CAVAC Six Monthly Report
July–December 2014

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AFD	Agence Française de Développement
AIF	Agribusiness Innovation Fund
AQIP	Agricultural Quality Improvement Project
ATSA	Agriculture Technology Services Association
AWP	Annual Work Plan
BANTIC	Banteay Thleay Irrigation Community
BHG	Bayon Heritage Holding Group Co., Ltd
CARDI	Cambodian Agricultural Research and Development Institute
CAVAC	Cambodia Agricultural Value Chain Program
CDRI	Cambodia Development Resource Institute
CMAC	Cambodian Mine Action Centre
CRF	Cambodian Rice Federation
DAE	Department of Agricultural Extension
DFAT	Department of Foreign Affairs and Trade
DPO	Disabled People's Organisation
EIA	Environmental Impact Assessment
EU	European Union
FCRMA	Federation of Cambodian Rice Miller Associations
FGD	Focus Group Discussion
FLD	Farmer Livelihood Development
FWUC	Farmer Water User Community
FWUG	Farmer Water User Group
GDA	General Directorate of Agriculture
GIZ	Deutsche Gesellschaftfür Internationale Zusammenarbeit
HARVEST	Helping Address Rural Vulnerabilities and Ecosystem Stability
HPC	Heng PichChhay
IFC	International Finance Corporation
IIRR	International Institute of Rural Reconstruction
IR	Indochina Research
IRRI	International Rice Research Institute
ISC	Irrigation Service Centre
ISF	Irrigation Service Fee
KAP	Knowledge, Attitude and Practice
KRIC	Kampong Krasang Irrigation Community
MAFF	Ministry of Agriculture, Forestry and Fisheries
M&E	Monitoring and Evaluation
MODE	Minority Organisation for Development of Economy
MOWRAM	Ministry of Water Resources and Meteorology
MSG	Maly San Group Co., Ltd
NGO	Non-Governmental Organisation
NSC	National Steering Committee

O&M	Operation and Management
PDA	Provincial Department of Agriculture
PDWRAM	Provincial Department of Water Resources and Meteorology
PLOVIC	Plov Touk Irrigation Community
PWS	Private Water Seller
QBIT	Queensland Biological Information Technology Group
RGC	Royal Government of Cambodia
RaPiD	Rice Pest and Disease Diagnostic Tool
SC	Secondary Canal
SEATV	South East Asia TV
SIF	Supplementary Investment Fund
SPM	Srov Pouch Meas, Co., Ltd.
TNA	Training Needs Assessment
TOT	Training of Trainers
UCA	United Cambodia Agriculture
UPL	United Phosphorus Limited
US	United States
UXO	Unexploded Ordnance
VVOB	Flemish Association for Development Cooperation and Technical Assistance

EXECUTIVE SUMMARY

Since commencing operation in March 2010, CAVAC has tested and refined effective ways of improving investments in irrigation, agribusiness, research, and the business enabling environment. CAVAC's approach is based on continuously improving successful activities, meanwhile adjusting, concluding, and drawing lessons from activities which were not. The tailoring of activities has ensured that 2014 was a very successful year; CAVAC has achieved its largest and most effective investments in irrigation to date and achieved high outreach in agribusiness activities, especially in the fertiliser market.

CAVAC updated projections in July 2014. CAVAC's projected outreach was increased with projections indicating the potential for the program to reach 264,000 households by 2017. Production growth was also adjusted with new figures indicating that production is expected to increase by 250,000 tons of paddy per annum. It is also estimated that more than 20,000 households will have access to better irrigation systems, which are expected to cover a total irrigation area of more than 20,000 hectares of paddy fields by December 2017. CAVAC has achieved these significant successes, despite some disruption due to budgeting issues. These issues have since been resolved, with CAVAC now focusing on meeting all requirements outlined in its Annual Work Plan for 2015.

Six months after updating these projections, the program is still confident that it will reach or even surpass them. Irrigation scheme construction finished ahead of schedule and most schemes appear to be working well. The work in the fertiliser market has been rolled out as planned, while CAVAC's new diagnostic tool in the pesticides market has resulted in a number of agreements with companies. In June 2014, CAVAC had two partnership agreements in place in the pesticide market; today CAVAC has agreements or verbal agreements with eight.

CAVAC's work extends far beyond these markets. After a long process, a TV station broadcasted 27 episodes of a commercial agricultural program which is likely to change agricultural practices of around 200,000 households. CAVAC played an instrumental role in supporting the creation of this TV series. The company producing the TV series has expressed the intention to produce and broadcast a second series on its own. In addition, CAVAC's support to rural media market research companies has led the companies to contribute their own investments beyond their agreements with CAVAC.

There are strong signals that a number of CAVAC supported activities in the vegetable sector are successful and will continue sustainably well into the future. CAVAC's main partner in this market, a large seed company, has started to invest in a much stronger retailer network to continue to reach farmers with advice and better products. Another large vegetable seed company that developed a rural one-stop centre with the support of CAVAC has opened a second shop without the assistance of CAVAC.

The irrigation team successfully completed most of CAVAC's irrigation schemes in the last semester of 2014. The number and scale of these irrigation schemes have far exceeded initial expectations. The irrigation team is now focusing on strengthening the capacity of farmers and their organisations to manage and maintain their schemes into the future.

Over the last six months, CAVAC transformed its flexible operational approach to a more structured and planned approach. The increased focus on detailed planning is required to ensure that all activities finish on time and to a high quality, and to ensure that the final monitoring activities are conducted in the most effective manner. CAVAC is confident that achievements and preparation undertaken during the last six months will provide the program with a strong foundation as the program enters its final year of operation.

1 INTRODUCTION

A Transition Semester

In 2015 CAVAC enters its final year of operation. In order to prepare for this final stage of the program, CAVAC has used the last six months to transition from a flexible approach – based on continuously creating opportunities– to an approach which focuses on completing all current interventions and enhancing the sustainability of earlier work.

At the outset of this reporting period, the irrigation team worked hard to finalise the majority of irrigation schemes. CAVAC's outputs in this area exceeded expectations, and as such only limited work is now needed to complete the remaining schemes in 2015. The main focus of the team has now shifted to the operation and maintenance (O&M) aspects of existing schemes. This will remain the focus of the irrigation work team's efforts for the remainder of the program, with expectations that these efforts will enhance the sustainability of work in this area.

This transition has also resulted in CAVAC maturing in its relationship with companies. Most interventions have reached a stage where CAVAC's involvement is changing from a supporting role to a monitoring role. One notable exception is CAVAC's work in the pesticide market, where CAVAC is beginning new partnerships with companies using a new tool to identify pests and recommend solutions.

This change from initiating activities to monitoring is also reflected in CAVAC's office culture. Since its inception, CAVAC has fostered a culture of open-minded and creative problem solving. While CAVAC is committed to maintaining this culture, focus over the next year also demands detailed planning in order to assure that there will be no loose ends at the end of the program. Over the period, resources will be increasingly devoted to measuring the impact of CAVAC.

Financial Discipline

In the last six months, the program introduced additional rigor to its financial management system. Construction work throughout 2014 was very successful, but depleted much of CAVAC's financial resources. Additional work in the irrigation sector has required the movement of considerable resources from operations to activities / interventions. This, along with a declining Australian dollar, has heightened the need for tight financial management over the last 12 months of the program, as funding limits will be met but not exceeded. Importantly, these changes have heightened CAVAC's emphasis on achieving value for money across all aspects of implementation.

Impact

The expected impact of CAVAC's irrigation and agribusiness activities are emerging. The previous semester report projected that CAVAC will have changed practices and income of at least 264,000 farming households two years after the program ends. Updated data from the irrigation activities supports these new projections. The updated data can be found in Annex 2.

Formal and informal information relating to the agribusiness activities also supports the July 2014 projections. A large media survey quantified the potential outreach of the media activities to around 200,000 households. There is however not yet an update on the impact of the activities in the fertiliser, pesticide and vegetable markets. Better information will become available when CAVAC conducts a

large fertiliser survey in February and March 2015, followed by a pesticide survey in July or August 2015.

Sustainability

CAVAC has always emphasised the need for interventions to be sustainable, as explained in the previous semester report. CAVAC's current focus on O&M in irrigation is expected to further increase the likelihood of sustainability of irrigation schemes.

Similarly in agribusiness, CAVAC is frequently exposed to new information indicating that the systemic approach CAVAC has used is genuinely creating a basis for sustainable impact, as detailed in section 2.1 of this report.

Cross Cutting Issues

CAVAC's gender approach is still on track. All interventions have been scanned for potential negative effects and for opportunities to proactively improve the situation for women. CAVAC is disaggregating data by gender when reporting on activities.

A work transition has also taken place in CAVAC's environmental protection activities. There was no need for new Environmental Impact Assessments during the reporting period given that no new schemes or activities are planned for the remainder of the program. CAVAC has continued to implement the existing Environmental Management Plans, particularly those in the irrigation component.

Planning

CAVAC is well placed to complete all remaining work during the final year of the program as a result of the transition over the last six months of 2014. It is expected that most field activities will end in October 2015. Over the next year the irrigation team will predominately focus on O&M, with some preparation for a potential second phase. At the same time, the agribusiness team will continue to focus on a number of interventions, and will dedicate significant resources to monitoring impact.

Human Resources

As CAVAC matures with every semester, both the organisation and its individual staff members become more effective. Under the guidance of the Irrigation Manager who joined two years ago, CAVAC was able to construct a large number of schemes without any major flaws. An increased maturity is also very visible in the agribusiness team where Cambodian experts are continuously taking over more tasks and responsibilities. After the previous General Manager left on maternity leave, her replacement took over the position smoothly. Staff turnover is very low with only one Cambodian expert leaving the program in the last semester.

2 SUMMARY OF PROGRESS AGAINST OBJECTIVES

2.1 Agribusiness and Information Systems

Within this reporting period, CAVAC's Agribusiness and Information Systems component started putting into action its 18-month detailed work plan. The last six months have seen a very strong drive to implement the existing agreements within the fertiliser, pesticides, vegetables, and media markets, as well as generate new agreements to implement the rice pest and disease diagnostic tool. In this period, CAVAC has also focussed significant resources on designing data collection surveys. Over the coming six months the team will focus on the actual monitoring and evaluation related work.

In working with companies in the **pesticide and fertiliser markets,** CAVAC has exceeded the expectations of the 2014 Annual Work Plan (AWP). CAVAC is currently working with six fertiliser companies in the fertiliser market. The completion of the rice pest and disease diagnostic tool (RaPiD) has generated significant interest from pesticide companies, and the demand for cooperation on implementation of the diagnostic tool is high. CAVAC currently has agreements with five pesticide companies to implement the tool and it is expected that this will have increased to eight or nine companies by the end of February 2015. This far exceeds earlier assessments of success, and demonstrates the importance of a balanced portfolio of interventions, especially within a changing and dynamic market where it is difficult to predict market uptake. Additionally CAVAC has completed the pesticide retailer training in partnership with the Provincial Departments of Agriculture (PDAs) of Kampot, Takeo and Kampong Thom. The curriculum of the pesticide retailer training was produced in conjunction with the General Directorate of Agriculture (GDA).

The UNI-MART agreement was added to the **vegetable** unit's portfolio, with the team currently implementing three large agreements. The vegetable sector has reached its full potential. CAVAC was unable to secure new agreements in the **rice export** sector. The agreement with Golden Daun Keo was signed by CAVAC; but changes within the management structure of the company have led to new management with different priorities. Within **information systems,** CAVAC has conducted three linking events, and is on track to train all the model farmers in the three provinces by the end of September 2015, covering both dry and wet season farming. CAVAC has signed an agreement with Nileda to stimulate farmers' innovation through a competition on the use of pesticides. In **media** the existing agreements proved to be very successful. They have the potential to deliver significant impact. However given the outstanding success in the pesticides markets and the timing within the project cycle resources have been targeted toward pesticides.

Activities with the PDAs are on schedule with only a few demonstrations cancelled due to adverse weather conditions. Implementation of the contract with the GDA was delayed in 2013 but in 2014 implementation was on schedule to finish in the middle of 2015.

2.1.1 Input Unit

Fertiliser

Work within the fertiliser market continues to build on previous successes. In early 2013, CAVAC achieved a significant progress when it was able to attract 12 fertiliser companies to partner with on group capacity building. Currently, CAVAC is focussed on implementing agreements with six fertiliser companies. Among the six active agreements, five are partnerships following on from the 12-company fertiliser training in 2013, and one is a partnership with a company that came to CAVAC to express its interest and seek collaboration. These agreements focus on different models of improved information delivery to farmers. Though they are at this stage in progress, they have already exhibited their first signs of sustainability.

Ye Tak and Heng Pich Chhay have been testing a combination of retailer training and field demonstrations. Heng Pich Chhay has conducted a number of field demonstrations on its own. It also has the intention to continue with retailer training although the company thinks it would be better to reduce the number of participants from 20 - 30 to 10 - 20 per training. For Ye Tak, it has already conducted a number of retailer training sessions and field demonstrations using its own resources.

Papaya and Maly San have been improving their information systems through improving field demonstrations. The owner of Papaya has indicated that he was very satisfied with the results and methodology of the demonstrations arranged with support from CAVAC. He has also indicated that while the intervention with CAVAC is ongoing, Papaya has organised at least two field demonstrations independently. Maly San in addition to organising further field demonstrations is experimenting conscientiously/purposely with the best way to organise field days so that the impact can be maximised.

Lay Seng – a company that had learned about CAVAC through other companies and interventions – has become interested in CAVAC's activities. Lay Seng approached CAVAC to seek support to improve its farmer meetings and start the field demonstrations for the first time. Lay Seng is currently expanding its activities beyond what was initially agreed with CAVAC. Lay Seng has increased the number of farmer meetings it conducts from four to 15 per month. It has also conducted seven additional field demonstrations. The original intervention had a cost sharing of US$10,000 from CAVAC and US$12,000 from Lay Seng. Lay Seng is investing an additional US$26,000 in expanding from four to 15 farmer meetings per month.

CAVAC also partners with the company Anachak to undertake activities which are somewhat different to activities with other partners. In this intervention, CAVAC supports Anachak to conduct field experiments in order to develop better fertiliser recommendations for farmers based on soil type and variety. By the end of this reporting period, the company had completed the wet season field experiments and is currently preparing for the dry season field experiments. At this stage it is too early to see signs of sustainability of this intervention; however the nature of the intervention is such that it may not be necessary for these field experiments to be conducted on a yearly basis.

In addition, CAVAC has learned that five of the seven companies that participated in the 12-company fertiliser training but did not have a follow-up agreement with CAVAC have updated the technical content of their information services with key messages from the training. They have changed some of their practices such as focusing technical messages with village level retailers, as village retailers are most likely to interact with farmers.

Pesticides

CAVAC's activities within the pesticide market started later in the program but have been growing fast and are currently at full momentum. The interventions have grown from small activities to nationwide retailer training. The work now also incorporates the promotion of the Rice Pest and Disease Diagnostic Tool (RaPiD) which has generated much excitement within CAVAC. A number of companies have shown significant interest in RaPiD, leading to several new partnerships even in the final year of implementation.

Through hard work with the International Rice Research Institute (IRRI), the University of Queensland and Cambodian Agriculture Consulting, CAVAC completed the development of RaPiD during this reporting period. RaPiD serves as Cambodia's first diagnostic tool for pest identification and problem explanation, as well as a tool for each company to store its specific pest control solutions. It is currently being implemented with pesticide companies: at the time of writing this report, CAVAC has agreements with five companies on the implementation of the diagnostic tool. CAVAC expects to sign agreements with three to four more companies. Although there are not yet signs of sustainability within this intervention, it is clear that the demand to improve embedded information services for farmers by companies exists.

CAVAC started in the pesticide market through its capacity building interventions with Nokorthom Agricultural Development and SPK. CAVAC's activities within this market have grown to the point where they include support to the General Directorate of Agriculture to develop a Rice Pest Management Manual, nationwide retailer training with a large pesticide company called An Giang and joint pesticide retailer training activities with the PDAs. The development of the Rice Pest Management Manual was completed and the Manual has become a resource document of the Ministry of Agriculture, Forestry and Fisheries (MAFF). The manual has since assisted MAFF to process, review and approve companies' extension services and materials. Joint pesticide retailer training with the PDAs was delivered in this reporting period, reaching most pesticide retailers in all the three target provinces where CAVAC operates. An Giang has continued implementing its agreement with CAVAC on retailer training with continuously improved methodology. CAVAC has observed that the training has not only increased retailers' capacity to diagnose and advise on pest control but also improve linkages between retailers and the company – contributing to the sustainability of the impact .

CAVAC has effectively internalised lessons learnt from past experiences working within the pesticide market. As such, CAVAC is uniquely placed to assess which activities within the pesticide market will most likely contribute to improved embedded information for farmers. The development of RaPiD is the result of such activity adjustments, responding to lessons learned. While pesticide retailer training is useful for major diseases, farmers' required use of pesticides is different from that of fertiliser. While

farmers will always apply fertiliser and therefore need to consider fertiliser use and apply it every planting cycle, this is not the case with pest and diseases; even the common diseases infestations may not happen every year. The training is therefore much less effective, especially since there are more than 70 pests, diseases, and deficiencies. It would not be efficient to train for all possible rice problems. Instead, CAVAC and some companies thought that a manual would be useful for field staff. With experience from developing a help desk database for agricultural problems and a training methodology in place for retailers, CAVAC was able to learn from these experiences and develop RaPiD, which would serve the same purpose as a manual but with greater flexibility and the ability of linking a diagnosis to each company's specific pest control recommendations.

2.1.2 Information Unit

Media

Over the last six months, many years of hard work and perseverance have come to fruition across the two main areas of work: Delight Cambodia's education drama series on agriculture and the market research work with Feedback Research and Indochina Research. The success of these interventions and the follow up independent investments of the partners are a real indicator of systemic change – as production houses and advertisers start to include rural viewers as targets for their media products. This was one of the more uncertain investments CAVAC made. The motivation behind the intervention was based on the logic that CAVAC's effort could be limited but the potential outreach could be huge.

