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CAMBODIA AGRICULTURAL VALUE CHAIN (CAVAC) – PHASE ONE


Completion evaluation

December 2017



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FOREWORD

The Cambodia Agricultural Value Chain Program Phase 1 (CAVAC I) aimed to increase the incomes of smallholder farmers by improving the productivity of rice-based farming systems. CAVAC is part of a long history of Australian aid assistance to Cambodian agriculture, an important sector given the majority of Cambodia's population depends on small-scale agriculture for their livelihood.

CAVAC I also marks a point of departure from previous programs. Its design espoused a market systems development approach working closely with the private sector rather than through the Cambodian government. It was envisaged as a flexible program, which could adapt to changes in local context and invest its time and resources in the areas where the promise of results was greatest.

The Office of Development Effectiveness undertook this independent evaluation of CAVAC's implementation to assess the major results and the extent to which these represent value for money. Through this, it informs the ongoing implementation of CAVAC II. It also provides evidence of the advantages and disadvantages of a market systems approach compared to other forms of donor assistance.

The evaluation found a number of exemplar aspects to CAVAC. Close attention to monitoring, underpinned by detailed logic for each element of the program, enabled CAVAC to effectively track the progress of its activities and adjust as necessary. This way of working put monitoring at the core of CAVAC's business model, and use of monitoring to facilitate learning and guide improvement of its activities put it at the forefront of the Australian aid program.

A deliberate 'trial and learn' approach also led CAVAC to pursue a small number of 'complete' irrigation schemes, which were more expensive to construct but were assessed to be sustainable operations in contrast to earlier models. These schemes constitute 'proof of concept' and are potentially one of CAVAC's triumphs, with a real possibility of having a systemic impact across agriculture in Cambodia.

The evaluation did identify some significant shortcomings in CAVAC's monitoring systems, which did not support accountability to its key stakeholders or provided them with readily accessible information to meet their needs. The program struggled to establish clear baselines, and shifts in indicators and targets made assessment of the adequacy of progress difficult. CAVAC's decision not to calculate changes in farmer income arising from its interventions hampered the ability of the program to fully demonstrate its impact.

This evaluation offers valuable lessons for how programs can use good adaptive management, an essential feature of market systems development. I endorse this evaluation and commend the findings to DFAT's Cambodia program, CAVAC II and other areas of DFAT considering a market systems approach in their programs.



Jim Adams
Chair, Independent Evaluation Committee

Cover: Mr Sim Ratana, Fertiliser wholesaler/retailer, Tram Kak, Kampot Province. All photos: DFAT.

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The evaluation team would also like to thank DFAT Phnom Penh and CAVAC for their comments on a draft of this evaluation report and at various other points of the evaluation. DFAT's Independent Evaluation Committee provided comments to help ensure independence and rigour to this report and the evaluation process.

THE EVALUATION TEAM

The Office of Development Effectiveness (ODE) within DFAT prepared this evaluation. The evaluation team comprised Simon Ernst (team leader, ODE), Dr Julie Delforce (senior sector specialist in DFAT's Agriculture and Food Security Section), Rob Rendell (irrigation specialist, independent consultant), John Fargher (value-for-money specialist, independent consultant) and Tanya Pridannikoff (evaluation manager, ODE).

The main research for this evaluation was completed between February to June 2017 with fieldwork in Cambodia in May 2017.

Office of Development Effectiveness

The Office of Development Effectiveness (ODE) is an independent branch within the Australian Government Department of Foreign Affairs and Trade (DFAT). ODE monitors the Australian aid program's performance, evaluates its impact, and contributes to international evidence and debate about aid and development effectiveness. ODE's work is overseen by the Independent Evaluation Committee (IEC), an advisory body that provides independent expert advice on ODE's evaluation strategy, work plan, analysis and reports.

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ACRONYMS AND ABBREVIATIONS

ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
AIPR-Rural	Australia-Indonesia Partnership for Rural Economic Development
AQC	Aid Quality Check
AusAID	Australian Agency for International Development
CAVAC	Cambodia Agricultural Value Chain Program
DCED	Donor Committee for Enterprise Development
DFAT	Department of Foreign Affairs and Trade
FAQC	Final Aid Quality Check
FWUC	Farmer Water User Community
GDA	General Directorate of Agriculture
IRR	Internal Rate of Return
KAP	Knowledge, Attitude, Practice
MAFF	Ministry of Agriculture, Forestry and Fisheries
M&E	Monitoring and Evaluation
MEF	Ministry of Economics and Finance
MOWRAM	Ministry of Water Resources and Meteorology
MSD	Market Systems Development
MTR	Mid-Term Review
NGO	Non-Government Organisation
NSC	National Steering Committee
ODE	Office of Development Effectiveness
O&M	Operation and Maintenance
PDAFF	Provincial Department of Agriculture, Forestry and Fisheries
PDD	Project design document
PDWRAM	Provincial Department of Water Resources and Meteorology
RGC	Royal Government of Cambodia
VFM	Value-for-Money

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EXECUTIVE SUMMARY

ODE undertook this evaluation at the request of DFAT's Phnom Penh post. The evaluation seeks to verify results reported during phase one of the Cambodia Agricultural Value Chain program (CAVAC) and capture lessons to inform implementation of the current phase (two). This evaluation assesses CAVAC Phase one's overall performance against six key evaluation questions. Evaluation questions focussed on CAVAC Phase one's monitoring and evaluation (M&E), innovation, effectiveness, sustainability, efficiency, and inclusivity respectively. Insights gained through this evaluation will also be useful for other DFAT market systems development (MSD) programs, as well as those that have an adaptive management and/or private sector focus.

Background

After more than five years of implementation, CAVAC Phase one* concluded in December 2015. The program dedicated its budget of approximately \$60 million to addressing poverty in rural Cambodia by improving the productivity of rice-based farming systems. CAVAC is part of a long history of Australian aid assistance to Cambodian agriculture. However, it also marks a point of departure from previous programs. CAVAC's design espoused a market systems development (MSD) approach working closely with the private sector rather than predominantly through the Cambodian government. It was envisaged as a flexible program, which could adapt to changes in local context and invest its time and resources in the areas where the promise of results was greatest.

From its earliest beginnings CAVAC travelled a dynamic, sometimes turbulent path. Its predecessor, a design and implement approach, was deemed unsuccessful and ended early. The (then) Australian Agency for International Development (AusAID) commissioned a new design and directly appointed a team leader, who remained without a team for more than 12 months. Over the first two years of implementation the program design was overtaken by events. Two of the original four program components were discontinued and a program partner, the Australian Centre for International Agricultural Research (ACIAR), withdrew. Nevertheless, an independent mid-term evaluation conducted in 2012 was positive about CAVAC's progress and helped confirm the direction adopted by the program.

Although some core elements remained, the new direction also represented a significant, but appropriate, shift from the original design. The MSD approach remained core to the program's philosophy but really only applied to its agribusiness development component. In CAVAC's case, the agribusiness component used only 11% of the activity budget. MSD programs require considerable human resources for market analysis, negotiating partnerships and measuring impacts, but 'activity' expenditure tends to be relatively low. On the other hand, the irrigation component – while innovative in many respects – reverted to a more traditional, direct delivery approach and ended up consuming over three-quarters of program activity expenditure. CAVAC's accounts suggest the program is perhaps more accurately described as an irrigation infrastructure rather than a value chain program, although this is not quite the full picture.

* CAVAC has had two phases. References to CAVAC generally denote Phase one or both phases. The term 'CAVAC Phase two' is used to specifically denote the current phase.

CAVAC Phase two commenced in early 2016, with an expanded budget of \$94 million. The Phase one team transitioned into the current program but under a new team leader. CAVAC Phase two carried forward Phase one's basic component structure and funding split for irrigation and added a new third component, rice milling and export. This evaluation does not assess CAVAC Phase two.

Monitoring and demonstrating results

As DFAT's first MSD program, CAVAC represented a new and innovative way of doing business. Its intent was to facilitate lasting change in the key market systems smallholders relied on. It therefore worked not directly with the poor, but predominantly through private companies such as fertiliser suppliers and, in its early stages, private water sellers. Detailed impact logics were developed for each intervention; these laid out the cause and effect pathway from CAVAC inputs to agribusiness outputs to improved outcomes for smallholder farmers. Critical risks and assumptions were documented alongside each logic model in addition to thorough calculations of projected impact. This step-wise approach enabled CAVAC to effectively monitor its agribusiness activities and quickly alter or abandon individual activities if their ultimate success appeared doubtful. This way of working put monitoring at the core of CAVAC's business model and made it a key responsibility for all staff. It is primarily for this reason that CAVAC's M&E* was repeatedly rated as 'very good' by DFAT. This evaluation concurs that CAVAC's use of monitoring to facilitate internal learning and guide improvement of its activities put it at the forefront of the Australian aid program.

However, CAVAC M&E exhibited significant shortcomings in the extent to which it supported accountability to its key stakeholders or provided them with readily accessible information appropriate to their needs. This report charts a series of shifts in indicators and targets, which in the absence of related changes in monitoring practices, makes assessment of the adequacy of progress difficult. It also notes that CAVAC's continued practice of reporting projections, alongside actual results achieved, even after the completion of the program further complicates any assessment of program performance. None of this suggests that CAVAC sought to obfuscate; the program has a clear rationale for its decisions and practices. However, these reflect a lack of practical emphasis on the needs of the donor and the recipient government, needs that were possibly not effectively communicated to the CAVAC team.

Impact of CAVAC agribusiness interventions

CAVAC's agribusiness component mostly involved partnering with input supply companies to both influence and leverage off their interactions with smallholder farmers. By strengthening companies' capacity to provide accurate and reliable advice through wholesale-retail outlets and direct to Cambodian farmers, the program was able to reach large numbers of farming households. In a similar manner smaller interventions, such as with a media company on a television series, sought to target many more farmers than CAVAC or government extension workers could do directly.

CAVAC has a sound approach to measuring the changes in farmer practice that its agribusiness interventions have brought about; this is referred to as 'outreach'. An early, indicative estimate suggested CAVAC could effectively target 60,000 smallholder farming households through its agribusiness component. The most recent projection is 321,000 households by end-2017. CAVAC reports outreach of 214,550 at program completion in 2015.[†] Whilst total agribusiness outreach of 321,000 in 2017 is considered plausible, CAVAC will only verify these forward estimates late in 2017.

* Note – Whilst the term monitoring and evaluation (M&E) is used broadly to describe the process of gathering and using data for evidence based decision making in CAVAC's case the focus was primarily on 'monitoring' rather than 'evaluation'.

[†] This figure is not clearly stated in the Completion Report, but CAVAC staff have advised that the sum of the separate intervention figures provided in Table 8 of that report is the 'actual' total outreach as at September 2015.

Whilst the agribusiness component performed strongly in terms of the number of households influenced, the significance of this is more difficult to assess. There is evidence linking improved practices to higher farm productivity; however translating this into firm figures on increased agricultural output is less robust. Furthermore, CAVAC's decision not to calculate changes in farmer income arising from its interventions hampers the ability of the program to fully demonstrate its impact.

This evaluation found that CAVAC did effectively influence the way its partner agri-input companies do business. It also confirmed that farmers do regard input retailers as a valuable source of farming advice. Whilst this is an irreversible change in the market system for agricultural inputs, the extent to which this is attributable to CAVAC cannot be reliably assessed. Many of the businesses consulted as part of this evaluation acknowledged that their training activities had diminished following the conclusion of CAVAC financial support, although this may also be a response to reduced demand for inputs in a period of low paddy prices. Little evidence was uncovered as to CAVAC's influence on non-partner companies. On the other hand, CAVAC's collaboration with the Cambodian government on pesticides clearly strengthened the technical underpinnings for policy implementation and helped enable that market to develop. Further, there is evidence that at least some senior government figures, particularly in the Ministry of Agriculture, Forestry and Fisheries (MAFF), are now much more accepting of the private sector's role in agricultural development.

Assessment of irrigation infrastructure

The focus of CAVAC's work on irrigation and water management shifted substantially throughout the course of implementation. The original program design nominated 75 pre-selected irrigation schemes to be rehabilitated at a modest up-front cost consistent with the prevailing design and construction management approach used in Cambodia. On close examination few if any of these schemes were deemed feasible. A series of new irrigation projects had to be identified and the early years of CAVAC involved extensive negotiation between CAVAC, farming communities and the local authorities as to the selection and type of schemes to be constructed. These early schemes consisted mainly of gravity fed earthen canals* that could be constructed at low cost. The nature of these schemes however means that periodic rehabilitation is required, and there is no guarantee of this occurring. The level of service provided by these schemes was also modest, meaning that farmers had to spend significant additional funds pumping water in order to irrigate crops, assuming sufficient water was available in the main canal. Given the limited service provided many farmers were unwilling to pay irrigation service fees, which compromised the ability of Farmer Water User Communities (FWUCs) to maintain and operate the schemes. The CAVAC team, in collaboration with this evaluation, has assessed six of the 20 schemes constructed as unsustainable as they exhibit these characteristics.

This sobering experience led CAVAC to trial an alternative approach, which has delivered generally good results although at a much greater up front cost. These schemes are 'complete' in that they involve a secure water source and a network of primary, secondary and tertiary canals that deliver reliable water to farmers. CAVAC's newer primary and secondary canals are generally concrete, hence requiring little maintenance and much less land area. Water in many of these systems is pumped by the FWUC using efficient electric pumps into above ground canals meaning farmers can access water with no additional effort or cost. For these schemes a high proportion pay irrigation service fees meaning that the FWUC is able to meet ongoing running costs whilst also accruing funds for periodic maintenance and repairs. However, the cost of construction is significantly higher than originally assumed. Five of the 20 CAVAC schemes fall into this category and are considered sustainable.†

These later schemes constitute what this evaluation has termed 'proof of concept' and are potentially one of CAVAC's triumphs. With a deliberate demonstration strategy and close collaboration between the CAVAC

* Another term for 'gravity fed canals' is 'run-of-the-river'.

† The remaining nine CAVAC schemes were considered somewhere in between sustainable and unsustainable.

team, DFAT officers, the Cambodian government, and other donors there is a real possibility of CAVAC exerting broader influence and hence systemic impact.

The original design estimated that up to 45,000 households would benefit from CAVAC's irrigation component. CAVAC's projections for the end of 2017 put this figure at over 19,000 households. As with agribusiness figures, these include projections that this evaluation has had cause to question.

CAVAC costs and benefits

This evaluation examined the value-for-money (VFM) delivered by CAVAC by comparing the costs incurred relative to the benefits delivered for smallholder farmers. The number of households assisted through CAVAC and the likely (although unmeasured) changes in income experienced by these households represents a positive return on DFAT investment. CAVAC allocations to direct activity or intervention costs show that more than two thirds of total investment is for technical delivery, which is in line with good practice benchmarks used by DFAT. Furthermore, with the agribusiness component CAVAC was able to use Australian government funds to effectively leverage private sector financing to the tune of 66 cents for every DFAT dollar invested. The income and yields data required to enable a comparison of returns achieved by the agribusiness and irrigation components is unavailable.

However, analysis of the outreach figures collected by CAVAC, along with interview data, does provide sufficient evidence to support the conclusion that a range of factors, in addition to development returns, played a role in shaping the CAVAC investment mix.

Ensuring equity and inclusivity

CAVAC coincided with a still ongoing period of rapid change within the Cambodian agriculture sector. This dynamic includes a shift from subsistence agriculture to cash cropping, a growing uptake of mechanisation, and an increased reliance on off-farm income particularly in regions with a burgeoning number of factories. These changes invariably have implications for gender roles within Cambodian farming households. CAVAC used a deliberative process to capture and understand the tasks that a majority of women and men respectively undertake within agricultural value chains. In doing this CAVAC sought to ensure its activities increased women's participation (for example, within FWUCs) and/ or women's productivity within those value chains. CAVAC did not however seek to question or alter the status quo of gender roles within value chains, roles which were changing in the wider community in any event. DFAT has since released new aid policies that mandate a more transformative approach.

Disability inclusion featured minimally in CAVAC implementation. CAVAC's focus in this area was primarily on ensuring that its internal processes and practices were disability friendly. Neither CAVAC nor DFAT sought to make this a program priority.

Recommendations

1. CAVAC should re-visit the idea of developing an influencing strategy, particularly around its irrigation work. Consistent with the broader goals of DFAT and the Australian aid program, CAVAC needs to consider how it can have a broader impact leveraging off the best of its completed irrigation schemes.
2. CAVAC should re-visit its approach to M&E, drawing upon independent expertise, with a view to improving accountability, results measurement and communication. This might include re-instating a short-term M&E specialist on the CAVAC team and/or reaching out to other DFAT MSD programs to compare systems and approaches.

3. Consistent with its goal statement under Phase two, CAVAC should measure and report on net attributable income change for smallholder farming households. The resulting information can be used to allocate resources and select interventions that will maximise the program's impact. It will also assist in establishing a set of clear, measurable targets to aid in program performance assessment and in communicating the program's results.
4. CAVAC should investigate and strategically pursue links between its irrigation, agribusiness and rice milling and export interventions. There is an opportunity under CAVAC Phase two to enable the market to deliver a complete package of inputs and services to targeted farmers alongside enhanced water availability to further improve agricultural productivity and maximise household income. Increased focus on diversification beyond rice will also be critical.
5. CAVAC should support gender equality and women's economic empowerment objectives consistent with DFAT policy settings, with appropriate staff resourcing, staff training and monitoring and evaluation of outcomes.

MANAGEMENT RESPONSE

Summary of Management Response

DFAT Phnom Penh and the CAVAC Phase two (CAVAC II) team thank the ODE evaluation team for its comprehensive report. This evaluation provides us with clear areas of focus going forward in order to maximise outcomes of CAVAC II.

In the spirit of collaboration and partnership, Phnom Penh Post and CAVAC II have agreed to issue a joint management response. We welcome the report's findings and five recommendations. We agree in full to four of the five recommendations, and partially agree to the fifth (measuring net attributable income). Our qualification regarding this recommendation centres on whether its implementation is fully possible within reasonable resourcing constraints given the complex, rapidly changing agriculture sector in Cambodia.

DFAT Phnom Penh requested ODE undertake this completion evaluation of CAVAC Phase one (CAVAC I) for two key reasons:

- to verify the results reported during CAVAC I, and
- capture lessons to inform the implementation of CAVAC II.

The completion evaluation delivered important learnings for us in both regards. It provided us with an important, timely assessment of end of program results, including confirming significant successes, and analysed program performance for one of the first Australian Government aid investments based on 'market systems development' (MSD) principles.

The self-reported, DFAT Phnom Penh-endorsed success of CAVAC I led to further Australian aid investments using MSD approaches in Cambodia (CAVAC II and Investing In Infrastructure) and elsewhere (for example, the multi-country Market Development Facility and the Indonesian PRISMA). In this context, the CAVAC I evaluation findings will not only inform ongoing implementation of CAVAC II, but may have relevance for other DFAT investments using MSD approaches - particularly the findings around monitoring and evaluation (M&E). The findings may also be relevant to other donors' MSD, value chain and irrigation programs.

We welcome the confirmation of CAVAC I's strengths, including:

- the sustainability and 'proof of concept' outcomes of CAVAC I's later irrigation schemes, and
- effective outcomes in agribusiness, including through farmer outreach, changing practices of agribusiness companies and leveraging of private sector financing in agri-business.

We acknowledge also the findings in relation to CAVAC I's efforts in M&E, gender equality and women's economic empowerment. These findings indicate further effort is required in order for CAVAC II to achieve better outcomes.

As outlined above, we agree with four of the five recommendations of the evaluation and partially agree to one recommendation (measuring net attributable income), which we will endeavour to implement, but wish to qualify the extent to which we feel this may be achievable. The table below provides further information on our responses and our commitment to address all five recommendations in a timely and collaborative manner and to the extent to which we believe is possible.

Management response to the recommendations

#	Recommendation	Response	Explanation	Action plan	Timeframe
1	CAVAC should re-visit the idea of developing an influencing strategy, particularly around its irrigation work. Consistent with the broader goals of DFAT and the Australian aid program, CAVAC needs to consider how it can have a broader impact leveraging off the best of its completed irrigation schemes.	Agree	In early 2017 a new Deputy Team Leader position was established to lead the development and implementation of CAVAC's influencing strategy. The new Deputy Team Leader is highly regarded in Cambodia and internationally for his work in engaging partner governments and development partners in policy dialogue, particularly in water basin management and irrigation. A Strategic Coordination Unit has been established and resourced to support the Deputy Team Leader. Progress has already been made in building and strengthening relationships between CAVAC and key stakeholders. The forthcoming Annual Work Plan will further articulate work in this area.	<ul style="list-style-type: none"> Recruit a Deputy Team Leader The Strategic Coordination Unit will develop and implement an influencing strategy. This will include an explicit identification of the development partners within government, civil society, the private sector and other donors (both multilateral and bilateral) CAVAC II we will seek to influence through policy dialogue. 	<ul style="list-style-type: none"> July 2017 (completed) By December 2017 (in-progress)
2	CAVAC should re-visit its approach to M&E, drawing upon independent expertise, with a view to improving accountability, results measurement and communication. This might include reinstating a short-term M&E specialist on the CAVAC team and/or reaching out to other DFAT MSD programs to compare systems and approaches.	Agree	CAVAC will review its approach to M&E. This will be managed to ensure that CAVAC's strong learning culture and adaptive management processes are continued, while accountability, results measurement and communication are enhanced. CAVAC notes that considerable work has been undertaken in recent months improving communication of M&E results.	<ul style="list-style-type: none"> Improve communications of M&E results with internal and external program stakeholders. Review and, as required, restructure the M&E team to ensure continued focus on monitoring and adaptive management balanced with more effective evaluation and knowledge management. Engage an external expert to undertake a detailed analysis of three of CAVAC's largest markets and review progress towards systemic change in them. 	<ul style="list-style-type: none"> On-going By September 2017 (completed) By December 2017 (in-progress)

#	Recommendation	Response	Explanation	Action plan	Timeframe
3	Consistent with its goal statement under Phase two, CAVAC should measure and report on net attributable income change for smallholder farming households. The resulting information can be used to allocate resources and select interventions that will maximise the program's impact. It will also assist in establishing a set of clear, measurable targets to aid in program performance assessment and in communicating the program's results.	Partially agree	External expertise will be engaged to develop a methodology to measure impact and net attributable income - or advise why this is not possible. While we will do this if we can, we have some concerns that this may not be possible within Cambodia's complex and rapidly changing agricultural context within a reasonable resourcing envelope. It may be that a more achievable approach may be to estimate and report, rather than measure and report. If 'measuring and reporting' is not possible, we will document why this is the case and what alternative actions we can take in order to improve outcomes in this area in CAVAC II. Information produced can be used internally for management purposes and externally for reporting.	<ul style="list-style-type: none"> Engage an external expert with experience with other MSD programs and DFAT priorities to work with the team to develop a methodology to measure impact and net attributable income, or advise why this is not possible and suggest an alternative approach. Organise an M&E Impact Workshop to review the work to date and report targets for the program. 	<ul style="list-style-type: none"> By October 2017 (completed) After Mid-Term Review in 2018
4	CAVAC should investigate and strategically pursue links between its irrigation, agribusiness and rice milling and export interventions. There is an opportunity under CAVAC Phase II to enable the market to deliver a complete package of inputs and services to targeted farmers alongside enhanced water availability to further improve agricultural productivity and maximise household income. Increased focus on diversification beyond rice will also be critical	Agree	Work in this area has already begun. Some team members experienced in MSD have been transferred to oversee a number of activities that are underway. The Strategic Coordination Unit will play a role in influencing knowledge, attitudes and practices amongst beneficiaries, government, development partner and private sector counterparts.	<ul style="list-style-type: none"> Work with the Strategic Advisory Team to develop a full and targeted strategy in this regard. The SAT will provide advice on trends in this field in agriculture and strategies for design, implementation, evaluation and analysis. Engage with Cambodian research institutions, donors especially multi-laterals and relevant Australian Government Departments to provide specialist inputs and sectoral advice. A conference will be convened to share the outcomes of these cross Component 	<ul style="list-style-type: none"> By December 2017 (in-progress) December 2017 Late 2018

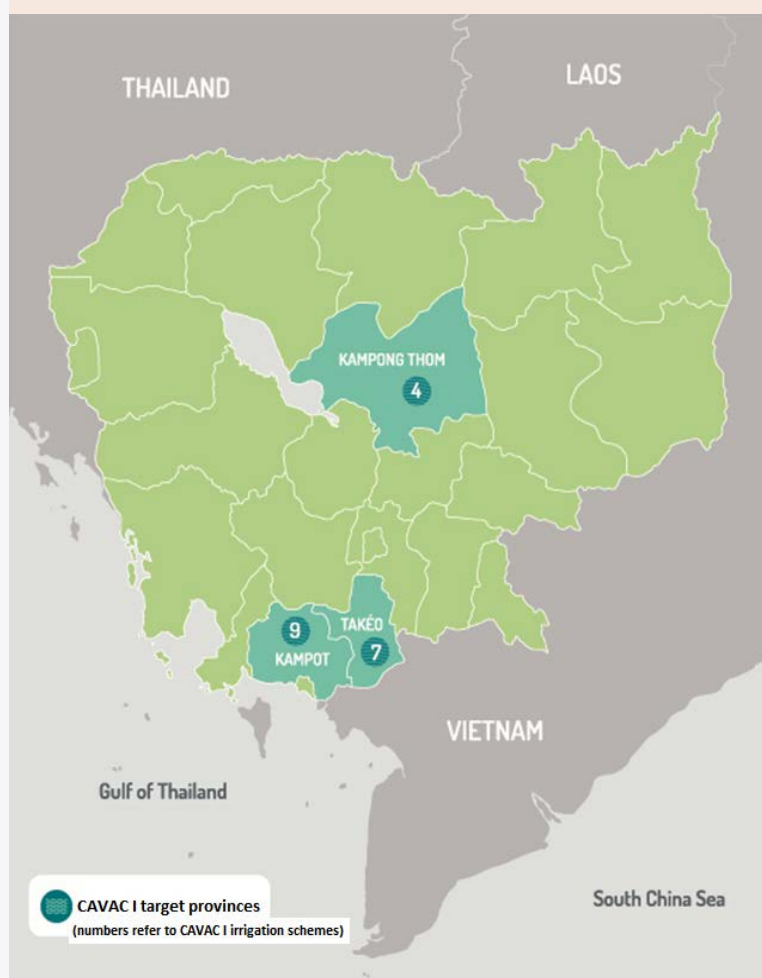
#	Recommendation	Response	Explanation	Action plan	Timeframe
				activities with CAVAC key partners. Outcomes will also be shared with key partners.	
5	CAVAC should support gender equality and women's economic empowerment objectives consistent with DFAT policy settings, with appropriate staff resourcing, staff training and monitoring and evaluation of outcomes.	Agree	The Team Leader will have direct oversight of this with the Women's Economic Empowerment Adviser, ensuring it is prioritised across the program. The Team Leader will lead the Program-wide integration of WEE policies and priorities in cooperation with the WEE adviser and Deputy Team Leader. These strategies will be shared with RGC and will be highlighted in the 2018 AWP. Collaboration within the donor community will be emphasised to draw upon local strategies and interventions on WEE in Cambodia.	<ul style="list-style-type: none"> Recruit a full time Women's Economic Empowerment Adviser Build on the Women's Economic Empowerment Strategy and develop an integration workplan. Advice from SAT WEE and Gender Adviser 	<ul style="list-style-type: none"> July 2017 (completed) September 2017 (completed) December 2017

1. OVERVIEW OF CAVAC

1.1 Project background and context

CAVAC Phase one was an AUD 59.8 million program established in March 2010 and implemented until December 2015. CAVAC's objective was to accelerate growth in the value of agricultural production and smallholder farmer income in rice-based farming systems* in three Cambodian provinces (see Figure 1). CAVAC's primary beneficiaries were intended to be smallholder farmers who had the capacity to produce an agricultural surplus. Indirect beneficiaries for different activities included private businesses and Cambodian government partners. CAVAC was implemented through an implementing contractor, contracted by Phnom Penh post (AusAID, and then DFAT). The program's team leader was also contracted by AusAID and then by DFAT at post and not by the implementing contractor. Specific CAVAC activities were decided on an annual basis through CAVAC's work plan approved by a National Steering Committee (NSC), co-chaired by Phnom Penh post (on behalf of Australia) and Cambodia's MAFF and Ministry of Water Resources and Meteorology (MOWRAM). Initially, Phnom Penh post was supported by an external sector monitoring group that provided independent performance monitoring and strategic advice on CAVAC and on Post's broader support for rural development in Cambodia.† By CAVAC's conclusion in 2015, around three-quarters of CAVAC's activity budget had been spent on water management and irrigation. Around one-tenth had been spent on agribusiness development, although this component employed significant numbers of staff.

