to help ensure a high standard of delivery. The National Coordinator reported to Meat & Livestock Australia's Program Manager - Sustainability Innovation.

During the period, an expert technical committee was formed and prepared a list of potential investment opportunities. An independent mid-term review of the MCV project was also undertaken and a final report received. The recommendations were reviewed by the PMC and progressively implemented. The national coordinator worked closely with partners including the Bureau of

Meteorology in identifying research and development areas with the greatest opportunity to enhance seasonal climate forecasts.

MCV's largest investment was the FWFA project, with several other research, development, extension, communication and market research projects undertaken including:

- Via Birchip Cropping Group (as the MCV Communication Manager), the development and implementation of a renewed communication plan. This included:
    - Combining and revitalising the MCV website and the Climate Kelpie website (the new Climate Kelpie website was attracting around 1,600 visitors monthly in 2020)
    - Rebranding CliMag to Climate Kelpie news and producing four relevant stories per quarter (circulated to 20,000 people) and listed on the Climate Kelpie Blog
    - Increasing the emphasis on social media platforms (for example, the Climate Kelpie twitter account continues to grow year on year and currently has over the 845 users).
- Support for the CliMate App (the App has been attracting approximately 200 new registrations per month, adding to the approximately 20,000 over the lifetime of the app)
- Research into summer rainfall trends in Australia's mid latitudes (CSIRO)
- Investment in the Grains Research and Development Corporation's (GRDC) 'AgScore' research project (under development)
- Market research into the use and utility of seasonal forecasts (under development).

Benefits to industry

The actions of the National Coordinator enabled the following benefits to the industry*:*

- Ongoing education (through extension and communication activities) of producers and their advisors on weather and seasonal climate forecasts through the Climate Kelpie website and CliMate website and App.
- The development of new R&D initiatives outside of MCV to develop extreme event forecasting products, namely the Forewarned is Forearmed Rural R&D for Profit Project.
- Research into specific issues furthering our weather and climate knowledge*.*

Future research and recommendations

Future research, development and adoption activities required include:

1. Improving the understanding of weather and seasonal climate forecasts among producers (presently there are significant misinterpretation issues prevent correct interpretation of forecast information);
2. Developing / refining decision support packages that allow producers and their advisors to seamlessly apply seasonal climate forecasts to key farm management decisions; and
3. The ongoing pursuit of improvements in the skill and use of seasonal climate forecasts.

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1. Background

The premise of the Managing Climate Variability (MCV) investment is that climate variability presents a significant and growing risk to Australian farmers. Estimates of the benefits from adoption of seasonal climate forecasts range as high as $1,930 million per year across agriculture. However, benefits vary between enterprise types, as do the specific requirements of forecasting models such as level of 'skill' (accuracy) requirements.

The MCV program is a long-term partnership across Rural Research & Development Corporations (RDC's). Investors in MCV phase 5 were Meat & Livestock Australia (MLA), Grains Research and Development Corporation (GRDC), Sugar Research Australia (SRA), Cotton Research and Development Corporation (CRDC) and AgriFutures Australia formerly known as the Rural Industries Research & Development Corporation (RIRDC). Research partners have historically included the Bureau of Meteorology (BoM), Commonwealth Scientific and Industrial Research Organisation (CSIRO), State Departments of Agriculture and Universities. Dairy Australia sits on the MCV Project Management Committee (PMC) in an observer capacity, while the Birchip Cropping Group (BCG) sits on the PMC as the MCV Communication Manager.

The MCV program has a strong focus on research and development products to improve climate forecasts for two weeks to months ahead. Australia's farmers and livestock producers require more skilful forecasts on these timeframes to manage climate risks in our variable and changing climate. MCV also invests in translating seasonal outlooks into products and tools of more value to agriculture and to providing this information via extension and communication activities in the most relevant way.

MCV is managed by MLA on behalf of partner RDC's. To achieve this, each of the funding parties holds a place on the MCV Project Management Committee (PMC) with an independent chair.

The Business Plan for MCV5[1] contained four major investment strategies. These were:

- Priority 1 – Improving the Forecast (~35% of budget)
- Priority 2 – Valuing the Forecast (~30% budget)
- Priority 3 – Using the forecast (~25% of budget)
- Priority 4 – Communications (~10% budget).

In the early stages of MCV5, several organisations joined forces with MCV partners to successfully apply for a Rural R&D for Profit project called 'Forewarned is Forearmed (FWFA)'. FWFA was allocated $1.5 million of MCV's $3.5 million five-year budget. A range of other research, development, extension and communication projects were also actioned.

[1] McIntosh, P. et al, (2017). *Managing Climate Variability V: A research and development operational plan for 2016-17 to 2021-22*.