Delight Cambodia, a Cambodian production house, approached CAVAC with the idea to produce an **educational drama** about agriculture (Dey Bomnas Thmey [Newly Ploughed Soil]). CAVAC supported Delight with capacity development, storyline workshops, production costs of two pilot episodes and events to seek commercial sponsors for the production of the series. Finally, Delight managed to secure about 80% of the production cost for the following 25 episodes from commercial advertising and requested that CAVAC support the additional 20%, to which CAVAC agreed. Dey Bomnas Thmey was broadcast on MyTV between September and November 2014, and gained good interest from viewers.

CAVAC estimates that nationwide, the outreach of Dey Bomnas Thmey is around 200,000 farming households. Delight is currently preparing for a second season without CAVAC's support and is considering repackaging it as a radio play. Below shows Delight Cambodia's planned investments in the area; these investments are independent of CAVAC.

Table 1: Delight Cambodia's future investments without CAVAC

	Future Investments without CAVAC	Amount	Progress
1	Produce TV drama series (Dey Bomnas Thmey – Season 2 – Episode 28 – Episode 54)	$189,000	Scripting, finalising with sponsors, and looking for other sources to support the costs
2	Radio drama of Dey Bomnas Thmey – Season 1 – Episode 1 – Episode 27	$32,000	Reviewing scripts, awaiting confirmation from sponsors, and partnership negotiating with 106FM
3	Bun Phum (linkage of agriculture services/products with farmers, daily consumption product exhibition, agriculture education games, field demonstration and farmers' harvest celebration)	$855,072	Negotiating with South East Asia TV (SEATV) for media partnership and sharing (Delight is planning to conduct a presentation for the SEATV Board in January 2015)
4	Agriculture discussion panel TV Show (partnership with SEATV, three-month pilot test)	$120,000	Reviewing the concept and finalising partnership terms with SEATV
5	Agriculture TV Game Show (Partnership with MyTV, three-month airing)	$280,000	Finalising the concept and mechanism

It is challenging to ascertain if, how, or when proposed investments will become a reality. However, Delight has claimed these investments fall within their current plans, and may have already undertaken some execution. The second season of Dey Bomnas Thmey is highly likely to happen as TV stations are willing and are negotiating to broadcast at prime time instead of from 6 to 7pm.

To improve the **availability of information on media consumption of rural audiences**, CAVAC worked with two media research companies (Feedback Research and Indochina Research) to expand their media research beyond urban audiences to rural audiences. CAVAC supported both companies with the cost of expansion into rural audiences and the cost of launching the research results in publicity events with potential commercial buyers of the research. The availability of a quality commercially attractive program in combination with viewing data on rural audiences provided advertisers with a less risky environment to target these audiences. Both companies report that all clients are currently demanding rural media data and that it has become a requirement. Assisting in the increased availability of rural media data allows the media market to become responsive to rural audience preferences.

A brief follow-up with Feedback Research has indicated that the company is continuing to work in the area and has made or is making a number of additional investments (see Table 2), very positively demonstrating the first signs of sustainability of CAVAC's initial investment.

Table 2: Estimated additional investments by Feedback Research without CAVAC's support

	Additional Investments without CAVAC	Amount	Starting
1	Invested in training on branding/communication using media data	$720	2014
2	Hired a creative team to work on advertisements for rural TV program rating data in order to attract research purchasers	$500	2014 (and ongoing)
3	Hired a media agency to do public relations for the rural media TV program rating	$300	2014 (and ongoing)
4	Hired a consultant on research and marketing strategies	$6,000	2014
5	Will invest in a software for data analysis with Telma to have a completed software to generate data	$15,000	2015
6	Will invest in a black box - a tool for TV channels tracking - to track TV viewing	$ 20,000	2016

Model Farmers

Finally, CAVAC's decision to tailor new approaches to working with model farmers has shown encouraging results. Starting in late 2013, CAVAC has worked towards fulfilling the specific needs of both dry season and wet season model farmers. For dry season model farmers, ***roadshows*** have been implemented to enable them to gain and share innovative knowledge. For wet season model farmers, ***model farmer training*** was chosen, along with considerable effort focussed on modifying the content, curriculum and methodology. These activities have become fully operational in each corresponding cultivation season of 2014, and through CAVAC's internal assessments model farmers have well benefited from these activities.

In September 2014, CAVAC conducted a pilot assessment on the effectiveness of roadshows. The assessment has positively indicated that there is a high adoption rate among model farmers participating in roadshows and a high intention to adopt among those model farmers whose cultivation season is yet to come. One of the key success factors of roadshows is that the innovation messages are presented by super model farmers. These messages are about the practices super model farmers have themselves applied and the superior results they have experienced, and therefore the messages are inspiring to roadshow participants. Furthermore, when the key speakers in the roadshows – the super model farmers themselves – share their experience about harvesting average yields of 8-9 tons per hectare (wet paddy), they earn great respect from the roadshow participants. This enables the roadshow atmosphere to be positive, motivating participants to listen attentively and actively participate in the discussion - ultimately contributing to a high adoption rate.

As of the end of December 2014, CAVAC has conducted 73 roadshows, attended by 1323 model farmers. CAVAC hopes to reach all dry season rice cultivation villages within the CAVAC target provinces by September 2015.

To further stimulate farmers' innovation so that they can share the knowledge with others, CAVAC signed a partnership agreement with Nileda to test the effectiveness of a competition between farmers on effective ways to control blast and stemborer. This initiative not only serves to stimulate innovation among farmers but also to help Nileda to better understand the effectiveness of its products. CAVAC expects that the results of this initiative will be known in April/May 2015.

Within this reporting period, CAVAC has implemented wet season model farmer training with a new content, curriculum and methodology. The modified training appears to be more flexible and better respond to real needs of model farmers, as it allows farmers to select the topics that are most relevant to them. The content on pesticides has been largely expanded from the previous training which included only weed control. CAVAC has always tried to link the types of pest and diseases to the types of pesticides locally available for model farmers. In addition, CAVAC conducts a feedback session after each training, in order to facilitate continuous improvement of the training based lessons from each session. CAVAC also continues to aggregate and analyse data from the pre and post evaluations of the training over the June-October 2014 period, in order to monitor the training effectiveness and to focus this activity for greatest benefits of model farmers. Below is a short summary of the average increases in knowledge among trained model farmers:

Table 3: Summary of the Average Percentages of Knowledge Gains over the June-October Period

Topic	Average Percentage of Knowledge Gains
Fertiliser	76%
Weed	87%
Brown plant hopper	95%
Rice blast	91%
Caseworm	91%
Leaffolder	72%
Stemborer	81%
Safe use of pesticide	85%

The wet season model farmer training continued as planned from January to October 2014. A total of 235 wet-season training sessions were conducted for a total of 2257 model farmers. The sessions conducted within the January-May 2014 period mostly served the purposes of testing and improving.

Table 4: Summary of Wet-Season Model Farmers Training in 2014

Province	Number of Training	Number of Household Trained
Takeo	114	1,115
Kampot	51	487
Kampong Thom	70	655
Total	**235**	**2,257**

Wider Market

Since linking model farmers to sources of knowledge is necessary to help the sustainability of CAVAC's work with model farmers, CAVAC conducted three linking events in the last quarter of 2014. 1049 model farmers attended these events and CAVAC's interviews with some model farmers during the events indicated their appreciation. A survey will be conducted at a later date in order to determine whether farmers have contacted companies from the linking event.

Similarly CAVAC is testing the diagnostic tool in a call centre setting. The objective of the test is twofold: 1) to ascertain the accuracy of the diagnostic tool in the context of a call centre (where there are no visual cues and diagnosis depends on a verbal description from farmers) and; 2) to assess demand for this service, given that farmers have access to several sources of information in their vicinity. This test will run during the dry season and results will be available in April/May 2015.

2.1.3 Vegetables and Rice Export Unit

Rice Export

For the rice export market, CAVAC is implementing two interventions: one with the Federation of Cambodian Rice Miller Associations (FCRMA) on improving market linkages and the other with Baitong on improving rice seed and paddy production techniques. The major accomplishment for this market within the past six month is that CAVAC's support contributed to the FCRMA's expansion of focus within Asia. The FCRMA's trade visits supported by CAVAC over the past six months have enabled the federation to gain more customers.

CAVAC works with the FCRMA by assisting with the costs of trade visits to foreign countries and buyer visits to Cambodia. In the last six months the FCRMA conducted trade visits to Malaysia, Brunei and China. The federation received buyer visits from Malaysia and the European Union. The FCRMA has realised several customers. The FCRMA has also become a member of a new organisation within the rice export sector, the Cambodian Rice Federation (CRF). CAVAC's agreement with the FCRMA is being renegotiated in order to arrive at a realistic budget for the final year of CAVAC.

The intervention with Baitong is almost completed. Currently Baitong has access to ongoing backstopping support on an ad hoc basis, however the company has not used this facility in the last

six months. Major activities for CAVAC will be to estimate outreach and impact of this intervention in the coming period.

Vegetables

Considerable work is still going ahead within the vegetables market. CAVAC has three large vegetable agreements with two large multinational seed companies: Pacific Seeds and East West Seed International. An exciting achievement within the vegetables market is CAVAC's work with Pacific Seeds on the UNI-MART. The first UNI-MART has generated great success, motivating Pacific Seeds to establish a second one in another province and to plan for more without CAVAC's support. Another great achievement is that CAVAC and both Pacific Seeds and East West Seed International have evolved to a point where they have shaped and well defined the next activities to implement that lead to long-term sustainability.

Pacific Seeds' first UNI-MART was started in February 2014 and was officially launched on the 20 June 2014. CAVAC's contribution to the UNIMART includes building the company staff capacity and improving the company's information services, such as training for farmers, input retailers, and others. Turnover in 2014 is estimated at US$600,000. On the 19 December 2014, the second UNI-MART was opened in Kampong Cham. There was no support from CAVAC towards the second UNI-MART. The management of Pacific Seeds and the United Phosphorus Limited [UPL] (Pacific Seeds' parent company) plan to open 10 UNI-MARTs in Cambodia. It is very positive that the company continues and largely expands what it has achieved through collaboration with CAVAC.

Another intervention of CAVAC with Pacific Seeds is the establishment of model plots to introduce Pacific Seeds varieties to Cambodia. Although designed in 2013 the model plot project was delayed due to staffing problems. Finally at the end of 2014 it was redesigned on a smaller scale to resolve the issues with the company's staff and to reflect the company's shifting priorities towards expanding the UNI-MART, following its notable success.

CAVAC supports East West in implementing embedded information systems through multiple channels. In August 2014 East West reviewed all of its activities in Cambodia and decided to make its presence more commercial. The company perceived that its activities had too great a focus on extension but not enough focus on sales. This review has led to an amendment to the East West / CAVAC partnership with a greater focus on key activities that would support embedded information and be sustainable in the long run. Those key activities include variety demonstration farms for the company to introduce its whole catalogue to input retailers, vegetable collectors, and interested others.

From the completed activities with CAVAC there are clear signs that farmers are using the information being provided through the company's embedded information services. CAVAC is monitoring the sales of East West's four key inputs through retailers. Currently almost all retailers report an increase in sales of East West seed and other inputs, including seedling trays, plastic mulch and trellising nets. However, these inputs can be used for multiple crops, therefore a few retailers have noticed a small decrease as farmers are reusing them.

2.1.4 Working with the GDA and PDAs

During the reporting period, CAVAC has continued to support the PDAs and GDA in the implementation of their priorities under the Annual Work Plan. By the end of December 2014, 23 contracts supporting the 2014 priorities have been signed (Table 5). In 2014 the GDA started replanning and implementing its agreement on the Rice Value Chain Improvement Project. Significant progress was achieved within this reporting period. To date, the activities implemented include rice seed production, field experiments, and printing books on insects. Approximately 30 out of a planned 41 workshops and forums were organised at the national and provincial levels by the end of December 2014.

The CAVAC-supported GDA Rice Pest Management Manual was completed and introduced to government officials in a dissemination workshop. The availability and adoption of the manual will be a critical element to further improve the Royal Government of Cambodia (RGC) policy around the use of pesticides. The manual assists companies to get their products and training approved.

Over the last 6 months CAVAC has also contributed to some of the printing costs of the GDA's extension materials.

Table 5: List of contracts signed with the three PDAs based on their priority areas in 2014

Signed Contracts	Provincial Department of Agriculture (PDA)
Rice demonstrations	Takeo PDA
Agricultural cooperative establishment	Takeo PDA
Laser land leveling	Takeo PDA
Rice seed production training and demonstrations	Takeo PDA
Farmers' meetings	Takeo PDA
PDA staff capacity building – study tour to Vietnam	Takeo PDA
Agricultural cooperative capacity building on bookkeeping and business planning	Takeo PDA
Agricultural cooperative and model farmer exchange visit	Takeo PDA
Workshop on pesticide and fertiliser law	Takeo PDA
Rice demonstrations	Kampot PDA
Rice seed demonstrations	Kampot PDA
Agricultural cooperative establishment	Kampot PDA
Laser land leveling	Kampot PDA
PDA staff capacity building – study tour to Vietnam	Kampot PDA
Rice demonstrations	Kampong Thom PDA
Laser land leveling	Kampong Thom PDA
Rice seed production training and demonstrations	Kampong Thom PDA
Rice seed production demonstrations	Kampong Thom PDA
Training on maintaining and repairing agricultural machinery	Kampong Thom PDA
Farmer local study visit inside province	Kampong Thom PDA
Post-harvest training	Kampong Thom PDA
Local study tour for agricultural cooperatives	Kampong Thom PDA

Signed Contracts	Provincial Department of Agriculture (PDA)
Annual general assembly for agricultural cooperatives	Kampong Thom PDA

2.1.5 Research

In this reporting period, CAVAC started implementing the second round of its **Action Research Fund**. Under this round, local research institutes were requested to research solutions for two of the most severe problems faced by Cambodian farmers: the high cost of daily labour and crop losses caused by rats. CAVAC awarded a research grant to a local company called Srer Khmer for research on labour saving practices and to the International Institute of Rural Reconstruction (IIRR) for research on methods of rat control.

Srer Khmer has been investigating the efficiency and effectiveness of a wet paddy seed. It started eight field trials: four in Pursat in September 2014 with 20 farmers participating and four in Kampot in November 2014.

IIRR tested three different methods of rat control in 20 field trials. The report – including conclusions from the tests – will be submitted to CAVAC in the first part of 2015.

2.2 Irrigation

2014 marked CAVAC's most successful year working in irrigation. All of the construction work, including new schemes and improvement work, was completed ahead of schedule, except three very large schemes that require procurement of modern and sophisticated pumps and equipment from abroad. Work at the three remaining schemes resumed in early December 2014 and has been concentrated on construction of pump houses, pump installation, soil erosion protection and some repairs of flood damage. Work on these schemes is expected to be completed by early February 2015.

Due to CAVAC's early completion of construction work, CAVAC has been able to concentrate its resources on the operation and maintenance (O&M) work of a large number of schemes, especially those schemes with innovative designs. Despite their innovative, sophisticated designs, CAVAC has successfully overcome the challenges in starting the operation of two completed pumping schemes by their Farmer Water User Communities (FWUCs), leaving a great model to be adapted at other innovative pumping schemes being finalised.

CAVAC also started with the preparation of scheme selection for 2016. In Takeo some sites were visited and CAVAC started preparing a design document for Phase 2. CAVAC received assistance from Mr. Ian Fox who had been recruited by the Department of Foreign Affairs and Trade of the Australian Government (DFAT).

2.2.1 Survey, Design and Construction

Most 2014 schemes and work required to improve schemes from previous years were completed at the beginning of this reporting period. Only three schemes remain to be finalised in early 2015, due to early start of the flood season and late supply of equipment. Wat Thmey package 1&2 in Takeo and Boeung Leas in Kampong Thom will be completed by February 2015. The last project to be completed

is the Angko project in Kampong Thom. Delays in completion of Angko were mainly caused by some flood damage and the late arrival of the pumping equipment purchased from Europe.

In this reporting period, the focus of CAVAC's survey and design work moved towards preparation for the second phase of the program. CAVAC completed a revised design for Package 3 of the Wat Thmey irrigation scheme in Takeo in November 2014. This will likely be one of the schemes to be constructed in CAVAC Phase II in 2016. Towards the end of the reporting period CAVAC spent some time visiting approximately 10 scheme in Takeo that were identified by the provincial and local authorities. The feasibility of these schemes will be determined in early 2015.

2.2.2 Supplementary Investment Fund (SIF)

Supplementary Investment Fund grants provided by CAVAC to three FWUCs (*Banteay Thleay Irrigation Community [BANTIC], Plov Touk Irrigation Community [PLOVIC] and Kampong Krasang Irrigation Community [KRIC]*) in the previous reporting period came to completion in July 2014. The grants provided support to dredge three separate sections of one main canal for increased access to irrigation. The three FWUCs contributed their cost-sharing funding and were monitoring the implementation with support from CAVAC. Close monitoring by these FWUCs signifies the value of ownership and participation from these communities.

2.2.3 Operation and Maintenance (O&M)

The challenges involved in enacting effective O&M work within Cambodia is widely recognised. Despite this, CAVAC has strived to achieve as much as it could through its independent efforts, as well as in collaboration with the Provincial Departments of Water Resources and Meteorology (PDWRAMs) and an expert organisation. Success has been realised for some schemes including the first two pumping schemes in Kampot as well as some regular gravity schemes. CAVAC's past experiences have shown that operational plans are key to successful O&M at various schemes. At the time of reporting, a number of operational plans have been completed, while some plans remain to be finalised within the next period. Most landholding surveys contracted out to the PDWRAMs are on their way to completion, adding to the effectiveness of the operational plans. In this reporting period, CAVAC also completed construction of FWUC offices at all schemes to enable the FWUCs to effectively hold meetings, provide training and store administrative and financial records.