Figure 1: Target Provinces under CAVAC Phase one



* 'Rice-based farming systems' includes all agricultural commodities produced in association or rotation with rice (e.g. vegetables, legumes, some fruits, livestock).

† An independent mid-term review (MTR) recommended that this group's role with respect to CAVAC be streamlined. The group was later disbanded.

1.1.1 Country context

At the time of CAVAC's design (2008)¹, Cambodia was benefitting from a decade of export-led growth averaging around 9% per annum, driven primarily by the garment, tourism and construction sectors. Agriculture sector growth was lagging, averaging just 2.6% in 2000-03. Around 70% of the economically active population remained reliant on agriculture – primarily in low-input, rain-fed rice-based systems – and 90% of poor households were located in rural areas. Average farm size was around 1 hectare and crop yields were low in comparison to elsewhere in South East Asia. Irrigation was recognised as critical to increasing agricultural productivity and reducing poverty. While Cambodia had successfully become a net rice exporter by 1999, nearly all of this was unmilled paddy, mostly exported through informal channels to neighbouring Vietnam and Thailand. After processing there, much of it would then be re-imported for consumption.

Capacity of the Royal Government of Cambodia (RGC) had been steadily improving, but the country still ranked well down Transparency International's Corruption index and the World Bank's Doing Business reports.* The government faced continuing challenges in establishing a favourable business-enabling environment and delivering quality agricultural research and extension services.

In 2007, international development assistance to Cambodia was equivalent to over 8% of its gross domestic product (GDP). However, the agriculture sector had been relatively neglected – its share of total aid disbursements had fallen below 5% and comprised many small uncoordinated activities.

For Australia's aid program, agriculture had been a major focus since 1990. By the mid-2000s, around 40% of the bilateral program was directed to addressing rural poverty through initiatives to improve agricultural production and marketing. An independent Effectiveness Review of Australia's 2003-07 Country Strategy for Cambodia recommended Australia remain strongly engaged in agriculture, including leading donor harmonisation efforts. However, experience from Australian and other donor programs suggested that a fundamentally different approach was needed if long-term development impacts were to be achieved.

During CAVAC's implementation, CAVAC had to contend with massive demographic changes and increased farm mechanisation. Stakeholders from MAFF, CAVAC and farmers themselves mentioned in interviews with the evaluation team that with each generation there were less people in Cambodia involved in farming. Estimates of Cambodians primarily involved in farming around ten years' ago range from 60% - 70%.[†] By 2016 MAFF estimates that this same figure had dropped around 20% within a decade to 40%.[‡]

1.1.2 CAVAC's approach and rationale

Australia's previous aid interventions had worked to strengthen public sector responses to specific agricultural productivity constraints – focusing on research, extension and seed production. CAVAC took a broader systemic approach, seeking to analyse and target inefficiencies across rice-based value chains (VCs). Four main areas of constraint were identified as at the CAVAC design (Figure 2)²:

* Cambodia ranked 156th out of 176 countries in Transparency International's 2016 Corruption Perceptions Index (https://www.transparency.org/news/feature/corruption_perceptions_index_2016#table), and 131st out of 190 economies in the World Bank's 2017 Doing Business Rankings (<http://www.doingbusiness.org/data/exploreeconomies/cambodia>).

[†] E.g. MAFF estimate for 2005: 60% (MAFF interview). CAVAC I design document: 70% for 2008 (at p. 23). And World Bank estimates, based on National Institute of Statistics (Cambodia) Socioeconomic Surveys of 57% in 2004: World Bank Group, *Cambodia Agriculture in Transition: Opportunities and Risks*, 2015 at p. 13.

[‡] An interview with MAFF stakeholders revealed their view that the percentage of Cambodians engaged in agriculture had decreased from 80% in 1993, 60% in 2005, and 40% in 2016 which represents an around 20% drop each decade. Other published figures also note a considerable drop in the agricultural workforce. See for e.g.: CIA, CIA World Factbook: Cambodia Economy Overview and 2013 estimates for the labour force by occupation: agriculture (48.7%), industry (19.9%), and services (31.5%) at www.cia.gov. <09/06/17>.

To address these constraints, CAVAC's program strategy was: *To develop mutually beneficial partnerships, market connections and competitive advantages between key actors along target VCs, thereby increasing total investment and generated value for stakeholders, particularly smallholder farmers.*³ This meant working directly with a broad range of market participants – especially from the private sector – rather than primarily through government as in the past. The program also supported establishment of farmer water user groups to take ownership and responsibility for local irrigation systems built or rehabilitated by CAVAC. In these ways, CAVAC sought to facilitate lasting change in the market systems smallholders relied on, potentially benefiting large numbers of farmers both within and beyond the target provinces.

The intended primary beneficiaries of CAVAC were smallholder farmers with the means and capacity to produce an agricultural surplus. The design document estimated that around 180,000 of the total 230,000 rural households across the three target provinces met this criterion. According to CAVAC's program logic, poorer households (those operating at or below subsistence level, including the landless) would indirectly benefit through improvements in on-farm and off-farm employment opportunities and lower food prices as the local smallholder economy grew. Agribusiness operators and traders, and both national and sub-national levels of government, were also expected to benefit from involvement in CAVAC.

CAVAC was Australian aid's first Market Systems Development (MSD) or 'Making Markets Work for the Poor' (M4P) program.⁴ An evaluation of Australia's rural development assistance in 2012 validated this new approach, noting that:

*Australia's rural development assistance ... is now moving to larger, more dynamic, market-oriented programs designed to achieve substantial and sustainable poverty benefits at scale. Of the interventions reviewed, those that generated the deepest pro-poor impacts were focused on adjusting underlying constraints in the rural economy – changing the 'rules of the game' – to help the poor and disadvantaged achieve the surpluses and trading opportunities to provide a sustainable pathway out of poverty.*⁵

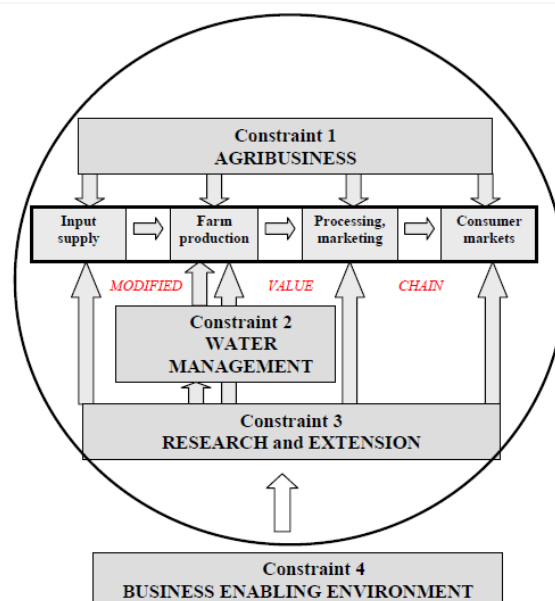
Consistent with these findings and with international trends, MSD has become an increasingly dominant approach in DFAT's agricultural development portfolio in recent years.

1.2 CAVAC's evolution

CAVAC's theory of change⁶ identified four intermediate outcomes, translating into four main program components with indicative budget shares as follows: agribusiness development (11%); irrigation and water management (22%); research and extension (12%); and business enabling environment (9%). The remaining budget (46%) was allocated to overarching program management including market analysis, monitoring and results measurement.

The CAVAC design was described as 'open architecture', building in a large degree of flexibility to respond to greater understanding and changing needs and circumstances. Specific activities were to be agreed through

Figure 2: Constraints identified in CAVAC Phase one design document*



*These constraints subsequently became CAVAC Phase one components

Annual Work Plans, submitted for approval to the NSC comprising representatives of the Australian and Cambodian governments.*

In espousing an MSD approach, CAVAC chose to engage primarily with the private sector. The Cambodian government was accustomed to being the implementing partner for donor programs, and it took CAVAC some time to establish its niche and secure acceptance of its approaches and proposed interventions.

By the time of the mid-term review (MTR) in 2012, CAVAC's efforts had been significantly re-focused. Its initial endeavours on the business-enabling environment were unable to get traction with government, and were substantially wound back. Four large agricultural research activities, implemented by the Cambodia Agricultural Research and Development Institute (CARDI) through ACIAR, were being progressed quite separately from the rest of CAVAC and under rather different institutional priorities and perspectives. By 2012, ACIAR decided to withdraw from CAVAC and manage the research projects independently. The extension activities that had also fallen under ACIAR's purview were then integrated into CAVAC's agribusiness component. These changes are summarised in Figure 3 (over page).

Another change was in geographic targeting. The design identified three provinces (Kampot and Takeo in the South, and Kampong Thom in central Cambodia) which have remained the focus of the irrigation activities. However, CAVAC also intended to have a 'demonstration effect' with wider impact across Cambodia as a whole. During implementation, the CAVAC team found that it would be counter-productive to restrict its agribusiness partners to the three provinces.⁷

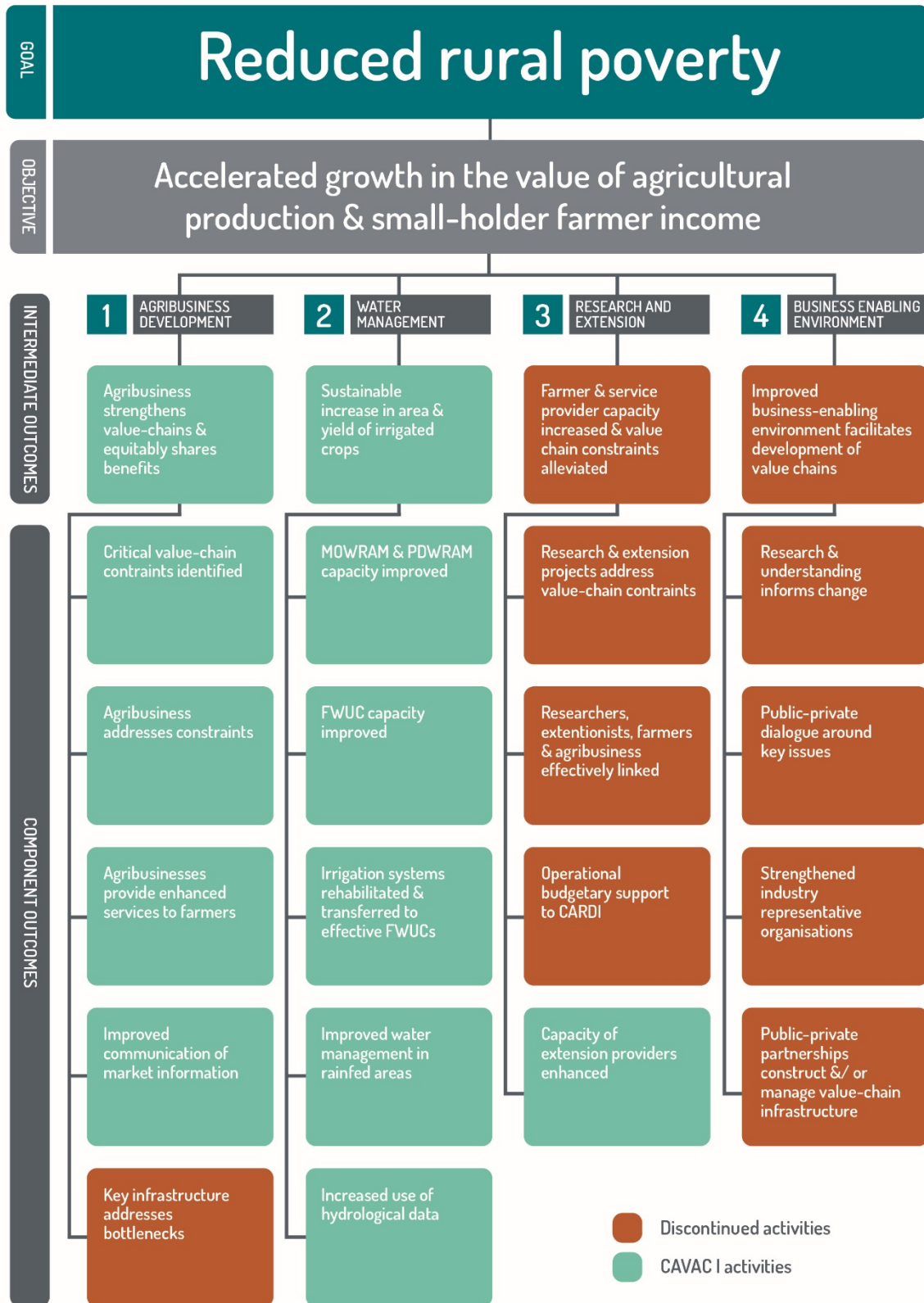
Over time, CAVAC's approaches in its irrigation and agri-business components increasingly diverged. As outlined in Section 4.1 (water management and irrigation), early efforts to stimulate private sector investment in irrigation had limited success and the schemes based on the original approach were deemed to be unsustainable. Instead the focus of the irrigation component came to revolve around 'proof-of-concept': demonstrating a new approach to irrigation design, construction and operation that would be sustainable. Developing the capacity of the management committees of FWUCs (FWUC Committees) to manage water flows and maintain the schemes remained an important part of the approach, but there was considerably less involvement of other private sector actors than originally envisaged. Given the high capital costs of the construction work, irrigation became by far the dominant component of CAVAC in terms of expenditure, accounting for around 56% of the total budget[†] and 76% of the activity budget.⁸

The agribusiness component continued to operate on MSD principles, partnering primarily with input supply companies to strengthen their engagement with farmers and distribution networks and improve the quality of information available to support farmers' input use decisions (see Section 4.2). Total Phase one expenditure on agribusiness was 8.4% of the overall program budget (11.3% of the activity budget).

* The NSC comprises senior representatives of Australia (AusAID and then DFAT), and Cambodia's MAFF and MOWRAM. The Provincial Departments of Agriculture (PDAs) and the Provincial Departments of Water Resources and Meteorology (PDWRAMs) from CAVAC target provinces also participated.

[†] Excluding contractor management fee.

Figure 3: CAVAC component and outcome structure



1.3 Past performance assessments

1.3.1 2012 Mid-term review

An independent MTR was undertaken in 2012. The MTR found that CAVAC was making good progress two years into implementation and was on track to achieve or exceed its initial objectives. The review judged CAVAC to be very good value for money, with a projected benefit-to-cost ratio of seven to one.* CAVAC's market systems approach was judged a valid way of leveraging additional private sector resources for sustainable impact. Irrigation support appeared low-cost, in terms of its construction, and effective. The MTR qualified these findings, however, noting they were based on *projected* results, not actual achievements. The MTR recommended that CAVAC's results measurement system, while 'rigorous', pay more attention to how it communicated the program's achievements to different stakeholders.

1.3.2 2013 Donor Committee for Enterprise Development audit

In 2013, the Donor Committee for Enterprise Development (DCED) audited CAVAC's application of the DCED results measurement standard. This standard 'provides programmes working in complex market systems with the framework, tools and incentives to monitor their results in a systematic way.'⁹ Overall, the audit concluded that CAVAC had a 'strong' results measurement system as viewed through a DCED lens. The logic behind results chains was well articulated and supported by adequate research, analysis and baseline data. The audit found that sufficient human and financial resources supported CAVAC's M&E system; the system guided staff in making decisions; and CAVAC exhibited a good 'learning culture'. The report also noted a clear system was in place for calculating net attributable income.

The main areas identified for improvement related to: inadequate documentation of reasons for changes in results chains; some indicators not being specific to the desired changes; a lack of qualitative information to assess sustainability; and the need to select a method for attributing the impacts of irrigation activities. The audit report noted that, at the time, CAVAC had not yet been able to measure and report upon impact and hence some of the DCED compliance criteria could not be assessed.

1.3.3 Aid quality checks

In accordance with DFAT's investment quality reporting system, aid quality checks (AQC) were completed annually from 2009 to 2015. These reports provide DFAT's self-assessment of project performance against standard criteria. The final AQC (FAQC) in 2015 reflected upon the performance of the investment overall.

Analysis of AQC ratings (Figure 4) suggests CAVAC performed well against most criteria most of the time. A notable exception is efficiency, judged unsatisfactory in 2009 and 2010. This reflected CAVAC's complex management arrangements including a period where a team leader was in place, but the operational contractor had not yet been mobilised. The AQC narratives capture the evolution of CAVAC's targets and associated performance indicators. Reporting, including in the FAQC, was mostly based on projected achievements. The 2014 report noted that many projections required validation. It also emphasised the need to document lessons learned in Phase one as by this stage the design of Phase two was well underway.

* Using a ten-year time horizon from the start of CAVAC Phase one in 2010 and a 6% discount rate.

Figure 4: Aid Quality Check (AQC) ratings for CAVAC



1.4 2015 situation

Over the period of CAVAC Phase one implementation, living standards in rural Cambodia improved markedly – although smallholder farming families remain vulnerable to production risks and low commodity prices.¹⁰ Areas with reliable irrigation water benefited most, with land productivity often tripling as dry season crops became feasible in addition to wet season rice. The relatively well-off have accumulated additional land and other assets such as agricultural machinery and equipment, which they hire out for ploughing, chemical application and harvesting. Farm incomes are increasingly supplemented by wages and remittances as the young take advantage of increasing opportunities for off-farm work – locally, in urban areas and in neighbouring countries.

Trends in rice production and exports since 2000, shown in Figure 5, highlight the rapid gains made. National statistics also show annual fertiliser (NPK) usage climbing – from under 4,000 tonnes in 2003 to 16,600 tonnes by 2012, before dropping back slightly to 14,200 tonnes in 2013 (Figure 6).^{*} Fieldwork undertaken by the evaluation team confirmed that farmers in both irrigated and rain fed locations are now spending far more than before on agricultural inputs including mechanisation. However, while rice yields have improved, farm-gate prices have recently fallen to around USD 150 per tonne, well under the USD200 per tonne assumed in CAVAC’s ‘value of production’ estimates. A 2015 World Bank report, using 2013 prices, found that the gross margins and returns to labour from wet season rice were below those from alternative crops such as cassava, maize, vegetables and dry season rice.¹¹ In consequence, farmers are increasingly seeking to diversify where feasible but their options are often constrained by limited access to irrigation.

^{*} Another source of fertiliser data (FAOSTAT) shows total fertiliser use rebounding strongly in 2014 due to nitrogen usage more than doubling from the previous year. (<http://www.fao.org/faostat/en/#country/115>).

Figure 5: Trends in Cambodian rice production and export¹²

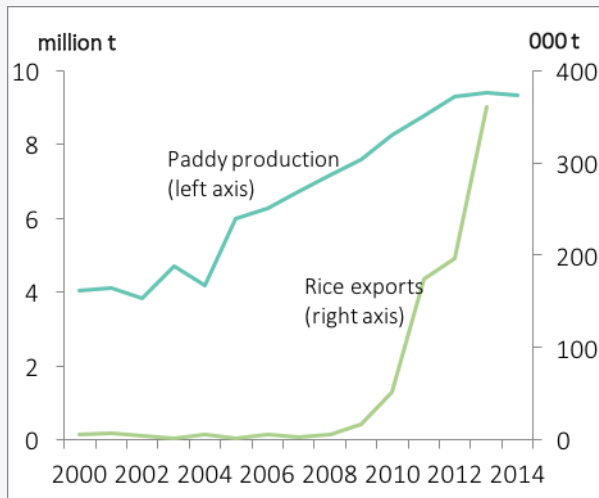
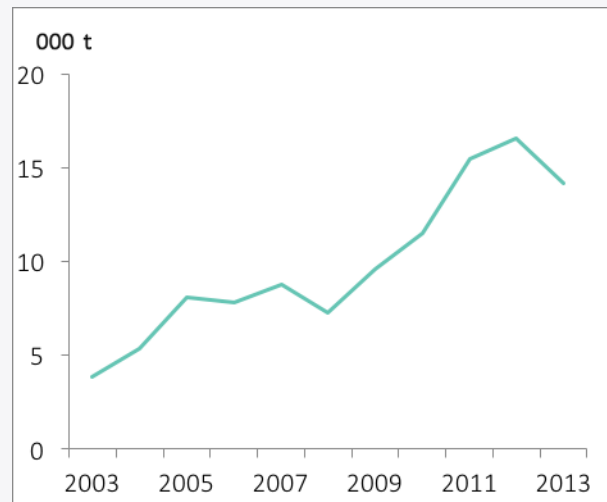


Figure 6: Fertiliser usage in Cambodia¹³



CAVAC was well positioned to support, facilitate and respond to many (if not all) of the rapid change processes underway in Cambodian agriculture at the time. In particular, it identified opportunities to improve the yield impact of farm inputs such as fertiliser and, later, pesticides, by helping agri-businesses provide better information to farmers. It also identified opportunities to improve the quality and sustainability of irrigation development.

By the time Phase one of CAVAC concluded in 2015, its agribusiness component had undertaken close to 40 separate activities working with at least 20 private companies, as well as supporting national and provincial agriculture departments on pesticide regulation and training. CAVAC's irrigation component had funded 20 irrigation schemes, many of which used new and/or uncommon forms of infrastructure and equipment such as concrete lined canals and submersible and screw pump systems.

2. ABOUT THE EVALUATION

2.1 Evaluation purpose and objectives

This evaluation's main purpose is to verify and assess CAVAC's major results and to do so in a way that will usefully guide implementation of CAVAC Phase two. As is often the case with development assistance projects many of the projected results associated with Phase one were not expected to become visible until after the program's end.

This evaluation was commissioned by DFAT Phnom Penh who are the primary intended users of this report. This evaluation provides DFAT Phnom Penh with an independent assessment of CAVAC's performance. The majority of current DFAT staff were not involved in the oversight of CAVAC. The other users of this evaluation are current CAVAC staff. In contrast, a significant number of CAVAC Phase two staff were also involved in implementing Phase one.

Other stakeholders in Cambodia are likely to find this evaluation enlightening. Stakeholders in MOWRAM, Provincial Departments of Water Resources and Meteorology (PDWRAMs), MAFF, Provincial Departments of Agriculture, Forestry and Fisheries (PDAFFs) and Ministry of Economics and Finance (MEF) in particular may be interested to take forward some of this evaluation's findings. Given CAVAC's duration (since 2010), other donors could find CAVAC's lessons instructive.

This evaluation will also feed into a synthesis study of several DFAT MSD investments that DFAT's Agriculture and Food Security Section is undertaking. CAVAC was the first major MSD initiative funded through Australian aid. The synthesis study will examine CAVAC along with several other MSD investments and will help inform DFAT's ongoing and future support in the agriculture sector.

2.2 Key evaluation questions

This evaluation examines the extent to which CAVAC's activities were efficient, effective and sustainable, and whether the program's own assessments of attributable impact were supported by the available evidence. This report documents the evaluation team's findings against the six key evaluation questions (below). Further detail, including sub-questions and evidence required, is provided in the evaluation framework in Annex Two.

1. **Sustainability:** Are the benefits from CAVAC likely to be sustained?
2. **Effectiveness:** Was CAVAC effective in achieving its intended outcomes?
3. **Efficiency:** Does CAVAC represent value for money, in terms of returns to smallholder farming households and any broader impact?
4. **Inclusivity:** Did CAVAC take adequate account of the needs of women, people with disabilities and the poor?
5. **Innovation:** Did CAVAC successfully integrate innovation, flexibility and adaptation into its approach?
6. **Monitoring & Evaluation:** Were CAVAC's M&E arrangements fit for purpose?

2.3 Approach and methodology

2.3.1 Approach

The five-member evaluation team had combined expertise in international development and program management, M&E, agricultural economics, rural development, MSD, irrigation and gender equality. Three of the five team members were DFAT staff who had corporate knowledge of DFAT's systems and policies.

To answer the evaluation questions, the evaluation team extensively interrogated and used the M&E data collected by the CAVAC team. Existing CAVAC monitoring data as well as quantitative findings from evaluative studies conducted by CAVAC were compiled, synthesised and analysed to answer key evaluation questions. In all, the evaluation team was provided with well over 200 program documents. It was not feasible for the evaluation team to verify the data contained within this large data set. However, the evaluation team scrutinised key assumptions, the validity of sources and the strength of major attribution claims. The team used the most current data available, with due care not to confuse CAVAC Phase one and Phase two interventions.

In addition, the evaluation team collected a broad range of mostly qualitative information during a two-week mission to Cambodia in May 2017. The in-country mission gathered the perspectives and experiences of a broad range of stakeholders and beneficiaries through 62 interview and focus groups (see further under 'Methods'). Evaluation team members inspected six irrigation schemes.

2.3.2 Methods

The evaluation team employed a range of evaluation methods to gather relevant data and perspectives (see Annex Two). Emerging evaluation themes were tested and triangulated to ensure accuracy and thoroughness. The evaluation team tested their preliminary findings at two separate exit briefings with DFAT Phnom Penh and CAVAC staff respectively.

Document and database review

The evaluation team studied documents for both phases of CAVAC, but focussed on Phase one documents. Documents produced by CAVAC included: strategies for both CAVAC phases, surveys, annual work plans, the M&E framework and the completion report for CAVAC. In addition, the evaluation team obtained specific monitoring data from the CAVAC team's M&E database. Documents produced by DFAT included: program design documents for CAVAC (both phases); the independent mid-term review, AQC's and the FAQC for CAVAC Phase one; and relevant DFAT policies. Documents cited in this report are listed at Annex Six.

Economic analysis

To address the evaluation question on value-for-money, the evaluation report compared CAVAC's M&E data against two widely-used indicators: 1) Social Return on Investment* and 2) Investment Leverage.† VFM analysis also investigated whether CAVAC resources were prioritised to areas with the highest returns and how CAVAC's financial and management arrangements informed such decision-making. This analysis also includes some comparisons with another DFAT MSD program, the Australia-Indonesia Partnership for Rural Economic Development (AIP-Rural).

Key informant interviews

The evaluation team conducted 43 semi-structured interviews. Interviewees included current and former staff of CAVAC, DFAT Phnom Penh, ACIAR, MOWRAM, MAFF, MEF, bilateral donors, development banks and agribusiness companies. Interviews were also conducted with PDWRAM, PDAFF and agricultural input

* Ex-post: The ratio of the actual value of farmers' net-income increase to the actual direct intervention costs.

† Ex-post: The ratio of the realised / actual value of additional investments by partners to the actual direct intervention costs.

retailers in CAVAC's target provinces and the Provincial Department of Women's Affairs in Kampot. Interview guides were used to ensure consistency of approach and coverage of key evaluation themes.

Focus groups

The evaluation conducted 19 focus group discussions with farmers in CAVAC's target provinces. CAVAC either had worked with these farmers directly (through its support for FWUCs and 'model farmers'), indirectly (through CAVAC's support for retailers and input companies), or not at all. A key principle of focus group meetings was that each group had participants with broadly similar interests.

Field inspections

The evaluation team's irrigation specialist visited six of the 20 irrigation schemes rehabilitated by CAVAC, together with another member of the evaluation team. Schemes inspected were at Sbov Andeth (Kampot), Chamlong Chrey (Kampot), Rokar Chhouk (Takeo), Wat Thmey (Takeo), Boueng Leas (Kampong Thom) and '6 January' (Kampong Thom). CAVAC staff nominated these schemes based on the evaluation team's desire to inspect a cross-section of schemes constructed in different years, of different sizes and complexity, which generated relatively large and small yield increases, and with relatively strong and weak FWUCs.