2. Objectives

The following table lists the National Coordinator roles and an assessment of their achievement over the period of the project.

Role	Statement of achievement
Reporting contractually to the Program Manager, Sustainability Innovation for MLA, for overall delivery and coordination of MCV5.	Achieved – regular contact.
Preparing monthly Program Management Committee (PMC) agenda papers, attend monthly meetings of the PMC and report to the PMC on individual project performance, budget and identify key issues of relevance to the success of the MCV5 Program.	Achieved – the PMC met almost monthly over the period.
Proactively identifying additional opportunities to gain support and financial investment in the program.	Partially achieved – while the area benefited from the external funding obtained for FWFA, no other external funds were obtained.
Working collaboratively with the MLA manager and staff, the PMC and key stakeholders to develop, prioritise and implement the MCV program.	Achieved – the PMC meetings constantly looked for priorities in the climate variability and climate change area.
Working with the climate science and agricultural research communities to develop new project proposals in line with the plans of MCV5.	Achieved – established a MCV expert technical committee to identify investment opportunities.
Providing timely reviews of milestone and final reports on MCV projects to ensure that the research and development projects deliver quality outputs relevant to Australian Agriculture.	Achieved – although there were relatively few projects.
Working collaboratively with the MCV 5 communications consultant to ensure a coordinated approach to MCV products and activities.	Achieved – strong working relationship with BCG who were the Communications Manager. Eleven editions of Climate Kelpie news achieved.
Undertaking other activities as necessary to ensure cost effective and efficient delivery of the portfolio of new and proposed MCV projects on behalf of investors and clients.	Achieved – as needed.
Providing information to relevant parties on the outputs and outcomes of the Managing Climate Variability Program	Achieved – primarily via the PMC and via BCG and the Climate Kelpie website.

3. Methodology

A methodology for the project is not particularly relevant as it was a national coordination role, rather than an experimental project. This is best displayed by progress against each of the 'duties' as listed in section 4 below. As noted above the main activities were:

- Development of an overarching MCV5 Operational Plan by the end of May 2017.
- Coordination of the PMC.
- Identification and contracting of relevant RD&E opportunities for the benefit of MCV partners and their stakeholders.
- Via BCG, who were the MCV Communications Manager, oversee the development and implementation of a renewed communication plan.
- Support for the CliMate App. (https://climateapp.net.au/)
- Monitoring of FWFA progress.

4. Results

The following table provides a summary of activities over the term of the project.

Duties	Activities to progress
1. In collaboration with the PMC, develop an overarching MCV5 Operating Plan that includes key elements of the MCV5 Business Plan, the 2016 R&D Operating Plan (McIntosh 2017), the 2015 Communications Review by Coutts J&R Ltd and past economic evaluations of the MCV program by AgTrans Research & Consulting.	• An initial operating plan was approved by the PMC in 2017. Regular updates of the plan were presented to the PMC over the period 2017 to 2020. • The key components of the Operating Plan were the likely R&D opportunities, reference to the separate communication plan and a monitoring and evaluation plan. • At the July 2019 meeting of the PMC a strategy session was held where it was agreed to commission an independent consultant to prepare a prospectus (business case) for Managing Climate Variability Phase 6 and would cover: o Management of MCV in the future o Achievements of MCV in the past o What is the value proposition going forward? o Ensure it is a pitch for Board investments and senior management engagement o Clarify value to other industries o Clarify outputs / outcomes desired and over what timeframe and what $'s are required.

	This activity was progressed in late 2020 and a report provided to the PMC in March 2021. A copy of that report accompanies this milestone report.
2. Develop an evaluation plan that MCV5 can utilise to evaluate its performance to investors over the life of the 5-year program of work.	• As noted above, within the Operating Plan, an evaluation plan was included. Its main focus was on successful implementation of FWFA, adoption of seasonal climate forecast products and successful completion of new major R&D project(s). • Market research is currently underway to better understand the use and utility of seasonal climate forecasts (SCF) by farmers. • A proposed repeat of the CIE review on the value of SCF to agriculture was not undertaken. • The Rural R&D for Profit Round 1 project (Improved use of seasonal forecasting to increase farmer profitability) completed case studies across a range of agricultural industries to value the use of seasonal forecasts (see point 3 below).
3. Work with the relevant RIRDC manager (AgriFutures Australia) to ensure the success of the Round One Rural R&D for Profit project (RR&D4P).	• There was a good working relationship established with the RR&D4P Round 1 project. • An amount of some $80,000 was accrued from interest for the project. The PMC asked the project to consider using this money to develop a legacy product – in the form of a generic training package. • A training package options paper was received by the PMC but the project did not proceed due to Round 1 project staffing constraints. • In May 2018, a final Forum on the outcomes of the Round 1 project was held. The Forum received an update on all components of the project.
4. If the Round 3 Rural R&D for Profit proposal submitted by MLA in December 2016 is successful, working with MLA and project partners to initiate the new project.	• The RR&D4P Rd 3 project titled Forewarned is Forearmed (FWFA) was successful in receiving Commonwealth Government funding. Formal advice from the Minister was received in June 2017. • Following the announcement, a range of activities were undertaken prior to 30 June 2017 including: ○ Rapidly preparing numerous versions of a contract between MLA and the Department of Agriculture and Water Resources (DAWR now the Department of Agriculture, Water and the Environment (DAWE)).