In **Kampot,** CAVAC has focussed efforts towards shaping its O&M activities at all schemes, especially at the two new pumping schemes since they required the FWUCs to have the capacity to effectively operate them.

CAVAC implemented O&M activities at *Chamlong Chrey* and *Hay Saun extension 1.* CAVAC took the lead in the development of the operational plans and appointed a water manger to assist both FWUCs during operation after their pumps were commissioned. Operation and management of a complete scheme served by a central pumping station is novel to most farmers, and farmers therefore needed to be made aware of the requirement to work together at the block level and manage the water in such a way that losses would be minimised. Field channels needed to be constructed by farmers themselves and a system for irrigation service fee (ISF) collection and administration was introduced. After the harvest of the first crop all farmers were happy with the reliable, timely and equitable distribution of water and all paid their ISF. The electricity bills were paid and some money was put in

the FWUCs' bank accounts for future maintenance and small improvements. Moreover, the landholding maps for these schemes have recently been completed, and thus they will help increase the effectiveness of the operation plans even further.

Reservoir 77, the only reservoir scheme constructed by CAVAC, was completed in July 2014. An operational plan for *Reservoir 77* is being prepared for the coming dry season when farmers want to grow vegetables in parts of the command area. The Kampot Water Manager will assist the Reservoir 77 FWUC in water management during early 2015. The landholding map of *Reservoir 77* has been finalised, contributing further to the quality of its operational plan.

At *O'Kak, Sbov Andeth, Thnoat*, their landholding maps are expected to be completed in July 2015. Meetings were held with the FWUCs of these schemes, resulting in an increased role of private water sellers in supplying pumped water to farmers along secondary canals from the main canal.

At *Thnoat* and *Spean Touch* a limited number of farmers were growing a second dry season rice crop as profit margins were too low in 2014. CAVAC is investigating possibilities to lower the production costs which fall within the remaining budget for 2015. One option is to construct more lined secondary canals to lower pumping costs and more efficient water distribution, but remaining budget may not allow for this capital intensive approach.

In **Takeo**, CAVAC has worked hard to ensure that O&M work at all schemes function. Despite many challenges within this area of work, CAVAC has persevered and made considerable progress, with plans to achieve more work before the end of the program in December 2015.

In this reporting period, CAVAC finished reorganising *BANTIC,* which is the overarching FWUC responsible for an irrigated area of about 7,000 ha. Three schemes constructed by CAVAC (*Krapum Chhouk*, *Kveng Tay*i, and *Tumnub Lork)* depend on water supplied through the main canal managed by *BANTIC*. PDWRAM and CAVAC have recently completed a landholding survey to assess the total area under *BANTIC's* responsibility. The committee members of *BANTIC* were re-elected and the organisation was simplified by omitting a layer in the structure. A transparent system for fee collection was established for both farmers and private water sellers. O&M plans were prepared and on-the-job training was provided during implementation of the SIF. *BANTIC* is now able to operate, maintain, and manage its irrigated area without much external support.

The *Wat Thmey* pumping scheme is the biggest and most expensive scheme supported by CAVAC. To some extent, *Wat Thmey* success depends on a strong and capable FWUC which is strong enough to manage its scheme and solve problems. To achieve this, the FWUC is being supported by the PDWRAM and CAVAC, and capacity building is expected to take time and support from the local authorities and politicians is necessary. CAVAC expects that it will take at least a year. CAVAC has appointed a water manager to assist the FWUC in operating the scheme, setting up an administrative system for fee collection and establishing a maintenance plan.

CAVAC has focussed significant resources on completing the design and construction of irrigation and drainage systems at the secondary/tertiary level with the FWUC and its members at *Wat Thmey*. Early floods and the start of the recession crop have made it more challenging as the scheme was not yet completed. Many meetings were held to explain to farmers the details of the design concept and to discuss the best options for scheme improvements. CAVAC established an ISF rate for the different areas to be served by the scheme. Political interference made it more difficult to help farmers

understand that continued services would largely depend on the maintenance of the scheme. These maintenance costs need to be shared by water users and the PDWRAM. The FWUC is responsible for the O&M of the scheme and is a new organisation that has to build up trust from farmers.

At *Prey Rumdeng* and *So Hang* the situation was more complicated. The ISF fees were originally set by the FWUCs in collaboration with O&M staff of the PDWRAM and CAVAC. Outside interference in lowering these fees has resulted in the reluctance of private water sellers to service farmers. CAVAC organised meetings at the local level with all parties involved but so far it has not yet been able to resolve the issue.

In *Rokar Chhouk* CAVAC made use of the pre-existing organisational structure. More farmers have joined after the completion of the scheme and CAVAC's O&M activities have concentrated on raising new members' awareness of their responsibility to pay the ISF and setting up a system for operation, maintenance and management of the scheme.

In **Kampong Thom**, CAVAC has continued working with the Irrigation Service Centre (ISC), an expert organisation, to ensure successful completion of O&M work for its irrigation schemes.

The ISC continued to carry out follow-up training for existing FWUCs and to establish the FWUCs at new schemes. The FWUCs at *Angko* and *Thnoat Chum* (old FWUCs) were trained, landholding maps prepared and operational plans developed. New FWUCs were established and trained at *Boeung Leas* and *6 January (Secondary Canal [SC1], SC2 &SC3)*.

CAVAC's O&M Expert assisted the ISC in problem solving and coordination between stakeholders and preparation of operational plans. Monthly meetings were held with all FWUCs to develop systems for operation and management including ISF collection and administering these funds. Farmers were encouraged to construct field channels to serve all farmers.

2.2.4 Working towards Sustainability in 2015

CAVAC has found that irrigation schemes are likely to be sustainable if:

- they are operated without problems and internal conflicts on water distribution;
- the FWUCs are capable of operating, maintaining and managing their schemes well, without the need for much external support; and
- sufficient funds are available for periodic, routine and emergency maintenance.

At the moment about 50% of CAVAC's schemes operate without conflicts and their FWUCs are capable of managing their schemes well. The only uncertain factor is the availability of financial resources in the long term to carry out all required maintenance. CAVAC is continuing to coordinate with FWUCs and the Ministry of Water Resources and Meteorology (MOWRAM) and/or PDWRAMs to enter in a cost sharing arrangement for O&M taking into account the growing O&M budget of MOWRAM and/or the Ministry of Economy and Finance for irrigation and support to FWUCs.

Most of the remaining 50% of CAVAC's schemes operate, but need further improvements. These improvements range from strengthening FWUCs, solving conflicts among FWUC member groups, limiting external interference aimed at undermining the role of the FWUCs in scheme management and improvements including more involvement of the private water sellers (PWSs). Only in one case (Prey Tonle) the FWUC has ceased to exist.

The introduction of the Sub-decree on FWUCs, as part of the Water Resources Law, is expected to be approved by the Cambodian Parliament in early 2015. As the Sub-decree includes articles on the setting and collection of the ISF, CAVAC expects that it will be easier to strengthen the FWUCs on this after the introduction of the Sub-decree.

Table 6 provides an overview of the Potential Command Area of each scheme based on available water resources and geographical issues as well as hydraulic boundaries and the Current Practiced Command Area as per November/December 2014. This shows that not all of the schemes have yet reached maximum potential. The CAVAC's Irrigation and Water Management team will work within the remaining one year on further scheme development by conducting the following activities:

- continued support to the FWUCs in improving the O&M of schemes;
- construction of more secondary canals (funds insufficient to do much in 2015);
- facilitation of the sustainable involvement of PWSs;
- assistance to the FWUCs in procurement of funds for scheme maintenance from the RGC and other sources; and
- downscaling of some of the Potential Command Areas as farmers use other water sources.

Over the next six months, CAVAC will also carry out further research on possibilities to have an increased and improved role of the private sector in irrigation development. A field trip to Vietnam will be organised for the irrigation team to study developments in the Mekong Delta in this field. A training program will be implemented for CAVAC staff to learn from the successes and failures of five years in CAVAC Phase I. The objective is to learn from mistakes and continue to improve and work towards more sustainable irrigation development.

Table 6: Status of CAVAC schemes as of 31 December 2014

Province	Scheme		Potential Command Area in Ha	% of Current Practiced Command Area in Wet Season	% of Current Practiced Command Area in Dry Season	Remarks
TAKEO	1	Tumnub Lork	2,000	63%	35%	Land sloping upwards
	2	Kveng Tayi	1,000	67%	55%	Lack of distribution canals and private water sellers
	3	Krapum Chhouk	590	57%	42%	Lack of distribution canals and private water sellers
	4	Prey Rumdeng	1,980	82%	82%	Lack of distribution canals and private water sellers
	5	So Hang	1,480	100%	50%	Lack of distribution canals and private water sellers
	6	Rokar Chhouk	700	100%	50%	Not enough water in dry season
	7	Wat Thmey 1 and 2	1,880	NA	100%	First crop after completion (recession rice crop) presently grown
KAMPOT	1	Prey Tonle	460	62%	62%	Another water source is used.
	2	Sbov Andeth	1,720	71%	71%	Some farmers grow a third crop

Province	Scheme		Potential Command Area in Ha	% of Current Practiced Command Area in Wet Season	% of Current Practiced Command Area in Dry Season	Remarks
	3	Thnoat	2,000	41%	41%	Lack of distribution canals and private water sellers
	4	Spean Touch	1,700	73%	16%	Lack of distribution canals and private water sellers
	5	O'Kak	240	100%	37%	High lift results in high pumping costs for dry season
	6	Prey Leu	900	100%	34%	Lack of distribution canals and private water sellers
	7	Hay Saun	760	71%	75%	Recently completed
	8	Chamlong Chrey	350	77%	21%	Recently completed
	9	Reservoir 77	500	40%	NA	Recently completed
KAMPONG THOM	1	Thnoat Chhum	1,200	100%	37%	Dry season crop increased
	2	Angko	1,100	96%	32%	
	3	Boeung Leas	350	97%	37%	Partly under construction
	4	6 January SC1	1,187	100%	5%	Most farmers still reluctant to grow dry season crop
	5	6 January SC2				
	6	6 January SC3				

3 CROSS CUTTING ISSUES

Over the past six months, CAVAC has continued to implement its existing gender and disability strategy. A second study was undertaken on farmers with disabilities to better understand what knowledge these farmers have gained from CAVAC's training; whether they have put the knowledge gained into practice; and, to what extent and how the new practices have affected their yields. CAVAC has continued screening new interventions to incorporate the gender and disability aspects where possible and collecting gender-disaggregated data on interventions being implemented.

CAVAC conducted its second assessment of farmers with disabilities in October 2014 to capture the changes in knowledge, attitude and practice (KAP) of the trained farmers with disabilities by focusing on the correct use of fertiliser on rice crop – a main component of CAVAC's training with these farmers. The training has reached 210 farmers who are members of disabled people's organisations (DPOs), 183 of whom reside in Kampot province. Among 23 farmers interviewed, 17 (74%) said that they had changed at least one aspect of their practices after the training. Ten of those 17 (59%) cited the changes caused by CAVAC's training. Ten out of the 23 interviewed farmers (43%) said that their yield had increased and seven of those 10 farmers said they had changed their practices based on what they learnt from CAVAC's training. Besides fertiliser, several farmers have also communicated their experiences relating to improved germination rate of preserved seeds, on account of the plastic bags for seed storage introduced by CAVAC. However, none of them has sought out to replace his/her worn-off plastic bag yet.

In the irrigation sector, 19 FWUCs and two Farmer Water User Groups (FWUGs) have been established. Among the 21 communities, women have been elected to the highest committee level at 12 schemes. There were some management structural changes in newly elected FWUCs, Wat Thmey and BANTIC in Takeo and Boeung Leas in Kampong Thom. This main structural change was the omission of a middle layer (FWUGs). In addition, during the election process CAVAC has strongly encouraged women to become candidates in FWUC elections and farmers to elect capable female representatives. However, CAVAC has found there are sometimes cultural barriers that influence farmers' decisions in electing their FWUC representatives. CAVAC succeeded in promoting better gender representation at the Boeung Leas pumping scheme in Kampong Thom, where women were elected to be representatives at both the committee and operation levels. At the Wat Thmey pumping scheme in Takeo, women were not elected, as farmers there tend to think that men fit better with a pumping scheme that requires rigorous labor to operate. Moreover, CAVAC has observed that women elected in various FWUC roles have continued to fulfil their duties well.

In the agribusiness sector, by collaborating with private and public partners, the technical information on growing techniques and input use could reach support providers and farmers through different methods, such as retailer group training, model farmer group training, door-to-door services and/or individual retailer coaching. Each method has reached women and men differently. Based on observations and collected data, female retailers made up about 16%-35% of participants in group training activities. Some input companies also implement door-to-door services or individual coaching, so the information could reach the key retailers, many of whom are women.

4 MONITORING AND EVALUATION

Early this reporting period, CAVAC developed a detailed 18-month Monitoring and Evaluation (M&E) work plan to cover the program's remaining period up until December 2015. CAVAC has started to implement this over the past six months. Some of the activities were more significant than others, depending on what was needed at each stage of the interventions. In the media market, a large survey with 200 samples was employed. Some other M&E activities were initial assessments and/or observations to collect information for improvement and/or to test the questionnaire. Within the next reporting period, the focus of CAVAC's M&E activities will be moving from assessing for learning and adjusting towards preparation for program completion by capturing the impact of the program activities so far and documenting useful lessons for the next phase and to be shared with a broader audience, particularly within the market development community.

Below is an outline of specific M&E related tasks undertaken across support markets within the past six months. Over the next six months, CAVAC will focus on consolidating impact figures for the program.

Table 7: Specific M&E Related Tasks Undertaken in the July – December 2014 Period

Support Market	Partner/Market/ Intervention	Timeframe	Activity Description
Fertiliser	Bayon Heriage	September 2014	- A group discussion with the company staff to check their level of satisfaction and confidence in conducting effective information services and to collect the information on outreach
	Lay Seng	October 2014	- An observation of Lay Seng's farmer meetings - An interview with the Company Manager to determine the company's satisfaction with CAVAC's intervention activities
	Anachak	November 2014	- Validated with the company the assumptions in projecting the intervention impact
	Fertiliser Market	November 2014 - May 2015	- Conducting a fertiliser market sustainability study – looking for any sign of static and dynamic sustainability by using a qualitative approach
Pesticides	PDA retailer training	July-December 2014	- Pre and post evaluations with training participants at every *PDA retailer training*
	Nokorthom	November 2014	- Checked the company's adoption of RaPiD - Presentation on the M&E functions for Nokorthom staff

Support Market	Partner/Market/ Intervention	Timeframe	Activity Description
Media	Delight Cambodia	November 2014	- A survey to quantify the number of farmer outreach in two provinces with a sample size of 200 farmers
Model Farmers	Roadshow	August 2014	- An initial assessment on the impact of the *roadshow* through in-depth interviews with roadshow participants
	Model Farmer Training	June - October 2014	- Pre and post evaluations of each wet season model farmer training
	Model Farmer Training	August - September 2014	- A baseline study on model farmers' fertiliser use in wet season rice cultivation in Takeo and Kampong Thom
Wider Market	Linking Events	October - December 2014	- Assessments with the model farmers who participated in the events to understand their perception of the events and how useful they were
Vegetables	UNI-MART	November 2014	- An early assessment with input retailers and farmers of the Unimart in order to check their KAP changes
	East West Seed International	December 2014	- An assessment to capture the changes in the KAP of input retailers trained by East West Seed International and retailers' sales volumes of East West inputs
Gender and Disability		October 2014	- KAP assessment of farmers with disabilities due to CAVAC's training

5 RISK MANAGEMENT

In this reporting period, several operational risks previously identified in the Risk Management Plan have decreased in likelihood or severity of impact on implementation, predominately due to the maturity of the program and / or proper action taken to manage them. As such many of these risks have been removed from or reduced in the Risk Management Plan.

In the last 12 months of the program it is important to highlight a new management risk. As the program gets closer to the financial limits of the head contract; managing partnership agreements and procurement contract payments becomes even more important. This is compounded by a fluctuating dollar. Regular monitoring and tight management of the budget is mitigating this risk.

In the first years of the program risks were related to private sector partners' interest and ability to collaborate. These risks are no longer present. Potential risk related to public support or other donor driven activities has also become very low in the last year of the program. With the construction of all irrigation schemes finished or close to being finished, many irrigation related risks have also become very low or irrelevant. The main risks now relate to the sustainability of the changes caused by unpredictable factors like the price of paddy, labour and other inputs that may bring uncertainties; and the aforementioned impact of the declining Australian dollar on the program's budget.

Annex 4 provides an updated Risk Management Plan.