2.4 Constraints and limitations

The evaluation team faced a number of constraints and limitations that the team tried to mitigate to deliver a robust evaluation. These included:

- **Shortage of time:** The evaluation had a relatively strict timeframe to conduct research, consistent with the expectations of management at DFAT Phnom Penh and the availability of evaluation team members. Not all key informants associated with CAVAC or the wider context could be interviewed.
- **Specific expertise of evaluation team:** Evaluation team members had multiple areas of expertise including in-depth sectoral expertise and some previous experience of advising programs operating in Cambodia. However, evaluation team members did not have extensive or recent experience working in Cambodia. The evaluation team did not have specialised disability inclusive development expertise.
- **Accuracy of data analysis:** This evaluation makes extensive use of CAVAC M&E data which is voluminous. Clarification on various aspects was therefore sought from the CAVAC M&E team.
- **Reliance on the perceptions of key informants:** CAVAC Phase one ended in December 2015 and there was a risk that respondents' memories were not comprehensive or accurate on some issues. Interview and focus group responses were however cross-checked with relevant documents. In some cases, the views of a small number of well-positioned individuals were instructive. In no instance however were this report's findings attributable solely to a single interviewed source.
- **Evaluation of higher-order benefits and limited primary data collection:** Many additional factors outside the control of CAVAC influenced the achievement of CAVAC's higher order goal of reduced rural poverty in target provinces. The evaluation was not able to assess the extent of changes in provincial or national poverty levels that might plausibly be attributed to CAVAC, particularly as CAVAC did not collect data on farmers' changes in income. Note that the evaluation plan did propose this type of analysis, but neither DFAT Phnom Penh nor CAVAC (who both provided comment) indicated that the necessary data was unavailable

3. LEARNING, ADAPTATION AND ACCOUNTABILITY

3.1 CAVAC’s approach to monitoring

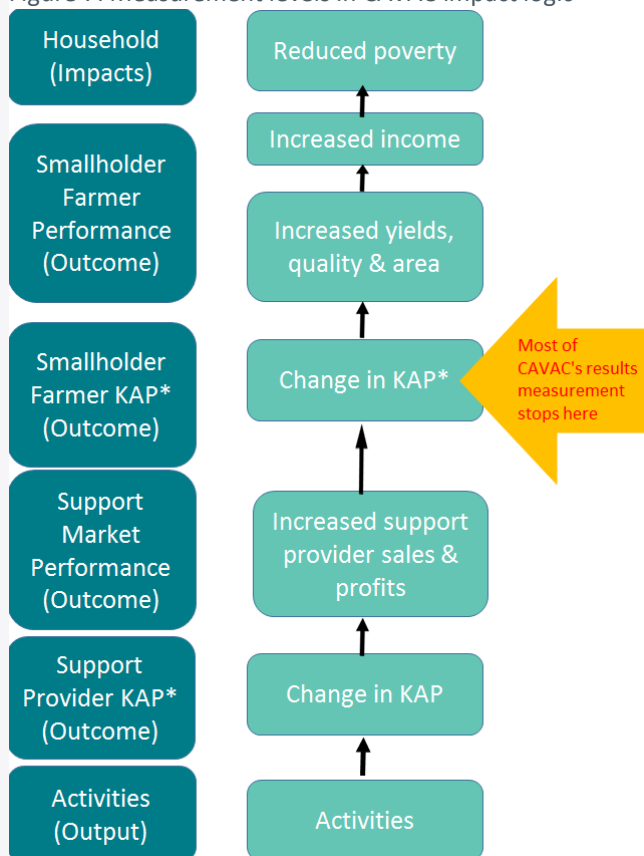
CAVAC defines M&E broadly to incorporate all activities related to the ‘collection, analysis, management and reporting of program performance.’¹⁴ The M&E manual outlines three purposes for M&E: i) help CAVAC staff improve implementation and results, ii) report program results to DFAT and the Cambodian government and iii) contribute to wider learning.¹⁵ CAVAC management estimate that staff spend 30% of their time on M&E*, although an exact figure is not known as M&E is core to implementation and ‘part of everyone’s job’. Perhaps in part because M&E was essentially mainstreamed across the program, the full inputs allocated for the International M&E adviser were not utilised.[†]

CAVAC’s approach centres around the use of impact logics for each intervention (see Figure 7). These illustrate the cause and effect relationships anticipated to lead to achievement of CAVAC’s higher-level objectives. To assess intervention effectiveness, CAVAC staff look for evidence that each of the lower level steps (or leading outcomes) have been realised before claiming credit for higher-level development outcomes.¹⁶ CAVAC focuses on leading outcomes as these are seen as the most useful indicators of effectiveness within the program timeframe.¹⁷ Leading indicator data also informs the three-monthly portfolio review process, reflecting CAVAC’s strong commitment to using M&E data to manage and improve activities. This aligns with DFAT’s MSD guidance which highlights the need to monitor closely and regularly.¹⁸

CAVAC’s leading indicators vary depending on the intervention. However, to monitor progress towards its objectives, CAVAC endeavours to collect data against a set of four core indicators across all its activities:¹⁹

- outreach – number of farmers who have changed farming practices
- yield – additional rice, vegetable or other crop yields
- area – change in area under cultivation attributable to CAVAC supported irrigation
- quality – of agricultural produce as measured by access to higher value markets.

Figure 7: Measurement levels in CAVAC impact logic



* KAP: Knowledge, Attitude, Practice

^{*} Note that although CAVAC documents and staff refer to ‘M&E’ generally it is ‘monitoring’ that CAVAC undertakes, not ‘evaluation’

[†] The contract between the Commonwealth of Australia and Cardno emerging markets specifies up to 9 months full time input for the M&E specialist, of this CAVAC expenditure data shows that only approximately 3 months was utilised.

Like other DFAT MSD programs, CAVAC subscribes to the DCED results measurement standard (see Section 1.3.2). Within CAVAC, M&E was led by the team leader and thereafter from within the agribusiness component and this probably also reinforced the choice to adopt (part of) the DCED standard. While the DCED standard is well-suited to the agribusiness component, CAVAC staff reflected in interviews that it had proved less suitable for CAVAC irrigation work and a different M&E approach for irrigation was now being used in Phase two. CAVAC was also reconsidering whether the DCED standard suits the third component, milling and export in Phase two.

CAVAC deliberately decided not to employ some other well-established M&E methods. It did not use control groups to compare the experience of farmers who had or had not been exposed to its interventions. CAVAC's website not unreasonably states that 'a quasi-experimental design with control groups may serve to verify specific impacts...but...by the time data shows that the expected impact did not take place it may be too late to adjust'.²⁰ CAVAC also did not use traditional baselines.²¹ In interviews, the CAVAC irrigation team reflected that they relied on FWUCs and landholding surveys rather than gathering baseline data. Agribusiness component staff explained that the survey of 1,200 farmers conducted in 2012 revealed rapid adoption of practices across the country – farmers travel and this creates the potential for contamination of control groups and similarly diminishes the value of baselines. CAVAC's first annual work plan states 'before/after type M&E systems also produce information when it is too late to adjust the activities'.²² CAVAC also appears to have avoided systematic consideration of unintended impacts as these are 'excluded from formal M&E reporting'.²³ Finally, interactions with some CAVAC managers and the program's website suggest a high degree of self-reliance and perhaps even a reluctance to engage external, independent advice; 'it is difficult for independent 'outsiders' to assess and quantify what is really happening'.²⁴

Finding

- » *CAVAC's use of monitoring to inform management and improvement of activities is a key strength of the program. However, this focus on management utility also had implications for CAVAC's ability to demonstrate results.*

3.2 What gets measured

The CAVAC project design document (PDD) outlines a goal of reducing the percentage of people living below the poverty line in the three target provinces. It also identifies objectives of increased household income and an increased value in the production of rice.²⁵ The PDD identifies a target group of 180,000 smallholder farmers and indicatively states that around 45,000 of these will benefit from improved water management whilst 60,000 households will benefit from agribusiness development activities.²⁶

Multiple interviews confirmed that the PDD contained a number of shortcomings* leading to a decision by both DFAT and the CAVAC management team for the design to be 'put aside'. The intent was that the 2012 MTR be used to set new targets and indicators against which the program could be measured.²⁷ The MTR subsequently stated that CAVAC was on track to, by 2016, create additional income for 230,000 households, extend irrigation to 32,000 hectares delivering yield increases of 200,000 tonnes (valued at AUD 50 million) and result in 20,000 smallholder-farming households gaining access to higher value markets. The program was also projected to result in at least a 10% increase in yields for farmers reached.²⁸

It is notable that of the four core indicators measured by CAVAC (see Section 3.1), only one – 'outreach' – belongs to the DCED set of recognised indicators. CAVAC does not collect data on other key DCED indicators, including attributable net income, as amongst other things these are said not to reflect 'CAVAC's development priorities'.²⁹

* Particularly with the irrigation component.

3.2.1 Change in income

A 2011 sector monitoring group report acknowledged CAVAC's four core indicators but stated 'the indicators are not sufficiently comprehensive to enable AusAID, the SMG,* the NSC and the RGC to understand the impact of the program.'³⁰ The report recommended that additional income accruing to farms also be measured. The 2012 CAVAC MTR re-affirmed the importance of measuring changes in income. Nevertheless, interviews confirm that sometime after the MTR, DFAT agreed to a proposal from CAVAC that changes in income not be measured. The rationale for not attempting to measure such a key outcome is confused. Interviews with many CAVAC staff dwelt on the difficulty of reliably attributing income changes to CAVAC's interventions given the rapidly evolving context. This is a reasonable concern. However, other DFAT MSD programs do measure and report on changes in net attributable income. One key CAVAC manager expressed doubt about the accuracy of these figures but did state that it could be done with the right human resources, which are very difficult to find. The CAVAC completion report states 'with some bold assumptions on profitability it is possible for the reader to calculate an average increase in income'.³¹ But the report also says 'there are so many uncertainties and assumptions needed to calculate additional income that CAVAC is not sharing their calculations'.³² This is inconsistent with CAVAC's claims on its website that 'with this data, based upon a number of assumptions, CAVAC can calculate what additional income farmers will have'.³³

Measuring net attributable income change matters because CAVAC staff know that increases in yield do not always translate to greater net incomes or decreased poverty. Interviewees reflected that households seek to maximise their income, not necessarily yield and that by focusing on reducing production costs (e.g. agricultural inputs such as fertiliser or fuel for pumping) some farmers were able to optimise their income. Irrigation activities in particular can involve substantial cost increases. Currently CAVAC can only calculate gross income based on assumed increases in agricultural output, but cannot demonstrate that irrigation farmers are better off financially after production costs are deducted.

The ability to report changes in net income attributable to CAVAC interventions would provide reassurance that the program is assisting its indirect, but primary, beneficiaries, smallholder farmers. It would also assist both DFAT and CAVAC in aggregating the impact of the program and setting meaningful program targets. CAVAC Phase two management advised the evaluation team that they recognised the importance of measuring changes in farmer's net attributable income and are resolved to do so under Phase two. The team is now considering how best to address this complex and difficult task.

3.2.2 Other measures

As noted above, CAVAC nominated four core indicators to help measure and report on program impact. However in interviews with CAVAC staff it was acknowledged that one of these indicators, quality, has proved impractical. Given market fluctuations, increases in produce prices or changes in market access are not necessarily correlated with better produce quality. Staff also reported that they had not yet established a fixed method of measuring the impact of pesticides work given the challenges associated with this intervention that prevents crop losses rather than increases yields.

3.2.3 Calculating impact: estimates and projections

CAVAC reports on its impact through i) direct measurement and ii) projections based on the impact logics. This allows estimation of the final impact, which may not be observable until after the program has finished. The CAVAC M&E manual states that 'CAVAC relies primarily on direct measurements of support provider KAP[†] and performance and of farmer KAP, complemented by projections, and relies primarily on projections of farmer performance and indirect impacts, complemented by direct measurement.'³⁴

* Sector Monitoring Group.

† Knowledge Attitude Practice.

The CAVAC completion report explains that program achievements are based upon the following formula:

$$\text{Total impact at time } X_1 = \text{estimated impact at time } X_0 + \text{predicted impact at time } X_1^*$$

CAVAC decided to report actual Phase one results a full two years after completion.[†] Therefore all impact figures for 2016 and 2017 remain projections at this stage, even though most interventions require only 1–2 crop cycles for actual results to be measureable. The difficulty with basing program completion reporting on a combination of actual improvements and projections is that, as noted in the MTR report, ‘predictions are based on assumptions and therefore require a caveat: they should not be treated as actual achievements’.³⁵

Findings

- » *CAVAC struggled to identify and consistently monitor and report upon a relevant set of indicators.*
- » *The decision not to capture before / after data but rather to base reporting on a mix of both actuals and projections creates a confusing, potentially misleading picture of program performance.*

3.2.4 Reporting results

CAVAC’s completion report states that over 19,000 households had benefitted from CAVAC rehabilitated irrigation schemes leading to an increased rice yield of over 200,000 tonnes, valued at approximately USD 40 million per annum. The report also indicates that by end-2017, a further 321,000 households would have altered their farming practices in ways that CAVAC research demonstrated would lead to increased yields.³⁶

Yet as noted above these results are based upon a mixture of actual (by 2015) and projected (end-2017) improvements. The business of proving that any program has led to a meaningful and lasting improvement in people’s lives is far from simple. This is especially true of a complex MSD program in a rapidly changing context like Cambodia. The CAVAC website claims that few MSD program can provide solid impact data.³⁷ Driven by this view CAVAC went to considerable effort to make its data available. The program website states that one of CAVAC’s rules is ‘to be transparent so that outsiders can easily check their credibility’.³⁸ The program completion report also invites readers to access the CAVAC data set so they might ‘validate CAVAC’s assumptions and calculations and draw [their] own conclusions from the data’.³⁹ CAVAC wanted examination and discussion of its results but the evaluation team understands it got none. On the other hand, there is evidence that DFAT advised the CAVAC team that the CAVAC program completion report was poorly written and not suitable for key audiences, including DFAT. Nevertheless evaluation interviews revealed that most if not all of the CAVAC team genuinely believed that DFAT was satisfied with CAVAC Phase one’s M&E.

The CAVAC M&E system was intended to produce information that could easily be incorporated into publications.⁴⁰ This may be true, but the publications are not easily digestible. The program completion report runs to 329 pages (including annexes) and includes charts of coefficients and other details of regression analyses used to estimate the yield impacts of CAVAC interventions. A further 220 documents were made available to the evaluation team online. The team did not have the time to review all of these documents closely, and it is thought that very few others would. Yet this appears to have been one of CAVAC’s expectations.

Notwithstanding the large amount of data available, the ability of CAVAC to report at the most important level – systemic change – is limited. As one key informant put it, the measure of CAVAC’s success is the degree to which it has facilitated systemic change. It therefore needs a plausible way of linking its activities to changes in the broader market. CAVAC acknowledged this as a challenge in its submission to 2012 MTR, citing the absence of any established international best practice in this area.⁴¹

* Where X_0 =current time and X_1 =future time.

† Late 2017

Finding

- » *CAVAC employed a thorough approach to calculating some results and projecting others. Although the program endeavoured to be transparent and was conscious not to over-claim its impact, it struggled to get beyond the complex data and clearly communicate the difference it had made to the lives of poor smallholder farmers.*

3.2.5 Donor needs and expectations

There is a clear emphasis in the terms of reference for this evaluation upon DFAT's need for verification of results claimed from CAVAC Phase one. In discussions with DFAT staff currently based in Phnom Penh, they admitted they had difficulty understanding CAVAC reporting of Phase one progress and results (particularly through the completion report). They wanted this evaluation to confirm whether CAVAC Phase one had achieved its objectives and whether these achievements would be sustained. Interviews with officers previously based in Cambodia confirmed that they also found CAVAC's M&E complicated and reflected that DFAT staff really needed a background in econometrics if they were to take CAVAC's claims on anything other than trust. Further complicating this situation, Phnom Penh post now has fewer staff resources than previously, meaning that monitoring visits by DFAT staff have diminished and that these staff have less time than their predecessors did for interrogating reports.

CAVAC originally acknowledged that it would need to prepare different M&E products for different audiences.⁴² CAVAC staff confirmed that their intention had been to provide additional products to complement the completion report* and that DFAT had requested case studies but somehow in the transition of CAVAC team leaders this did not occur. CAVAC staff reported that overall they believed DFAT was happy with their M&E and cites the value of the CAVAC data hub in helping report on DFAT's aggregate development results.

3.2.6 Cambodian government buy-in

Evaluation interviews with officials in MAFF and MOWRAM as well as their provincial counterparts revealed some similar sentiments with respect to CAVAC reporting. MAFF staff indicated that they did not know whether CAVAC used baselines, how the program evaluates performance or whether CAVAC had achieved its objectives. MOWRAM staff said they did not get enough information from CAVAC and stated that CAVAC needs to communicate with the institution not just the individual. These staff expressed MOWRAM's desire to learn from CAVAC's technical work. DFAT Phnom Penh staff confirmed that Cambodian government officials interacting with the program frequently made these sorts of statements. CAVAC team staff also noted there was a significant change in the MOWRAM staff CAVAC liaised with (in particular with former MOWRAM staff transferring to MAFF), during the transition from CAVAC Phase one to Phase two. The CAVAC website states that a series of indicators were developed to assist the government of Cambodia in monitoring progress and that these are reported upon quarterly.⁴³ Interviews conducted with both Australian and Cambodian government officials suggest either they are unaware of such reports or the practice has lapsed.

Finding

- » *CAVAC's monitoring and evaluation is fit for neither DFAT nor Cambodian government purposes. Program reporting is based upon unrealistic expectations as to the amount of time and expertise its key stakeholders have to interrogate the program's results. The program needs an approach that helps it to simply and succinctly demonstrate the impact achieved by the program. This is essential for accountability but also for embedding the effectiveness of the program.*

* Note there is also a summary completion report, but this is more an executive summary, rather than a complementary report written with a different purpose and audience in mind.

3.3 How CAVAC learns and adapts

DFAT expects its MSD initiatives to maintain a strong focus on learning and the sharing of lessons.⁴⁴ This requisite focus on learning is closely related to a project's M&E function. As outlined, the use of M&E within the program is a key strength. CAVAC has worked to develop an inquiring culture where M&E is not seen as a policing function and it is fine for staff to say something is not working. Again as outlined earlier CAVAC prioritises the collection of leading indicator data that helps the program to quickly identify likely successes and failures. These are key elements in CAVAC's three-monthly review process that is used to confirm whether interventions continue, are re-configured or discontinued.

Box 1: Learning and adapting through surveys

'Wet season and dry season farmers are very different. Early on CAVAC did a survey with university students and ACIAR that resulted in a focus on fertiliser practices. This was followed by a larger, 1,200 farmer survey comparing trained model farmers and untrained farmers, half wet season and half dry season. For the dry season farmers there was little yield difference between the trained and untrained model farmers. So that indicated there was little point continuing training dry season farmers; it was not having an impact. CAVAC then did extra research to try and understand how innovation works in Cambodian farming. CAVAC understood it was not nimble enough to make training work for dry season farmers. As an alternative CAVAC tried a road show instead which provided a platform for the most innovative farmers to get quick feedback from suppliers. This alternative was budget neutral and the shift was endorsed by DFAT. We still delivered an activity for dry season farmers, just a different approach, with better results.'⁴⁵

Finding

- » *CAVAC employed a sound approach to identifying both likely successes and failures and adjusted or discontinued its interventions accordingly.*

3.3.1 Applying the lessons of Phase one

As outlined earlier, the original design for CAVAC became outdated and multiple informants advised the evaluation team that this was effectively replaced by the 2012 MTR report. Whilst this seems a sensible approach, the absence of any documented management response from DFAT to the MTR is a critical weakness. The evaluation team, or for that matter current DFAT staff at Phnom Penh post, simply don't know whether recommendations were agreed to and what action DFAT and by extension the CAVAC team agreed to implement as a result. CAVAC informants reported that a workshop was held following the MTR where recommendations were discussed and changes agreed.

The overlapping timeframes between submission of the CAVAC completion report and development of the CAVAC Phase two design did little to facilitate the systematic consideration of lessons from Phase one and how these should be integrated into Phase two.* Fortunately however, key staff on both the CAVAC and DFAT sides who had been involved throughout much of the implementation of Phase one were instrumental to the development of the design for Phase two. The DFAT FAQC notes the importance of capturing lessons from Phase one and that this is yet to occur. It also notes the need for CAVAC to publish details of its results; given much of the completion report has only CAVAC projections to draw upon.⁴⁶ The CAVAC Phase two design document contains a useful annex of lessons learned from Phase one whilst many of the lessons outlined in the CAVAC completion report are of a general nature. The institutionalisation, documentation and sharing of these lessons however could have been better. MOWRAM reported to the evaluation team their desire to learn from CAVAC technical work. Certainly, there are valuable insights to be gained and communicated from CAVAC's experience in the irrigation sector but as yet there appeared to be no influencing strategy to ensure this occurred during Phase one. Similarly, interviews suggest that CAVAC

* The evaluation team notes that a concurrent design process is not unusual for DFAT programs generally.

Phase one did not have an established system for strategically sharing lessons beyond the program and that efforts had been ad hoc.

Finding

- » *Many of the lessons from Phase one have been carried through into the current phase of CAVAC. However, this success relied upon the corporate knowledge of key individuals, some of whom are no longer involved with the program. The absence of any strategy to synthesise, document and institutionalise these lessons leaves CAVAC vulnerable should there be further turnover of personnel.*

3.3.2 Facilitating adaptation

As outlined earlier CAVAC evolved significantly over the course of its implementation. To an extent, this was envisaged: 'CAVAC is designed as a modern program where results and impacts are important and where the design should be flexible enough to reach the results'.⁴⁷

Part of CAVAC's adaptation strategy was to adopt a portfolio approach with its interventions. One key informant described CAVAC as an investment portfolio where the majority of funds are invested in blue chip irrigation, which delivers safe, predictable returns. Agribusiness on the other hand can be seen as more speculative, and as this evaluation has found the returns are harder to demonstrate. It is in this space that some of CAVAC's most innovative work, such as smart phone applications, call centres and TV programs reside.

DFAT's MSD guidance affirms that programs like CAVAC are about trying new things and taking some risks. An MSD portfolio should contain low and high-risk activities, some that promise early returns, and others that might offer little promise of tangible results but are undertaken for strategic reasons.⁴⁸ CAVAC fits this model. DFAT's FAQC report reflects that CAVAC started with a wide range of activities, taking out less successful ones and reallocating resources to maximise impact. The program changed continuously and without such changes, it could not have achieved success.⁴⁹ As remarked by one key informant, for this approach to work the portfolio had to be of a reasonable size.

Whilst adaptability lies at the core of the agribusiness component this is less true for irrigation work where adaptation occurred over much longer time frames (years) and wasn't able to adopt a strategy of 'fail fast and get out'. Furthermore, whilst CAVAC's irrigation schemes are diverse, they do not really represent a portfolio approach, rather a staged evolution.

Finding

- » *CAVAC had a sufficiently diversified portfolio, or range, of higher and lower risk interventions to facilitate flexibility and adaptability.*

3.3.3 Adaptation in program management

CAVAC's contracting and program management arrangements assisted CAVAC's ability to employ an adaptive management approach, to some degree, though this was largely limited to the agribusiness component. Whilst DFAT confirmed that funds can theoretically be moved between components, the planning and design timeframes associated with the construction of irrigation infrastructure means that activities and expenditure must follow a reasonably set schedule. DFAT also confirmed that the relatively large budget allocations for irrigation in both CAVAC phases represented the clear wishes of both the governments of Australian and Cambodia and those allocations were far less about following the principles of adaptive management and maximising impact. With the majority of program funds assigned through more or less traditional infrastructure projects there were minimal demands for adaptation. This also eased the process of accurately scheduling month-by-month expenditure as required by DFAT financial systems – a process further eased by the use of an imprest account under Phase one.

Finding

- » *Program management was generally flexible enough to allow an adaptive approach. However, this was perhaps only possible because a large proportion of expenditure, being that related to irrigation, followed a thoroughly planned implementation schedule that demanded minimal short term adaptation.*

3.3.4 CAVAC governance and decision making

DFAT's MSD guidance acknowledges that programs like CAVAC can present challenges for delegates tasked with approving concepts and budgets.⁵⁰ This challenge is reinforced in CAVAC reporting which specifies that the program has to be able to change sector, interventions and activities without being restricted by its governing structure.⁵¹ Twice yearly visits by the sector-monitoring group in the early years of CAVAC helped give the Australian Government confidence in the program.⁵²

MSD programs can also challenge partner government views of their role in program governance. CAVAC's major governance body was the NSC. Although the NSC was intended to meet between two and four times per year, in reality it often met only annually.⁵³ This has clear implications as to the extent that the NSC was able to be involved in major decisions or ensure CAVAC's alignment with Cambodian government priorities. The completion report notes that the approach of engaging Cambodian civil servants and deputy team leaders within CAVAC was also of limited effect as this practice did not fit well with the manner in which decisions are generally made within MOWRAM and MAFF.⁵⁴ Interviews with Cambodian government stakeholders revealed some dissatisfaction with CAVAC's governance arrangements, particularly from current MOWRAM staff.* The evaluation team was told that the NSC should not be used to simply file reports, that requested information was often not provided, and that greater consultation and involvement in decision making was required. However, arrangements relating to the NSC have shifted recently and it is understood that there are now regular meetings between the CAVAC team leader and government counterparts and a significant degree of 'out of session' work with the NSC on key decisions. Nevertheless, DFAT did acknowledge that the timing of NSC meetings could be improved in order to strengthen Cambodian ownership of the program.

Finding

- » *Governance appears to have been adequate in Phase one but the need to now consider the program's broader influence and the clearly expressed desire for greater engagement by Cambodian government suggests arrangements for consultation and updating on CAVAC progress need to be re-examined.*

* As noted previously, a number of MOWRAM staff during Phase one transferred to MAFF during Phase two. During interviews, these former MOWRAM staff appeared well disposed to CAVAC (Phase one).

4. ASSESSMENT OF KEY OUTCOMES

4.1 Water management and irrigation

4.1.1 Initial project concept

The CAVAC PDD sets out the proposed Irrigation and water management approach as:

The Program will focus on the [Operation and Maintenance (O&M)] and rehabilitation of small and medium irrigation schemes. This approach leverages off previous capital investments whilst acknowledging that sub-optimal O&M has historically been a major reason why many irrigation systems fail or are operating far below capacity. Addressing the weak governance arrangements for O&M in what is a complex institutional environment in a manner which is sustainable will be the largest challenge to be faced. The identification of market linkages will be integral to this process in order to establish a sound financial basis for FWUC operations. The effectiveness of the partnerships established with both the provincial water management authorities and the individual farmer water user groups will be the key to success. The development of linkages with the ongoing programs of other donors in water management (e.g. large-scale capacity building programs within MOWRAM) will enable greater aid effectiveness. Recognising the challenge of institutional sustainability there will be moves to increasingly align and integrate support to within RGC programs and systems.⁵⁵

Box 2: Irrigation in Cambodia

Some degree of irrigation is practised throughout much of Cambodia, with up to 2,500 schemes in existence. However most of these are in poor physical condition. Nearly all the major irrigation development over the last 10 years has involved constructing reservoirs and large canal systems, with little attention paid to how farmers would connect to these schemes. A recent World Bank strategic framework* for irrigation describes forms of water supply as follows:⁵⁶

- farmers pumping from the poorly functioning schemes
- farmers utilising groundwater where possible – mainly shallow wells of limited reliability in dry periods
- water harvesting from local catchments – small scale supplementary pumping for rainfed crops
- pumping from rivers – adjoining landholders piping water, generally over short distances of up to a kilometre.

The irrigation component aimed to address the fundamental problems of irrigation in Cambodia which were:

- New irrigation systems included reservoirs and main canals (known as the primary and secondary system) but did not include tertiary canals. This meant that farmers were generally unable to connect without substantial additional works being undertaken.
- There was insufficient private investment or water sellers for tertiary canals to be constructed. Farmers were also unable to collectively find ways of connecting to the main canals or water sources.

* At the time of writing this strategic framework was a draft.

- MOWRAM and PDWRAMS did not have sufficient funds and the limited systems that did exist were not being maintained.
- There was no method of collecting fees from the farmers for operation and maintenance of the systems and the farmers were reluctant to pay for water because of the poor level of service.

The initial focus of CAVAC was to develop a 'market systems' irrigation approach to develop tertiary connections. Over nine million Australian dollars or 22% of its activity budget was allocated to establishing 75 low cost tertiary connections servicing 45,000 households. Approximately one-third of these systems were to be rehabilitated at a cost of USD 500 per hectare in accordance with the prevailing approach used in Cambodia.

It was expected that PDWRAM would design and manage the construction of the secondary canals. CAVAC would strengthen the capacity of Cambodian authorities to design, develop, operate and maintain irrigation schemes. Specialised training in design was also planned for selected MOWRAM and PDWRAM engineers.