	○ Holding an Industry Advisory Group (IAG) meeting to brief all partners (funding contributors and research organisations) on the program and plan the next steps. • The National Co-ordinator was actively involved in initiating all aspects of the FWFA project. • Regular updates on progress with FWFA have been provided to the PMC. Indeed, joint meetings between the FWFA Project Leaders Group (PLG) and the PMC have been held regularly. • The FWFA project has been progressing well.
5. Establish the MCV Technical Committee.	• The MCV Technical Committee was established mid-2018. • It comprised Prof Andrew Pitman (University of New South Wales), Dr Jaci Brown (CSIRO), Dr Zvi Hochman (CSIRO), Prof Christian Jakob (Monash University), Dr Oscar Alves (BoM) and Dr Luke Shelley (BoM). • The MCV Technical Committee met with the MCV Project Management Committee in July 2018 and successfully identified a range of potential Research Development & Evaluation (RD&E) opportunities. • These potential RD&E opportunities were the subject of ongoing discussion at the PMC.
6. In collaboration with the Project Management Committee and the MCV Technical Committee, identify relevant RD&E opportunities that MCV may fund. Contract relevant RD&E projects and manage their implementation.	• The PMC has met in person or via teleconference on a (almost) monthly basis. • The main discussion points have been: ○ R&D opportunities identified by the technical committee ○ Communication activities ○ MCV review and associated actions ○ The scope of future opportunities for MCV (e.g. climate change, RDC Climate Initiative, Future Drought Fund etc.). • The main R&D opportunities progressed were: ○ Maintenance of CliMate App ○ Investigation into changes in summer rainfall at Australian mid-latitudes

	○ Investment in the GRDC led 'AgScore' project which was looking at the three and six month forecast skill of a number of climate forecasts globally ○ Conduct of market research on the use and utility of seasonal climate forecasts. • The National Coordinator has also worked closely with Bureau of Meteorology (BOM) in identifying research and development areas with the greatest opportunity to enhance seasonal climate forecasts. A draft version of this listing accompanies this report.
7. Undertake a mid-term review of MCV.	• A tender was prepared in late 2019 and numerous applications were received. • AgEconPlus was chosen as the preferred supplier. • A draft report was discussed in March 2020 by the PMC and finalised in April. • Recommendations arising from the report have been discussed by the PMC and with MLA and actions developed, including some noted in this report. • A copy of that report accompanies this final report. • Subsequent to the mid-term review, a separate review of MCV was undertaken with a view to establish a 'business case' for MCV6. That review accompanies this report. It noted the complex 'climate' space given the emergence of Agriculture Innovation Australia (AIA) and the associated climate initiative and the Commonwealth Governments Future Drought Fund (FDF), including the Climate Services for Agriculture initiative. As noted earlier, three options were provided for the future of MCV which were discussed by partners via the PMC. At its May 2021 meeting, the MCV PMC decided not to progress with a twelve-month extension of MCV and that a transition process for assets (such as remaining funds, CliMate App, Climate Kelpie website) be enacted.
8. Further implement the communication strategy	• A communication plan was prepared in 2017 and has been progressively implemented. • The Communication Plan included three (3) short-term recommendations which have been completed: ○ Undertake a stakeholder analysis of MCV agencies communication activities ○ Rebuild the Climate Kelpie website – the MCV website and the Climate Kelpie website have been merged and simplified.