ANNEX 1: INTERVENTION UPDATES

Number	Intervention Title	AWP
Rice Seed Market		
Inp 10.2	Improving quality and availability of commercial seed	1.2
Inp 11.2	Providing training to small seed producers (production knowledge)	1.2
Inp 11.3	Supporting associations to promote modern wet season rice seed varieties and market access for rice seed	1.2
Inp 12.9	Strengthening production knowledge to enhance availability of good quality rice seed in the market	1.2
Inp 12.10	Dry season rice seed market	1.2
Fertiliser Market		
Ext 10.1	Supporting a fertiliser company to improve its information services for farmers	3.2
Inp 10.1	Supporting a fertiliser company in providing training to retailers	1.2
Inp 12.4	Supporting fertiliser companies in staff capacity building	1.2
Inp 12.5	Fertiliser forum	1.2
Inp 12.6	Supporting a fertiliser company to provide better training to farmers	1.2
Inp 12.8	Supporting a fertiliser company in staff capacity building and pilot retailer training	1.2
Inp 12.11	Supporting a fertiliser company in its retailer training and retailers' field demonstrations	1.2
Inp 13.6	Supporting a fertiliser company in improving its field demonstrations	1.2
Inp 13.6	Supporting a fertiliser company in improving its field demonstrations and farmer meetings	1.2
Inp 13.6	Supporting a fertiliser company to develop fertiliser recommendations	1.2
Inp 13.9	Supporting a fertiliser company in staff capacity building, development of an effective field demonstration management guideline, and farmer meeting improvement	1.2
Pesticide Market		
Inp 11.4 and Inp 12.1	Supporting a local pesticide company through capacity building for technical staff and information dissemination strategy development	1.2
Inp 12.2	Supporting a pesticide company to provide better training to farmers	1.2
Inp 12.13	Supporting a pesticide company in its pesticide wholesaler / retailer training	1.2
Inp 13.4	Pesticide retailer training in partnership with PDAs	1.2
Inp 13.5	Supporting a local pesticide company in implementing its information dissemination strategy	1.2
Inp 14.1	Supporting a pesticide company to improve its information services for farmers through the use of a rice pest and disease diagnostic tool (RaPiD)	1.2
Inp 14.1	Supporting a local pesticide company to improve its agronomic advisory system through integration of a rice pest and disease diagnostic tool (RaPiD)	1.2
Inp 14.1	Supporting a local pesticide company through the use of a rice pest and disease diagnostic tool (RaPiD) and improvement of its existing information services	1.2
Rice Export Market		
Mar 11.1	Technical assistance on rice and rice seed production for export markets	1.2
Mar 11.2	Feasibility study of warehouse receipt system	1.2
Mar 12.1	Export promotion – support to the federation's market linkages	1.2
Inp 13.3	Improving Golden Daun Keo Rice Mill's quality of paddy of export varieties	1.2
Vegetable Market		
Inp 12.3 (B)	Vegetable farmers' practice change – East West Seed International	1.2
Inp 12.3 (A)	Vegetable farmers' practice change – Pacific Seeds	1.2

Number	Intervention Title	AWP
Inp 12.7	Vegetable seed retailer outlet training	1.2
Inp 13.7	Support to an integrated retailer UNI-MART	1.2
Media Market		
Ext 11.1	Support to a media agency to produce a quality agricultural TV program (drama)	1.2
Ext 13.1	Support to media research companies	1.2
Model Farmers		
Ext 10.3	Activities with model farmers to improve model farmers' roles and knowledge	1.2 (previously 3.2)
Wider Market		
Ext 11.2	Support to MAFF for extension materials	1.6 (previously 3.2)
Ext 11.3	Assisting training and information system support providers with training materials, capacity building and promotion	1.2 (previously 3.2)
Ext 11.5	Linking events	1.2 (previously 3.2)
Ext 11.6	Supporting a private call centre	1.2 (previously 3.2)
Irrigation Construction		
Takeo		
Irr 10.1	Development and construction of an irrigation scheme: Krapum Chhouk canal, Takeo province	2.3
Irr 10.3	Development and construction of an irrigation scheme: Tumnub Lork canal, Takeo province	2.3
Irr 10.4	Development and construction of an irrigation scheme: Kveng Tayi canal, Takeo province	2.3
Irr 12.3	Development and construction of an irrigation scheme: So Hang canal, Takeo province	2.3
Irr 12.4	Development and construction of an irrigation scheme: Prey Rumdeng canal, Takeo province	2.3
Irr 12.5	SIF: Support to BANTIC and PLOVIC in rehabilitating two secondary canals in Takeo	2.2
Irr 13.1	Development and construction of an irrigation scheme: Rokar Chhouk canal, Takeo province	2.3
Irr 13.2 and Irr 13.3	SIF: Support to BANTIC and PLOVIC in dredging their main canal in Takeo	2.2
Irr 14.1	Development and construction of an irrigation scheme: Wat Thmey pumping scheme, Takeo province	2.3
Irr 14.1	SIF: Support to BANTIC, PLOVIC and KRIC in dredging their main canal in Takeo	2.2
Kampot		
Irr 10.2	Development and construction of an irrigation scheme: Prey Tonle canal, Kampot province	2.3
Irr 10.6	Development and construction of an irrigation scheme: Sbov Andeth canal, Kampot province	2.3
Irr 10.7	Development and construction of an irrigation scheme: O'Kak canal, Kampot province	2.3
Irr 10.8	Development and construction of an irrigation scheme: Thnoat canal, Kampot province	2.3
Irr 12.1	Development and construction of an irrigation scheme: Spean Touch canal, Kampot province	2.3
Irr 12.2	Development and construction of an irrigation scheme: Prey Leu canal, Kampot province	2.3

Number	Intervention Title	AWP
Irr 13.1	Development and construction of an irrigation scheme: Hay Saun canal, Kampot province	2.3
Irr 13.1	Development and construction of an irrigation scheme: Chamlong Chrey canal, Kampot province	2.3
Irr 13.1	Development and construction of an irrigation scheme: Reservoir 77, Kampot province	2.3
Kampong Thom		
Irr 10.12	Development and construction of an irrigation scheme: Thnoat Chum canal, Kampong Thom province	2.3
Irr 10.13	Development and construction of an irrigation scheme: Angko canal, Kampong Thom province	2.3
Irr 13.1	Development and construction of irrigation schemes: Secondary Canals 1,2, and 3 of the 6 January canal, Kampong Thom province	2.3
Irr 14.1	Development and construction of an irrigation scheme: Boeung Leas pumping scheme, Kampong Thom province	2.3

Legend

Res = Research
Irr = Water and Irrigation
Inp = Input Markets
Bee = Business Enabling Environment
Mar = Production Markets
Gen = Others
Ext = Extension

INTERVENTION UPDATE: Int. No: Inp 10.2 AWP No: 1.2 Date: 31 December 2014	
Name:	**Improving quality and availability of commercial seed**
Summary:	The seed production business requires intensive capital investment, skilled production knowledge, effective and efficient human resource management and good branding. CAVAC intended to contribute to the growth of seed businesses through its support on building seed producers' capacity to produce and market quality seed. In 2011, CAVAC started partnering with a seed producer in Kampong Thom, Srov Pouch Meas Co., Ltd. (SPM). CAVAC's intended intervention plans with this partner were divided into two phases: 1) Technical Assistance and Business Development; and 2) Business Expansion. CAVAC's activities with SPM in the first phase included: ▪ conducting a study on the intellectual property rights for non-Cambodian rice varieties; ▪ hiring an international seed production specialist from Vietnam to train key technical staff of SPM in seed production techniques; and ▪ hiring a company to develop a Rice Seed Business Plan for SPM. This plan assisted the company's strategic direction and informed methods to seek new partners. CAVAC's second phase of support to SPM on business expansion was put on hold due to land tenure issues faced by the company. In early 2013, SPM approached CAVAC again to request equipment support. This request was analysed and reviewed and was not approved as CAVAC understood that the rice seed business was not a priority for SPM given that it had many businesses.
Achievements to Date:	Activities completed include: ▪ A study was completed on the intellectual property rights for non-Cambodian rice varieties. ▪ A rice seed business plan for SPM was developed in order to provide strategic directions and inform methods for the company to seek business partners. ▪ A rice seed production manual was developed. ▪ Rice seed production training for technical staff (theoretical and practical concepts) was held. ▪ SPM's Agribusiness Innovation Fund (AIF) application on the business expansion assistance project was approved but it has not progressed due to the company's land tenure issues. ▪ In September 2013, CAVAC conducted an assessment on the progress of SPM's rice seed production and on farmers' buying SPM's seed. The assessment found that the rice seed market remained unfavourable and uncertain, as good quality seed production required large-scale investment which carried significant risks. For example, risks relating to natural phenomena - such as unpredictable floods, which often destroy paddy fields and a volatile paddy price - mean that farmers are reluctant to buy good quality seed. There are also risks relating to farmers' habit of seed retaining and exchange. ▪ An intervention summary report has been produced to show completed activities, key findings during the implementation process, activity adjustments, and lessons learnt for this specific intervention.
Next Steps:	None
Lessons Learnt:	SPM has faced land tenure issues because some of its dry season rice cultivation areas are situated in Zone 3 of the Tonle Sap area, a zone where cultivation is not allowed. This is a reminder for CAVAC that before reaching an agreement with any new partner, it is necessary to physically check and confirm the location of production land. It is hard to find committed partners in the rice seed market as the rice seed business is costly as well as risky as mentioned above. At this stage, there seem to be no official seed producers/distributors for the varieties that best meet market demands.

INTERVENTION UPDATE: Int. No: Inp 11.2 AWP No: 1.2 Date: 31 December 2014	
Name:	**Providing training to small seed producers (production knowledge)**
Summary:	This intervention aimed to provide individual small seed producers with training in appropriate seed production techniques, which can be applied in both wet and dry seasons. It was expected that the training would enable small seed producers to increase their production of modern varieties, resulting in greater adoption among smallholder farmers through seed purchase or exchange, thereby leading to higher yields.
Achievements to Date:	Three rice seed production training sessions were conducted for 61 dry and wet season seed producers (including four PDA staff members) in Takeo and Kampong Thom. After the training, an informal assessment was conducted with some of the trained seed producers. The assessment revealed that most smallholder producers had knowledge on proper rice production techniques and practiced some of those techniques, but had less access to information on appropriate use of inputs, including fertiliser and pesticide, compared to trained seed producers contracted with the Agricultural Quality Improvement Project (AQIP) and large scale producers (2-10 hectares). Follow-up phone calls in May 2013 found that some producers were producing modern varieties and exchanged their seed with other farmers' paddy or sold it at the paddy market price. This has helped increase farmers' access to modern varieties. An intervention summary report has been produced to show completed activities, key findings during the implementation process, activity adjustments, and lessons learnt for this specific intervention.
Next steps:	None
Lessons Learnt:	Some neighbouring farmers of the trained seed producers have provided feedback that some of the production techniques, such as single row planting, were useful for their paddy production – using less seed and producing higher yields. Exchanging paddy for good seed also creates challenges for seed producers. To CAVAC, the culture of paddy exchange allows a faster and wider spread of new varieties that provide higher yields to farmers; therefore it is, in a way, beneficial, especially in areas where farmers are still producing traditional varieties.

INTERVENTION UPDATE: Int. No: Inp 11.3 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting associations to promote modern wet season rice seed varieties and market access for rice seed**
Summary:	CAVAC's intervention to support rice seed production associations is in line with the RGC's policy to support the establishment of farmer cooperatives. The policy enables farmers to organise into legally recognised cooperatives, which could improve their market and legal positions and access to financial and technical support. CAVAC supported associations in the areas of seed production techniques and knowledge of rice seed marketing. This included aspects of optimal input usage, quality control of seed production, crop protection and post-harvest management. CAVAC also supported rice seed production associations in developing market access strategies so that they could become self-reliant in the long run. CAVAC linked rice seed production associations to rice seed sellers, paddy traders, and rice millers through field day activities in order to create linkages among all the actors in the market. Activities under this intervention were expected to provide information to wet season rice farmers on new and more profitable practices – especially the benefits of using modern varieties which were yield increases. CAVAC expected farmers to better use inputs and adopt modern varieties that were appropriate for their conditions.
Achievements to Date:	In 2011, CAVAC supported four associations to conduct 11 paddy field demonstrations. CAVAC organised four field days to share demonstration results with farmers within communities; and to link associations with millers and rice / paddy traders to stimulate commercial interest for modern wet season varieties. An adoption study was conducted in early October 2012 for the work completed with the four associations in 2011 (Champei in Takeo, Sre Cheng and Boeung Nimul in Kampot and Kvek Meanrith in Kampong Thom). The study found that the adoption rate of Phka Rumduol variety was high in commercial areas such as Kvek and Champei but it was very low in non-commercial areas such as Boeung Nimul. Boeung Nimul seems isolated from the market and has had no record of producing Phka Rumduol before. Thus, paddy traders have never approached this area for the particular variety. Overall, the finding was positive. Despite the early introduction of the variety, CAVAC's field demonstrations and field days contributed to increased production areas of Phka Rumduol. The area increase was in total 135 hectares (92 households) in the four communities of the four associations. In the first half of 2012, 10 rice seed producers (who are association members) were trained by CAVAC in rice seed production techniques. CAVAC worked with three associations to organise 10 rice seed production demonstrations; and with one association in Po Samrong on paddy production. In addition, four field days for rice seed field demonstrations were conducted to link actors on the supply side (such as seed producers) with the actors on the demand side (such as farmers, village chiefs, commune council members, paddy traders, seed sellers and millers). In the first half of 2013, the rice seed market strategies were developed for Kvek Meanrith, Champei and Boeung Nimul associations. CAVAC discussed ways to ensure sustainability of the associations' seed production while achieving the goal of having wet season rice farmers' shift from producing traditional to modern varieties that are higher-yielding – further boosting incomes. After the strategies had been developed, five field demonstrations (one with Champei and four with Boeung Nimul) were managed by association chiefs in nearby villages / communes of the associations, using seed provided by the same associations (Phka Rumduol for Champei and Phka Romeat for Boeung Nimul). Input retailers / companies also took part through their contribution to the costs of fertiliser. CAVAC was mainly acting as a back-stopper on technical aspects and other relevant expenses including field days, of which two were conducted in 2013. During the implementation of these field demonstrations, it was found that rat infestation and other pest and disease damage were a major concern in Champei while Boeung Nimul was hardly affected. In March 2014, CAVAC conducted an impact assessment on the seed production demonstrations conducted with Kvek Meanrith, Champei, Boeung Nimul and paddy field demonstration with Po Samroang. The assessment focused on changes in association members/seed producers' KAP and farmers' adoption of modern varieties due to those demonstrations. It used newly collected data from the fields and secondary data from CAVAC's previous studies. The assessment revealed that there was no real market demand for quality seed, and due to this lack of market demand half of association members stopped producing seed despite their knowledge gains. It also indicated that the increase of the production areas of modern varieties was 22 ha (64 households) in the areas of these associations. Based on this latest assessment, CAVAC concluded that association members have gained more knowledge on seed production but the problems with the market demand were beyond CAVAC's capacity to address at this stage. Nonetheless, this intervention has laid a foundation for more adoption, and consequently more production, to take place by itself if external conditions, such as market demands, become favorable in the future.
Next Steps:	Write an intervention summary report.

Lessons Learnt:	Both availability and adoption of modern varieties are largely dependent on or responsive to the market, i.e. higher paddy price, and consistent demands. Large buyers such as middlemen and rice traders are seen to play a key role in inducing production and adoption of commercially viable modern varieties; therefore, promotion of wet season modern varieties should concentrate more on working with these players and linking them to producers, rather than working with producers alone. In working with associations, it is important to assess their internal capacity, such as organisational structure, management skills and members' incentives, sufficiently before starting an intervention. That is because these factors determine their ability and commitment to carry out intervention activities properly, and therefore the success of an intervention.

INTERVENTION UPDATE: Int. No: Inp 12.9 AWP No: 1.2 Date: 31 December 2014	
Name:	**Strengthening production knowledge to enhance the availability of good quality rice seed in the market**
Summary:	The seed production business requires intensive capital investment, skilled production knowledge, effective and efficient human resource management and good branding. CAVAC intended to contribute to the growth of seed businesses through its support on building seed producers' capacity to produce and market quality seed. In 2012, CAVAC started partnering with Mr. Sokunthea – a seed producer in Kampong Thom. CAVAC's intervention plan with Mr. Sokunthea included: ▪ Hiring a local rice seed market access expert to help Mr. Sokunthea's team develop a rice seed market strategy and an implementation plan for his rice seed business. ▪ Hiring a local seed production specialist to provide Mr. Sokunthea's team with theoretical and practical knowledge about proper seed production for both wet and dry seasons.
Achievements to Date:	A rice seed market access strategy for Mr. Sokunthea was developed. As of July 2013 Mr. Sokunthea officially informed CAVAC that he was unable to produce seed yet due to several reasons: 1. lack of water due to damage to his irrigation system. This was due to an inability to get approval to dig a canal from a tributary of Tonle Sap; 2. limited access to his fields in wet season, as per the above constraint; and 3. unpredictability and likelihood of flood which can lead to crop loss during production and harvest. As a result, the recruitment of a part-time rice seed production consultant has been delayed. In the July-December 2014 period, CAVAC decided to close this intevention. An intervention summary report has been produced to show completed activities, key findings during the implementation process, and activity adjustments for this specific intervention.
Next Steps:	None
Lessons Learnt:	

INTERVENTION UPDATE: Int. No: Inp 12.10 AWP No: 1.2 Date: 31 December 2014	
Name:	**Dry season rice seed market**
Summary:	Cambodian dry season rice farmers are entrepreneurial. The majority use rice varieties that respond to paddy buyers' demands and requirements. Without support, Cambodian medium and large dry season rice seed producers are struggling with access to quality seed. There is also limited knowledge of seed production and how to market quality seed. Through this intervention, CAVAC planned to work with existing medium and large seed producers to improve their quality seed supply to the market. It was supposed to focus on providing seed producers with appropriate seed production techniques through training; and linking producers with the best local or international seed production companies through study tours.
Achievements to Date:	In 2012, CAVAC conducted training in dry season rice seed production techniques in Kampong Thom. A quick assessment was conducted, and it revealed that most seed producers produced good paddy, not seed, and that the culture of exchanging seed also played a main role in the dry season rice seed market. As the rice seed business is associated with high risks, it is less likely that the current so-called seed producers will become legitimate seed producers. CAVAC understands that it cannot contribute much to addressing any constraints in this market. In the first half of 2013, CAVAC contacted several dry season rice seed producers and millers outside of its target provinces (Kampong Cham and Prey Veng provinces) to understand their rice seed production and business situation. Based on those contacts, CAVAC has found the following: - Those seed producers received some kinds of training on seed production techniques from various non-governmental organisations/development programs. Those producers also faced the challenge of selling their seed, and thus produced good paddy instead of seed and did not get to apply proper seed production knowledge. - Millers did not want to invest in the seed production business because they thought that this business was complicated and risky and that it should be a role of the government to ensure that farmers had good seed to use to meet real market demand.
Next Steps:	This intervention has been cancelled.
Lessons Learnt:	The rice seed market is complex from the policy to farmer level, which makes it hard for seed producers to secure their businesses. The price of rice seed has not been high enough to compensate for the high cost of the recommended rice seed production techniques. This has led producers to keep producing only good paddy to sell as seed. Moreover, Vietnamese varieties are popular for dry season rice cultivation and those varieties are not supported by the RGC policy. The rice seed business is therefore considered to have a number of high risks associated with it. It is challenging to find existing seed producers who conform to seed production standards as defined by the International Rice Research Institute.