It was proposed to utilise private water sellers to connect and distribute the water at the local level. CAVAC proposed assisting the FWUCs that PDWRAM would establish to operate and maintain and collect fees for the secondary supply system.

CAVAC rehabilitated a number of schemes in the early years in line with this approach. There were however challenges. Agreement between CAVAC and the PDWRAMs on the selection of schemes and the design and construction approach often involved protracted negotiation. CAVAC's view did not always prevail. Further the private water sellers did not eventuate to the extent expected mostly because of high business risks.

It was apparent very quickly that the area CAVAC could serve was much less than initially expected. Although individual farmers adjoining the canals were able to pump water directly, those farmers who were any distance away could not do so or if they did, it was very expensive. Similarly, the FWUC Committees that were established found it difficult to assert authority and farmers saw it as a right to be able to pump from the earthen canals, and thus fee collection and maintenance did not occur. The life of these early schemes was predicted to be only 5-8 years. In addition at least one of the initial schemes (Boueng Leas) was constructed from an unreliable water source and thus water ran out during the dry season. Another challenge was that the land area taken up by earthen canals was excessive and this disadvantaged some farmers.

As documented in the CAVAC Phase one completion report, *'The program also inherited expectations in irrigation. The PDD [project design] was partly based on misinformation that there were many irrigation schemes in Cambodia that only needed minor improvements. An Interim CAVAC team even developed detailed designs for irrigation rehabilitation.'* None of the schemes that were identified for large rehabilitation presented value for money and they offered very little chance of sustainability.⁵⁷

CAVAC was less than satisfied with the schemes arising from this approach. The evaluation team's site inspections and focus group discussions with FWUC Committees and local farmers at three such schemes (Sbov Andeth, Rokar Chhouk and Tang Krasang) revealed that such schemes have poor sustainability, a view shared by the CAVAC team. Nevertheless, some farmers gained access to additional water and were able to increase production at least in the short term. Importantly however these schemes provided valuable lessons about what not to do and have become a useful point of comparison with the more successful later schemes.

4.1.2 Revised irrigation approach

Over time, a new irrigation concept was developed which greatly increased the likelihood of sustainability in a way previously untried in Cambodia. This process was evolutionary as even at the MTR stage in May 2012 the initial approach adopted had only been slightly modified. Considerable effort was required to ensure the schemes functioned and would be sustained. This involved:

- Provision of a high level of service to farmers. In practice this meant gravity fed distribution to farms to avoid individual farmers pumping; tertiary canals providing direct supply to almost every property; FWUC management of water distribution; connecting to a reliable water source; and fees at a price that rice farmers could afford.
- Choosing a design that enabled sustainability and where the fees generated would be sufficient to enable long term maintenance. This included using concrete lined canals to reduce the land losses which previously had been a substantial block to landholders participating.
- Utilising CAVAC, not government, designers.* CAVAC continued to consult with PDWRAMs in selecting, designing and managing the schemes.
- CAVAC conducting direct community engagement to determine the key aspects of the schemes. CAVAC also engaged and trained the FWUCs which owned and operated the schemes with PDWRAM approval.

The new approach produced designs that were able to be built, were actually built and are operating, are sustainable and provide farmers with plentiful and reliable access to water. However these newer schemes cost approximately four times the original estimated cost per hectare and perhaps as a result CAVAC was only able to connect half of the original target area.

According to the CAVAC completion report:

... Realising that sustainability was key to success, a high priority has been given to ownership, management and maintenance. Over the years many lessons have been learnt and incorporated into design and implementation. Indeed the size, type and selection criteria of schemes has proved to be critical to longer term sustainability. The final judgement of success will take a few more years, but at the end of 2015 it looks like a good group of schemes are well managed and have a good chance to be well maintained. For another group of schemes, the local farmer organisations will need more support over the next few years and this is intended to occur under CAVAC Phase II. For the third group, unfortunately the chances that farmers are able to deal with management issues and that future maintenance costs will be covered by water fees are minimal.⁵⁸

With the benefit of hindsight, the evaluation team has labelled the revised approach a ‘proof of concept’ of ‘complete’ irrigation schemes. Getting to this stage involved clearing a number of obstacles and some important lessons. These lessons include:

Technical learnings: The complete scheme concept is evident in three of the schemes inspected by the evaluation team: Wat Thmey, Chamlong Chrey and Boeung Leas. These complete schemes adopted a number of different technical solutions that were quite different to anything PDWRAMs had previously implemented. Therefore PDWRAMs were reluctant to approve the concept, at least initially. Solutions such as large submersible or screw pumps, or concrete lined canals are uncommon in Cambodia but essential for the success of these schemes.

Skill development: CAVAC elected to develop the skills of its own staff and within the private sector. CAVAC provided limited capacity building to the PDWRAMs and interviews revealed that this has caused some dissatisfaction.

Design, construction and pump maintenance: It has taken CAVAC a number of years to develop a private sector contractor capable of meeting the technical demands of the later CAVAC schemes, which is not unreasonable.

Community support: Early on, communities did not trust CAVAC and were reluctant to commit to the approach being promoted (i.e. community pumping and concrete canals and gravity supply). The FWUC Committee at Sbov Andeth scheme advised the evaluation team that they now regret not agreeing to the

* Only the design of pumping equipment was outsourced to the private sector.

approach adopted in adjoining Chamlong Chrey. It has taken considerable time and the construction of some example schemes in order for communities to understand and see the benefits.

FWUCs: Establishment of FWUCs is critical to scheme sustainability but by no means guarantees success. One PDWRAM official interviewed indicated of the 51 schemes in his province with FWUCs only three were functioning, two of which were CAVAC schemes. Common limitations are that the FWUCs lack sufficient skills, the water law gives them limited rights, and the service provided by many systems is not sufficient to convince farmers to pay fees. For each new scheme CAVAC must work extensively on establishing and building the capacity of the new FWUC.

PDWRAM/MOWRAM: A decision was made by CAVAC to adopt an independent model to funding, design and construction outside of PDWRAMs' direct control. However, CAVAC continued to consult with, and required regulatory support from, both MOWRAM and PDWRAMs. Evaluation interviews revealed some frustration from local PDWRAM officials with this approach. Many now appreciate having a high-standard, 'proof of concept' scheme in their jurisdiction but some remain unconvinced that these are affordable.

Unforeseen challenges: Even with solid planning, unanticipated obstacles can arise. For example, CAVAC scheme 6 January SC1,2 & 3, is without water for up to three years whilst an Asian Development Bank (ADB) financed project renovates an adjoining supply canal. Another scheme was adversely affected by a technical disagreement with the PDWRAM resulting in the failure of sections of the concrete canal (O Kak). A third scheme was developed against CAVAC better judgement and is now without sufficient water. This scheme (Rokar Chhouk) is now being modified as part of Phase two.

Limiting the solutions attempted: In order to get 'successful' schemes, CAVAC targeted schemes with reliable water supply, generally stand-alone schemes based on 'run of river' water sources. Schemes of less than 1,000 hectares were also favoured although with experience CAVAC has now been able to increase the size of the target schemes. CAVAC focused the design of its schemes on traditional rice based farming systems and gave limited attention to higher value crops. CAVAC also learned to only attempt schemes where the community is strongly engaged and to avoid any schemes that involved resettlement.

Findings

- » *This evaluation and CAVAC agree that a number of the early schemes are not sustainable.*
- » *CAVAC changed its approach and this has resulted in a 'proof of concept' for a complete sustainable scheme – not previously attempted in Cambodia.*
- » *CAVAC deliberately limited its selection of schemes to those with the best chances of success.*
- » *CAVAC in developing a sustainable 'proof of concept – complete' scheme learned a great many valuable lessons. These lessons have not been documented so as to be able to be shared widely beyond the program.*

4.1.3 Key Outcomes

As noted earlier, the original intent of CAVAC was to undertake a MSD approach. In particular, there was an intended focus on improving the capacity of MOWRAM and PDWRAMs, the utilisation of private water sellers and FWUC development. CAVAC did not pursue capacity building within MOWRAM or partnerships with private water sellers and pursued limited capacity building within PDWRAMs. However FWUC development certainly did occur. Similarly, although CAVAC extended irrigation to a substantial area and number of households the number of schemes and the coverage they provide is well below that originally envisaged.

Whilst CAVAC clearly shifted to a 'proof of concept of complete irrigation systems' approach, some limited market system development did occur. This includes:

- Fostering the development of a local company to undertake design, construction and maintenance of pump stations

- A series of self-reliant FWUCs that manage and operate schemes arising from a community focused design and planning process.
- Development of irrigation skills within the CAVAC team – a benefit for the current phase.
- Development of a private sector contractor capable of meeting the technical demands of current CAVAC schemes.

However the primary outcome was the delivery of 20 rehabilitated irrigation schemes with varying levels of service and sustainability. The initial six schemes reflected the PDWRAM approach. Whilst relatively inexpensive at less than USD 1,000 per hectare, these have significant shortcomings. The effectively irrigated area is less than planned and is reducing further due to lack of maintenance. The costs associated with additional pumping and/or infrastructure are a barrier to use. The reliability of water also limits production.

The five most recent schemes, typically costing USD 1,500-3,000 per hectare, are fully functioning ‘complete’ and sustainable schemes. The evaluation team inspected three examples that CAVAC considered the most sustainable. At least one of these (Wat Thmey) was constructed to a standard typical of that seen in developed countries. These schemes generally deliver a high level of service, with labour savings for farmers and relatively low operating costs. Water is supplied by a community operated pumping scheme and gravity fed to individual plots. These schemes use a mix of earthen and concrete canals which minimise both land acquisition and the ongoing maintenance costs.

The remaining nine schemes reflect the transition over time from the earlier PDRWRAM approach to the complete schemes approach devised by CAVAC. Details of all 20 schemes can be found in Annex Three.

CAVAC collects data on each scheme and has calculated the change in yield at the end of 2015 and projected through to the end of 2017. This data has been provided by the FWUCs and has not been independently checked or analysed. CAVAC has then compared this data against pre-scheme yields for the 19,265 targeted households. CAVAC reports an increase in irrigated area of 21,379 hectares for wet/recession rice, 14,205 hectares for early wet season rice and 1,649 hectares for dry season rice – generally a doubling of the irrigated area. The estimated increase in rice production across all schemes in 2015 was 146,615 metric tonnes, representing an average yield of 6.86 tonnes per hectare for the area irrigated. This estimated increase was due to a combination of increased production from the additional cropped area and enhanced yields on the existing cropped area.

The evaluation team’s inspections of six schemes and data gathered through focus groups with FWUC Committee members suggest that CAVAC recorded data is at the upper end of yields achieved. The FWUCs appear to have provided yields representative of ‘good season’ production, whereas the averages are invariably less when all seasons are considered. Secondly, a number of FWUC Committees reported a lower area and lower numbers of households connected to water during focus groups than outlined in CAVAC reporting. Finally, an insufficient water source for some schemes e.g. Rokar Chhouk and 6 January SC1,2 &3, means that the actual area currently provided with water is much reduced. Interviews with key CAVAC staff and analysis of CAVAC irrigation data confirmed that what is reported is access to water, not use of water. CAVAC staff said they felt this a reasonable approach, as ‘you wouldn’t pay for water if you were not going to crop’. However, focus group discussions conducted by the evaluation team revealed that for a number of schemes farmers are not actually paying for water. The irrigation results claimed appear to reflect a theoretical maximum as opposed to actual, verified results.

Findings

- » *Irrigation results reported by CAVAC are less than those envisaged in the program design, but broadly consistent with the MTR targets.*
- » *There is evidence of an increase in agricultural production, but the extent of this as reported by CAVAC may be over optimistic.*

4.2 Agribusiness development

4.2.1 Overview

CAVAC expenditure on agribusiness activities was a relatively small portion of its overall budget but, in common with other MSD programs, this work used human resources intensively to identify, negotiate and monitor business partnerships. Over the life of Phase one, CAVAC trialled activities in several markets and sub-sectors (summarised in Annex Four), gradually narrowing its focus to four* main areas assessed as having greatest potential (see Table 1).

4.2.2 Qualitative assessment

Documents, evaluation interviews and focus groups indicate that CAVAC's agribusiness component was implemented broadly as intended in the program design. The implementing team began by researching particular markets (or value chains) and identifying practical and cost-effective ways to support changes in business and farm practices that would potentially benefit many smallholder farmers. As outlined in Section 3.3 an 'adaptive management' approach allowed promising areas of work to be fully pursued further and less successful interventions discontinued.

Table 1: Agribusiness focus under CAVAC⁵⁹

Intervention area	Description	Outreach by Sep 2015	Projected Dec 2017 outreach
Fertiliser	CAVAC provided training on technical and farmer engagement methods to twelve fertiliser companies, and then supported seven companies' own training and on-farm demonstration activities. These interventions were aimed at improving farmers' access to quality information on fertiliser use, both directly from company representatives and via those companies' wholesale-retail distribution networks. Model farmer training and roadshows supported by CAVAC are also included under this heading.	139,005 households	244,727 households
Pesticides	Pesticide use was largely unregulated when CAVAC commenced, and initial attempts to engage with companies were unsuccessful. The program then funded preparation of a pesticide handbook, later approved by MAFF. It also worked with PDAFFs to improve the quality of training they provided to pesticide retailers. CAVAC later partnered with eight pesticide companies to support their own training of retailers and farmers.	71,208 households	168,717 households
Vegetables (seeds)	An early CAVAC activity was the training of seed retailers in three provinces. However these were outside Cambodia's main commercial vegetable-growing areas. CAVAC later partnered with two large seed companies to help make modern farming techniques available to farmers in core vegetable-producing areas (not confined to target provinces).	–	9,400 households
Media	CAVAC commissioned research into media habits in rural areas, demonstrating the potential commercial viability of television programming focused on agricultural issues. It then supported a media production company to develop a 27-episode TV series.	–	196,870 households

The evaluation team's interviews and focus groups with agri-businesses, retailers and farmers confirmed that the overall focus of the agribusiness component, and most of its specific intervention areas, were appropriate and useful. For example, six **agri-input companies** interviewed acknowledged that their

* The CAVAC Phase one completion report identifies a fifth area, business enabling environment, but this primarily involved engagement on pesticides and irrigation so it is not included separately in Table 1. Note that the projected outreach figures shown here cannot simply be added to give total agribusiness outreach, due to double-counting. Total CAVAC Phase one outreach, corrected for double-counting, is estimated at 340,000 including 19,000 specific to irrigation activities.

partnerships with CAVAC had an important influence on business practices. In particular, the combination of technical training and advice on farmer engagement had helped shift company mindsets from basic product *promotion* to providing detailed information on product *use*, generally through a combination of retailer training and field demonstrations. CAVAC helped build companies' staff capacity, trial new approaches and improve the effectiveness of existing outreach activities. These companies acknowledged that the inclusion of training in their operating model had helped their businesses grow in spite of increasing competition and, recently, unfavourable commodity prices. Having farmers reap maximum benefit from using their products was clearly an important factor. Businesses involved in 'training-of-trainers', via retailers, found it to be an effective way of boosting yields and thereby building farmer confidence in their brand.

The five **retailers** interviewed confirmed that the business environment has changed considerably over recent years. Farmers, especially in irrigated areas, are now cropping more intensively (2-3 crops per year instead of one), using more fertiliser and pesticide, and generally achieving higher yields.* These trends have supported strong business growth, but also increased competitive pressures as new retail outlets opened. Being recognised by farmers as a source of sound advice was an important part of a retailer's competitive edge. While these business operators recognised the value of formal training they had received (whether directly from CAVAC, or via CAVAC's partner companies, or from PDAFF), they also drew from their own experience and did their own research including, in some cases, by travelling outside of their province.

Discussions were also held with six groups of **farmers** in Kampot and Takeo provinces who had received some form of support as part of CAVAC's agribusiness interventions.† These farmers generally displayed strong confidence in their current levels of knowledge about farming practices, and in their ability to source additional information when required. They chose which inputs to apply based on a combination of their own experience and observations, the price and availability of particular types of inputs, and recommendations from a range of sources. For some this included company representatives who visited regularly, provided training and demonstration and could also be contacted by telephone. There was general agreement that local retailers were a good source of advice on unfamiliar problems or products, to supplement what the farmers themselves could read on product labels. Some reported regular access to PDAFF; others reporting having no contact with government extension worker. Many were also involved with or aware of NGO or other donor programs providing local training and other support. On the other hand, the CAVAC-supported TV show on farming practices had only been viewed by a handful of those interviewed and seemed to have had limited impact.

4.2.3 Quantifying impacts

As outlined in Chapter 3, CAVAC only partially quantified its impacts on its ultimate target beneficiaries (smallholder farmers). Under the agribusiness component, the main focus of its reporting was around household outreach, defined in terms of changes in farmer practices that could reasonably be attributed to CAVAC. Logically, changed practices would bring about increases in yields, production and, ultimately, incomes. Each specific intervention had an 'impact logic' detailing the process through which it would help the target population and contribute to program objectives. While efforts were made to quantify the relationship between practices and yield (through large-scale surveys and econometric analyses), final program reporting only included 'additional production' estimates for fertiliser (and irrigation) interventions.

Nevertheless, some conclusions can be drawn on the effectiveness of CAVAC's agribusiness component based on the program's estimates and projections of farmer outreach, given its program and intervention logics are considered generally sound.‡

* Some risks were also mentioned, including hardening of the ground due to over-use of fertiliser, and health risks from incorrect pesticide application.

† These included 'model farmers' and women's farmer groups; they were in addition to the FWUC Committee focus groups discussed in the Irrigation section (Section 4.1) above.

‡ For instance as assessed by the MTR and DCED audit.

At the time of CAVAC's design, the outreach envisaged from the agribusiness component (not including extension activities) was 60,000 households.⁶⁰ This was clearly intended as an initial indication only, and projections increased progressively over the life of CAVAC as its trajectory became clearer. * An early (2010) program projection of total outreach across all components was 130,000 households; the MTR's estimate in 2012 was 230,000 (within and beyond target provinces).

The program initially projected farmer outreach based on participation data from specific activities, such as partner companies' field demonstrations or training. Follow-up impact surveys and some plausible (generally conservative) assumptions allowed estimation of changes in farmers' KAP [knowledge, attitudes and practices] attributable to each intervention – i.e. 'actual' outreach. Meanwhile projections were updated as further activities took place, with or without direct CAVAC support. The latest data available to the evaluation team included actual outreach as of August 2015 and projections to December 2017, summarised in impact spreadsheets within CAVAC's M&E system.⁶¹

CAVAC clearly put considerable time and effort into its estimates and projections, and its methodology was broadly DCED-compliant. Even so, the Phase one completion report puts many caveats around the robustness of virtually all impact estimates, including outreach. The evaluation team's interviews and focus groups with companies, retailers and farmers (summarised above) suggested that the impacts reported as directly attributable to CAVAC activities were based in some instances on over-optimistic assumptions. However, these impressionistic conclusions cannot be readily quantified. Larger and/or additional surveys might have made CAVAC's figures more robust, but at a further cost to the program.

The CAVAC completion report provides outreach figures for 2015 and 2017 for the main intervention areas.⁶² It then explains in detail how the intervention estimates can be aggregated to give whole-of-program figures which minimise double-counting. Using this method, the report concludes that CAVAC will have achieved outreach of 340,359 households by the end of 2017.⁶³ This includes 19,265 irrigation-specific outreach – leaving a total of 321,094 households impacted by the agribusiness component.

The completion report does not give a clear aggregate figure for actual (2015) outreach, although this can be inferred from the component figures in its Table 8. CAVAC staff informed this evaluation that the agribusiness component had reached a total of 214,550 households by the end of Phase one.[†]

The projected 2016-17 figures cannot be substantiated at this point. They are based on partner companies' actual self-funded activities in 2015 and their plans for 2016 and 2017, scaled down slightly to allow for slippage in actual delivery. In line with the practice throughout Phase one, validating the projected 2016 and 2017 figures will require collection of updated information from CAVAC partner companies, and further farmer impact surveys. These are planned for late 2017. Evaluation interviews suggest that some of the expectations for continued company implementation may be overly optimistic (see Chapter five). Attribution of farmers' KAP changes to program interventions also becomes less robust for the 2016-17 period.[‡]

The CAVAC completion report discusses the challenges of estimating impacts beyond farmer outreach. A program spreadsheet provided to the evaluation team⁶⁴ shows additional production of 96,329 metric tonnes from fertiliser and model farmer interventions. A further 115,384 metric tonnes was estimated to have been gained from pesticide interventions, but this was not included in reported totals. These estimates are based on survey data and regression analyses aimed at quantifying the extent to which yield increases could be attributed to CAVAC-induced improvements in farm practices.^{§65} The results varied considerably across the groups of farmers surveyed. Estimates for dry season farmers were more robust ($R^2 = 0.483$)

* This is standard practice in market systems development programs, since specific activities are not defined in the design but rather evolve over the life of the program.

† The evaluation team has not seen the calculations underpinning this estimate.

‡ This was recognised by CAVAC, and the degree of attribution was scaled back for out-years.

§ The relationship between practices and yield was modelled via multivariate regression analysis based on a survey of 1,200 farmers in 2012. A further survey in 2015 was used to measure practice change and calculate yields and incomes. According to the survey report, average yield increases due to changing fertiliser use were 4.4% for the wet season rice crop and 8% for the dry season crop. CAVAC uses a 4.4% one-off gain as a 'safe' estimate of the yield impact of its fertiliser interventions.

compared to wet season farmers (R^2 below 0.3). CAVAC decided to use a conservative estimate of 4.4% for the attributable yield impact of its fertiliser interventions, based on these analyses. However, the discussion and charts in the completion report highlight the great diversity in both fertiliser use and yields across the farmers sampled. It has not been possible for this evaluation to verify these data sources and calculations.

As outlined in Chapter 3, above, CAVAC has not reported on income impacts of its agribusiness interventions.

Findings

- » *The broad areas of focus within the agribusiness component – particularly the fertiliser and pesticide interventions – were appropriate and relevant to intended beneficiaries.*
- » *Actual outreach figures of 214,550 by September 2015 for CAVAC's agribusiness interventions are plausible.*
- » *CAVAC's agribusiness interventions resulted in changes in farming practices among significantly more households than had been originally envisaged. However, a large proportion of CAVAC's claimed agribusiness outreach remains an unverified projection as of mid-2017.*
- » *CAVAC can demonstrate a connection between its activities and changes in farmer practices, and the link between these practices and increased yields. However the program was unable to quantify its contribution to increased agricultural output in a robust manner.*
- » *In consequence, for the agribusiness component it is only possible to partially answer the evaluation question as to whether CAVAC delivered expected increases in trade, productivity and incomes for smallholder farmers.*

5. SUSTAINABILITY AND INFLUENCE

5.1 Sustainability of irrigation infrastructure

Improving the sustainability of irrigation infrastructure was a key CAVAC objective. The early schemes were deemed unsustainable; over time the schemes became more sustainable; and the recent ones are considered fully sustainable. CAVAC's irrigation staff advised the evaluation team that to be sustainable the schemes had to have:

- An adequate, reliable and affordable supply of water that enable farmers to be profitable,
- Sufficient fee recovery by FWUCs so as to ensure adequate funds for long term maintenance,
- All farmers remaining connected and having access to water,
- Design and construction features which would ensure that infrastructure would last, and
- Sufficient maintenance and sufficient capacity of the FWUC.

The five key features outlined above provide a sound basis for assessing sustainability. CAVAC selected schemes for inspection by the evaluation team that represented the full spectrum of its irrigation work. CAVAC staff are to be congratulated on deliberately exposing the evaluation team to lessons learnt from the less sustainable schemes and in being completely transparent in describing their operations.

A sustainability assessment and ranking of the six schemes inspected by the evaluation is provided at Annex Five. At the request of the evaluation team, CAVAC staff also provided a sustainability ranking and assessment for the other 14 schemes which this evaluation was not able to visit. This is also outlined in Annex Five. It does not include an assessment of the quality or life of physical works of the scheme. This is understood to have been considered by CAVAC and drove some of the decisions about scheme design (e.g. pump selection) but has not been formally assessed. Nevertheless cursory inspections undertaken by the evaluation team indicate that physical works are of a generally high standard.

The data presented in Annex Five indicates that five schemes have a ranking of 8 or more and are considered sustainable in the Cambodian context, six schemes have a ranked of 2 or less and are considered unsustainable and nine schemes are ranked between 3 and 7. Whilst this information on sustainability has been readily provided by CAVAC, there does not appear to have been any systematic ongoing monitoring and assessment of scheme sustainability.

Finding

- » *CAVAC has constructed five sustainable schemes, six considered unsustainable and nine considered somewhere in between.*

5.2 Durability of agribusiness activities

CAVAC's direct support to its agribusiness partners was deliberately limited in scope and duration. The intent was to demonstrate to companies the benefits of modifying their business models, and provide them additional skills and 'seed funding' to trial new approaches. The expectation was that companies would subsequently maintain these approaches through their own resourcing. CAVAC's summary spreadsheets confirm that by 2015, all but three partner companies had implemented further activities without additional CAVAC funding.⁶⁶

CAVAC's projections of partner company activity and farmer outreach for 2016 and 2017, outlined in Section 4.2 above, could be interpreted as early indicators of sustainability.

Projected outreach in those two years was 83,360 households for fertiliser, 97,509 for pesticide and 10,565 for model farmer interventions.⁶⁷ With corrections to minimise double-counting, this amounts to a little over 150,000 households projected outreach in the two years following conclusion of CAVAC. As noted above, a thorough verification of these projections would require further surveys to be undertaken as part of CAVAC Phase two.

The evaluation team interviewed six **agri-input companies** that had partnered with CAVAC. Overall, these companies had clearly retained an awareness of the benefits of providing training in product use as part of their business models. Most were continuing to do this through some combination of retailer engagement and direct farmer outreach. One reported that this year alone, they had conducted about 100 field demonstrations on fertiliser use using their own resources. However, with paddy prices now well below levels of 2-3 years ago, demand for inputs has declined. Some companies reported that the new practices begun with CAVAC assistance had since been modified or scaled back to fit within limited marketing budgets and staffing resources. One company planned to bring groups of retailers together to promote product awareness, but said this would be 'more marketing than training'. Another had done one round of retailer training with CAVAC support but was non-committal about repeating this, given limited staff. A third said they now ran their own modified roadshows but would need additional financial support to maintain training activities.

The **retailers** spoken to were continuing routinely to provide advice to farmers on use of the products they sold, although their reported access to on-going training services varied. Some outlets had company representatives regularly (even permanently) on-site, who would talk directly to customers and also conduct farm visits. Others were relying primarily on training received some time ago, plus their own research and/or reading of product labels or brochures.

The **farmer** focus groups confirmed to the evaluation team that advisory support continued to be available through a range of sources including fertiliser and pesticide retailers and direct agri-input company training and demonstration activities in their local area.

CAVAC also influenced information flows to farmers through two interventions with **government** (see Annex Four). Following a change in Cambodian government policy in support of chemical pesticide use to increase rice exports, CAVAC became aware in 2012 that MAFF did not have a suitable technical reference document on chemical pest management. Over a 2-year period, CAVAC supported MAFF's development of a pesticide manual, 5,000 copies of which were then printed and distributed to all PDAFFs to assist in their extension activities. Meanwhile, CAVAC worked directly with PDAFF offices in its three target provinces to strengthen the compulsory business licence training they provided to agri-chemical retailers. CAVAC provided technical content for the curriculum, developed training materials and helped roll out a series of training sessions. According to CAVAC's own assessment of these activities, PDAFFs subsequently reported having used CAVAC's curriculum and materials in their training of retailers and model farmers, and an intention to formally incorporate the curriculum into future retailer licensing courses. CAVAC's follow-up interviews with retailers found they generally remembered key elements of the course content, consulted the handouts as required and considered themselves to be providing better advice as a result.⁶⁸ A PDAFF officer interviewed for this evaluation acknowledged CAVAC's contribution and confirmed that retailers are now far better equipped to advise farmers on chemical input use.