	○ All communications products be branded under the 'Climate Kelpie' umbrella. • Numerous editions of the Climate Kelpie news (which has replaced CliMag) have been developed. Each quarterly edition has four articles with a climate variability theme and is circulated to an audience of approximately 20,000. • Tracking of website use and social media hits were regularly reported to the PMC. • The maintenance of the CliMate App was a constant source of interest. Unfortunately, warranty issues between MLA and GRDC limited the further development of the App. Transition arrangements are currently under consideration.
9. With the PMC, monitor the implementation of the FWFA project	• The RR&D4P Rd 3 project titled 'Forewarned is Forearmed' (FWFA) is into its fourth year (of five) of implementation. • The MCV National Coordinator and the FWFA National Coordinator are the same contractor, allowing for efficiency between the two projects. • As noted above, the national coordinator provided regular updates on FWFA to the PMC. • There have also been opportunities for the FWFA Project Leaders Group and the MCV PMC to meet jointly.
10. Engage with an annual review of the National Coordinator position performance against contractual duties in July of each calendar year.	• There has been weekly contact between the National Co-ordinator and the MLA Program Manager for Sustainable Innovation. • An annual review was also completed and duties for the forthcoming year agreed.

5. Conclusion

5.1 Key Findings

Over the last two decades, MCV has been pivotal in assisting Australian agriculture to better manage its variable and changing climate. Amongst its many achievements has been the important role it played in moving the Bureau of Meteorology from statistical to dynamic modelling for seasonal climate forecasts and getting the Water and The Land (WATL) service established.

The MCV 5 project has continued to provide communication and collaboration opportunities for partner RDC's and their stakeholders. MCV's main investment over the period in FWFA is progressing very well and will deliver enhanced seasonal forecasts, new extreme event forecast products and farmer risk management strategies for extreme weather events.

The PMC has been a vital 'sounding board' for matters of weather / climate and communication activities. The CliMate app has been a strong performer for MCV. On the other hand, while some progress has been made with the commissioning and contracting of other R&D projects, the process to identify and contract good projects has been less than optimum.

Apart from MCV's investment in the FWFA project, several other research, development, extension, communication and market research projects have been undertaken including:

- Via BCG, overseeing the development and implementation of a renewed communication plan. This included:
    - Combining and revitalising the MCV website and the Climate Kelpie website (the new Climate Kelpie website was attracting around 1,600 visitors monthly in 2020)
    - Rebranding CliMag to Climate Kelpie news and producing four relevant stories per quarter (circulated to 20,000 people) and listed on Climate Kelpie Blog
    - Increasing the emphasis on social media platforms (for example, the Climate Kelpie twitter account continues to grow year on year and currently has over the 845 users).
- Support for the CliMate App (the App has been attracting approximately 200 new registrations per month, adding to approximately 20,000 over the lifetime of the app)
- Research into summer rainfall trends in Australia's mid latitudes (CSIRO)
- Investment in the Grains Research and Development Corporation's (GRDC) 'AgScore' research project (CSIRO, under development)
- Market research into the use and utility of seasonal forecasts (Quantum, under development).

As noted in this report and the accompanying MCV review, the climate space is currently quite complicated. The emergence of the Climate Initiative, tight RDC budgets and the 'likelihood that some or all of the MCV partner RDCs will not wish to invest in climate RD&E through both Agriculture Innovation Australia (AIA) and MCV, may mean the end of direct funding for MCV regardless of its track record'. This has proven to be the case.

5.2 Benefits to Industry

The MCV 5 project has built on progress made through earlier phases of MCV. It has provided the following benefits to the agricultural sector:

- Ongoing education (through extension and communication activities) of farmers and their advisors on weather and seasonal climate forecasts
- Via FWFA, the pending release of new BOM forecast products (weeks to months out) of extreme weather events
- Research into specific issues furthering our weather and climate knowledge.

The red meat industry, the majority of which is very exposed to seasonal conditions, has been a beneficiary of these benefits. Nonetheless, there remains gaps / limitations for producers in the level of understanding in relation to seasonal climate forecasts (especially the probabilistic nature of seasonal forecasts) and in the forecast's accuracy / skill. These remain key issues to be addressed by both forecasting agencies and the agricultural sector (see section 6).

6. Future research and recommendations

Given Australia's variable and changing climate, combined with the fact that weather / climate has a huge impact on agricultural productivity and profitability (especially for extensive industries), improved seasonal climate forecasts and their application by the agricultural sector remains a very high priority.

The need for ongoing research, development and extension in the weather and climate space remain as relevant today as it did twenty years ago.

It is recommended that a continuing focus be placed on:

1. Improving Australian farmers understanding of weather and seasonal climate forecasts;
2. Developing / refining decision support packages that allow farmers / advisors to seamlessly apply seasonal climate forecasts to key farm management decisions; and
3. The ongoing pursuit of improvements in the accuracy (skill) and use of seasonal climate forecasts.

It is hoped that some recent initiatives such as the Climate Services for Agriculture and the emergence of AIA will see this critical work continue.

7. References

McIntosh, P. et al, (2017). *Managing Climate Variability V: A research and development operational plan for 2016-17 to 2021-22*. 44 pages.
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