INTERVENTION UPDATE: Int. No: Ext 10.1 AWP No: 3.2 Date: 31 December 2014	
Name:	**Supporting a fertiliser company to improve its information services for farmers**
Summary:	CAVAC's interviews with farmers and retailers indicated that most farmers did not possess an appropriate level of knowledge on fertiliser application. CAVAC found that farmers used fertiliser based on peer advice or trial and error, and made decisions based on available budget. In most cases this method does not provide an optimal yield. Disseminating information on appropriate use of fertiliser to farmers via retailers, or direct interaction with farmers by private companies, is seen to be an effective and sustainable way of reaching farmers. The purpose of this intervention was to enhance the capacity of Heng Pich Chhay (HPC)'s information services for farmers. Heng Pich Chhay is a fertiliser company in Cambodia. CAVAC was working with HPC: ▪ to build HPC staff capacity on fertiliser use to enable staff to effectively operate help desks; ▪ to conduct more field demonstrations; and ▪ to implement retailer training workshops.
Achievements to Date:	▪ In 2011, two HPC staff members were sent to Vietnam to attend a three-month training course on fertiliser use in rice cultivation. ▪ CAVAC also supported HPC to conduct 120 field demonstrations, two field days in Kampot and Takeo, and two training workshops in Kampot and Kampong Thom. The total number of participants in these training activities was 447, including 360 farmers. ▪ M&E activities were conducted by collecting information from HPC staff, trained retailers and farmers. These activities found that the capacity of staff trained in Vietnam remained insufficient after the training, and as such the staff remained unable to give appropriate advice over the telephone. The M&E also revealed that retailer training and field demonstrations were of low quality. The M&E results were discussed with HPC. Both CAVAC and HPC accepted that HPC did not have enough field staff to carry out the activities and that its staff's technical knowledge was still a constraint. In order to improve the quality of its information services, the company continued to build its staff capacity by sending two staff members (including one that had previously received training in Vietnam) to join a training session with personnel from 11 other fertiliser companies in early 2013. The main topics covered by the training were fertiliser use, participatory retailer Training of Trainers (TOT), and the retailer business case. ▪ M&E activities were also conducted at the farmer level with a strong focus on assessing knowledge and practices of field demonstration farmers and other farmers for both dry and wet season rice cultivation. The M&E results revealed that the majority of demonstration farmers did not follow HPC's recommendations. This was due to HPC's limited capacity to manage field demonstrations (limited staff numbers / poor communication). As such, demonstration farmers were not convinced of HPC's recommendations, resulting in a lower than expected uptake. CAVAC observed that farmers who followed the company's recommendations on fertiliser use in their field demonstrations had become information sources for their communities. These farmers have increased their yield by roughly 15-30 per cent when compared to their previous practices. ▪ After CAVAC shared several M&E reports with the company, HPC shifted from conducting a large number of low quality extension activities to a reasonable number of focused activities. ▪ In the first six months of 2014, CAVAC conducted a random check with various field demonstration farmers to confirm the previous findings. Again, the results have shown that most farmers did not remember or apply fertiliser according to the company's recommendations. This was due to low capacity of HPC staff at that time, which led to poor field demonstration management and communication between the company and field demonstration farmers.
Next Steps:	Capture sustainability signs for this intervention.
Lessons Learnt:	The retailer training workshop was not conducted effectively and as a result, trained retailers did not gain sufficient knowledge required to provide advice to farmers. In regards to field demonstrations, some farmers were given fertiliser without proper usage instructions or were not given fertiliser on time. This was due to the company's limited staff resources to carry out a large number of field demonstrations. Therefore, CAVAC needs to consider the capacity of the company's staff in carrying out agreed activities to ensure quality of demonstrations. Maximum involvement of the company staff in assessments especially at the retailer and / or farmer level significantly contributes to the company's acceptance of the findings. Both CAVAC and HPC have taken on board the valuable lessons from these activities. After sharing the results of the M&E activities, CAVAC observed that the company had shifted its focus from quantity to quality.

INTERVENTION UPDATE: Int. No: Inp 10.1 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a fertiliser company in providing training to retailers**
Summary:	Farmers' lack of knowledge on fertiliser application is a major issue preventing farmers from obtaining maximum incomes. In order to help address this constraint, CAVAC works with fertiliser companies to provide better information services to farmers through their retailers. Fertiliser retailers interact directly with farmers and can provide greater outreach compared to traditional information service approaches. The expected impact of a retailer's provision of information services (such as advice to farmers) is to increase demand for that retailer's product, providing an incentive for the retailer to continue supplying information on the use of the product. If a retailer becomes successful using this approach, other retailers will offer similar services in order to retain customer share. Additionally if more products and services are offered by retailers, more information and choices become available to farmers. Farmers will increasingly be able to access information on the appropriate application of fertiliser to more efficiently produce crops. Furthermore, through training retailers, the fertiliser company will enhance its relationship with retailers, enabling improved quality control at the retailer level. CAVAC's intervention with Ye Tak supported retailer training. Prior to CAVAC's assistance, Ye Tak conducted national retailer training workshops, which were in the format of a promotional product campaign rather than technical training. At the beginning of the intervention, CAVAC supported Ye Tak to conduct one national retailer training workshop which was led and managed by the company. A joint assessment of the workshop revealed that improvements on technical information as well as the training methodology were needed and that the training should focus more on retailers rather than wholesalers. Ye Tak accepted the assessment results and continued working with CAVAC to conduct provincial retailer training with improved training curriculum and methodology. Six provincial retailer training sessions were conducted in 2012. In addition, CAVAC hired an international fertiliser quality assurance consultant to assess the quality of Ye Tak's product supply chain and services as well as its retailers' and wholesalers' confidence in distributing fertiliser. The assessment was to find out if there was adulteration of Ye Tak's fertiliser within the supply chain and how fertiliser was adulterated.
Achievements to Date:	**Fertiliser retailer training** ▪ Two Training Needs Assessments (TNAs), one national retailer training session and six provincial retailer training sessions were conducted. ▪ CAVAC's M&E team evaluated the retailer training conducted by Ye Tak. Key lessons learned were collected and shared within the CAVAC team in order to improve the next retailer training activities. Following the training, Ye Tak added two staff members into its information system team – one newly recruited and one internally promoted. At that time Ye Tak had five technical staff members that provided information services. ▪ In the first half of 2014, CAVAC conducted an assessment to measure change in KAP at the farmer level due to this intervention in Takeo, Kampot, Kampong Thom and Prey Veng. It was found that one retailer shared information on fertiliser usage to about 90 farmers on average per year. Of these farmers who received the information, 91% changed their practices, of which 55% followed the advice fully and 36% followed partly. ▪ CAVAC started discussing the methodology to capture static and dynamic sustainability signs for this intervention. **Fertiliser quality assurance** ▪ Ye Tak quality assurance assessment was conducted by an international consultant. The consultant visited a number of retailer outlets (small scale to large scale) in 15 different provinces. The consultant also assessed the operations of Ye Tak's competitors. However, the study found no evidence (outside of what could be considered as an occasional practice) of the misuse of the Ye Tak brand to promote sales of adulterated fertiliser or as a means to promote a competitor's product. The study suggested that the problem of adulterated fertiliser occurred primarily when the fertiliser price in the international market surged, particularly during 2007-2008. ▪ In April 2014, CAVAC reviewed a study by the Cambodia Development Resource Institute (CDRI) on the "Development of the Fertiliser Industry in Cambodia: Structure of the Market, Challenges in the Demand and Supply Sides, and the Way Forward". The study highlighted some claims about issues relating to adulterate quality of fertiliser leading to lower rice yields on farmer fields. However, the sample size of the study was too small, while the study was based largely on assumptions relating to farmer perception. There are many factors leading to lower yields from year to year. More precise study and analysis should be undertaken. At this stage, CAVAC concluded that the fertiliser quality issue is still in doubt and remains in observation.
Next Steps:	▪ Work on capturing both static and dynamic sustainability for this intervention. ▪ Capture farmer outreach and reach of this intervention. The research is expected to be undertaken

	in February-March 2015.
Lessons Learnt:	The jointly conducted TNA found that the training methodology and curriculum used must take into account different educational backgrounds and knowledge in the use of fertiliser of the trainees, in order to ensure effective knowledge transfer. Retailers play an essential role in providing technical knowledge to farmers. Currently, farmers tend to accept retailers' advice more if retailers demonstrate their technical knowledge in the field. In the past, farmers believed that retailers lacked farming knowledge and as such they would not be able to provide effective advice. The last M&E activities conducted showed that village retailers were the key actors in influencing farmers' behaviour. This finding has been incorporated in current activities with input companies. When working with partners, it is important to discuss in advance the kind of data that CAVAC requires from them and their clients for M&E activities. A work plan should be developed and agreed with the company, with both sides able to update and modify at each implementing stage. CAVAC must also consider the company's ability to commit time and staff capacity to implement the intervention in advance.

INTERVENTION UPDATE: Int. No: Inp 12.4 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting fertiliser companies in staff capacity building**
Summary:	With the rapid change within the fertiliser market, farmers need to keep up-to-date with technical information on the types of fertiliser available and updated application techniques in order to increase their productivity and comparative advantage. Private enterprises are seen as a sustainable source to disseminate information to farmers. Though most companies have some information services, these are generally poor quality due to limited in-house technical knowledge and less effective information transfer. This has made it harder for farmers and retailers to access information on appropriate fertiliser application. CAVAC aimed to improve fertiliser companies' capacity to provide knowledge of best practice fertiliser management. This focused on the general '4R's – 'right type, right amount, right time, and right application'. Facilitated by CAVAC, target fertiliser companies are now attempting to provide fertiliser application principles so that farmers can optimise their rice production to maximise income. For this intervention CAVAC worked with 12 fertiliser companies by providing training to improve the capacity of staff in three areas: 1) understanding the incentive to provide product information services and being able to develop business cases; 2) more appropriate technical knowledge of rice production; and 3) providing more effective training to their retailers / customers (through a participatory training approach).
Achievements to Date:	▪ Two training institutions were selected to conduct the training; the Agriculture Technology Services Association (ATSA) on technical knowledge of rice production, and SILAKA on the participatory training approach. ▪ Lessons learnt from the previous retailer training were incorporated into the curriculum. ▪ A total of 25 staff members from 12 fertiliser companies (including 4 female participants) attended the training. The business case development session was tailored to meet the needs of the participants by CAVAC staff. ▪ In early 2014, CAVAC conducted an assessment at the company level to capture any change in the companies' current information system activities resulting from group capacity building. Five companies (Heng Pich Chhay, Maly San, Papaya, Anachak and Ye Tak) requested further support from CAVAC (Intervention Number Inp 13.6). Some companies have integrated lessons learnt through the group training in their information services, such as participatory approaches, retailer business case (retailer's provision of product information to farmers is likely to bring more customers to the retailer), and disseminating fertiliser use information based on rice growth stages. ▪ Within the second half of 2014, CAVAC conducted an assessment on the KAP change at the company level.
Next Steps:	Capture sustainability signs for this intervention.
Lessons Learnt:	Most participants committed to apply the training in practice and showed their eagerness to maintain the network among participants from the training. Participating companies, which also sell pesticides, asked CAVAC to organise a similar training for best practice in pest management. Participating companies distributed different types of fertiliser (i.e. mineral fertiliser, organic, and foliar). Based on a fertiliser KAP survey and literature review conducted with a sample size of 1200, it was highlighted that the application of mineral fertiliser might have a greater impact on rice crop production. Given this finding, CAVAC investigated ways that fertiliser training could focus on application advice in order to facilitate the largest possible potential yield increase. Most fertiliser companies conducted farmer meetings as part of their information services. They conducted a large number of meetings, and those meetings did not prove to be very effective. CAVAC has now figured out how this service could be improved. After the training, all companies believed that village retailers play an important role in communicating directly with farmers. It has now been observed that some companies have put more focus on village retailers within their information services.

INTERVENTION UPDATE: Int. No: Inp 12.5 AWP No: 1.2 Date: 31 December 2014	
Name:	**Fertiliser forum**
Summary:	With the fertiliser market in Cambodia growing quickly, fertiliser companies are trying to get technical information from a variety of different sources. However, private companies and public agricultural research institutes have different approaches to applying fertliser. These inconsistant views have created challenges for farmers who require accurate information when making decisions, resulting in constrained productivity improvement. CAVAC initiated a fertiliser forum, bringing together scientists from research institutes, private companies, and other relevant participants. The main objectives were: ▪ to discuss issues around various fertiliser recommendations; ▪ to minimise the gaps between knowledge provided by all stakeholders; ▪ to discuss the practicality, economic efficiency, social impact, environmental impact and biosafety issues of organic, inorganic and bio-fertiliser; and ▪ to build the relationship between the public and private sectors. However, CAVAC's 2013 KAP survey on fertiliser-yield response in rice production, with a sample of 1200 farmers, indicated that the yield response to fertiliser recommendations from private companies was already high. Based on this result, CAVAC has decided that a fertiliser forum should not be a priority at this stage.
Achievements to Date:	CAVAC's fertiliser team had discussions with a number of private fertiliser companies and institutions within the public sector in the first six months of 2012. In May 2013, CAVAC decided to drop this intervention based on the results of its fertiliser KAP survey in early 2013.
Next Steps:	None
Surprises, Adjustments or Problems:	
Lessons Learnt:	

INTERVENTION UPDATE: Int. No: Inp 12.6 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a fertiliser company to provide better training to farmers**
Summary:	CAVAC supported Bayon Heritage Holding Group Co., Ltd (BHG) to increase the effectiveness of its information system. The company currently imports and distributes fertiliser for the rice and vegetable markets. The company's main information system activities are providing training in crop production to farmers using the company's products and field demonstration. However, the quality of its training and field demonstration were limited due to the poor technical knowledge of staff and limited understanding of effective methodology for these two activities. CAVAC designed an intervention with the company to improve its information system team's technical knowledge in rice and vegetable production and participatory training approaches. It was expected that after this training, the company would conduct more effective information services and increase the number of available services, which would ultimately influence farmers' behaviour and increase adoption of more efficient practices in crop management.
Achievements to Date:	Training on rice and vegetable production, and effective means of communication with farmers (i.e. through a participatory approach) was conducted by a jointly selected training provider, ATSA. 43 staff members from Bayon Heritage participated in the training, of which five staff were female. ATSA submitted a training report. Based on a phone conversation with BHG's Sales and Marketing Manager in 2013, BHG staff were more confident in providing advice to farmers following the training. This finding was subsequently confirmed through M&E activities. During the first half of 2014, CAVAC conducted an assessment with 12 BHG staff members (including management staff). The assessment has found the following : ▪ Participants are generally satisfied with the training. ▪ Fertiliser recommendations for four soil types in the areas around Tonle Sap (Bakan, Kbal Po, Tuol Sam Rong and Krakor) have been updated after technical staff received intensive knowledge of soil types and their characteristics from the training. ▪ BHG staff members are more confident in providing information services, such as farmer meetings, field demonstrations and technical assistance. ▪ BHG is currently also supplying organic pesticides to the market as there is a growing opportunity in the pesticide market within Cambodia.
Next Steps:	▪ Conduct M&E activities at the farmer level to assess farmers' KAP changes resulting from this intervention.
Lessons Learnt:	It has been noticed that organic fertiliser helps to contribute to the soil's capacity in maintaining nutrients from chemical fertiliser. Some actions may be taken to confirm this. It has been noticed that agricultural input companies supplying fertiliser have also started supplying pesticides, and those supplying pesticides tend to also add fertiliser to their products.