Findings

- » *The types of support services that CAVAC facilitated— including through agri-input companies, retailers and PDAFF—continue to be available to smallholder farmers in CAVAC's target provinces.*
- » *CAVAC misjudged both the quantity and quality of on-going company support services. This evaluation cannot quantify actual outreach beyond 2015 but believes CAVAC's projections are overly optimistic.*

5.3 Overall assessment of sustainability

5.3.1 Irrigation

As outlined above, CAVAC's later irrigation schemes can be described as 'proof of concept, complete schemes'. The sustainability of the schemes themselves is strong. However, the sustainability of this 'proof of concept' approach is a different matter. Given that conventional PDWRAM schemes cost about one quarter of what the 'proof of concept' CAVAC schemes do, CAVAC needs to demonstrate that these schemes are more cost effective in the longer term. This is a complex conclusion to convey, given that both traditional and newer CAVAC schemes deliver similar increases in yield immediately post-construction and that it is only with the passage of time that agricultural productivity under the traditional schemes starts to diminish. Table 2 highlights features of these two types of scheme, based on the evaluation team's inspections and interviews around different CAVAC-rehabilitated schemes.

Table 2 – Comparison of the traditional irrigation approach with the latest CAVAC approach

Feature	Early traditional schemes	Later sustainable schemes
Cost per hectare (physical works only)	USD 200 – 1,000	USD 1,500 - 3,000
System design and construction	Undertaken primarily within PDWRAMs	Designed by CAVAC staff Constructed by private contractor, supervised by CAVAC staff
Level of Service	Farmers pump and provide their own pumps; often the water is far from the property	Gravity supply direct to the field
Farmers' additional costs	Considerable pumping costs and hard physical labour required	Nil – very low labour input
Land acquisition	All earthen canals requiring substantial private land to be acquired	Mixture of earthen and concrete canals minimise private land acquisition
Farmers Irrigation Service Fees	Fee calculated at 50-75kg of rice, which is considered unaffordable as farmers still have their own pumping/labour costs to access water	Approximately double the traditional schemes but considered very affordable given few other costs
Farmers' viability	Much lower as costs higher and labour input higher	Relatively much better
Service fee recovery (% of farmers who pay the fees)	Very low, less than 25%	Very high, more than 90%
Life of scheme	5-7 years before major maintenance required	20 years plus because of better design and materials used
Likely success of FWUCs	Very low as fee recovery is low regardless of training	Very high provided adequately trained
Maintenance	Very limited because of low fee recovery levels; early failure likely	Limited maintenance required; and maintenance likely to be undertaken by FWUCs, although running costs are higher

The evaluation team determined that the differences between the approaches are substantial and that CAVAC has now settled on a sustainable approach to complete irrigation schemes. However, the evaluation team encountered a wide range of opinions from within PDWRAMs, MOWRAM, MEF, MAFF and other donors as to whether the differences justify the additional expenditure or whether Cambodia could afford to construct such schemes with its own resources.

This evaluation was unable to assess whether the later, sustainable schemes CAVAC had constructed were in fact value for money in comparison with the traditional approach and should be adopted more widely in Cambodia. This weakness needs to be addressed by CAVAC as it currently inhibits the ability of CAVAC and the Australian aid program to contribute to discussion on irrigation policy in Cambodia.

Finding

- » *CAVAC has identified the characteristics of sustainable, 'complete' schemes compared to the traditional schemes and has excellent examples of both approaches. However, there has been no detailed analysis to demonstrate the value for money of the more sustainable CAVAC approach to help inform irrigation policy in Cambodia.*

5.3.2 Agribusiness

As referred to in preceding sections, most of CAVAC's agribusiness interventions sought to improve the quality of information available to smallholders to support their decisions on farming practices. In broad terms, the types of change supported by CAVAC appear likely to be sustained into the future. While companies will continue to adjust the extent and nature of their efforts, they generally acknowledge the importance of including product information as part of their marketing and promotion activities. Retailers are now recognised by both the supplying companies and the end-user farmers as an important link in the chain, not just for product flow but also for channelling related information to farmers. CAVAC's influence is also likely to persist through the curriculum and materials associated with PDAFF's compulsory retailer training.

The logic of CAVAC's results frame suggests that maintaining information flows over time will contribute to the sustainability of any improvements in yields, incomes and trade attributable to CAVAC. However, given those indicators were not consistently measured and tracked over time by the program, there is little conclusive evidence on which to assess whether improvements will be maintained. For example, having estimated that improved fertiliser practices would result in a 4.4% increase in rice yield, CAVAC simply assumed that this new yield level would be maintained in future years.

Finding

- » *CAVAC supported long-term changes in Cambodia's rice-based farming systems, particularly in relation to information quality and availability and farmer practices. However, it is not possible to quantify the program's continued impact on yields, incomes or trade.*

5.4 Influence and systemic change

5.4.1 CAVAC's impact on the irrigation sector

Much of CAVAC's potential to contribute, beyond the 20 schemes built, to the broader Cambodian irrigation sector is as yet unrealised, and there are some hurdles to overcome:

Demonstrating value: A key difference with CAVAC 'complete' schemes has been that the level of investment in the tertiary component has been much higher than previously undertaken in Cambodia. There is doubt within both government agencies and some other donors about the benefits relative to the cost. CAVAC data does not readily facilitate a robust comparison of the value for money of the initial cheaper (unsustainable) schemes and the latter more expensive, but sustainable schemes. This is further complicated by inaccurate figures for traditional schemes on irrigated area and the number of connected households.

Scalability: The CAVAC approach requires a very high level of support for the FWUCs to develop and function satisfactorily. To date CAVAC has completed 20 schemes in Phase one and proposes a further 13 in Phase two. In contrast, the World Bank estimates that there are around 2,500 schemes requiring investment

throughout Cambodia. For the CAVAC approach to be adopted more broadly, a substantial scaling up of support for the FWUCs from the PDWRAMs or elsewhere is required.

Site specific: CAVAC was able to select schemes showing the best chances of success. The World Bank however has indicated that the CAVAC approach is only relevant to about one third of the country.* CAVAC should broaden its applicability, or at least identify those parts that may apply, to a greater proportion of those schemes yet to be developed.

Changing environment CAVAC is premised upon small landholdings growing rice, whereas rural Cambodia is changing rapidly, the rice price has declined substantially and the need to grow higher value crops is increasing. The ability of the CAVAC approach to support crops other than rice may prove critical.

There appears to have been no deliberate strategy for systemic change either recorded or adopted. However, there has been some 'accidental' policy change in order to develop the proof of concept. For example, a change has occurred in the type of schemes that are now approved by PDWRAMs, who earlier were reluctant to endorse concrete canals or communally pumped systems. Similarly, there appears to be reasonable acceptance within government about the need for 'complete or tertiary systems', which is a significant, although not universal, shift. The current Minister for Agriculture is a strong supporter and is currently intending to use CAVAC's approach in small schemes that are under the control of his Ministry. Some PDWRAMs (not all) also support the CAVAC whole-scheme approach.† These indicated to the evaluation team their desire for capacity building which they believe should have been associated with the CAVAC scheme development.

CAVAC has clearly also influenced the World Bank Strategic Framework for the Irrigation Sector, where the World Bank acknowledged the applicability of CAVAC's approach. Thus there is an opportunity to shape World Bank lending to the sector. Other aid donors such as Agence Française Développement (AFD) are aware of the CAVAC approach but indicated reservations about its affordability. Thus it would appear that CAVAC could explore further dialogue with the AFD and other donors and development banks (such as the ADB) in an attempt to understand their concerns and look to developing the CAVAC approach to have wider applicability within Cambodia.

Given the apparent need for up to 2,500 schemes to be upgraded, there is an opportunity for Australia to make a further policy contribution to this challenge. This could include working closely across the whole irrigation sector including the various funding agencies including World Bank, the various government agencies at both the National and the local levels, and also presenting at technical forums in Asia.

Findings

- » *The CAVAC complete scheme is more expensive than the traditional PDWRAM approach and whilst the benefits are recognised there is divided opinion as to the affordability of this approach.*
- » *A number of issues need to be addressed before the CAVAC model can be adopted more widely across Cambodia, in particular the benefits of CAVAC complete schemes relative to the cost.*

5.4.2 Copying and crowding in of CAVAC agribusiness interventions

While MSD programs often focus quite narrowly on particular locations, value chains, partners and interventions, they aim to stimulate far greater systemic impact across the broader market. In the case of CAVAC, short-term partnerships with agri-input companies were expected to demonstrate new business models that those companies could apply elsewhere and into the future. Other, non-partner companies would also become convinced of the benefits of those new practices, and copy them in their own

* The CAVAC approach was considered unsuitable for other parts of the country due to periodic flooding (around one third of the country) and water supply by large reservoirs which currently do not integrate with the CAVAC approach and vice-versa (also around one third of the country).

† Those PDWRAMs that did not, expressed concerns largely related to cost.

operations. CAVAC staff have advised that they plan to contract a specialist team later in 2017 to assess levels of systemic change in fertiliser, pesticide, and media markets.

The CAVAC summary brochure to the completion report claims, in relation to the fertiliser interventions alone, that 'the companies CAVAC partnered with ultimately served a third of the rice farmers in Cambodia' (600,000 households), and that by 2015 'up to 2 million rice farmers were able to access information about fertiliser application close to their communities'.⁶⁹ While the brochure does not credit CAVAC with full responsibility for this result, it implies that CAVAC played a significant role.

CAVAC partner companies interviewed for this evaluation had generally expanded their operations in recent years. While the business growth itself could not be attributed to CAVAC's influence, it does appear that CAVAC-supported outreach practices were being applied in the new areas now serviced by those companies. Companies which had not partnered with CAVAC also reported approaches to marketing and distribution that involved demonstration farms and a degree of training for wholesalers, retailers and farmers. However the CAVAC partners did not consider the practices of other firms to be similar to their own, commenting that other firms simply 'promoted' their products through their distribution channels.

Two non-partner pesticide companies interviewed also denied any CAVAC influence, claiming instead that they had 'always' incorporated a strong element of farmer and dealer training into their business models. One observed that while CAVAC's partners would certainly have benefited from the program's support, 'we have our own way of working and philosophy.'

While CAVAC interacted primarily with the private sector, another potential avenue for achieving systemic change was through influencing other critical elements of the market system – particularly government. CAVAC initially had a dedicated 'business enabling' component, intended to complement the private sector interventions by influencing the policy and regulatory environment within which those businesses operated. While this component was discontinued, the program did engage with government on a number of issues. For example, it supported development and distribution of a MAFF pesticide manual and worked with PDAFFs to improve the technical content of their retailer training. More recently, CAVAC Phase two has been working closely with the Cambodian authorities in response to the European Union's decision to ban imports of agricultural products found to contain traces of the tricyclazole fungicide.

CAVAC staff interviewed for this evaluation perceived a significant change in attitudes among key MAFF personnel since 2010 – from viewing the private sector with suspicion, to accepting its important role in agricultural development. Staff claimed that CAVAC had influenced a shift in MAFF's role from being a service provider to being a facilitator and regulator; this was explicit, for example, in a 2014 MAFF strategy which noted the private sector's role in extension and also referred directly to CAVAC.* On the other hand, during evaluation interviews with senior government officials at national and provincial levels it was evident that many still viewed the role of government from a traditional 'command and control' perspective. There was dissatisfaction with CAVAC's decision to operate through a more holistic, market-based approach. Some officials remained untrusting about the motives of private sector operators and insisted their own departments should have far greater say in determining what CAVAC did, where and with whom.

Findings

- » *CAVAC has had some impact beyond target areas and groups, but the evaluation team did not find conclusive evidence of copying and crowding-in.*
- » *CAVAC's agribusiness interventions supported, and perhaps helped accelerate, the significant change processes underway since 2010 in Cambodia's agricultural input markets. However, it is difficult to determine the extent of change directly attributable to CAVAC.*

* However the evaluation team has not seen this MAFF strategy.

- » *CAVAC's work with the Cambodian government on pesticides played an important role in the government's policy development and implementation. Having demonstrated its value-add, CAVAC is well-positioned to provide further support in other important areas of agricultural policy.*
- » *While CAVAC's private sector focus is appropriate, CAVAC might have achieved even greater influence across Cambodia's rice-based agricultural systems had it engaged more actively with government, providing clear evidence-based and policy-relevant messages relating to smallholder farmers and the role of the private sector in agriculture.*

6. WEIGHING UP THE COSTS AND THE BENEFITS

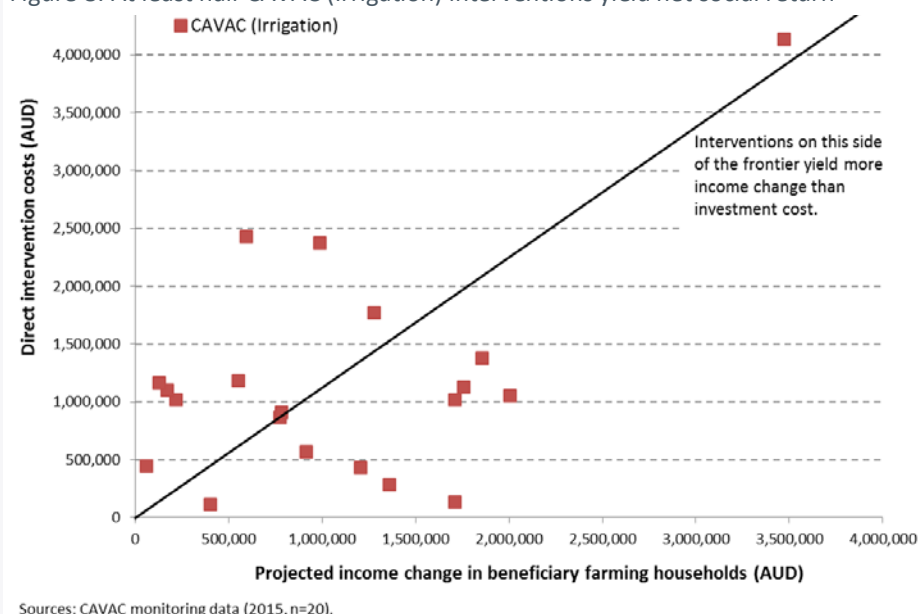
6.1 Social return on CAVAC investment

The social return of an investment can be assessed by comparing the projected net benefits or impacts on targeted farming households and the costs of the interventions that contribute to those impacts.* For CAVAC, this evaluation assessed the ratio of increased financial returns to smallholder farming households relative to funds invested through CAVAC. This evaluation also asked how these ratios compare across the different components and interventions. The DCED standard focuses on indicators linked to the impact chain or logic model for each intervention and the program overall. However, CAVAC's irrigation and agribusiness components have very different logic models.†

CAVAC projected and subsequently measured actual outreach for some **irrigation** interventions. These changes can be used to imply a change in income resulting from use and effective management of new irrigation systems. For **agribusiness**, CAVAC focused on measuring behaviour change in farmers and intermediate service providers – changes in knowledge, attitudes and, ultimately, practices. The impact of changed practices on net income and the number of farmers who actually changed practices was projected but not consistently measured. This makes it difficult to quantitatively assess actual changes in net income for smallholder farming households. Projections suggest this, but the DCED standard encourages actual measurement of *net attributable income change* to demonstrate impact. Without this, it is difficult to assess the social return on investment (the ratio of changed farmer incomes relative to funds invested through CAVAC).

Figure 8 compares DFAT investment in CAVAC's irrigation interventions with the income change projected by CAVAC. This analysis shows that around half of the CAVAC irrigation interventions are relatively expensive for the income benefits they are expected to provide - in the short term. If the irrigation systems are operated and maintained in a sustainable way, the medium-term returns to farming households and also to capital investment may be acceptable. Financial analysis in 2012 by CAVAC using planned and actual construction costs and projected returns to farmers suggested benefit:cost ratios exceeding three, which implies an acceptable investment.

Figure 8: At least half CAVAC (Irrigation) interventions yield net social return



* This is the way the DCED standard uses the term 'social return on investment'. However, this definition is not the one way to define the term.

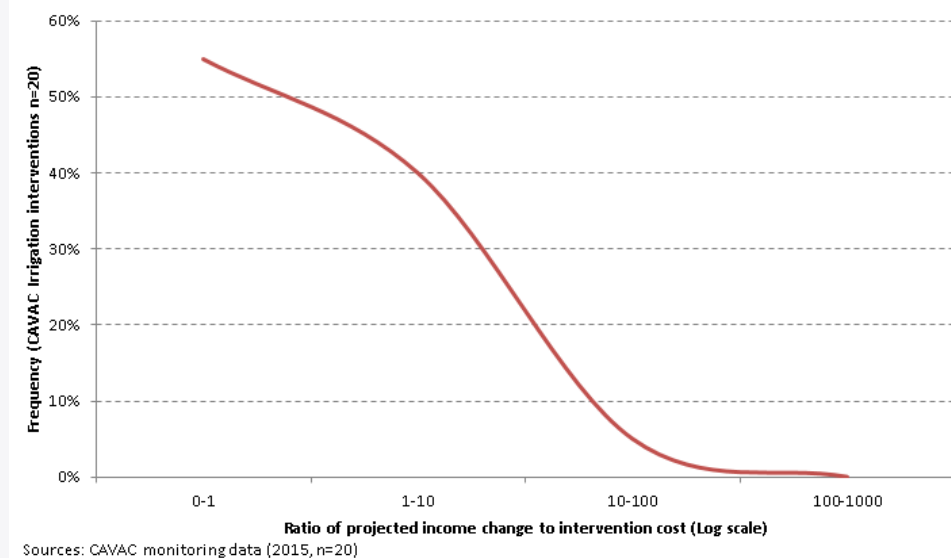
† Irrigation infrastructure - designed to improve farmers' access to reliable water for rice production, enabling extended or additional growing seasons; and Agribusiness - designed to facilitate intermediate service providers to increase the number of farmers they serve and improve the quality of advice and services they provide.

However, these are projections and need to be tested with actual data: actual construction costs and actual net attributable income changes to benefiting farming households. (See Sections 5.3.1 and 5.4.1 for further discussion on the importance of robust value for money analysis of CAVAC's 'complete' irrigation schemes.)

Analysis of the distribution of ratios for CAVAC's irrigation interventions (Figure 9) shows that most have a ratio of projected income change to investment cost between 0 and 10. This suggests theoretically that Australia's investment is benefiting farming households through increased incomes and that reach attributable to that investment is adequate. CAVAC irrigation investments also produced some unexpected changes for farming households, including electrification for some rural communities (as the installed irrigation pumps use

electric power) and improved road access (as new/rehabilitated canals are generally also serviced by new/rehabilitated roads paid for by CAVAC). Any impact of these changes on households has not been measured by CAVAC's M&E system. That is an opportunity to consider in Phase two.

Figure 9: Distribution of social return on investment across irrigation portfolio



Findings

- » Overall, CAVAC appears to represent value for money. The measured number of households that benefited from the investment and the projected income changes in those households represents a positive return on investment.
- » CAVAC did not monitor net attributable income change and so it is not possible to assess the overall return on investment.

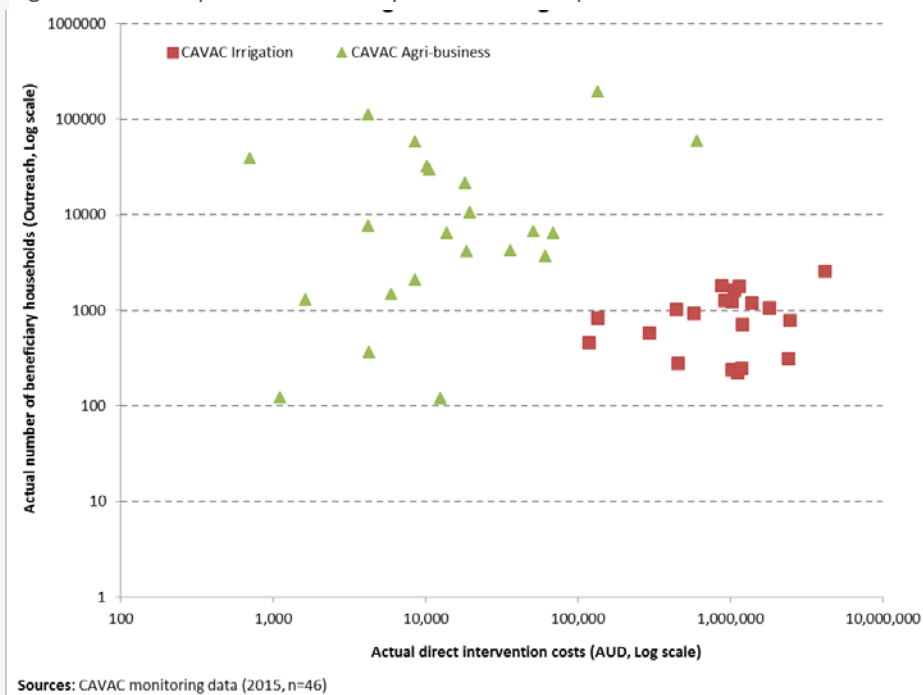
6.2 Prioritising results/ portfolio efficiency

CAVAC is managed as a portfolio of irrigation investments and facilitated agribusiness interventions and adjusts to political priorities (Cambodian and Australian) and levels of local community support and capacities. To ensure value for money, it is relevant to ask whether resources were prioritised to those areas offering and/ or delivering the highest returns. This section answers this question with three measures:

- a comparison of intervention costs and numbers of benefiting households
- an analysis of activity costs as a share of total investment
- a more detailed assessment of how activity costs are allocated against interventions, and how that allocation changes over time.

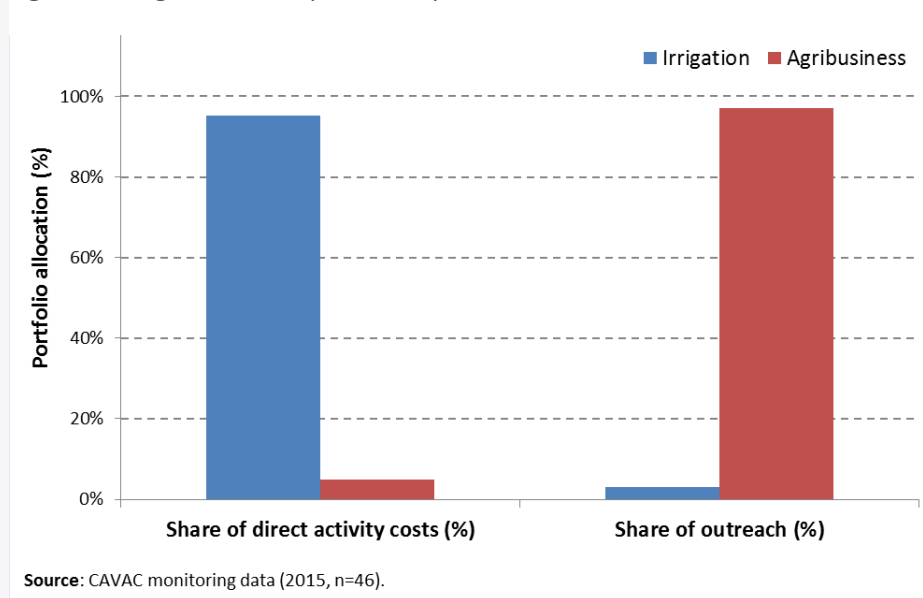
In simple terms, and assuming ‘outreach’ as the appropriate measure, CAVAC interventions show mixed performance in a comparison of intervention costs and numbers of benefiting households (Figure 10).^{*} CAVAC agribusiness interventions mostly deliver more outreach (number of farming households that measurably benefit from the investment) than CAVAC irrigation interventions. This suggests the allocation of resources to irrigation resulted in a smaller number of households benefiting from CAVAC. An efficient portfolio allocation process would demonstrate an increasing share of investment being allocated to the component delivering the greatest outreach.

Figure 10: Mixed portfolio efficiency – between components



This does not seem to have occurred in CAVAC – where irrigation intervention costs represent more than three quarters of activity costs but represent less than 5% of total outreach (Figure 11). This reflects the difference between capital investment – where benefits are assumed to continue for at least 10 years if infrastructure is operated and maintained as planned – and recurrent investment in facilitated change in market systems – where significant human resource inputs are used to facilitate market changes. Agribusiness interventions are also assumed to deliver sustained benefits as the private sector is motivated to sustain new practices for their own benefit and through this also stimulate expanded outreach as well as responses from other businesses. (see Chapter 5 for discussion on the extent that benefits are expected to continue flowing from CAVAC’s agribusiness interventions.)

Figure 11: Irrigation is an expensive way to deliver outreach



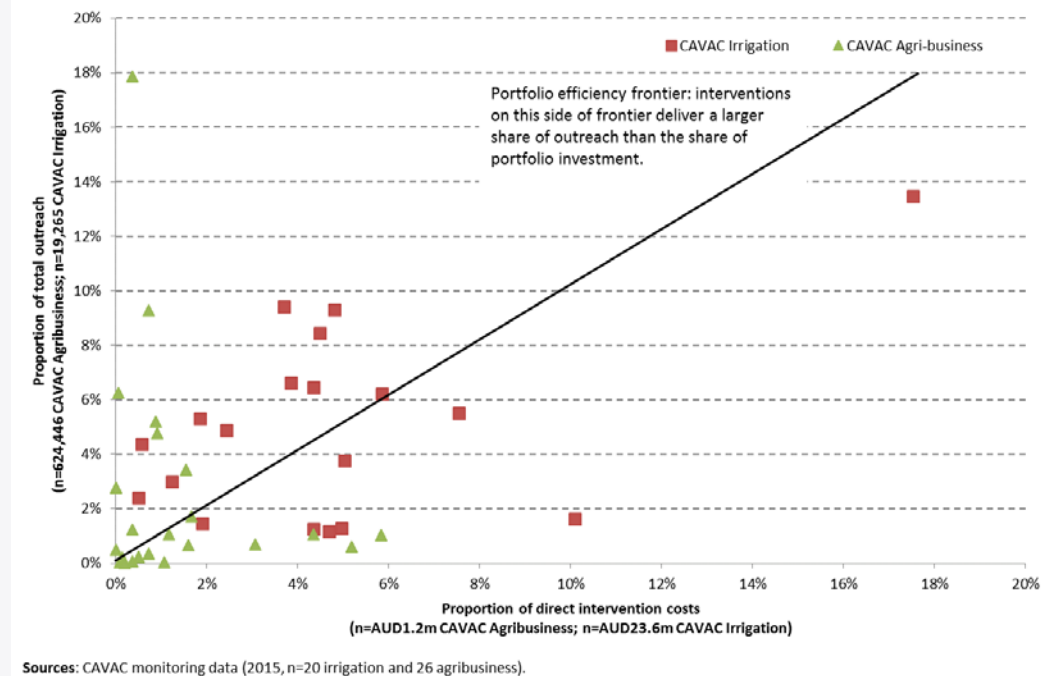
If the agribusiness media and model farmer training interventions are excluded from the CAVAC portfolio analysis, and if the costs of personnel are included, agribusiness is still a more efficient component assuming

^{*} This evaluation report uses the term ‘outreach’ consistent with its specific meaning in the DCED Standard (i.e. number of farming households that measurably benefit from the investment through net attributable income change).

outreach (that is the number of farming households changing their practices) is the criterion for assessing portfolio performance.

An analysis of activity costs as a share of total investment is revealing. CAVAC's agribusiness component and its irrigation component demonstrate similar portfolio distributions of investment and outreach within the components (Figure 12) despite their different overall scale. Each component has interventions distributed around the portfolio efficiency frontier (where a given proportion of investment yields an equal proportion of outreach). This suggests effective portfolio management to optimise outreach from investment within each component.

Figure 12: Efficient portfolio allocation – within components



There are some outliers in the analysis shown in Figure 12. For example, Wat Thmey irrigation intervention used 18% of the direct intervention costs and delivered 13% of the total outreach. The Angko irrigation intervention and improvements used 10% of the costs and delivered 2% of the outreach. The Boeung Leas irrigation intervention used 5% of the activity budget for 1% of the outreach. Two agribusiness interventions were so exceptional that it was considered better to exclude them from this analysis: the model farmer training used 51% of agribusiness activity costs and was projected to deliver 10% of the outreach from this component; and support to media research companies to research consumption habits in rural populations used 11% of the activity budget and was projected to deliver 32% of total outreach. Model farmer training was linked to legacy ACIAR activities in Phase one that are discontinued in Phase two. The media research is discussed further at Section 6.3.

Finding

- » A more effective portfolio review process, using quantitative value for money information from the monitoring system, would improve value for money. This would also provide information to support policy dialogue with Cambodia.