INTERVENTION UPDATE: Int. No: Inp 12.8 AWP No: 1.2 Date: 31 December 2014

Name:	**Supporting a fertiliser company in staff capacity building and piloting retailer training**
Summary:	The results of the intervention (Ext 10.1) to 'improve HPC's information services' showed that HPC did not have enough capacity to provide participatory training on appropriate fertiliser application and rice production to retailers and farmers. As such, the effectiveness and quality of the intervention's earlier training was compromised. CAVAC's M&E activities indicated that trained retailers and farmers could not recall the key messages of the workshop. Based on these lessons learnt, a new intervention has been designed to improve the effectiveness and quality of retailer training conducted by fertiliser companies, including HPC. The previous findings from the M&E activities for the first intervention revealed that HPC's retailer training workshops needed significant improvement. HPC has then requested support for effective retailer training. HPC and CAVAC shortly later planned to pilot four retailer training sessions, to be conducted by the company's previously trained staff (from Inp.12.4) to village level retailers. After the intervention, it is expected that HPC will conduct retailer training without CAVAC's support. In addition to retailer training, the company also requested CAVAC support to undertake field experiments in order to improve and update the company's recommendations on fertiliser use. The main purpose of the field experiments is to find more economically efficient fertiliser recommendations for the benefits of Cambodian farmers at large, both for wet season rice and dry season rice cultivation. Ten experiments are planned, five of which will be conducted with direct support of a selected technical consultant. This selected consultant will also provide mentoring and coaching to HPC's staff, as well as retailers who are involved in the activity. The other five field experiments will be managed by either HPC staff or HPC retailers (or both) so that they can apply lessons learnt in a practical context.
Achievements to Date:	▪ The training curriculum and trainee selection criteria were jointly developed by CAVAC and HPC. Training materials which had been used to provide training to 12 fertiliser companies were integrated into the curriculum. ▪ Four village retailer training sessions have been piloted by trained HPC staff in Takeo, Kampot, Prey Veng, and Battambang respectively, with 121 participants in total, including 20 females. The first two training sessions were conducted with technical support on participatory approaches from a CAVAC consultant, while the last two were fully delivered and managed by HPC staff. ▪ Two feedback sessions between CAVAC and HPC were conducted after each of the first two training sessions. Following the sessions, a list of improvements was produced and agreed upon. These constructive comments, derived from the feedback sessions and the list of improvements, have increased the confidence of HPC trainers to carry out subsequent training themselves. ▪ One of the two trained staff (under Inp 12.4) has shown the capability and confidence to provide quality training. CAVAC's mentoring support through this intervention has helped to strengthen the capacity of this staff member (main trainer). The main trainer has also been mentoring two other staff members (late joiners) through on-the-job training and has started to transfer some sub-sessions of the training to them to carry out. ▪ A field experiment protocol has been developed and shared with relevant HPC staff and retailers. ▪ One wet season field experiment was completed. The prolong drought in the 2014 wet season damaged the seedlings of one field and later two more fields were damaged due to severe infestation of rice blast, leaving only one field valid for experimentation. CAVAC and its consultant are currently working on the data analysis for this one field experiment.
Next Steps:	▪ Conduct an early check on the change in retailers' practice and that of farmers after joining fertiliser retailer training with HPC. ▪ Draw result of data analysis of wet season rice's field experiment. ▪ Discuss with the company on the field experiment result and its intended approach going forward.
Lessons Learnt:	Good communication between CAVAC and partners such as HPC is central to improvements in the quality of an intervention. For example, previous experience has shown that joint leadership by both parties and timely monitoring are important for intervention quality. While HPC took the lead on this intervention, CAVAC worked closely with the partner in each part of the implementation plan and ensured a timely update of work progress together with the partner. CAVAC has observed that HPC may now see the benefit of transferring technical knowledge to retailers and that they have increased the investment made in retailer training at the village level. The company also seems to have shifted its focus from quantity to quality. During a feedback session with the HPC Director, it was mentioned that the company tried to respond to retailers' feedback comments from the training to develop information services that would fit to their requirements. HPC has also started to build its retailers' capacity in managing field demonstrations, in order to disseminate the company's fertiliser recommendations as well as the company brand in their

	community. This is a new trend, where other companies have shown increased dependency on their village retailers. Another advantage from this model is that retailers have evidence in the actual fields to show and convince their farmer clients. However, chance of failure of the field demonstration is high as it seems that this is an additional role of retailers in their business, and if they do not take ownership of it and commit with action plan to manage it, the demonstration can fail, impacting more negatively on the companies.

INTERVENTION UPDATE: Int. No: Inp 12.11 AWP No: 1.2 Date: 31 December 2014

Name:	**Supporting a fertiliser company in its retailer training and retailers' field demonstrations**
Summary:	After seeing the results and lessons learnt from its previous intervention on fertiliser retailer training (Inp 10.1), Ye Tak has shifted its focus from a national and provincial level training to more on demand-based training at the commune and village levels. The company has reallocated its budget to reflect this shift of focus. CAVAC has found that retailers who have gained knowledge on the use of fertiliser from the original training have been providing advice on correct fertiliser application to farmers. This enables retailers to attract more clients and sell more products. Some have even assured farmers of the expected yields if farmers follow their recommendations. Therefore, to improve the effectiveness of information services (including retailer training) and thus ultimately extend outreach as well as build a sustainable market system, CAVAC has been working to improve Ye Tak's retailer capacity to deliver best advice to farmers. This intervention is divided into two parts: 1. Organise seven fertiliser training sessions aimed at the village retailer level, to be conducted by staff trained through group fertiliser training (from Inp. 12.4). This will allow staff to practice their knowledge and skills whilst also allowing the company to have a close interaction with retailers who have direct contacts with farmers. 2. Work with the company to develop an effective field demonstration protocol and ensure that staffare competent in transferring this knowledge to retailers. The knowledge on this protocol will be transferred by the company's staff to selected trained retailers. Those selected retailers will conduct field demonstrations on their own fields using the protocol given by the company staff. This will perpetuate the business case for retailers: The field demonstrations by retailers will provide real evidence to farmers, which will have a potential effect on influencing change in farmers' practices. In addition, it was later agreed that a short farmer meeting would be conducted before each field demonstration to draw farmers' interest and attention, and equip them with some basic knowledge on fertiliser application in rice production.
Achievements to Date:	**For Village Retailer Training:** ▪ Training curriculum and criteria for trainee selection have been jointly developed by CAVAC and Ye Tak. A list of lessons learnt from the previous intervention and M&E reports have been integrated into the curriculum. Some parts of the training materials from the group training for 12 fertiliser companies have been integrated into the curriculum. ▪ Seven village retailer training sessions have been conducted by trained staff. An improvement plan from each training session has been integrated into the next training session, to ensure ongoing improvement. **For Retailer Field Demonstrations:** ▪ A contract amendment to introduce a short farmer meeting prior to every field demonstration was made. ▪ A field demonstration protocol and a work plan for field demonstration management were finalised. ▪ Eight farmer meetings and eight early wet season field demonstrations were conducted, and trained retailers were coached on how to manage field demonstrations by themselves with distance support from the company. Due to drought and failure to comply with recommendations, only three field demonstrations were accepted; one field day was conducted. ▪ Eight farmer meetings and eight wet season field demonstrations were started, but one was cancelled due to flood.
Next Steps:	**For Village Retailer Training:** ▪ Conduct an early check on the impact of the training at the retailer level. **For Retailer Field Demonstrations:** ▪ Monitor the on-going seven wet season rice field demonstrations, including field days. ▪ Follow up with the company on the remaining 11 dry season rice field demonstrations and three wet season rice field demonstrations.

Lessons Learnt:	It is important that chances for adjusting activities to reflect changes in the market or new situations in the field are taken on board during implementation of the intervention. This requires CAVAC to allow some flexibility in activity implementation, in order to ensure the quality of work still remains. For example, during the preparation for the field demonstrations, a new idea was suggested by Ye Tak to add a short farmer meeting to each field demonstration to increase farmers' interest and participation in the field demonstrations through the provision of basic knowledge on fertiliser application and practical experiments in the field. A company's internal management issues, such as lack of willingness to delegate responsibilities from senior to junior staff, lack of commitment towards activity implementation given staff's time constraint in other activities, and staff movement, could negatively affect the intervention implementation. It is therefore important that CAVAC adequately assess a company's internal management aspects before starting an intervention.

INTERVENTION UPDATE: Int. No: Inp 13.6 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a fertiliser company in improving its field demonstrations**
Summary:	CAVAC has agreed to further support Papaya Trading Co., Ltd to improve the company's information services for farmers, following their participation in the group fertiliser training. Papaya believes that farmers' improved knowledge of correct fertiliser application holds the key to its success and growth in the long run. Papaya has identified improvements to its current field demonstrations, which are partial demonstrations, and farmer meetings as a requirement for growth. Involvement of successful farmers in these information service activities is at the centre of the company's focus, as they are the people who can use their credibility and knowledge to disseminate knowledge on proper use of fertiliser effectively to other farmers. These activities are in line with CAVAC's strategy in the fertiliser market 'to provide proper advice on best practice in fertiliser management on rice production, which can help farmers achieve cost effectiveness and optimal yields'. The benefits from these activities are twofold; addressing both farmers' constraints, and those of suppliers and the support market as a whole, which would potentially lead to increase in yield and incomes. Initially, CAVAC's support to Papaya focused on the development of an effective field demonstration management guideline by piloting six field demonstrations (four for paddy and two for vegetables) and six field days. However, as Papaya later found it was more beneficial to focus only on paddy field demonstrations and smaller size plots in order to increase marketing opportunities, it requested to convert the two vegetable field demonstrations into two paddy field demonstrations, and split each of the agreed number of paddy field demonstrations into two smaller ones. Therefore the revised total number of paddy field demonstrations is ten, and that of field days is nine.
Achievements to Date:	▪ Following the first three pilot fields and field days, a guideline on effective field demonstration management was developed for Papaya, incorporating lessons learned from the first three demonstrations. It has become an insightful and practical tool for future field demonstration management, and assists in ensuring consistent quality and effectiveness across all Papaya's field demonstrations. ▪ The guideline was jointly presented by CAVAC staff and Papaya's focal person to Papaya's sales and technical staff in Kampong Cham office, and to staff in Battambang office by Papaya's focal person. ▪ Seven paddy field demonstrations and six field days were conducted by Papaya's focal persons in Kandal and Kampong Cham, following the suggested guideline and with constant feedback and support from CAVAC.
Next Steps:	▪ Follow up with the remaining three other field demonstrations and field days to be conducted by Papaya's staff in Battambang, based on the presented guideline.
Lessons Learnt:	A participatory approach plays a very crucial role in effective field demonstration management. Besides demonstration farmers, other farmers need to be engaged in every step of a field demonstration, particularly the three fertiliser top dressings. This is to ensure that they have witnessed the field demonstration from the conception (i.e. broadcasting or transplanting) to its harvesting Good results from field demonstrations on less productive soil are more likely to lead to high adoption of the growing techniques and fertiliser application. To increase farmers' trust in a company's information services, the company needs to share and disseminate some basic knowledge of fertiliser, especially on nitrogen (N), phosphorus (P) and potassium (K) and then link it to the company's recommended product at each fertiliser top dressing. With this method, farmers tend to feel more confident to follow the company's advice this season or later.

INTERVENTION UPDATE: Int. No: Inp 13.6 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a fertiliser company in improving its field demonstrations and farmer meetings**
Summary:	Fertiliser companies such as Maly San Group Co., Ltd (MSG) have embedded various information services in their daily business operations. However, the outcomes are still limited and can be optimised through some improvements to their work. Following on from its participation in the group fertiliser training, MSG has requested further support to improve the capacity of its staff through joint collaboration in providing one farmer meeting, three wet season paddy field demonstrations and three dry season paddy field demonstrations. MSG hopes that by collaborating with CAVAC, its staff will become more knowledgeable and confident in implementing information services, which will help farmers increase yields, resulting in better trust between the company and its customers. During the implementation of the first field demonstration, which was preceded by a farmer meeting, MSG realised that it would be better to replace farmer meetings with field days to be conducted upon the end of field demonstrations, as their results would serve as hard evidence to convince farmers of the company's fertiliser quality. Later, however, small meetings to assess willingness of field demonstration farmers were added prior to the field demonstrations.
Achievements to Date:	▪ A technical consultant for field demonstration management was recruited to oversee the field demonstrations and coach MSG's staff on the field techniques. His contract, however, was later terminated as MSG found his performance unsatisfactory after the first field demonstration. MSG technical manager has taken over the role of the terminated consultant. ▪ Two farmer meetings were conducted, and CAVAC provided necessary feedback for future improvement. ▪ A field demonstration guideline was developed and oriented to all field staff. ▪ Three field demonstrations, one for dry season rice and two for wet season rice, and one combined field day for the two wet season field demonstrations were conducted following the guideline.
Next Steps:	▪ Continue monitoring the remaining three field demonstrations and field days conducted by the company staff. These activities serve as a practical experimentation for them to apply knowledge from the training into the field. Throughout these activities, CAVAC is to provide constructive feedback related to participatory approaches for MSG to improve its next activities.
Lessons Learnt:	Assessing partners' demand for support can be challenging if insufficient information is supplied by the key personnel responsible for the activity. During the initial discussions to determine the type of support MSG would need from CAVAC, the technical manager of MSG was not involved. This led to the decision to recruit a technical consultant to support MSG in the management of the field demonstrations. It was only when MSG's technical manager made a complaint about the consultant's unsatisfactory performance, and a subsequent request for the termination of his contract that it was clear that the consultant had not been the real demand, because the technical manager would be able to manage the technical aspects of the field demonstrations sufficiently. Spaces for continual learning and adjusting are crucial for companies to improve their extension activities. During the course of three field demonstrations with MSG, MSG has shown efforts to constantly experiment advice provided by CAVAC to improve its field demonstrations and farmer meetings. Following the essence of the guideline developed for managing its field demonstrations, MSG has adjusted a number of activities to increase the efficiency of its activities, including: - replacing farmer meetings of about 25 people with small and quick meetings of about 10 people; - adjusting criteria to select field demonstration farmers; - negotiating a deal with field demonstration farmers that require them to pay for their own inputs while the company provides only full technical support; and - conducting big field day events (one field day for two demonstrations) to disseminate information on its field demonstrations.

INTERVENTION UPDATE: Int. No: Inp 13.6 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a fertiliser company to develop fertiliser recommendations**
Summary:	A consultant working on the development of an information dissemination strategy in 2012 identified the perception amongst Cambodian farmers that yields for wet season paddy and dry season paddy could be increased by 55% and 40%, respectively. The most important method to achieve the potential yield increase is correct fertiliser application in terms of both the amount and timing. Cambodia is a fertiliser importing country, with significant imports arriving from Thailand and Vietnam. As such, the fertiliser recommendations of most companies in Cambodia are directly translated from Thai and Vietnamese. Some of the instructions are not suitable for the Cambodian contexts, both in terms of the cropping system / pattern and socio-economic factors affecting the rice production profitability of Cambodian farmers. Therefore producing locally adapted fertiliser recommendations would benefit Cambodian rice farmers, as they would help increase farmers' yields and ultimately incomes. In return, the company would gain trust in its products and associated advice from farmers. CAVAC is currently working with a fertiliser company (Anachak) to conduct field experimentation to develop rice fertiliser recommendations on some major and representative soil types in Cambodia. The activity serves two main objectives, to develop better fertiliser recommendations for Anachak on the selected soil types and to build capacity of Anachak in fertiliser recommendation experimentation. The experimentation is planned to be conducted in both wet and dry season rice production in four different provinces (Kampong Cham, Takeo, Pursat and Battambang). Two different varieties of each rice season will be selected for the experimentation. Different types of consultants were recruited to work on the activity, including consultants in field experimental design and data analysis, soil nutrients, rice varieties and field experimentation management to develop detail experimentation protocol, to mentoring Anachak staff to operate experimentation and data analysis
Achievements to Date:	▪ Four consultants focusing on four different tasks (field experimental design and data analysis, soil nutrients, rice varieties, and field experimentation management) have been recruited to work with Anachak on this intervention. ▪ The kick-start meeting was conducted among CAVAC, Anachak and the four consultants to facilitate the development of the first field experiment protocol (wet season) by the consultants. ▪ Three field experiments in Bakan-Pursat, Bovel-Battambang, and Batheay-Kampong Cham were conducted. The plan for field experimentation in Takeo was cancelled due to drought. Data analysis on these three wet season rice field experiments is in progress. ▪ Four field experiment protocols were developed based on different soil types. ▪ Anachak recruited four temporary staff to manage field experiments. They were trained by consultants to implement the work. These temporary staff have the potential to become permanent staff after the completion of the experiments, according to Anachak. ▪ Another five locations for dry season rice field experiments were identified. Experimentation in Prey Veng started. ▪ The first feedback session was conducted among CAVAC, Anachak and consultants. It was agreed to reduce experimentation sites by decreasing the number of treatments from seven to six and replication from four to three for better management and ease in finding suitable field size. Moreover, field experiment management needs a lot of improvement.
Next Steps:	▪ Get results from analysing the data on the three wet season field experiments. ▪ Organise training on experimentation data processing and analysis for Anachak staff. ▪ Monitor dry season field experiments, data collection, and data analysis to develop site specific fertiliser recommendations. ▪ Follow up on the company's plan on dissemination of the updated wet season fertiliser recommendations and other information services.
Lessons Learnt:	There was a delay in starting this task due to the challenges in recruiting qualified consultants to implement the task. Field experiment management requires time, skills and resources to make sure everything follows the protocol in order to produce results as planned. Company partners in particular need to plan in advance to make sure all required resources are available during the implementation of the work. Because the company asked the farmers who own the fields to make the bunds for experiments and look after the field while company staff only monitor and check the progress, some farmers were not happy with the implementation, with specific complaints relating to the required workload. Moreover, there is potential that the company relies too much on farmers for daily field monitoring. This can

	have an effect on the result of the experimentation. Therefore, the company has to minimize the roles of farmers and deploy their own staff in each experimentation site. Although good planning was done for the field experiment, there were many external factors which impacted on the field experimentation. For instance, farmers could not make the bunds in some field experiments after the soil is harrowed because the soil type is enriched with sand; the field was damaged by rat infestation and pest outbreak; and there was a shortage of water at the beginning of the experiment.

INTERVENTION UPDATE: Int. No: Inp 13.9 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a fertiliser company in staff capacity building, development of an effective field demonstration management guideline, and farmer meeting improvement**
Summary:	Due to limited in-house technical knowledge as well as information services, Lay Seng Co., Ltd. is concerned about the strength of its position in the fertiliser market. The company therefore decided to invest in its staff capacity and the improvement and diversification of its current information services in order to strengthen its market position and increase its market share, particularly in the southern part of Cambodia, where sales are not yet strong. This investment corresponds to the shortage of supply of information on proper use of fertiliser to farmers, contributing to improving the information flow from the company to the end users as well as the quality of the information itself. In early 2014, CAVAC agreed to a proposal of Lay Seng, which included three main activities: staff capacity building on fertiliser use and rice production, development of an effective field demonstration management guideline which is a new information service of Lay Seng, and improvement of its current farmer meetings. Four pilot paddy field demonstrations (i.e. two in wet season and two in dry season) and four pilot farmer meetings will be conducted as part of the development of the relevant guideline. It is expected that after the staff training activity, staff will be sufficiently competent and confident to conduct the pilot field demonstrations as well as pilot farmer meetings with mentoring support from selected consultants in relevant activities. Finally, after these pilot activities, it is expected that staff will be fully competent and confident to carry out information services for Lay Seng, and thus become resource persons of the company in the long-run.
Achievements to Date:	▪ CAVAC and its consultant on participatory approaches observed one farmer meeting of Lay Seng in Kampong Chhnang province. CAVAC and Lay Seng staff also met afterwards to discuss feedback from the observation. ▪ Staff capacity building on fertiliser use, rice production, and participatory approaches was provided to Lay Seng's staff by relevant consultants. ▪ Mentoring support in four pilot farmer meetings was completed. ▪ Farmer meeting presentation slides had been jointly developed between the company staff and a consultant of CAVAC. The slide presentation was printed on posters, to be used in farmer meetings. Noticeably, posters have completely replaced PowerPoint presentation slides, as they are much more conveniently used in open air and more personalised with farmers. ▪ The farmer meeting guideline based on four pilot farmer meetings was developed by CAVAC (English and Khmer versions) and shared to the company to use as needed. ▪ A field demonstration management consultant was recruited to provide on the job training on field demonstration management to Lay Seng staff. ▪ On the job training on the first two wet season rice field demonstrations conducted in Prey Kabas district of Takeo province was completed.
Next Steps:	▪ Continue to monitor on the job training on two pilot dry season rice field demonstration and field day management. ▪ Work with the company to incorporate its comments on field demonstration management into the standard guideline of effective field demonstration management, and finalise it for the company for future use. ▪ Observe more farmer meetings of Lay Seng after providing improvement recommendations to the company. ▪ Discuss future plan for extension activities with the company.
Lessons Learnt:	The involvement of both the management staff and extension staff while implementing the agreed activities resulted in better quality of implementation. This is because the management staff could see the gaps within the company's extension activities, and thus were motivated to boost commitment of their staff to minimize the gaps altogether, leading to a faster practice change at the company level.

INTERVENTION UPDATE: Int. No: Inp 11.4 and 12.1 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a local pesticide company through capacity building for technical staff and information dissemination strategy development**
Summary:	Pests are a serious constraint for Cambodian farmers seeking to achieve high yields. Farmers, particularly commercial ones, use pesticides to target specific pests. While pesticides are used fairly regularly, it is commonly accepted that pesticide management among Cambodian farmers needs to be improved. One of the major constraints for the uptake of pesticide management amongst Cambodian farmers is a lack of knowledge on pesticide management within the pesticide market. The pesticide market covers a broad spectrum of actors such as farmers, pesticide companies (and their information service staff), retailers and the PDAs. CAVAC has found that most pesticide distributors are local companies whose in-house technical expertise is limited. As such, information distribution from companies to retailers and farmers on pesticide management could be significantly improved. To improve this information flow, CAVAC entered into a partnership with Nokorthom Agricultural Development – a local pesticide company which imports pesticides from Vietnam for distribution within Cambodia. The company has always understood that information services are a strong component of product marketing. CAVAC's first intervention with Nokorthom was conducted in 2011. That intervention focused on capacity building for the company's information agents, as those agents were known to have limited practical knowledge on pesticide management. Given the dynamics and increased competition within the pesticide market, Nokorthom requested support from CAVAC to develop a clear information dissemination strategy in order to establish a strong position in the market. CAVAC hired an international consultant to design the strategy, which was completed in early 2013.

Achievements to Date:	▪ Capacity building for Nokorthom's information service providers was completed in November 2011. This capacity building intervention was a joint training session provided by Cambodian and Vietnamese trainers from Nong Lam University. The training was composed of in-class lectures, two field trips within Cambodia and a field trip to Vietnam. Seven case studies on farmers' receiving information services directly from Nokorthom's information service providers were produced.
	▪ CAVAC's M&E team conducted an assessment on the satisfaction of Nokorthom's staff trained under the capacity building intervention. In general, the company staff were satisfied with the training.
	▪ CAVAC noticed changes within the company after the capacity building project had been completed. In early 2012, Nokorthom decided to double its sales volume. It then recruited more technical staff, improved information system materials, expanded information system activities and improved its product packaging.
	▪ The information system strategy for the company was developed by an international consultant and completed in early 2013. Nokorthom has been happy with the strategy and committed to incorporating most of the recommendations into its implementation.
	▪ In August 2013, a small assessment was conducted with the company staff, pesticide retailers, PDAs, and farmers to collect more information on the potential impact of the staff capacity building intervention. Below are some results of the assessment:
	  ▪ The company's field staff gained more knowledge in pest management.
	  ▪ The company's information services were not very satisfactory. Only 25% of retailers who were coached received knowledge on pest control, as the coaching was done very quickly using leaflets. Farmer meetings have also led to a very small change in farmers' practices because they were not conducted effectively. Emergency interventions have generated fairly good impact. Farmers receiving emergency services were satisfied with the services. For field demonstrations, it was hard to meet with farmers who conducted field demonstrations. One farmer with whom CAVAC met was very satisfied with the effectiveness of Nokorthom's product in controlling pest.
	▪ An assessment on the information dissemination strategy at the company level was conducted in September 2013. The information dissemination strategy recommendation framework is still a valuable resource for the company and will likely be a long term asset for the company.

Next Steps:	▪ Continue monitoring Nokorthom's implementation of the recommendations from the information dissemination strategy and keep observing changes made at Nokorthom due to CAVAC's support. ▪ Prepare for M&E activities at the farmer level. ▪ Write an intervention summary report.
Lessons Learnt:	Due to lack of domestic experts in pest management, Vietnamese trainers were selected for the Nokorthom staff training. Training materials were not translated in advance for trainees. The training quality would have been even better had the materials been translated into Khmer beforehand. Providing one-off capacity building to field staff is not sufficient. Based on this experience, companies

	operating in the pesticide market need to ensure that core staff keep gathering information from field staff, and that they continue to research in order to find solutions to continuously train and support field staff. This is crucial because farmers continue to face new problems or new disease breakouts in the field. Nokorthom was started as a family-owned business. Many parts of its operations need to be adjusted in order to accommodate the recommendations from the information dissemination strategy. As a result, Nokorthom could not incorporate all the recommendations into its implementation as planned and expected. To speed up the process, Nokorthom needs further support.

INTERVENTION UPDATE: Int. No: Inp 12.2 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a pesticide company to provide better training to farmers**
Summary:	In Cambodia, farmers' knowledge of pesticide application remains basic. Consequently, most farmers do not apply pesticide on their crops appropriately, which results in significant yield loss and / or large pesticide costs. CAVAC found that major market actors (such as private companies, PDAs, and retailers) had limited knowledge of pest management and their method for distributing information to farmers needed improvement. The pesticide market in Cambodia is dynamic. There are many companies which recognise the importance of embedded information to provide this knowledge to farmers. Most private companies conduct direct farmer meetings, and SPK (a local pesticide company that imports pesticides from Vietnam) was one of them. However, facilitating a high quality farmer meeting is known to be a challenge for most companies. To help address this challenge, CAVAC and SPK worked together to improve the quality of information system materials and staff capacity in farmer meetings. At the time of implementation of this intervention, farmer meetings/training was a major information service of SPK. It was expected that after the intervention, SPK would be able to conduct more effective farmer meetings, which would lead farmers to alter practices, resulting in yield increases. Consequently, trained farmers would have more confidence in using SPK's products, which in return would result in an increase in company sales. SPK would increase profits from its sales due to embedded information services, and it would continue to improve and update its information services – thereby contributing to the sustainability of the intervention. Since January 2014, SPK has stopped implementing farmer meetings due to the difficulty in inviting farmers to join the training. Instead, the company has turned to a strategy based on "Standby at Retailer Store" activity, in which staff help to diagnose the problems of farmers coming to the store and then recommend appropriate SPK products. Another new activity replacing farmer meetings is field days upon completion of its successful field demonstrations. CAVAC has therefore decided to stop its M&E activity at that stage.
Achievements to Date:	▪ The GDA of MAFF reviewed SPK's information system materials and provided comments. SPK then updated its information system materials based on GDA's comments. The updated material was approved by the GDA, and much of it was printed. ▪ One half-day training of trainers (TOT) session on new training materials and methodology for SPK field staff was conducted in December 2012. An assessment was then conducted in January 2013 to see how well SPK staff could perform in farmer meetings after the TOT. The result was not satisfactory; it was found that field staff still lacked confidence, as their knowledge on pest management and the participatory approach remained very limited. ▪ In August 2013 a small assessment at the company level (SPK field and management staff) was conducted. It was suggested that training materials and methodologies need to be improved. ▪ CAVAC observed two farmer meetings of SPK to obtain the overall understanding and quality of the activities conducted. Although some parts need to be further improved, the meetings were acceptable in quality (in a sense of the product push nature) with a good impression from farmer participants. ▪ In April 2014, an ad hoc assessment was conducted at the farmer level with a sample of 30 farmers, in order to capture the effectiveness of SPK's farmer meetings in terms of farmer practice change in Prey Veng and Takeo. The study found that about 86% of farmers interviewed were satisfied with the meetings, and 30% of trained farmers have changed to use SPK's products, particularly herbicide. 89% of trained farmers who have changed practice were direct users of pesticide. Nevertheless, CAVAC also found that some farmer meetings reported by SPK did not actually happen. ▪ The company's focal point for CAVAC has been replaced since early 2014. The new focal point does not have any knowledge about the joint-activities between SPK and CAVAC, making the communication difficult. After many attempts to follow-up with the company, in late August 2014 CAVAC sent an official letter to SPK to inform the company of the remaining work within the agreement – leaflet printing – and gave the company a timeframe by which they should implement the remaining work (until 31 October 2014). The letter did not result in any action from SPK; therefore, the agreement between SPK and CAVAC was closed on 31 October 2014.
Next Steps:	Write up an intervention summary report to wrap up the intervention.
Lessons Learnt:	A half-day orientation session is not sufficient to enable company staff to conduct participatory training for farmers. Moreover, solid knowledge of pest management is very important; otherwise, field staff cannot educate farmers beyond the training materials and methodology. A longer training session should be considered for future staff training to cover essential aspects of both technical knowledge and participatory methodology. CAVAC had difficulty in locating farmers for interviews because many farmers could not remember whether they had joined SPK farmer meetings as they had attended many similar meetings. In the future, CAVAC should consider creating a distinctive feature of a particular information service of the company so that farmers can distinguish the company's activity from that of its competitors. In addition, that distinctive feature can be a crucial point contributing to the success of the activity as well, as it

	stands out from other similar activities in the market. From the farmer KAP assessment, we can infer that a meeting with direct users of pesticide is more successful than a meeting with non-direct users. Hence, a company should be as selective as possible when inviting farmers to participate in any information service.

INTERVENTION UPDATE: Int. No: 12.13 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a pesticide company in its pesticide wholesaler / retailer training**
Summary:	CAVAC's field interviews with farmers determined that the proper use of pesticides remains an important issue among farmers. Farmers lack even the most basic information, such as: which pesticides are appropriate for which pest; when in the pests' life cycle should farmers apply pesticides; what doses are required to be effective; which pesticide mixes are safe; what is the correct re-entry after spraying; and during which pre-harvest period it is best not to spray. Both farmers and pesticide sellers realise that it is important to receive and supply instructions on the usage of pesticides. However there is still a limitation in pesticides knowledge from the sellers' side. This makes it difficult for sellers to convey the right message to farmers even on safe product use, let alone explaining the techniques in using any specific product. CAVAC's intervention intends to assist An Giang Plant Protection, a pesticide company in Cambodia, in training its wholesalers / retailers in the following content: ▪ pest identification; ▪ techniques in pesticide usage (timing and amount, etc.); ▪ safe product use; ▪ new policies on pesticides, i.e. penalties on selling illegal / banned pesticides; ▪ ethics in the pesticide business; and ▪ business case of providing information to farmers. With the above-mentioned content, trainees will be able to understand technical, legal and business aspects of pesticides and will therefore be better equipped to convey clear and accurate messages to end users (farmers). With the right approach used in applying pesticides, farmers can decrease their yield loss resulting from pests, insects, and diseases, etc. In addition, farmers' increased knowledge on the benefits and the importance of information from the sellers will create more demand for information linked to sales, which will further generate better information services.
Achievements to Date:	▪ A TNA was conducted. ▪ CAVAC and An Giang agreed to assess An Giang's previous training to find what could be improved in the joint retailer training activities. The assessment looked at the curriculum, methodology and participants' satisfaction. An assessment was conducted and a conclusion was drawn jointly with An Giang. ▪ Training materials were developed by An Giang with comments from CAVAC. Picture booklets and posters were printed out. ▪ A session plan for the training was developed by CAVAC's consultant on participatory approaches. ▪ An orientation on the training session plan and the "business case" topic (the incentives for retailers to do information services) was conducted for An Giang's trainers. ▪ Ten retailer training sessions have been conducted. In the first four sessions, An Giang was working closely with CAVAC. The last six sessions were conducted by An Giang independently and randomly monitored by CAVAC. ▪ Improvement to the training materials and training methodology was done continuously after each of the first four training sessions. ▪ CAVAC continued monitoring An Giang's retailer training implementation and observed that it would need further improvement.
Next Steps:	▪ Continue monitoring training conducted by An Giang. ▪ Discuss with An Giang how to improve next training.
Lessons Learnt:	An Giang assessed its training curriculum, materials, and methodology as fairly strong. However, a joint assessment was needed to confirm this and to collect lessons in order to improve joint training activities. This approach can also be adapted in other similar situations.

INTERVENTION UPDATE: Int. No: Inp 13.4 AWP No: 1.2 Date: 31 December 2014	
Name:	**Pesticide retailer training in partnership with PDAs**
Summary:	Pest control contributes significantly to reducing yield loss of rice farmers. As such, pest management has been identified as one of the main constraints for Cambodian rice farmers. Most farmers believe that only pesticide application can minimise their rice yield loss. With limited knowledge of good pesticide use, farmers use whatever they can find without any solid foundation. The current practice can lead to many negative side effects, such as ineffective pest control, environmental impact, and health issues. It was observed that when farmers faced a pest outbreak, the main sources of support for pest control were retailers, who provide both prescription and product supply. However, a number of research activities found that retailers' knowledge on pesticide use was limited and led to inappropriate recommendations on pesticide use to their clients (farmers). As stated in Sub-decree 69 as well as in a new law on Chemical Fertiliser and Pesticide Management, all pesticide wholesalers / retailers must be licensed by MAFF before conducting any business within Cambodia. To obtain a license, pesticide wholesalers / retailers are required to attend a training course organised by PDAs to ensure that wholesalers / retailers are knowledgeable in pesticide application. To date, PDAs have conducted some training sessions for pesticide wholesalers / retailers; however, their training curriculum is predominantly based on pesticide legislation, storage, and management. Technical knowledge on chemical control for pest management is not included in the training curriculum. The absence of this critical information is due to the fact that there is not a widely approved technical manual at the ministry level. CAVAC worked with the GDA to develop a Rice Pest Management Manual. The manual is expected to provide detailed technical knowledge on chemical control of major pests, including practical identification of pests, the types of pesticide to be used, when to apply pesticide based on the pest development cycle and suitable time of day, how much to use, and how to apply. The manual was used to develop training materials and methodologies for pesticide retailer training to be conducted in partnership with PDAs. This retailer training was different from the retailer training conducted by pesticide companies. Pesticide companies focus on their products in their training, but this retailer training focused on the active ingredients needed in pest control. The training curriculum included general information, such as pest identification, pest morphology, life development cycle of pests, symptoms of destruction, and active ingredients to be used with each major pest, timing of pesticide spraying, and field practice. It was expected that this intervention would provide comprehensive and neutral knowledge to pesticide wholesalers / retailers so that they would have knowledge on pest management to recommend to farmers. Moreover, a technical manual on good practice of pesticide use and the training materials and methodology for major pest training would be available for stakeholders (agricultural officials, non-governmental organisations [NGOs], private companies, and development programs). PDA teams working on this intervention would become good local sources of knowledge linking to retailers as well as farmers.
Achievements to Date:	▪ The TNA was conducted in the three provinces and the results of the TNA were agreed between CAVAC and the PDA teams. ▪ The GDA's Rice Pest Management Manual was completed. A dissemination workshop to launch the maual was conducted. This manual was also used as a reference to design the training curriculum for this joint pesticide retailer training with the PDAs. ▪ CAVAC also provided two technical training sessions on the pesticides for Kampot and Kampong Thom PDAs and one training session on the participatory methodology for Kampong Thom PDA. ▪ Several testings were conducted with pesticide retailers and farmers to get feedback on the training curriculum and materials. The feedback collected each time was used to improve the curriculum and materials. ▪ The pesticide retailer training for the three target provinces was completed: two training sessions in Kampot with 23 paticipants (19 males and four females); five training sessions in Takeo with 63 particpants (50 males and 13 females); and eight training sessions in Kampong Thom with 90 participants (65 males and 25 females). ▪ During the implementation, CAVAC also conducted a few feedback sessions to improve quality of the training and make some adjustments to the training curriculum and methodology.
Next Steps:	▪ Summarise the training report for each province and share the training reports/results with the PDAs. ▪ Conduct M&E activities.
Lessons Learnt:	Before the TNA, CAVAC and the PDAs planned to invite all pesticide wholesalers / retailers to join this training. However the findings from the TNA indicated that it would be better to invite only wholesalers / retailers who were willing to join the training. Asking retailers to list and prioritise their problems and to choose what topics they wanted to learn

	at the beginning of the session resulted in retailers maintaining strong focus throughout on the training. Selecting a right training location significantly contributed to successful training. When the training was conducted near retailer shops (within their districts), retailers did not need to stay overnight, leading to higher attendance and especially higher involvement from female retailers who often were main sellers.