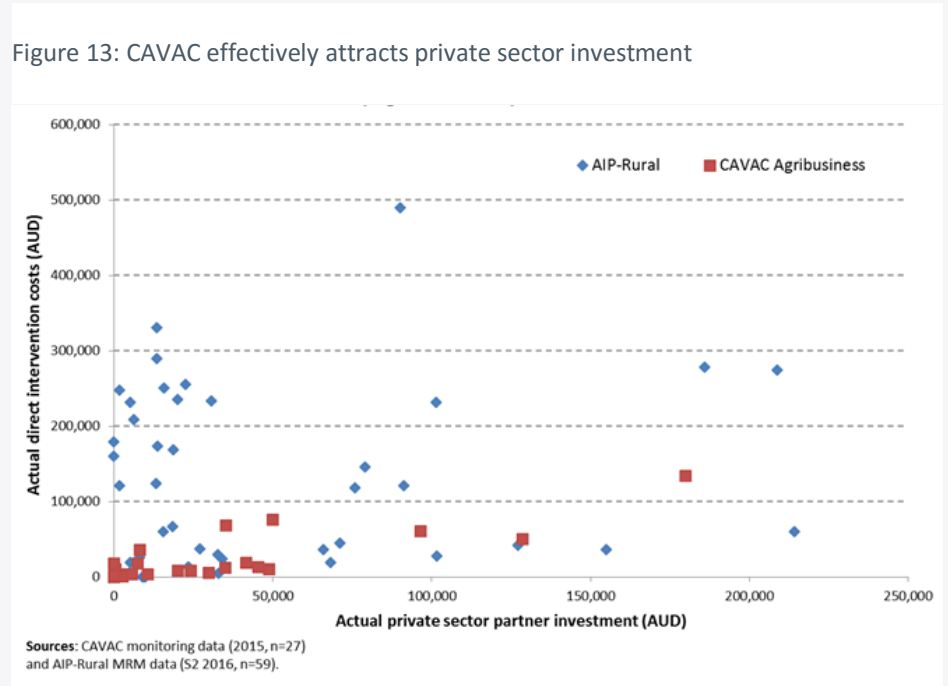
6.3 Private sector leverage

A central element of a MSD approach is use of donor investment to leverage investment by private sector businesses. If an intervention opens up a commercial opportunity for a private sector partner, they have an incentive to co-finance it during adoption and then take it over and invest further during adaption and expansion, so ensuring sustainability. Because of this, it is appropriate to ask how effective CAVAC was in leveraging private sector investment.

There is no private sector co-investment in CAVAC irrigation schemes supported by Australia. This evaluation notes that CAVAC is currently facilitating one private sector company to invest in constructing and managing

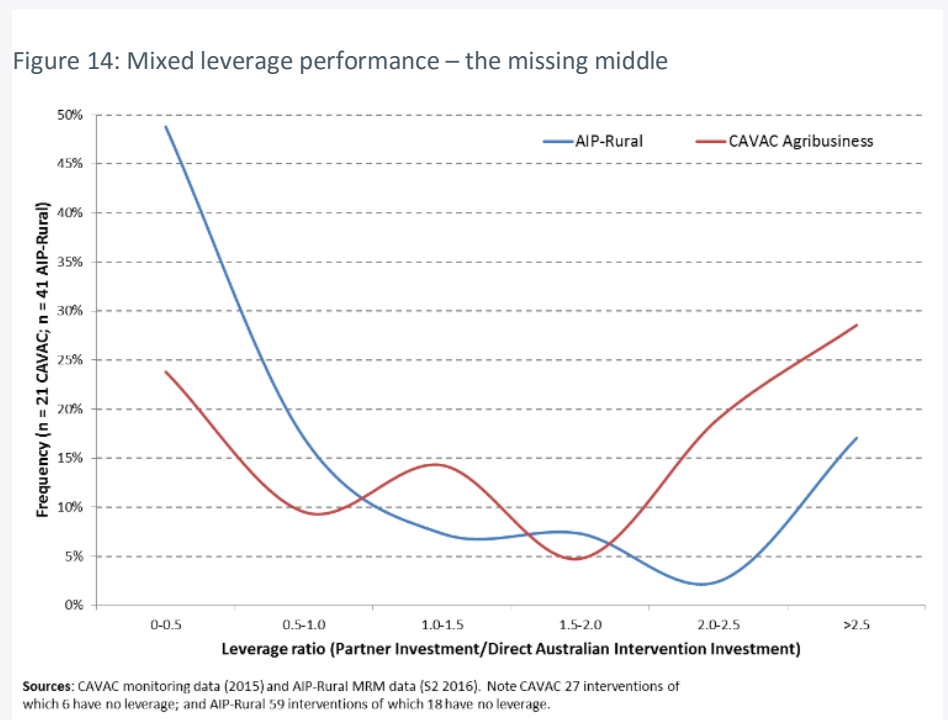
an irrigation scheme in Kampong Cham province – a scheme that would be fully funded by the private sector, using the CAVAC ‘complete scheme’ model. This is an example of market response to program interventions and will represent both leverage and value for money once the investment is committed.

CAVAC reports that farmers who will benefit from access to new irrigation infrastructure provide land for irrigation channels and related infrastructure, which is a form of private sector contribution. DFAT aggregated development results reporting and CAVAC analysis in 2015 estimated this contribution to be around 9% of the capital cost. This is a legitimate projection for calculating total leverage but is not included in the analysis for this evaluation because it is a projection at a constant or average rate across all schemes. As such this analysis focuses on 27 CAVAC agribusiness interventions, and benchmarks them against 59 similar interventions implemented with Australian support under AIP-Rural in eastern Indonesia (Figure 13).*



Overall, CAVAC agribusiness interventions perform well on leverage. On average, actual leverage across the CAVAC agribusiness portfolio was 0.66. That is for every dollar invested by Australia in CAVAC agribusiness interventions, private sector partners invested sixty six cents. This is a good result and reflects the mature stage of implementation. By comparison, average actual leverage across the ‘younger’ AIP-Rural portfolio was 0.38.

These average leverage numbers mask a wide range of facilitated private sector investment. As shown in Figure 14 CAVAC has some high-leverage interventions and some low-leverage interventions, with few in the middle.



CAVAC has a number of interventions with very effective leverage, exceeding 2.5 times the investment by Australia. For example, private sector investment equivalent to 462% was attracted for the Fertiliser Lay Seng intervention; 284% for the Pesticide An Giang intervention; and 280% for the Extension HPC-I intervention. The media research investment achieved even more exceptional leverage– Australian investment of AUD 134,241 attracted private sector

* See: <http://aip-rural.or.id/index.php/about> or <http://aip-rural.or.id/prisma/> for background information.

partner investment exceeding AUD 650,000. However, 22% of CAVAC interventions by number have no private sector investment.

There is an opportunity for CAVAC to monitor and report leverage annually using a normalised approach that accounts for the number of years of investment by the program and its partners.

Finding

- » Overall, CAVAC agribusiness interventions perform well on leverage. On average, for every dollar invested by Australia in CAVAC agribusiness interventions, private sector partners invested sixty six cents.

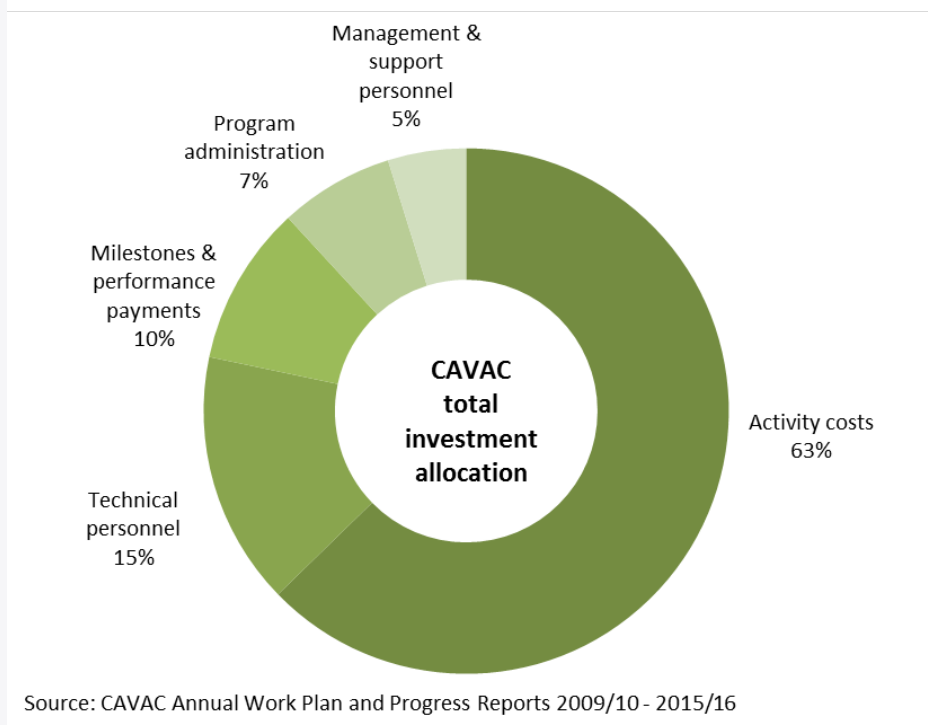
6.4 CAVAC financial management – balancing value-for-money and adaptability

Value for money is ultimately delivered by effective management of a portfolio and the efficient implementation of interventions. So it is sensible to ask if CAVAC’s financial management arrangements support the principles of both value for money and of adaptive management.

From the data provided by CAVAC it is possible to analyse the overall allocation of resources and make a judgement about efficiency. CAVAC allocated nearly two thirds of its total investment to technical delivery (direct activity or intervention costs) (see Figure 15).* This is in line with good practice benchmarks used by DFAT.

As discussed earlier, CAVAC used three-monthly reviews of the portfolio to review actual performance of interventions against plans and strategies. These reviews did not result in a change of portfolio – neither allocation between irrigation and agribusiness nor allocation to interventions was changed as a result. The way the program’s irrigation and agribusiness strategies evolved over the course of Phase one demonstrates responsive management with a focus on performance and value for money.

Figure 15: Allocation of investment by CAVAC



* The technical personnel dedicated to activity implementation accounts for a further 15%.

7. INCLUSIVITY AND CROSS-CUTTING ISSUES

7.1 Gender issues

7.1.1 Changing context

Cambodia has done well on some gender indicators and poorly on others. Women engaged in agricultural work fare relatively well in terms of equality with men in decisions about agricultural production,^{*} ownership of assets, and control over use of income.⁷⁰ Women fare poorly regarding workload, which also negatively impacts on women's ability to take up community leadership roles.[†] Rates of sexual violence against women in Cambodia are high, reflecting social patterns of gender inequality.⁷¹ Of 620 Cambodian women consulted as part of a United Nations' multi-country survey, 67% believed a woman should tolerate violence to keep a family together (the highest percentage of the countries surveyed).[‡] Poorer Cambodian women are at higher risks of domestic violence.⁷³

During CAVAC, Cambodia underwent massive demographic changes that ushered in alternate livelihood opportunities to farming, including work in factories and construction (sectors generally employing younger women and men respectively). (see also Sections 1.1.1 and 1.4). At the same time, the need for unpaid family labour on smallholder farms has diminished somewhat with increasing mechanisation. Farmers noted in focus group discussions that women's and men's roles in farming had changed significantly even over CAVAC's five-year period with increased mechanisation and other opportunities. However, despite these changes, farming roles remained quite gendered.[§] Men generally operated the farm machines, which also replaced women's 'traditional' labour in many cases. Younger women increasingly work in Cambodian factories and earn a significantly higher wage. Older women continue to perform agricultural tasks unaffected by mechanisation or in small-scale enterprises such as handicraft production.

To increase agricultural productivity, address the labour shortage on farms for some farming tasks, and increase women's choice to remain in agriculture, a key MAFF interviewee suggested a new, two-track approach for CAVAC Phase two. First, support should be provided to increase the effectiveness and efficiency of women's 'traditional' agricultural inputs. Second, women should also be supported to engage in 'non-traditional' agricultural tasks, if women wished.

7.1.2 CAVAC Phase one's approach and implementation

CAVAC Phase one targeted its agribusiness interventions based on 'typology studies' of women's and men's agricultural roles. On the plus-side for promoting gender equality, CAVAC's typology studies provided an understanding of roles which did not appear to have been widely documented before. This understanding was a *precondition* for supporting any gender equality change effort. CAVAC was able to suggest

* That is, 'sole or joint decision-making power over food or cash-crop farming, livestock and fisheries, as well as autonomy in agricultural production': see Alkire, S et al 'Measuring Progress Toward Empowerment, Women's Empowerment in Agriculture Index: Baseline Report', USAID, 2014, at p 1

† For workload: see Ibid, and For leadership see: Chhouen, T, Sok, P & Byrne, C 'Citadel of Women: strengthening female leadership in rural Cambodia', *Gender and Development*, <<http://dx.doi.org/10.1080/13552070802465433>> <12/06/16>.

‡ As compared to women surveyed in Sri Lanka (58%), China (12.9%) and Bougainville in Papua New Guinea (12.3%).

§ In rice production, application of fertiliser and pesticides, land ploughing and use of the water pumping machine were mostly done by men, while women were more involved in transplanting, negotiating the rice price and (to a lesser extent) harvesting: CAVAC, 'Farmer Household's Typology Survey [Rice]', January 2012.

amendments to CAVAC's activities to increase women's participation and promote economic efficiency. For example, CAVAC typology studies had revealed that women did not like to travel far from home to buy products.⁷⁴ CAVAC therefore targeted fertiliser retailers at the village level to ensure women also had access to enhanced fertiliser techniques.

However, CAVAC's primary aim was to increase agricultural productivity– not to transform gender roles or promote women's empowerment. Consistent with this, CAVAC's design promised little more than to promote 'equity in capacity building'.⁷⁵ CAVAC's research prior to its agribusiness interventions noted how different demographic groups preferred to access information.⁷⁶ However, program planning and reporting – through annual work plans and the completion report – stopped short of reporting on how CAVAC's interventions responded to shifts that were affecting these different demographic groups. CAVAC's strategies also relied upon CAVAC partners taking gender considerations into account. While CAVAC sought sex-disaggregated reporting, none of the six interviewed agri-input companies indicated that CAVAC had significantly influenced how they approached female clients or otherwise responded to women's needs.

The approach of CAVAC's irrigation component was to increase women's participation in male-dominated FWUC Committees. FWUC Committee members admitted that the roles were poorly paid but that they took on these roles as a civic duty. If elected to a FWUC Committee by the water user community, female committee members were generally elected to the Treasurer role. The CAVAC irrigation team reported however that around half of the women elected to FWUCs then ended up dropping out. This was due to women's 'triple burden' – of extra community work, paid work, and work at home.

CAVAC's specialist resourcing for gender inclusion was minimal. A gender adviser was appointed from 2011 to 2014. However, from mid-2012 onwards her duties changed so that 60% - 70% of her time was devoted to separate agribusiness-specific work and not gender inclusion. CAVAC had no specialist gender resource during its final year.

CAVAC's approach and resourcing for gender inclusion was implicitly sanctioned by DFAT Phnom Penh.* The CAVAC design indicated that CAVAC should fully analyse and consider the gender dimensions of all 'business-enabling environment issues'.⁷⁷ However, this original program component was phased out. In interviews, former DFAT Phnom Penh staff stated that CAVAC had made a 'huge effort' to promote gender inclusion through its direct and indirect capacity development.[†] They agreed that it was not a transformative approach but that they did not expect one. This can be contrasted to current DFAT Phnom Penh's views that 'gender was not a focus of CAVAC [Phase one], but is a focus in CAVAC Phase two ... after a push'. It can also be contrasted to the views of DFAT's gender equality team in their advice to Post during Phase one.⁷⁸

DFAT's subsequent guidance on gender equality and women's economic empowerment, in agriculture (September 2015)⁷⁹ and generally for DFAT programs (February 2016),⁸⁰ outline more specific expectations for particular domains. Donors worldwide are now also attempting to close the 'knowledge gap' on how donor support to agribusiness and value chain projects respond to transformative agendas regarding gender and women's empowerment.[‡]

7.1.3 CAVAC Phase two's proposed approach

CAVAC Phase two's Women's Economic Empowerment and Gender Strategy (January 2017) provides more detailed guidance for gender-sensitive programming than CAVAC's 2010 strategy. For example, for agribusiness interventions the 2017 strategy recommends working within female-dominated parts of the value chain for depth of impact for women.⁸¹ The strategy also recommends focusing on truly

* As shown in section 1.3.3, CAVAC I was given an 'adequate' rating of '4' out of 6 in AQCs for gender inclusion its first three years by former DFAT Phnom Penh staff who were not interviewed. DFAT staff then gave CAVAC I a rating of '5' (a 'good' rating) in AQCs for CAVAC I's final two years.

† That is, typology studies to inform CAVAC I's support for retailers and 'model farmers', and support for FWUCs.

‡ See eg. Bishop, C 'Women's Economic Empowerment and Agribusiness: Opportunities for the gender transformative agenda' [Draft, unpublished], *Global Donor Platform for Rural Development*, Spring 2017.

mainstreaming women's economic empowerment. This aims to achieve impact (of varying depth) for women *and* scale.⁸² Gender transformation is an explicit program goal.* DFAT Phnom Penh indicated that they now emphasise the importance of addressing gender in their interactions with CAVAC. Accordingly, CAVAC Phase two's 2017 gender strategy is a contractual milestone.

Findings

- » *CAVAC efforts on gender were modest relative to DFAT's current expectations. The current phase has adopted a revised approach that elevates the importance of gender equality in CAVAC's activities and outcomes.*

7.2 Disability inclusive development

Disability inclusion did not feature in CAVAC's design and received limited focus in implementation. Following publication of AusAID's Disability Inclusive Development Strategy (November 2008)[†] and the Cambodian government's National Plan of Action for Persons with Disabilities (2009), CAVAC developed a Manual of Operations for the CAVAC Gender and Disability Strategy. The manual stated that the CAVAC team was 'committed to ... *to modelling good practice in project management in regards to disability.*'⁸³ However, the manual went on to say that CAVAC's target group was 'not the poorest of the poor', and consequently people with a disability were 'not a key program focus.'⁸⁴

Efforts to mainstream disability inclusion focussed not on CAVAC program activities but on organisational practices affecting the CAVAC team. This included making the program office and program publications disability-friendly.⁸⁵ Early on CAVAC conducted research so as to better understand the constraints faced by persons with disability in agriculture and the potential to develop CAVAC program-related interventions.⁸⁶ The main recommendation seems to have resulted in a 2012 training, described below. Implementation of the Gender and Disability Strategy was to be reviewed 'at a minimum' on an annual basis to reflect lessons through program activities.⁸⁷ Interviews with CAVAC staff confirmed that an annual review did not occur.

As noted in focus group discussions, farmers with disabilities either continued farming or provided oversight of other family members' farming activities. During 2012, CAVAC provided 'model farmer' training for 210 farmers with disabilities and their families. Eighty-seven percent of these participants (183) were members of disabled peoples' organisations from Kampot province.⁸⁸ A CAVAC staff member noted that participants from Kampot lived in areas affected by landmines. CAVAC staff admitted that this training 'did not go well'. A sample of 16 farmers, who were trained in fertiliser practices, was interviewed by CAVAC. Each farmer participated in three training sessions. When asked whether they had changed their practices as a result of the training, there were only five positive responses (out of a possible 48; 10% influence rate). The most common reasons given for not changing practices were 'no money to apply fertiliser three times' and a preference for previous habits. CAVAC's completion report admitted that CAVAC found it difficult to engage on disability.⁸⁹

Finding

- » *CAVAC did not do much work on disability inclusion apart from its model farmer training in 2012. Disability inclusion was not a feature of CAVAC's design or DFAT Phnom Penh's oversight.*

* This is also in contrast to CAVAC II's original design, which had no such goal. The CAVAC II design document notes that 'CAVAC II will not have gender [sic] as a high-level objective; but it will attempt to ensure gender equality is promoted.' (at p. 33).

[†] AusAID, *Development for All*, November 2008.

7.3 CAVAC's poverty focus

CAVAC gave mixed messages as to its focus on poverty. CAVAC aimed to benefit subsistence smallholder farmers who were capable of producing a marketable surplus, and farmers that could increase their marketable surplus. CAVAC's program logic assumed that by stimulating agricultural and economic growth, the poorest farmers (who would likely remain as subsistence farmers and/ or land-less) would also benefit, either directly or indirectly. Ten years ago, in 2006, the overwhelming majority of subsistence farmers in Cambodia were women (78%).⁹⁰

CAVAC completed various research studies that provided a more nuanced view of the impact of economic growth on poor households. For example, a study of poverty in six rural villages found that:

- targeting interventions in poor communities can significantly reduce poverty, even when the interventions are not targeted to the poorest; and
- the poor do not always benefit from economic growth, but this risk can be minimised by appropriate efforts by Cambodian government and development programs and partners.⁹¹

Other CAVAC studies looked at different degrees of poverty among farmers and pointed out how interventions like CAVAC, focussed on growth, would likely benefit each category of the poor differently.⁹²

CAVAC's research on poverty in its target provinces was comprehensive. However it is not clear from CAVAC reporting whether this shaped future CAVAC activities and, if so, how. During and after CAVAC's interventions, CAVAC did not monitor its impact on income (for its target group of smallholder farmers capable of producing a surplus) or its direct and indirect impact on poverty in its target provinces.

Anecdotal evidence, including from focus group discussions with farmers, suggests there is both a direct and indirect impact on poverty following CAVAC's successful rehabilitation of an irrigation scheme. While increased yield data was captured in CAVAC reporting other indirect impacts also exist but are not recorded. These include access to newly built roads, better access to education and off-farm employment. In some cases for extremely poor labourers, the additional labour needed for this extra production made up for the labouring jobs now done by farm machines.⁹³

The impact on poverty of agribusiness component activities were harder to pinpoint. Focus group discussions revealed barriers for poorer farmers to copy new practices of the more innovative and successful farmers. One group of farmers had received one-off fertiliser training by a CAVAC partner company. These focus group farmers were all in debt. They acknowledged that the yields of a particular 'model farmer' were greater following his improved use of fertiliser and pesticide. However, these focus group farmers had no interest in following his lead. The 'model farmer's' yield had marginally increased but the price of rice had dramatically decreased. The other farmers, being in debt, did not think it worth 'the risk' to copy. The savings in using an agricultural input correctly (for example, fertiliser) was cited by CAVAC but did not appear to be quantified or indeed uppermost in the minds of these poorer, risk-averse farmers.

Finding

- » *CAVAC provided mixed messages on its focus to alleviate poverty. CAVAC's research on its potential to alleviate poverty was suitably nuanced. However, CAVAC ultimately stopped short of measuring its impact on poverty.*

ANNEX ONE: SUMMARY OF FINDINGS AND RECOMMENDATIONS

Recommendations

1: CAVAC should re-visit the idea of developing an influencing strategy, particularly around its irrigation work. Consistent with the broader goals of DFAT and the Australian aid program, CAVAC needs to consider how it can have a broader impact leveraging off the best of its completed irrigation schemes.

2: CAVAC should re-visit its approach to M&E, drawing upon independent expertise, with a view to improving accountability, results measurement and communication. This might include re-instating a short-term M&E specialist on the CAVAC team and/or reaching out to other DFAT MSD programs to compare systems and approaches.

3: Consistent with its goal statement under Phase two, CAVAC should measure and report on net attributable income change for smallholder farming households. The resulting information can be used to allocate resources and select interventions that will maximise the program's impact. It will also assist in establishing a set of clear, measurable targets to aid in program performance assessment and in communicating the program's results.

4: CAVAC should investigate and strategically pursue links between its irrigation, agribusiness and rice milling and export interventions. There is an opportunity under CAVAC Phase two to enable the market to deliver a complete package of inputs and services to targeted farmers alongside enhanced water availability to further improve agricultural productivity and maximise household income. Increased focus on diversification beyond rice will also be critical.

5: CAVAC should support gender equality and women's economic empowerment objectives consistent with DFAT policy settings, with appropriate staff resourcing, staff training and monitoring and evaluation of outcomes.

	Finding (for CAVAC Phase one)	Relevant Recommendations (for CAVAC Phase two)	Reference in this evaluation report (Section)
1	CAVAC's use of monitoring to inform management and improvement of activities is a key strength of the program. However, this focus on management utility also had implications for CAVAC's ability to demonstrate results.	Recommendation 2	Section 3.1
2	CAVAC struggled to identify and consistently monitor and report upon a relevant set of indicators.	Recommendation 2 Recommendation 5	Section 3.2.3
3	The decision not to capture before / after data but rather to base reporting on a mix of both actuals and projections creates a confusing, potentially misleading picture of program performance.	Recommendation 2	Section 3.2.3

4	CAVAC employed a thorough approach to calculating some results and projecting others. Although the program endeavoured to be transparent and was conscious not to over-claim its impact, it struggled to get beyond the complex data and clearly communicate the difference it had made to the lives of poor smallholder farmers.	Recommendation 2 Recommendation 3	Section 3.2.4
5	CAVAC's monitoring and evaluation is fit for neither DFAT nor Cambodian government purposes. Program reporting is based upon unrealistic expectations as to the amount of time and expertise its key stakeholders have to interrogate the program's results. The program needs an approach that helps it to simply and succinctly demonstrate the impact achieved by the program. This is essential for accountability but also for embedding the effectiveness of the program.	Recommendation 1 Recommendation 2 Recommendation 5	Section 3.26
6	CAVAC employed a sound approach to identifying both likely successes and failures and adjusted or discontinued its interventions accordingly.	Recommendation 2 Recommendation 4	Section 3.3
7	Many of the lessons from Phase one have been carried through into the current phase of CAVAC. However, this success relied upon the corporate knowledge of key individuals some of whom are no longer involved with the program. The absence of any strategy to synthesise, document and institutionalise these lessons leaves CAVAC vulnerable should there be further turnover of personnel.	Recommendation 1 Recommendation 2 Recommendation 4	Section 3.3.1
8	CAVAC had a sufficiently diversified portfolio, or range, of higher and lower risk interventions to facilitate flexibility and adaptability.	Recommendation 2 Recommendation 4	Section 3.3.2
9	Program management was generally flexible enough to allow an adaptive approach. However, this was perhaps only possible because a large proportion of expenditure, being that related to irrigation, followed a thoroughly planned implementation schedule that demanded minimal short term adaptation.	Recommendation 5	Section 3.3.3
10	Governance and decision making appears to have been adequate in Phase one but the need to now consider the program's broader influence and the clearly expressed desire for greater engagement by Cambodian government suggests arrangements for consultation and updating on CAVAC progress need to be re-examined.	Recommendation 1	Section 3.3.4
11	This evaluation and CAVAC agree that a number of the early schemes are not sustainable.	Recommendation 2	Section 4.1.2
12	CAVAC changed its approach and this has resulted in a 'proof of concept' for a complete sustainable scheme – not previously attempted in Cambodia.		Section 4.1.2
13	CAVAC deliberately limited its selection of schemes to those with the best chances of success.		Section 4.1.2

14	CAVAC in developing a sustainable ‘proof of concept – complete’ scheme learned a great many valuable lessons. These lessons have not been documented so as to be able to be shared widely beyond the program.	Recommendation 1	Section 4.1.2
15	Irrigation results reported by CAVAC are less than those envisaged in the program design, but broadly consistent with the MTR targets.	Recommendation 2	Section 4.1.3
16	There is evidence of an increase in agricultural production, but the extent of this as reported by CAVAC may be over optimistic.	Recommendation 2	Section 4.1.3
17	The broad areas of focus within the agribusiness component – particularly the fertiliser and pesticide interventions – were appropriate and relevant to intended beneficiaries.	Recommendation 2	Section 4.2.3
18	Actual outreach figures of 214,550 by September 2015 for CAVAC’s agribusiness interventions are plausible.		Section 4.2.3
19	CAVAC’s agribusiness interventions resulted in changes in farming practices among significantly more households than had been originally envisaged. However, a large proportion of CAVAC’s claimed agribusiness outreach remains an unverified projection as of mid-2017.		Section 4.2.3
20	CAVAC can demonstrate a connection between its activities and changes in farmer practices, and the link between these practices and increased yields. However the program was unable to quantify its contribution to increased agricultural output in a robust manner.		Section 4.2.3
21	In consequence, for the agribusiness component it is only possible to partially answer the evaluation question as to whether CAVAC delivered expected increases in trade, productivity and incomes for smallholder farmers.	Recommendation 2 Recommendation 3 Recommendation 5	Section 4.2.3
22	CAVAC has constructed five sustainable schemes, six considered unsustainable and nine considered somewhere in between.	Recommendation 2	Section 5.1
23	The types of support services that CAVAC facilitated– including through agri-input companies, retailers and PDAFF – continue to be available to smallholder farmers in CAVAC’s target provinces.	Recommendation 2 Recommendation 4 Recommendation 5	Section 5.2

24	CAVAC misjudged both the quantity and quality of on-going company support services. This evaluation cannot quantify actual outreach beyond 2015 but believes CAVAC's projections are overly optimistic.	Recommendation 2 Recommendation 5	Section 5.2
25	CAVAC has identified the characteristics of sustainable schemes compared to the traditional schemes and has excellent examples of both approaches. However, there has been no detailed analysis to demonstrate the value for money of the more sustainable CAVAC approach.	Recommendation 1 Recommendation 2 Recommendation 4	Section 5.3.1
26	CAVAC supported long-term changes in Cambodia's rice-based farming systems, particularly in relation to information quality and availability and farmer practices. However, it is not possible to quantify the program's continued impact on yields, incomes or trade.	Recommendation 2 Recommendation 3 Recommendation 4 Recommendation 5	Section 5.3.2
27	The CAVAC complete scheme is more expensive than the traditional PDWRAM approach and whilst the benefits are recognised there is divided opinion as to the affordability of this approach.	Recommendation 1 Recommendation 2	Section 5.4.1
28	A number of issues need to be addressed before the CAVAC model can be adopted more widely across Cambodia, in particular the benefits of the schemes relative to the cost. CAVAC should explore further dialogue with other donors to develop the CAVAC approach to have wider application.		
29	CAVAC has had some impact beyond target areas and groups [with respect to its agribusiness component], but the evaluation team did not find conclusive evidence of copying and crowding-in.	Recommendation 2 Recommendation 5	Section 5.4.2
30	CAVAC's agribusiness interventions supported, and perhaps helped accelerate, the significant change processes underway since 2010 in Cambodia's agricultural input markets. However, it is difficult to determine the extent of change directly attributable to CAVAC.	Recommendation 2 Recommendation 5	Section 5.4.2
31	CAVAC's work with the Cambodian government on pesticides played an important role in the government's policy development and implementation. Having demonstrated its value-add, CAVAC is well-positioned to provide further support in other important areas of agricultural policy.	Recommendation 1	Section 5.4.2

32	While CAVAC's private sector focus is appropriate, CAVAC might have achieved even greater influence across Cambodia's rice-based agricultural systems had it engaged more actively with government, providing clear evidence-based and policy-relevant messages relating to smallholder farmers and the role of the private sector in agriculture.	Recommendation 1 Recommendation 2 Recommendation 3 Recommendation 4 Recommendation 5	Section 5.4.2
33	Overall, CAVAC appears to represent value-for-money. The measured number of households that benefited from the investment and the projected income changes in those households represents a positive return on investment	Recommendation 1 Recommendation 2	Section 6.1
34	CAVAC did not monitor net attributable income change and so it is not possible to assess the overall return on investment.	Recommendation 3 Recommendation 4 Recommendation 5	
35	A more effective portfolio review process, using quantitative value-for-money information from the monitoring system, would improve value for money. This would also provide information to support policy dialogue with Cambodia.	Recommendation 1 Recommendation 2 Recommendation 3 Recommendation 4 Recommendation 5	Section 6.2
36	Overall, CAVAC agribusiness interventions perform well on leverage. On average, for every dollar invested by Australia in CAVAC agribusiness interventions, private sector partners invested sixty six cents.	Recommendation 1 Recommendation 2	Section 6.3
37	CAVAC efforts on gender were modest relative to DFAT's current expectations. The current phase has adopted a revised approach which elevates the importance of gender equality in CAVAC's activities and outcomes.	Recommendation 5	Section 7.1.3
38	CAVAC did not do much work on disability inclusion apart from its model farmer training in 2012. Disability inclusion was not a feature of CAVAC's design or DFAT Phnom Penh's oversight.	Recommendation 1 Recommendation 2 Recommendation 5	Section 7.2

39	CAVAC provided mixed messages on its focus to alleviate poverty. CAVAC's research on its potential to alleviate poverty was suitably nuanced. However, CAVAC ultimately stopped short of measuring its impact on poverty.	Recommendation 1 Recommendation 2 Recommendation 3 Recommendation 5	Section 7.3
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ANNEX TWO: EVALUATION FRAMEWORK

Evaluation question / sub-question	Evidence required	Data collection method & source	Analytical approach
Sustainability: Are the benefits from CAVAC likely to be sustained?			
Have improvements in yields, incomes and trade achieved during Phase one been maintained? (S1)	1.1. If improvements have not been sustained what factors have contributed to the decline?	<p>Document review: CAVAC M&E data including Knowledge Attitude Practice (KAP) surveys, work plans that identify start-finish dates for individual activities.</p> <p>Key informant interviews: Water user groups, small holder farmers, CAVAC supported businesses</p>	<p>Test for changes post intervention by running trend analysis on CAVAC M&E data.</p> <p>Explore any apparent decline.</p>
Have the support services that CAVAC assisted in making available to smallholder farming households continued following removal of the CAVAC subsidy? (S2)	1.2. Are CAVAC supported interventions (e.g. training in fertiliser use) continuing?	<p>Focus group meetings: Water user groups, small holder farmers, CAVAC supported businesses, other (non-CAVAC supported) business</p>	<p>Test for continuation of CAVAC supported interventions.</p>
How successful has CAVAC been in ensuring that irrigation infrastructure, once renovated, is appropriately managed and maintained? (S3)	<p>1.3. Are CAVAC supported water user groups still functioning? Are water user groups working effectively with government authorities? Have appropriate budget allocations been made for repairs and maintenance?</p> <p>1.4. Does visual inspection of a sample of CAVAC irrigation schemes confirm they remain in good working order?</p> <p>1.5. Were the Local water supply system designed with Level of Service (LOS) fit for purpose with agreed water sharing and system operation arrangements - it will only be maintained if it meets the needs?</p> <p>1.6. Are there other aspects of water management that limit outcomes? i.e. Government Policy/Water resource management/irrigation (primary/secondary canals) system management</p>	<p>Key informant interviews: MOWRAM & MAFF officials</p> <p>Focus group meeting: Water user groups, smallholder farmers.</p> <p>Field inspection: purposeful sample of at least 6 irrigation schemes</p>	<p>Test that maintenance and management arrangements remain in place.</p> <p>Visual inspection of selected irrigation schemes.</p>

Evaluation question / sub-question	Evidence required	Data collection method & source	Analytical approach
Effectiveness: Was CAVAC effective in achieving its intended outcomes?			
Did CAVAC deliver projected increases in productivity, trade and incomes for smallholder farming households in target areas? (E1)	<p>The degree to which CAVAC's actual results reflect original and/or revised projections. Data required includes:</p> <p>2.1. Additional area newly serviced by CAVAC supported irrigation infrastructure per annum (ha, 2011 – 2016)</p> <p>2.2. Additional smallholder farming households newly connected to CAVAC supported irrigation infrastructure per annum (2011 – 2016).</p> <p>2.3. Additional paddy production per annum (tonnes, 2011 – 2016) disaggregated by location (province, district) component (agribusiness or irrigation or both), intervention type (e.g. increased use of fertiliser, pesticides, post-harvest processing etc.).</p> <p>2.4. Number of smallholder farming households reached by CAVAC per annum (2011 – 2016) disaggregated by sex, location (province, district) component (agribusiness or irrigation or both), intervention type (e.g. increased use of fertiliser, pesticides, post-harvest processing etc.)</p>	<p>Document review: CAVAC M&E team to extract data from M&E system.</p> <p>(Data to be made available in MS Excel)</p>	<p>Map planned outcomes against actual results.</p> <p>Assess strength of attribution claims.</p> <p>Compare results between components, intervention types, years, and locations.</p> <p>Compare results between CAVAC and non-CAVAC provinces and districts, before and after intervention.</p>
What were the relative contributions of each CAVAC component to any overall increase in productivity, trade and incomes? (E2)	<p>2.5. Additional volume of paddy/vegetables/other exported per annum (tonnes, 2011 – 2016) and value of additional turnover of intermediary service providers (ISPs) in USD.</p> <p>2.6. Indicators for adoption and also changes in yield disaggregated by location and intervention type, for each year (number of farming households, and net tonnes yield 2011 – 2016).</p> <p>2.7. Official Cambodian government agricultural statistics on crop yields, irrigation coverage, export tonnage etc. (by province, district, per annum)</p> <p>2.8. Given the mixed sources of income for rural households, how relevant is investment in irrigation compared with other interventions?</p>		
Did CAVAC have an impact beyond target areas and groups? Is there evidence of copying and crowding-in	<p>2.9. To what degree has the example set by model farmers been adopted?</p> <p>2.10. Is there evidence of businesses/suppliers in non-CAVAC provinces adopting CAVAC approaches</p>	<p>Document review: Examine CAVAC docs for evidence (completion report)</p>	<p>Test for examples of broader impact.</p>

following examples supported by CAVAC? (I1)	2.11. What evidence is there of non-CAVAC supported businesses adopting business practices similar to those supported by CAVAC	Key informant interviews: Industry umbrella groups, sample of CAVAC supported and other (non-supported) businesses. Sample of model and non-model farmers	
Did CAVAC successfully influence Cambodian government policy, economic reforms or other systemic improvements, which benefit smallholder-farming households? (I2)	2.12. Are there any examples of areas where CAVAC has influenced government policy? 2.13. Are there any examples of systemic benefits created by CAVAC?	Document review: CAVAC reporting Key informant interviews: CAVAC staff, MAFF, MEF & MOWRAM officials, ACIAR	Test for examples of broader impact. Test for examples of copying and/or crowding in.
Evaluation question / sub-question	Evidence required	Data collection method & source	Analytical approach
Efficiency: Does CAVAC represent value for money, in terms of returns to smallholder farming households and any broader impact?			
What is the ratio of increased financial returns to smallholder farming household relative to funds invested through CAVAC? How do these ratios compare across the different components and interventions? (VFM1)	3.1. CAVAC direct intervention costs: disaggregated by location, component, intervention type and year (2010- 2016). Detail on CAVAC direct and overhead costs also required. DFAT/AusAID costs (e.g. design, oversight, MTR) to be excluded. 3.2. What is the cost per ha of treated area and what would the cost be extrapolated to the rest of 2,500 schemes? 3.3. Could a different Level of Service (LoS) or approach to irrigation infrastructure have got a more cost effective outcome? 3.4. Increased production cost in tonnes of rice per \$ spent is a suggested measure and the range of the schemes is enormous - why? 3.5. How many households benefit from agribusiness interventions? Do Income projections focus on net attributable income change rather than gross?	Document review: CAVAC M&E team to extract data from M&E system. (Data to be made available in MS Excel)	Compare actual ratios to earlier projections, to those outlined in the MTR and to other similar investments (AIP Rural, DfID & CGAP projects)
To what extent were resources prioritised to those areas offering and/or delivering the highest returns? (VFM2)	3.6. Additional smallholder farming households newly connected to CAVAC supported irrigation infrastructure per annum (2011 – 2016). Same data as 2.2. 3.7. Number of smallholder farming households reached by CAVAC per annum (2011 – 2016) disaggregated by location (province, district) component (agribusiness or irrigation or both),	Document review: CAVAC reports & work plans, CAVAC Phase two design document	Test for link between returns and subsequent budget allocation

	<p>intervention type (e.g. increased use of fertiliser, pesticides, post-harvest processing etc.). Same data as 2.4.</p> <p>3.8. How well aligned are the irrigation and agribusiness interventions?</p>	<p>Key informant interviews: CAVAC Phase two design team, DFAT investment managers, CAVAC implementing team, ACIAR</p>	
<p>How effective was CAVAC in leveraging private sector investment? (VFM3)</p>	<p>3.9. Value of CAVAC intervention cash costs per annum (USD, 2011 – 2016) disaggregated by intervention.</p> <p>3.10. Value of actual additional cash investments by partner per annum (USD, 2011 – 2016) disaggregated by intervention</p> <p>3.11. Evidence of continued investment by CAVAC partners following conclusion of CAVAC support</p> <p>3.12. Evidence of new investment by other business in areas similar to that supported by CAVAC</p> <p>3.13. How realistic is the reliance on Private Water Sellers (PWS) to provide tertiary system infrastructure?</p>	<p>Document review: CAVAC M&E team to extract data from M&E system. (Data to be made available in MS Excel)</p> <p>Key informant interviews: sample of CAVAC supported businesses and other businesses</p>	<p>Calculate ratio of CAVAC support to private sector investment.</p> <p>Synthesise and triangulate feedback from CAVAC supported business owners</p>
<p>Did CAVAC's financial management arrangements support both the principles of value for money and of adaptive management? (VFM4)</p>	<p>3.14. How were work plan and contract targets derived?</p> <p>3.15. How does post budget for program expenditure? How are over or underspends managed?</p> <p>3.16. What are the implications of contractual incentives around timely expenditure and achievement of results? Did the operational contractor's contract allow reasonable shifts in allocation between contract budget lines?</p> <p>3.17. Identify any examples of substantial changes in approach and/or programming and ascertain how these changes were managed.</p> <p>3.18. Actual direct intervention cash costs (AUD/year)</p> <p>3.19. Number of participating farm households (HH/year) and \$/HH for the different schemes.</p>	<p>Document review: Operational contractor's contract, CAVAC work plans.</p> <p>Key informant interviews: current and former staff DFAT post, current and former members of CAVAC implementing team, ACIAR</p>	<p>Synthesis and triangulation of interview data</p>

Evaluation question / sub-question	Evidence required	Data collection method & source	Analytical approach
Inclusivity: Did CAVAC take adequate account of the needs of women, people with disabilities and the poor?			
Did CAVAC employ an effective strategy for engaging women and enabling them to contribute fully to increased agricultural productivity? (W1)	4.1. Were/are CAVAC Phase 1 & 2 gender strategies adequate, implemented and reported against? 4.2. How did CAVAC monitor the impact of, and involvement in, its activities on/ by Cambodian women and important sub-groups of Cambodian women? 4.3. What if any sex disaggregated data did CAVAC collect? Was program data disaggregated by other important demographic variables? (E.g. ethnicity, socio-economic characteristics such as migration affects, marital status, disability, age and/ or other). 4.4. Are there any examples of how CAVAC has altered its approach in order to improve outcomes for women and/or sub-groups of women? 4.5. What are female interviewees' most pressing needs for action, according to them? Has CAVAC responded to these needs? 4.6. Labour productivity is a key factor in improving household income - did it change that particularly for women	Document review: CAVAC gender strategies & studies, sex disaggregated CAVAC M&E data, CAVAC work plans and progress reports. Key informant interviews: DFAT post, DFAT gender adviser, CAVAC implementing team, Focus group meeting: local women	Describe CAVAC's approach to ensuring gender equality. Test for monitoring against gender outcomes and adaptation of the approach if necessary.
Noting that CAVAC did generally not work directly with smallholder farming households how did it ensure that services it supported were benefiting the poor? (P1)	4.7. What if any poverty analysis did CAVAC undertake in each activity location? Were CAVAC activities explicitly targeted to the poor? 4.8. How did CAVAC monitor the impact of its activities on the end user / poor?	Document review: poverty analysis, project design, work plans and progress report. Key informant interviews: DFAT post, CAVAC implementing team, CAVAC supported business, Focus group meeting: Small holder farmers	Describe CAVAC's approach to the poor. Test for monitoring of impact on the poor.
Did the CAVAC monitoring and results measurement (MRM) system provide sufficient disaggregated data to help CAVAC understand and improve the targeting of women, the disabled and poor farmers? (WP1)	4.9. Did CAVAC collect sex and poverty data? If so, how was this used to ensure the appropriate targeting of CAVAC activities? Same data as 4.2 to 4.7.	Document Review: CAVAC M&E system, transmission mechanism study, CAVAC gender strategy, 2011 CAVAC gender and disability studies. Key informant interviews: CAVAC implementing team	Test for monitoring of impact on women and the poor.

Evaluation question / sub-question	Evidence required	Data collection method & source	Analytical approach
Innovation: Did CAVAC successfully integrate innovation, flexibility and adaptation into its approach?			
Did CAVAC's governance, management and decision making processes support a flexible and adaptive approach? (IV1)	5.1. How often did the CAVAC National Steering Committee meet? What were the typical agenda items? Do meeting minutes suggest regular discussion and approval of proposed changes in approach and/or programming? 5.2. How often did the CAVAC implementing team meet with DFAT? What items were typically discussed?	Document review: Operational contractor's contract, work plans, steering committee agenda and minutes, six-monthly reports, monthly exception reports. Key informant interviews: DFAT Post, CAVAC implementing team, National Steering committee members, ACIAR	Describe key governance features based on document review. Test and triangulate these features with stakeholder interviews
Were contractual and annual work plan requirements consistent with an adaptive management approach? (IV2)	5.3. Were any contract and/or work plan amendments required because of changes to approach and/or programming? 5.4. Did CAVAC's project management arrangements support flexibility and adaptive managements (e.g. portfolio monitoring, internal meetings) 5.5. Are the irrigation systems innovative for Cambodia in terms of technology/policy/management/level of service?		
Did CAVAC's portfolio of activities provide a sufficiently diversified and balanced approach to both impact and risk? (IV3)	5.6. Does analysis of data identified at 2.1 to 2.6 above suggest a mix of intervention types, costs and returns? 5.7. To what extent does CAVAC subject each new intervention type and partner to risk analysis prior to commencement? How are risks monitoring and managed? 5.8. Probe for examples of high risk, high return or low risk, guaranteed return investment types. 5.9. Timing is key - was the project able to work on the key issues of the day?	Document review: CAVAC work plans, risk matrices Key informant interviews: DFAT post, CAVAC implementing team	Analyse documents for discussion on risk. Test in interviews how considerations of risk versus returns were factored into decision-making.
Evaluation question / sub-question	Evidence required	Data collection method & source	Analytical approach
Monitoring & Evaluation: Were CAVAC's monitoring and evaluation arrangements fit for purpose?			
Did CAVAC maintain a sufficiently robust and transparent approach to calculating expected results? How much confidence can key stakeholders place in CAVAC projections? (ME1)	6.1. Did CAVAC meet the DCED standard for projected results? Were assumptions reasonable? Were identified success/failure factors appropriate? 6.2. Does CAVAC reporting adequately present results achieved against key projections? Is the basis of calculations adequately described? Is data sufficiently robust to support VFM analysis?	Document review: CAVAC 2012 MTR, DCED audit, CAVAC reporting Key informant interviews: CAVAC M&E staff	Analyse M&E approach and test for fidelity in its implementation

<p>Does CAVAC have adequate measures in place to verify actual results achieved? (ME2)</p>	<p>6.3. Are surveys or other data collection measures used to test actual results against projections? If so what sampling, survey testing and other approaches are used to ensure statistical significance, accuracy and reliability?</p> <p>6.4. Given the purpose of CAVAC, how is income change monitored in farming households attributable to program interventions?</p>		
<p>How was the success or failure of trial activities identified? To what extent has information coming from CAVAC's monitoring and evaluation system helped improve existing activities and future work plans. (ME3)</p>	<p>6.5. How does CAVAC's M&E system operate? Are clear measures of success/failure identified in advance? How frequently is data collected? How is it analysed and used? How often and in what format is M&E data provided to DFAT and the National Steering Committee?</p> <p>6.6. How has CAVAC's approach and work program evolve over time? What was the rationale behind any key changes?</p> <p>6.7. Is there an apparent link between analyses of M&E data and subsequent work plans?</p> <p>6.8. What examples are there of M&E data being used to identify failure (or short comings) and the discontinuation of activities or success and the scaling up of activities?</p>	<p>Document review: CAVAC M&E manual, CAVAC progress reports, CAVAC work plans</p> <p>Key informant interviews: DFAT Post, CAVAC implementing team, steering committee members, ACIAR.</p>	<p>Test influence of CAVAC M&E data</p>
<p>Have lessons emerging from Phase one, including those captured in the mid-term review, been effectively integrated into the current phase. (ME4)</p>	<p>6.9. Have the recommendations of the 2012 MTR been fully implemented.</p>	<p>Document review: CAVAC 2012 MTR & management response, AQC reports, DCED audit, CAVAC documentation of P1 lessons learned, DCED standard</p> <p>Key informant interviews: current and former staff from DFAT Post, current and former CAVAC M&E team</p>	<p>Test for analysis and use of M&E data</p>

Scheme Name	Flooded/No n-flooded (F/N)	No of Rice crops / year	Before: Constr. Rainfed (MT/HA)	Before: Constr. EWSR/Rec. (MT/HA)	After: Dry season irrigated (MT/HA)	After: Early wet season Irrigated (MT/HA)	After: Recession with suppl. Irr (MT/HA)	Yield increase at Mid 2015 (MT)	Yield increase potential (MT)	No of HH's	Average landholding /HH in HA	Additional income (USD)
Krapum Chouk	F	2	2.5	3.0	6.0	4.0	6.0	11,441	11,562	839	1.56	2,312,400
Kveng Tayi	F	2	2.5	3.0	6.0	4.0	6.0	9,097	9,496	579	1.95	1,899,120
Tumnob Lork	F	2	2.5	3.0	5.5	4.5	5.5	11,427	11,427	1,243	1.21	2,285,440
Prey Rumdeng	F	2	2.5	3.0	5.5	4.5	5.5	13,431	15,364	1,625	1.32	3,072,780
So Hang	F	2	2.5	3.3	5.5	4.5	5.5	8,560	9,894	1,062	1.39	1,978,800
Rokar Chhouk	F	2	2.5	3.5	6.0	4.5	5.5	8,066	10,983	1,024	1.22	2,196,600
Wat Thmey	F/N	2/3	2.5	3.5	6.0	4.5	5.5	23,247	23,244	2,594	0.87	4,648,720
Prey Tonle	F	2	2.5	4.0	7.0	6.0	6.5	2,678	4,878	460	1.00	975,600
O Kak	N	3	2.0	3.5	6.5	5.5	6.0	1,436	2,755	240	1.00	551,000
Sbov Andet	F/N	2/3	2.0	3.5	6.5	5.5	6.0	12,400	14,454	1,196	1.00	2,890,800
Thnoat	F/N	2/3	2.5	4.0	7.0	6.0	6.5	11,748	18,250	1,790	1.00	3,650,000
Spean Touch	N	3	2.5	4.0	7.0	6.0	6.5	5,171	27,429	1,815	0.92	5,485,700
Prey Leu	N	3	2.5	3.5	6.5	5.5	6.0	6,118	14,075	942	0.96	2,815,000
Hay Saun	N	3	2.5	3.5	4.5	3.5	4.0	3,683	6,157	724	0.89	1,231,300
Chamlong Chray	N	3	2.5	3.0	4.5	3.5	4.0	1,129	2,922	225	1.36	584,400
Reservoir 77	N	3	2.0			3.0	3.5	375	1,125	280	0.89	225,000
Thnoat Chum	F	2	2.5	4.0	6.0	5.5	5.5	5,215	9,840	1,275	0.94	1,968,000
Angko + improvement	F/N	2/3	3.0	5.0	7.0	5.5	6.5	6,594	8,459	313	3.51	1,691,800
Boeung Leas	F/N	2/3	3.5	4.0	7.0	5.5	6.5	833	1,873	250	1.20	374,500
6 January SC1,2 and 3	N	3	2.0	3.5	5.0	4.5	5.0	3,969	14,276	789	1.84	2,855,200
TOTALS/AVERAGE			2.5	3.6	6.1	4.8	5.6	146,615	218,461	19,265	1.30	43,692,160

ANNEX FOUR: AGRIBUSINESS AND RELATED INTERVENTIONS UNDER CAVAC PHASE ONE 54

Partners	Main Activities	Period of agreement/ activity	Actual outreach by Dec 2015 (households)	Projected outreach by Dec 2017 (households)
Fertiliser			102,066	185,426
Heng Pich Chhay (HPC) I	Field demonstrations; half-day training / workshop on rice cultivation; staff training in Vietnam	Jul 2010 – Dec 2012		[pilot – not counted]
Ye Tak I	Ye Tak's retailer training at national level Hiring of international expert in quality assurance system to assess the whole supply chain of Ye Tak's products and relevant stakeholders along the chain Improvement to national retailer training, applied to provincial level	Apr 2011 – Feb 2012	4,273	4,273
12 companies	Three-week training to 12 fertiliser companies' staff on fertiliser use in rice production, participatory methodology, and business case	Sep 2012 – Mar 2013	12,825	32,490
Bayon Heritage	2-week staff training on rice and vegetable production techniques, and participatory extension methodology	Oct 2012–May 2013	68,092	111,595
HPC II	Mentoring HPC's staff to conduct effective retailer training with four pilots One hundred and four village retailer training sessions and conducting semi field experimentation to identify better fertilizer recommendation	Apr 2013 – Dec 2014	4,186	4,186
YeTak II	Seven village retailer trainings; retailer field demonstration trainings. Twenty-four sets of field demos starting with farmer meeting before field demo, field demo, and field day	Jun 2013 – Nov 2015	0	10,614
Malysan	Staff capacity building in participatory methodology to conduct farmer meeting and field demonstration	Oct 2013 – Dec2014	260	364
Papaya	Improvement on field demonstration management with development of tailored field demo guideline with the implementation of pilot paddy field demos and seven field days	Nov 2013 – Jun 2015	78	123
Lay Seng	Staff capacity building in rice production knowledge and participatory methodology Preparation of an 'effective farmer meeting' guideline and on the job staff training via four farmer meetings Field demonstration management guideline with four pilot field demos and field days	Mar 2014 – Jun 2015	5,159	15,248
Anachak	Fertiliser field experiment based on soil type. The objective is to help the company formulate its site-specific fertiliser recommendations and continuing updating them	Sep 2014 –Jul 2015	0	6,533 ⁵⁵
Pesticides			71,208	168,717
Royal University of Agriculture; & MAFF	Contract with RUA to prepare a handbook on the use of pesticides; then working with MAFF to finalise an officially sanctioned manual on application of approved pesticides. CAVAC also funded MAFF to disseminate the manual through a workshop	Oct 2012–Sep 2013		-
Provincial Departments of Agriculture (PDAFFs)	Improving the quality of the compulsory training provided by PDAFFs to agro-chemical retailers – for instance including technical content and discussion of the business case for providing advice to farmers. Model farmer training including 'roadshow'. Establishment of PDAFF help desks	Sep 2013–Nov 2014	20,011	21,458

⁵⁴ Sources: CAVAC Phase one Completion Report, including project summary annexes.

⁵⁵ Not achieved because the company suspended operations in July 2015.

Queensland Alliance for Agriculture and Food Innovation	Contract for development of a rice pest electronic diagnostic tool, later named 'RaPiD', which could underpin all companies' strategies to help farmers choose the right solutions for the major pests. This was subsequently offered free to all reputable companies that submitted a credible plan on how they would incorporate the tool in a better system to support farmers	Dec 2013 – May 2015		
Nokor Thom I	Staff capacity building on pest management on rice and vegetable so that Nokor Thom can improve their farmer training, long-term field demonstrations and emergency interventions	May 2011- Nov 2012	3,268	3,268
Nokor Thom II	Information Dissemination Strategy Development, staff training and customisation of "RaPiD" with pest management solutions using Nokor Thom's products	Apr 2014-May 2015	3,187	3,187
An Giang	Retailer training (nationwide) Farmer workshops	Jan 2014- Sep 15	43,446	57,957
SPK	Improving farmer meetings using effective material and participatory training methodology. Building staff capacity to conduct farmer meetings	2013-14Jun 2012-Oct 2014	1,296	1,296
Angkor Green	Customisation of 'RaPiD' diagnostic tool with treatment solutions using Angkor Green products. Installation of RaPiD on tablet devices and training of Angkor Green staff on its use Improvement of farmer training, emergency intervention, village based farmer meetings, product field demonstrations and individual consultations with farmers	Dec 2014-Jul 2015	0	7,665
Nileda	Customisation of RaPiD diagnostic tool with treatment solutions using Nileda's products. Installation and staff orientation on use of 'RaPiD' so that Nileda staff can improve their information dissemination services such as field demonstrations, individual consultations and outbreak interventions in the field, individual consultations at retailers' premises and farmer meetings	Nov 2014-Aug 2015	0	38,991
Lay Seng	Farmer meetings and individual consultations, using 'RaPiD' diagnostic tool	Mar 2014-Jun 2015	0	14,542
Hen Chen	Customisation of 'RaPiD' diagnostic tool with treatment solutions using Hen Chen's products. Installation and staff orientation on use of 'RaPiD', to improve Hen Chen's information services such as field demonstrations, farmer meetings, individual consultations, phone advice and direct intervention in the field during outbreaks	Jan 2015-Sep 2015	0	17,363
United Cambodia Agriculture (UCA)	Customization of 'RaPiD' diagnostic tool with treatment solutions using UCA products, to improve individual consultations with farmers and farmer meetings	Nov 2014-Sep 2015	0	2,990
Seed (vegetable)			0	9,400
-	Training of seed retailers in the three CAVAC provinces (seed companies participated, but not formal partners)			na
East-West Seeds	Partnership to enhance farmers' agronomic knowledge; provide relevant agro-inputs including high-yielding vegetable seeds, seedling trays, trellis netting, plastic mulch; also to build stronger relationships of market actors to improve access to market information for farmers in core vegetable-producing areas (i.e. not confined to CAVAC target provinces). In the first phase EWS established 160 field demonstrations, conducted 85 field days and 24 training sessions for 35 input retailers and 48 vegetable collectors both collectively and individually, and developed cultivation leaflets for nine different crops. In the second phase, the focus shifted away from demonstration farms towards more permanent support. EWS established three catalogue farms with field days and 30 cultivation and variety trials, conducted two collector workshops, and translated various extension materials.	Feb 2012-Sep 2015		3,700
Pacific Seeds (Unimart)	CAVAC supported Pacific Seeds (maize seed specialists) to develop staff capacity and establish training methodologies; also supported its development of UNIMART, a one stop shop for products and services for maize and other crops. CAVAC worked with UNIMART to establish methodologies for mobile farmer training; and in-situ training for larger stakeholders such as retailers and cooperatives.	Dec 2013- Sep 2015		5,700

Model farmers (MF)			59,301
-	<p>Evolved from farmer field schools conducted under ACIAR activities. Began with focus group discussions to better understand the roles, training needs and interests of model farmers. Training initially focused on proper fertiliser use and seed storage; pesticide use later added to the wet season training curriculum. Three main activities to improve model farmers' knowledge and practices, and their consequent impact on the broader farm community:</p> <p>Wet season (WS) training – 1,125 trainings involving 13,005 model farmer households Dry season (DS) training – 686 trainings involving 9,336 households (limited impact; discontinued) Dry season road show – particularly innovative 'super' model farmers were identified; their practices assessed by agricultural specialists; and 113 roadshows conducted whereby the 'super' farmers could inspire participating model farmers (total 2379) with innovative solutions to their farming problems</p>	2010-15	WS training: 49,449 DS roadshow: 9,852
Media interventions			[196,870]
Asia Master	Adding agriculture to its existing Call Centre. The activity included developing agricultural content, building capacity of its agents and promoting the service	2011-2015	na
-	CAVAC commissioned research into media habits in rural areas, demonstrating the potential commercial viability of television programming focused on agricultural issues.		-
Delight (media production company)	CAVAC supported Delight to develop a 27-episode agricultural / rural drama series for TV, through: capacity building to produce a good quality agriculture drama; linking Delight to a network of agricultural specialists to ensure quality content; production of a pilot episode; and media sponsorship events to present the series to the market. CAVAC required Delight to sign a contract with a TV station to broadcast the drama. CAVAC subsequently contributed a small proportion of the total production cost of the series.	Aug 2011-Oct 2014	['Farmer perception': 196,893; Not counted as Outreach]
Indochina Research	Promoting media research that impacted on rural people via support for two waves of media consumption research and an event to promote the findings of the first wave	May 2013 – Oct 2014	na
Feedback Research	Supporting four waves of TV ratings	August 2015-October 2015	na
Export⁵⁶			2,078
Baitang Mill	Introduction of 'contract farming' aimed at improving the quality of paddy available to Baitang. CAVAC trained Baitang staff in paddy and seed production of the two most important fragrant rice varieties. The mill then advised community members how to improve the quality of their paddy by producing and/or using quality seed. Quality paddy is rewarded by Baitang with higher prices.	Mar 2012-Dec 2014	2,078
Federation of Cambodian Rice Miller Associations (FCRMA)	Assisting FCRMA and lead millers to explore new markets for Cambodian milled rice and find a model for successful export. Market research identified the European Union as the market with the highest potential due to tax concessions through the 'Everything but Arms' treaty with Cambodia. CAVAC shared costs for FCRMA marketing visits overseas and for new potential buyers visiting Cambodia.	Mar 2012-Jul 2015	[Not claimed]

⁵⁶ In late 2010, the Cambodian government announced a policy to increase exports from a little more than 200,000 tons of milled rice to one million tons in 2015. Although it was not in the original design of CAVAC both the Australian and Cambodian Governments requested CAVAC to contribute towards improving rice exports.

Business Enabling Environment (BEE)				
Capacity support to provincial departments (PDAFFs) and GDA	<p>104 output-based contracts signed with PDAFFs in the three CAVAC provinces. Activities included:</p> <ul style="list-style-type: none"> • 282 ha of laser land levelling demonstrations (visited by over 2000 farmers, students, academics, MAFF minister and senior officials, PDAFF directors, officers from other provinces) • over 500 PDAFF field demonstrations on 10 rice varieties promoted by MAFF • establishment of 64 agricultural cooperatives and provision of 16 training sessions to strengthen their capacity in areas such as business planning, management and leadership, financial systems and bookkeeping • four agricultural cooperative forums organised, involving input companies, rice traders and millers and technical experts • 65 training sessions on post-harvest techniques conducted by the three PDAFFs, involving 1,569 model farmers, rice millers, commune and village extension workers • 10 international study visits for PDAFF staff to the Philippines, Thailand, Vietnam, China and Lao PDR, mainly focused on new techniques in rice production, agricultural cooperative development, and export strategies • 20 local study visits to allow agricultural cooperative members, model farmers and village and commune extension workers to visit and exchange experiences, techniques and views with other farmers in and outside their provinces • 46 training sessions on rice seed production conducted by PDAFFs with 1,884 farmers to help disseminate MAFF's recommended seed varieties • 260 farmer meetings involving more than 10,000 participants, to discuss experiences and challenges in rice production, with PDAFF experts available to answer questions • 10 fertiliser and pesticide law workshops involving about 1,000 fertiliser and pesticide retailers, PDAFF officers and local authorities • A study to understand the cassava plantation practice in Kampong Thom, followed by a dissemination workshop with 81 participants. 	2012-15	49,848	[52,800 'reached'; but impacts not measured]
Policy facility for RGC and Govt of Australia	Used once only (by Australian Government), to support a census. Results were not available at the time of Completion Report preparation.			-
Public private dialogue support	Three contracts with the Asia Foundation: (a) to explore possibilities for public private dialogue on infrastructure investments such as market places; (b) to conduct three provincial public private dialogues; (c) to find and support drivers of change.			Limited; discontinued
Research (through ACIAR)				
Assisting the RGC to develop research capacity and up to date agricultural knowledge; Supporting local research institutes	Investments in Cambodia Agricultural Research Fund Support to Cambodian Agricultural Research and Development Institute (CARDI) Major research programs on horticulture, rice establishment, farm water management and rice seeds	2010-12 (later continued independent of CAVAC)		na
TOTAL OUTREACH	As estimated/projected in Completion Report, adjusted to avoid double-counting		214,550	321,094

ANNEX FIVE: SUSTAINABILITY AND OTHER CHARACTERISTICS OF CAVAC IRRIGATION SCHEMES

Schemes visited by the review team – Summary of key aspects.						
Scheme Name	Sbov Andeth (Kampot) 2011/14	Chamlong Chrey (Kampot) 2013/14	Rokar Chhouk (Takeo) 2013/14	Wat Thmey (WT) (Takeo) 2014/15	Boeung Leas (Kampong Thom) 2014/15	Tang Krasang or 6 January SC1,2&3 (Kampong Thom) 2013/14
Target						
Area in ha	1,196	306	539	2,117	300	1,456
HH's	950	225	687	1,966	250	789
Connected						
Area in ha	1,250 - 3 rice crops	100 %	About 60% as others take water from adjoining Wat Thmey pumping scheme.	100%	100 % after the new pumps were installed in April 2017	0% as water is blocked by main canal construction. The first year 100 %
HH's	950		Very few effectively connected for the EWS crop as the scheme runs out of water			
Scheme type	Main canal run-of-the river; water distributed by individual mobile pumping	Pumping station at head of the main canal. Water distributed through canal network by gravity	Main canal run-of-the river; water distributed by individual mobile pumping	Pumping station at head of the main canal. Water distributed by canal network by gravity.	Pumping station at head of the main canal. Water distributed by canal network by gravity.	Water taken from Main Canal of the Tang Krasang reservoir and distributed through canal network by gravity.
Costs– total	1,033,661	828,768	328,501	4,286,106 Second pump station was constructed during Phase	877,284	1,825,259

				two. This amount combines all.		
Cost \$/ha	864	2,708 609	2025609 2924	2,0254	2,924	1,254
Irrigation Service Fee (ISF)	50 kg of paddy Will be close to zero by next year. Farmers claim high pumping costs are the main reason	KHR 1,350 per kWh consumed for pumping. This includes operational and maintenance costs. Electricity cost per kWh = KHR 740	KHR 20,000 = USD 5 Will be close to zero by next year. Farmers claim high pumping costs are the main reason	KHR 1,550 per kWh consumed for pumping. This includes operational and maintenance costs. Electricity cost per kWh = KHR 720		KHR 20,000 = USD 5 Will be close to zero by next year. Farmers claim high pumping costs are the main reason
% of farmer paying ISF	20%	100%	11%	100%	100%	0% as water has been blocked by construction in Main canal by ADB funded project
Access						
Roads	Road constructed along main canal	Road constructed along main and secondary canals	Road constructed along main canal	Road constructed along main and secondary canals	Road constructed along main and secondary canals	Road constructed along secondary canals
Power	No Power	Power connection available	No Power	Power connection available near 2 nd PH	No power connections variable (diesel genset)	No Power
Yield increase by 2015 – rice t	8,066	23,247	12,400	1,128	832	3,968
Life of project	After 7 years, performance will reduce to 30 % due to silting up of main canal.	20 years	After 7 years, performance will reduce to 30 % due to silting up of main canal. Water resources availability not secure. Scheme will be largely served by new scheme to be constructed in 2018	20 years	20 years	Depending on maintenance of main canal. Expected to be 15 years as some reduction is expected after 10 years of operation due to lack of sufficient maintenance.

<p>Effectiveness of FWUC</p>	<p>Expected to fail after 1 or 2 years as no ISF will be collected anymore. FWUC Committee members will be reluctant to work for free.</p> <p>Looks that PDWRAM is willing to provide funds for scheme improvements and maintenance</p>	<p>Well-functioning FWUC. Expected to continue as 100% of farmers pay ISF</p>	<p>Expected to fail after 1 or 2 years as no ISF will be collected anymore. FWUC Committee members will be reluctant to work for free'</p> <p>Scheme will be part of the new scheme to be constructed in 2018.</p>	<p>Well-functioning FWUC. Expected to continue as 100% of farmers pay ISF</p>	<p>Well-functioning FWUC. Expected to continue as 100% of farmers pay ISF</p> <p>Scheme needs to be more effective after new pumps were installed in April 2017</p>	<p>FWUC will need to be re-activated after completion of construction work along Main Canal by ADB. No FWUC is being established by ADB as far as we know. Ideally a larger FWUC needs to be established of which the CAVAC-supported FWUC is a member.</p>
<p>Scheme sustainability score 0-10</p>	<p>4</p>	<p>9</p>	<p>2</p>	<p>10</p>	<p>9</p>	<p>5</p>

Schemes not visited by the evaluation team							
Scheme Name	Krapum Chouk (Takeo) 2010	Kveng Tayi (Takeo) 2011	Tumnob Lork (Takeo) 2011/12/13	Prey Rumdeng(Takeo) 2012	So Hang (Takeo) 2011/12	Prey Tonle (Kampot) 2010	O Kak (Kampot) 2011/12/14
Target							
Area in ha	1,306	1,130	1,503	2,150	1,476	460	240
HH's	839	579	1,243	1,625	1,062	460	240
Connected							
Area in ha	1,276 EWS	1,030 EWS	1,503 EWS	1,720 EWS	1,180 EWS	284 EWS	90 EWS
HH's	1,306 RR	1,130 RR	1,503 RR	2,150 RR	1,475 RR	284 RR	240 WS
	2 rice crops	2 rice crops	2 rice crops	2 rice crops	2 rice crops	2 rice crops	24 DS 3 rice crops
Scheme type	Main canal run-of-the river; water distributed by individual mobile pumping and some PWSs	Run-off from Main Canal; water distributed by individual mobile pumping and some PWSs	Run-off from Main Canal; water distributed by individual mobile pumping and some PWSs	Extension from Thnoat canal in Kampot; water distributed by individual mobile pumping	Main canal run-of-the river; water distributed by individual mobile pumping	Main canal run-of-the river; water distributed by individual mobile pumping	Main canal run-of-the river; water distributed by individual mobile pumping
Costs – total	100,847	218,458	767,389	793,243	1,333,716	88,369	767,479
Costs \$/ha	77	193	511	369	904	192	3,198
Irrigation Service Fee (ISF)	75 kg of paddy in 2015	75 kg of paddy in 2015	75 kg of paddy in 2015	45 kg of paddy in 2015	80 kg of paddy in 2015 Will be close to 0 as internal conflicts	50 kg originally but no farmers are paying now as FWUC in non-functioning as nearby PDWRAM	150 kg originally but no farmers are paying now as FWUC in non-functioning and scheme has technically failed

	Will be less by next year. Farmers claim low paddy price is the main reason	Will be less by next year. Farmers claim low paddy price is the main reason	Will be less by next year. Farmers claim low paddy price is the main reason	Will be less by next year. Farmers claim low paddy price is the main reason	resulted in collapse of the FWUC	constructed scheme is not charging anything	as PDWRAM Director disagreed with proposed design options by CAVAC
% of farmer paying ISF	50%	50%	70%	20%	8%	0%	0%
Access							
Roads	No Road	No Road	Road partially paved along Main Canal	Road constructed along main Canal	Road constructed along main Canal	No Road	Road constructed along main Canal
Power	No Power	No Power	No Power	No power	No power	No Power	No power
Yield increase 2015 – rice t	11,441	9,097	11,427	13,430	8,559	2,678	1,436
Life of project	After 7 years, performance will reduce to 30 % due to silting up of main canal.	After 7 years, performance will reduce to 30 % due to silting up of main canal.	After 7 years, performance will reduce to 30 % due to silting up of main canal.	After 7 years, performance will reduce to 30 % due to silting up of main canal.	After 7 years, performance will reduce to 30 % due to silting up of main canal.	After 7 years, performance will reduce to 30 % due to silting up of main canal.	After 5 years, scheme has technically failed
Effectiveness of FWUC	Expected to fail after 3 or 4 years as the ISF dropped so significantly due to election campaign this year and the following year. Also the performance of BANTIC is not trusted by the PWSs. FWUC	Expected to fail after 3 or 4 years as the ISF dropped so significantly due to election campaign this year and the following year. Also the performance of BANTIC is not trusted by the PWSs. FWUC Committee members will be reluctant to work for free.	Functions rather well. Water source not very secure. The canal was a drainage system, sediment of the canal in the upstream (connected to PRASAC canal) is very high. It needs to have a stabilised embankment. If this problem resolved will be	Expected to fail after 1 or 2 years as no ISF will be collected anymore. Political interference is very high. It results in no fee collection in the coming years. The FWUC Committee members will be reluctant to work for free.	Expected to fail after 1 or 2 years as no ISF will be collected anymore. Political interference is very high. It results in no fee collection in the coming years. The FWUC Committee members will be	Non-functioning at present.	Expected to fail after 1 or 2 years as no ISF will be collected anymore. FWUC Committee members will be reluctant to work for free.

	members will be reluctant to work for free.		effective over many years because the FWUC is active.		reluctant to work for free		
Scheme sustainability score 0-10	4	4	7	2	1	0	2

Schemes not visited by the evaluation team (continued)						
Scheme Name	Spean Touch (Kampot) 2012/13	Prey Leu (Kampot) 2012	Hay Saun (Kampot) 2013/14	Reservoir 77 (kampot) 2013/14	Thnoat Chum (Kampong Thom) 2011/14	Angko (Kampong thom) (2011/12/14/15)
Target						
Area in ha	1,663	900	643	250	1,200	1,100
HH's	1,815	942	724	280	1,275	313
Connected						
Area in ha	271 EWS	375 EWS	570 EWS	250 WS	150 EWS	540 EWS
HH's	1,250 WS 60 DS 3 rice crops	900 WS 120 DS 3 rice crops	643 WS 150 DS 3 rice crops		1,200 RR 50 DS 3 rice crops	1,200 RR 50 DS 3 rice crops
Scheme type	Main canal run-of-the river; water distributed by individual mobile pumping	Main canal run-of-the river; water distributed by individual mobile pumping and some PWSs	Main canal run-of-the river; water distributed by individual mobile pumping	Reservoir mainly for supplementary wet season irrigation	Run-off from Main Canal; water distributed by gravity for most of the command area.	Pump station at the river bank (screw pump). Water distributed by gravity

			and pump house for the extension of the scheme			
Costs – total	654,183	431,175	890,025	336,214	682,418	1,783,800
Costs \$/ha	393	479	1,384	1,345	569	1,622
Irrigation Service Fee (ISF)	500 kg	USD 110 paid to PWSs	140 kg	120 kg	62 kg	USD 80
% of farmer paying ISF	20%	100% of farmers pay to PWSs, but only half of the total amount to be paid to FWUC by PWS.	100% (irrigated by lining canals) 30% through PWS (irrigated by earthen canal)	0%	0%	88%
Access						
Roads	Road constructed along main Canal	Road constructed along main Canal	Road constructed along main Canal	Road constructed along the dam	Road constructed along main Canal	Road constructed along main Canal and secondary canals
Power	No power	No power	No power	No Power	No power	No power (Diesel engine)
Yield increase 2015 – rice t						
	5,171	6,117	3,682	375	5,215	6,594
Life of project	After 7 years, performance will reduce to 30 % due to silting up of main canal.	After 7 years, performance will reduce to 30 % due to silting up of main canal.	20 years if we can strengthen the FWUC in 2017/18	20 years but reservoir storage capacity will be reduced over the years resulting in decrease of area	20 years if the FWUC of the Stung Chinit scheme will be strengthened which is unlikely at present. If not 10 years	20 years as farmers pay the full amount and pumping costs relatively low and yields are high.

Effectiveness of FWUC	<p>Expected to fail after 1 or 2 years as no ISF will be collected anymore. FWUC Committee members will be reluctant to work for free</p>	<p>Expect to function if FWUC is further supported especially in working with PWS.</p>	<p>Well-functioning FWUC. Expected to continue as 100% of farmers pay ISF, but the concern is the area that supplied by earthen canal. It needs technical and O&M concentration.</p>	<p>Low yields so farmers will not pay ISF after some years. Not very effective after that.</p>	<p>Is not very effective now. Future depending on management upstream.</p>	<p>Well-functioning FWUC. Expected to continue to 100% of farmers pay ISF. If the FWUC will stay as strong, but hopefully without the interference of the upcoming election.</p>
Scheme sustainability score 0-10	<p>4</p>	<p>5</p>	<p>8</p>	<p>5</p>	<p>5</p>	<p>8</p>

ANNEX SIX: REFERENCES

-
- ¹ Australian Agency for International Development (AusAID), *Cambodia Agricultural Value Chain Program (CAVAC) Program Design Document*, Australian Government, Canberra, December 2008.
- ² Ibid, p. 24.
- ³ Ibid, p. 23.
- ⁴ DFAT, *Market Systems Development – Operational Guidance Note*, Australian Government, Canberra, 2017. Available at: <http://dfat.gov.au/about-us/publications/Pages/agriculture-and-food-security-operational-guidance-notes.aspx>.
- ⁵ AusAID, *From Seed to Scale-Up: Lessons learned from Australia’s rural development assistance*, Australian Government, Canberra, April 2012.
- ⁶ Australian Agency for International Development (AusAID), *Cambodia Agricultural Value Chain Program (CAVAC) Program Design Document*, Australian Government, Canberra, December 2008.
- ⁷ Evaluation team interviews with current and former CAVAC I staff.
- ⁸ Cambodia Agricultural Value Chain Program (CAVAC), *Cambodia Agricultural Value Chain Program Completion Report*, Cardno, unpublished, November 2015, pp 53-54.
- ⁹ DCED standard for results measurement : a summary, <http://www.enterprise-development.org/measuring-results-the-dced-standard/introduction-to-the-dced-standard/>, 11 April 2017.
- ¹⁰ World Bank, *Cambodian Agriculture in Transition: Opportunities and Risks*, Washington, 2015.
- ¹¹ Ibid, p. xiii.
- ¹² <http://ricepedia.org/cambodia> (accessed 11/06/17).
- ¹³ Drawn from data in Ibid.
- ¹⁴ CAVAC, *Monitoring and evaluation manual: Version 4*, Cardno, July 2015, p. 52
- ¹⁵ Ibid, p. 7
- ¹⁶ CAVAC, *Monitoring and evaluation manual*, p. 9.
- ¹⁷ Ibid, p. 13
- ¹⁸ DFAT 2017, op cit.
- ¹⁹ CAVAC, *Monitoring and evaluation manual*, p. 36.
- ²⁰ http://www.cavackh.org/assuring_quality/index/en
- ²¹ CAVAC, *Monitoring and evaluation manual*, p. 49.
- ²² CAVAC, *Inception report and 2010 work plan*, Cardno, 2010, p. 35.
- ²³ http://www.cavackh.org/assuring_quality/index/en
- ²⁴ Ibid.
- ²⁵ Australian Agency for International Development (AusAID), *Cambodia Agricultural Value Chain Program (CAVAC) Program Design Document*, Australian Government, Canberra, December 2008. p. 38.
- ²⁶ Ibid, p. 40.
- ²⁷ CAVAC, ‘Reflections on M&E week’, November 2009, p.2
- ²⁸ Hitchins, R et al, *Cambodian agricultural value chain program: mid-term review*, May 2012, p. 2.
- ²⁹ Ibid, p. 36.
- ³⁰ Miehlbradt, A., ‘CAVAC, Report on SMG M&E Technical Mission’, May 2011, p. 6.
- ³¹ CAVAC, *CAVAC completion report*, p. 40.
- ³² Ibid, p. 75.
- ³³ http://www.cavackh.org/assuring_quality/index/en
- ³⁴ CAVAC, *Monitoring and evaluation manual*, p. 45.
- ³⁵ Hitchins, R. et al, p. 2.
- ³⁶ CAVAC, *CAVAC completion report* p. 6.

- ³⁷ http://www.cavackh.org/assuring_quality/index/en
- ³⁸ Ibid
- ³⁹ CAVAC, CAVAC completion report, p. 9.
- ⁴⁰ CAVAC, Monitoring and evaluation manual, p. 8.
- ⁴¹ CAVAC, 'Internal background document for the mid-term review mission', February 2012, [unpublished], p. 18.
- ⁴² CAVAC, Reflections on M&E week, p.3.
- ⁴³ http://www.cavackh.org/assuring_quality/index/en
- ⁴⁴ DFAT 2017, op cit.
- ⁴⁵ CAVAC staff member
- ⁴⁶ DFAT, 'Final Aid Quality Check for: ING754 Cambodia Agricultural Value Chain Program', April 2016, [unpublished], p. 8.
- ⁴⁷ CAVAC, Reflections on M&E week, p.1.
- ⁴⁸ DFAT 2017, op cit.
- ⁴⁹ DFAT, Final Aid Quality Check, p. 2.
- ⁵⁰ DFAT 2017, op cit.
- ⁵¹ CAVAC, CAVAC completion report, p. 45.
- ⁵² Ibid, p. 22.
- ⁵³ Ibid, p. 15.
- ⁵⁴ Ibid, p. 12.
- ⁵⁵ AusAID, CAVAC program design document, p. 27
- ⁵⁶ World Bank, PowerPoint of Draft Strategic Framework for the Irrigation Sector, 2017 [unpublished].
- ⁵⁷ CAVAC, CAVAC completion report, p. 6.
- ⁵⁸ Ibid, p. 57
- ⁵⁹ Ibid, Table 8, p. 36 for outreach figures. Numbers of partnerships are from CAVAC Impact Sheets (unpublished).
- ⁶⁰ Australian Agency for International Development (AusAID), Cambodia Agricultural Value Chain Program (CAVAC) Program Design Document, Australian Government, Canberra, December 2008.
- ⁶¹ CAVAC – Impact Sheet_All Projections.xlsx (provided to evaluation team).
- ⁶² CAVAC, CAVAC completion report, Table 8, pp. 36-37.
- ⁶³ Ibid, Table 9, p. 37.
- ⁶⁴ CAVAC data response 1.xlsx, agribusiness spreadsheet (updated 5 April 2017), provided to evaluation team.
- ⁶⁵ More details are provided in CAVAC's 'Baseline survey of fertiliser and pesticide use and impact survey of the two markets', provided to evaluation team.
- ⁶⁶ CAVAC – Impact Sheet_All Projections.xlsx (provided to evaluation team).
- ⁶⁷ Ibid.
- ⁶⁸ CAVAC, 'Pesticide retailer training in partnership with PDAs', in CAVAC, Completion Report, Annex 1 Intervention Summaries, pp. 46-48, unpublished, 2015.
- ⁶⁹ CAVAC, Completion report summary.
- ⁷⁰ Alkire, S et al, *Measuring Progress Toward Empowerment, Women's Empowerment in Agriculture Index: Baseline Report*, USAID, 2014, p. 11.
- ⁷¹ Ibid.
- ⁷² Partners for Prevention, Why do Some Men Use Violence Against Women and How Can We Prevent It?: Quantitative Findings from the United Nations Multi-Country Study on Men and Violence in Asia and the Pacific, UNDP, UNFPA, UN Women and UNV, 2013, p. 53.
- ⁷³ Eng, S, Szmodis, W, and Grace, K 'Cambodian Remarried Women are at Risk for Domestic Violence', *Journal of Interpersonal Violence*, 8 February 2017 <<https://doi.org/10.1177/0886260517691520>> <09/06/17>.
- ⁷⁴ CAVAC I Gender Typology of Farming Households [unpublished].
- ⁷⁵ AusAID, CAVAC Program design document, p. 30.
- ⁷⁶ CAVAC I, 'Wrap up on Vegetable-Gender Interview, 27 April, 2012' [unpublished].
- ⁷⁷ AusAID, CAVAC Program design document, p 31.
- ⁷⁸ DFAT, Comments on QAIs for Cambodia and Laos [Education, Disability and Gender Equality Branch comments], February 2014 [unpublished].
- ⁷⁹ DFAT, *Gender Equality and Women's Economic Empowerment in Agriculture*, September 2015.
- ⁸⁰ DFAT, *Gender Equality and Women's Empowerment Strategy*, February 2016.
- ⁸¹ CAVAC II, *Women's Economic Empowerment and Gender Strategy*, Cardno, January 2017, p 7.
- ⁸² Ibid.
- ⁸³ CAVAC, *Manual of Operations for the CAVAC Gender and Disability Strategy*, Cardno, June 2010, p 1, emphasis added.
- ⁸⁴ Ibid.

⁸⁵ Ibid, pp 8-9.

⁸⁶ Ibid, pp 9- 10.

⁸⁷ CAVAC, Manual of Operations for the CAVAC Gender and Disability Strategy, p 1.

⁸⁸ CAVAC, 'Assessment with Disable [sic] farmers: Model farmer training' [unpublished], 13 – 15 March 2013.

⁸⁹ CAVAC, Completion report, p. 24.

⁹⁰ Samson, M & Hoy, S 'The impact of economic growth on poor households: Evidence from six rural villages in Cambodia' [Preliminary Draft]', February 2012, unpublished, p 11.

⁹¹ Ibid, pp 4 – 5.

⁹² Bekkers, H 'Poverty Strategy Paper for the Cambodia Agricultural Value Chain Program (CAVAC)', 2011, [unpublished], cited in *ibid*.

⁹³ Samson, M & Hoy, S 'The impact of economic growth on poor households', pp. 47 - 50.