INTERVENTION UPDATE: Int. No: Inp 13.5 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a local pesticide company in implementing its information dissemination strategy**
Summary:	Nokorthom is a local pesticide company importing pesticides mainly from Vietnam. CAVAC previously supported Nokorthom in staff capacity building (Inp 11.4) and information dissemination strategy development (Inp 12.1). With its strong intent to optimise the benefits of embedded information services, Nokorthom approached CAVAC again for further collaboration. The new agreement has been signed, and this new intervention encompasses the company's key staff capacity building, development of a diagnostic tool, improvement of the company's operational systems and farmer training, and retailer coaching.
Achievements to Date:	▪ Staff capacity building was conducted for Nokorthom technical staff by trainers from Vietnam. ▪ The rice pest and disease diagnostic tool (RaPiD) has been developed and provided to the company. Nokorthom also completed inputting the company's pest management advice and product information into the tool to customise it for the company's usage. The company has now installed it in three tablets for its field staff and one computer at the company office. ▪ CAVAC conducted training on how to operate RaPiD and provided some limited field training/practice for Nokorthom staff in Takeo, Kampot and Kampong Cham. ▪ Nokorthom and CAVAC also met to discuss planning for other activities, including the potential to support the improvement of the company's operational systems and farmer training and retailer coaching.
Next Steps:	▪ Monitor the use of RaPiD at Nokorthom. ▪ Work with Nokorthom to implement remaining activities in the agreement.
Lessons Learnt:	Field practices appear to be very helpful to a company's field staff to really know how to operate RaPiD. It is challenging to get many retailers to attend a collective retailer training session. Retailer coaching therefore seems to be more feasible approach to providing training. Moreover, important messages can be passed on more effectively in a one-on-one session.

INTERVENTION UPDATE: Int. No: Inp 14.1 AWP No: 1.2 Date: 31 December 2014	
Name:	**Supporting a pesticide company to improve its information services for farmers through the use of a rice pest and disease diagnostic tool (RaPiD)**
Summary:	Nileda is a local pesticide company providing pest solutions for farmers in eight provinces of Cambodia. To improve its services with better solutions for farmers and to gain a competitive advantage over its competitors, the company has entered into a partnership agreement with CAVAC to integrate RaPiD into its current advisory services. It is planning to install RaPiD in 20 Android smart phones used by staff of the company. As RaPiD is a database of technical information on pesticides, the company expects that the more company staff use the tool, the more technical knowledge on pesticides staff will gain, leading to improved efficiency and effectiveness of the company's information services (including retailer coaching, farmer meetings, and field demonstrations). CAVAC expects that, with better information from using the tool, retailers' knowledge can be improved through the company's retailer coaching activities. As a result, CAVAC expects that retailers will provide better solutions to farmers. Likewise, sales staff will be able to better diagnose farmers' problems in the field and provide better solutions. Together, they will promote proper use of pesticides through which environmental impact will be reduced along with farmers' yield loss.
Achievements to Date:	An agreement between CAVAC and Nileda has been signed. Nileda has been inputting the company's pest management advice and product information into RaPiD in order to customise it so that it becomes a company tool.
Next Steps:	Monitor the company's customisation of the tool (Nileda inputting its product information). Monitor the company's use of the tool once it is up and running.
Lessons Learnt:	

INTERVENTION UPDATE: Int. No: Inp 14.1 AWP No: 1.2 Date: 31 December 2014	
Name:	Supporting a local pesticide company to improve its agronomic advisory system through integration of a rice pest and disease diagnostic tool (RaPiD)
Summary:	The United Cambodia Agriculture (UCA) is a local company offering quality assured agricultural inputs to farmers, value-added with best-practice extension advice delivered through mobile commercial agronomists and in-store based advice. One of its focuses on improving services for its farmers is to use Information Technology . UCA views the use of RaPiD as aiding its operations through increased staff capacity and confidence in pest diagnosis, which in turns helps build trust among farmers whose benefits will affect the sales of the company. For this purpose, CAVAC agreed to provide UCA with RaPiD, which will be implemented through two approaches: i) Mobile Commercial Agronomists using RaPiD on tablets, and ii) In-store based Commercial Agronomists using RaPiD on computers. It is expected that, with better information provided by the tool, UCA's agronomists will have better knowledge and confidence in pest diagnosis, leading to improved pest management advice for farmers. As a result, CAVAC expects this will result in a reduction in yield loss and an increase in income for farmers who utilise advice provided by UCA.
Achievements to Date:	An agreement between CAVAC and UCA has been signed. UCA has been inputting its pest management advice and product information into RaPiD to customise it to become its own tool.
Next Steps:	Monitor UCA's tool customisation and use.
Lessons Learnt:	

INTERVENTION UPDATE: Int. No: Inp 14.1 AWP No: 1.2 Date: 31 December 2014	
Name:	Supporting a local pesticide company through the use of a rice pest and disease diagnostic tool (RaPiD) and improvement of its existing information services
Summary:	With lack of proper support from public institutions on best practice of pest management, local pesticide companies face challenges relating to technical knowledge on pesticides and information system activities. Companies to do not possess sufficient technical knowledge and effective information system activities to pass on proper knowledge to farmers who are the ultimate customers of pesticides. Solutions to those challenges will benefit both companies and farmers. Angkor Green is a local pesticide company actively providing information services to farmers. The company expresses a commitment to grow in the highly competitive market using information systems as a marketing tool. Currently, Angkor Green implements field demonstrations, village-based farmer meetings, larger-scale farmer meetings and retailer/wholesaler meetings as its core information system activities. Through various discussions, Angkor Green and CAVAC have entered into a partnership agreement to improve Angkor Green' information services through the following activities: ▪ Building capacity of Angkor Green staff through introduction to RaPiD (which serves as a database of technical information on pesticides and assists training on pesticide resistance management). Angkor Green plans to equip its technical staff with tablets to access RaPiD so that they can use RaPiD in their field activities. Moreover, it plans to install RaPiD in one PC in the head office for any calling in for technical advice. ▪ Improving village-based farmer meetings and larger-scale farmer meetings. ▪ Improving field demonstrations.
Achievements to Date:	An agreement between Angkor Green and CAVAC was signed. Angkor Green has been inputting its pest management advice and product information into RaPiD to customise it to become its own tool.
Next Steps:	Monitor the company's RaPiD customisation and use. Work on improving the company's field demonstrations, village-based meetings and larger-scale farmer meetings.
Lessons Learnt:	

INTERVENTION UPDATE: Int. No: Mar 11.1 AWP No: 1.2 Date: 31 December 2014	
Name:	Technical assistance on rice and rice seed production for export markets
Summary:	The RGC's paddy production and rice export policy indicates that a key success factor for domestic export millers will be their ability to purchase sufficient paddy at competitive prices. Baitong Kampuchea, Plc. has been identified as a key partner for this intervention – a rice milling and exporting company based in Battambang province. There are some fundamental issues which make it difficult for Baitong to achieve its rice export goal. Although highly attractive fragrant varieties are being produced, they are not pure and this has an impact on milling efficiency and the quality of the rice being produced. With the support of CAVAC, Baitong is aiming to introduce good quality seed in its catchment area of rice production to improve the quality of milled rice. In addition, Baitong will aim to build its capacity to conduct successful field demonstrations which demonstrate the impact of correct production methodologies for its rice producing community. CAVAC's intervention with Baitong focuses on providing technical assistance on rice seed and paddy production for selected export varieties. To stimulate this, CAVAC contracted a rice specialist to conduct training, including field demonstrations for selected company staff members. These trained staff will extend knowledge and practice to the Baitong rice production community. The activities of this intervention include: ▪ July – Nov 2012: Training in paddy production for a photosensitive rice variety (First) ▪ Nov 2012 – Feb 2013: Training in rice seed production (Second) and rice paddy production (Third) for a non-photosensitive variety ▪ July – Nov 2013: Training in rice seed production for a photosensitive variety (Last) ▪ Backstopping support
Achievements to Date:	All the above training activities were completed by the end of December 2013. The topics that were addressed in the training included: seed preparation; transplanting; replanting; insect and disease management; fertiliser application at the panicle initiation stage; roguing off-type plants; and harvesting and postharvest management. During the final training Baitong staff gave advice to farmers while reselecting and re-organising Baitong community members. Post-training feedback found that farmers thought the knowledge learned was very useful, and Baitong staff also informed their manager about this. The work plan for backstopping the company's staff in their work within the community has been completed. However, the backstopping sessions have been delayed due to the resignation of three of Baitong's trained staff members in February 2014, and the promotion of another trained staff member to a higher position in a different department. Baitong recruited five new staff members with agronomic backgrounds in April 2014. CAVAC then requested Baitong to redraft a backstopping plan based on the company's needs and remaining duration of the contract. However, Baitang and CAVAC could not implement the revised backstopping plan according to a prolonged drought and floods near the end of the wet season in Battambang in 2014. CAVAC has drafted an interim assessment questionnaire and an intervention summary report.
Next Steps:	Conduct an interim assessment of this intervention.
Lessons Learnt:	Prior to working with a partner, CAVAC needs to ensure that: 1) the partner has a clear future plan on how to use knowledge from the intervention activities; 2) the partner has a committed team to work with CAVAC; and 3) the training program should be flexible enough to assist new trainees with gaps in their knowledge. Staff turnover slows down the progress of each activity because time is required to train newly recruited staff. To deal with this problem, a program intervention to develop an application such as a diagnostic tool or the like would be a better alternative to frequent staff training. With an application like a diagnostic tool, new staff members may need some limited training but it is likely to take less time. It would therefore be a good idea to introduce such a tool to companies that want to improve their embedded services for the farmers.

INTERVENTION UPDATE: Int. No: Mar 11.2 AWP No: 1.2 Date: 31 December 2014	
Name:	**Feasibility study of warehouse receipt system**
Summary:	Eighty per cent of Cambodian paddy is produced in the wet season. During the harvest months traders from Vietnam and Thailand come to buy paddy, competing with Cambodian millers on price. Milled rice exported from Cambodia was assessed as approximately 60,000 tons per annum in 2010 which was equivalent to about 100,000 tons of paddy. To be able to reach the target of exporting one million tons of milled rice by 2015, approximately three million tons of paddy must be available for local millers. Therefore, the constraints in acquiring paddy (quality and quantity) are increasing. Having a consistent supply of paddy will help rice millers to best utilise their milling capacity throughout the year. According to the French Agency of Development's (L'Agence Française de Développement (AFD)) economic survey of the rice sector in Cambodia, Golden Rice and Baitong Kampuchea Plc. are the companies that have the highest usage of their milling capacity. However, the percentage of capacity utilisation of these companies is only around 30 percent. Warehouse receipts provide farmers with an instrument that will allow them to extend the sales period of modestly perishable products well beyond the harvesting season. It also provides financial assistance for farmers. By producing warehouse receipts in designated banks, farmers will be able to access finance. Rice millers would therefore have a constant supply of paddy to utilise their milling capacity. This also eases rice millers' financial burden, as they would not need to buy paddy all at once in the harvest season to store for an entire year.
Achievements to Date:	▪ CAVAC has discussed with a few potential millers and exporters the possibility of CAVAC playing a facilitation role in implementing the warehouse receipt system. However, the discussions have not led to an agreement. The warehouse receipt system is new within the Cambodia context, and important players, such as millers, financial institutions, and farmers, are not ready for it at this point of time. ▪ Within the first semester of 2013, CAVAC also held follow-up talks with other development partners involved in this sector, such as the Helping Address Rural Vulnerabilities and Ecosystem Stability (HARVEST) and the International Finance Corporation (IFC), and learned that they had not yet taken further steps on the warehouse receipt system due to the uncertainty of the sustainability and ownership of the system – and how the benefits would be shared. ▪ Considering internal capacity and current market, CAVAC has decided not to work on this intervention.
Next Steps:	None
Surprises, Adjustments or Problems:	No agreement was reached. No player in the Cambodian rice export market seems ready to be involved in the warehouse receipt system.
Lessons Learnt:	

INTERVENTION UPDATE: Int. No: Mar 12.1 AWP No: 1.2 Date: 31 December 2014	
Name:	**Export promotion – support to the federation's market linkages**
Summary:	Cambodian-milled rice is new to international markets. Therefore, there are weak commercial linkages with international purchasers and poor understanding of international market requirements within Cambodia. Further, the Cambodian market has limited understanding of the quality standards of milled rice products required by international buyers, as well as the quality standards for processing facilities required to produce standard-compliant milled rice products. The continued push in export market development is expected to help contribute to the one million-ton milled rice export goal of the Cambodian Government by 2015. CAVAC is supporting efforts to increase knowledge of export markets through the facilitation of international networking opportunities both in Cambodia and abroad.
Achievements to Date:	CAVAC signed a contract with the Federation of Cambodian Rice Miller Associations (FCRMA) to increase its knowledge on rice export markets and build up its international business networks. Initially the agreement was to create linkages between the FCRMA and the European Union (EU) and United States (US) markets. This has later been amended to include all potential markets. In 2012, a member of the FCRMA made a visit to Malaysia and hosted a buyer in Cambodia, and a number of sale agreements were reached. Further, a member and an adviser from the FCRMA visited seven countries in the EU and Singapore where they gained more knowledge on quality assurance and market requirements in those countries. Other FCRMA members have expressed their interest in joining trade visits to the EU, Australia and the US. CAVAC has also discussed with FCRMA members about opportunities to collaborate on other possible activities. Some have suggested marketing support such as website development. After a series of discussions both within CAVAC and with the FCRMA, CAVAC has decided to continue this export promotion facility for the FCRMA on the same basis as before, with any member of the FCRMA eligible to receive support up to 50% of the costs of trade visits and 45% of the costs of buyer visits. During the last six months of 2014, the FCRMA has diverted its market focus to emerging Asian rice markets. A member of FCRMA made trips to Malaysia, China, and Brunei, and hosted buyers from Malaysia and Europe. According to the FCRMA, trade and buyer visits greatly helped Baitong, a member of the FCRMA, in strengthening the company's relations with the existing and prospective buyers. The visits have resulted in new or renewed purchasing orders from buyers visited and hosted. Baitong as the most leading company of the FCRMA has also sourced milled rice from other members to supplement the supply to new and existing buyers.
Next Steps:	Continues to support the FCRMA in trade visits and buyer visits.
Lessons Learnt:	The purpose of the intervention is to give all members of the FCRMA an opportunity to network with prospective buyers. However, only one company, Baitong Plc, whose director is the chairman of the FCRMA has taken the opportunity CAVAC is offering. In early 2013, CAVAC conducted a meeting with other FCRMA members to make them aware of the opportunity and let them give CAVAC feedback. CAVAC has found that other members rely on the FCRMA to take the lead on market development activites. Below are the reasons that other members do not participate in the market development activities: ▪ business visits to foreign countries are expensive; ▪ most FCRMA members are suppliers to Baitong (the head of the FCRMA), as their individual production is not large enough for them to export on their own; ▪ lack of language capacity to communicate with buyers; and ▪ it is preferred that business meetings be conducted one-on-one with buyers, as each meeting usually discusses sensitive business information. ▪ FCRMA members have expressed some concern regarding the usefulness of the trips, as they only want to spend time and resources with potential buyers, rather than general buyers. Nevertheless, other FCRMA members could benefits from the intervention indirectly as Baitong has sourced milled rice from them to supplement its export volumes.

INTERVENTION UPDATE: Int. No: Inp 13.3 AWP No: 1.2 Date: 31 December 2014	
Name:	**Improving Golden Daun Keo Rice Mill's quality of paddy of export varieties**
Summary:	There are two types of rice which are attractive to large mills interested in exporting rice: the fragrant varieties generally aimed at the high end export markets, such as the US and Europe; and white rice usually targeted at less discerning markets. A key constraint in the export of both types of varieties is the lack of uniform seed, causing the purchase of mixed paddy which decreases the quality of the milled rice, and increases milling losses. To successfully export milled rice, millers need to ensure effective monitoring of all steps involved in the process, from paddy production to milling. This intervention was aimed at increasing the availability of quality dry season rice seed and modern wet season rice seed varieties to help ensure sufficient export quality rice. CAVAC's planned support to the Golden Daun Keo focused on capacity building on rice seed production for its technical field staff and contracted small seed producers; and post-harvest management for the company's mill technicians and paddy collectors.
Achievements to Date:	In 2013, CAVAC and the company discussed and agreed on an activity plan, cost-sharing options, the nature of collaboration, and the details of a confidentiality agreement. In early 2014, the Golden Daun Keo decided to withdraw from this collaboration because the company did not have sufficient staff capacity to implement its plan with CAVAC.
Next Steps:	
Lessons Learnt:	Changes in a partner's internal operations can occur unexpectedly. Such changes can significantly affect the partner's workplan with CAVAC.

INTERVENTION UPDATE: Int. No: Inp 12.3 (B) AWP No: 1.2 Date: 31 December 2014	
Name:	**Vegetable farmers' practice change – East West Seed International**
Summary:	The supply of locally-produced vegetables is often constrained due to several factors, including: the effects of seasonality; water shortage in the off-season; pest infestation; farmers' knowledge of inputs; production techniques; and ability to access appropriate knowledge. Productivity increases can be achieved by providing farmers with knowledge across several areas, including knowledge pertaining to high-yielding crop varieties that adapt to the local climate; use of quality seeds; improved irrigation; modern production techniques; proper use of fertiliser and pesticide; and harvest and postharvest handling techniques. This information can be transferred through demonstration plots, on-site training, extension material development, or other methods through specialised seed companies and fertiliser or pesticide companies. To contribute to helping farmers achieve vegetable productivity increases, CAVAC is partnering with a large vegetable seed company, East West Seed International, to conduct vegetable demonstration plots (including coaching for farmers and their neighbours on growing techniques), field days, and training on insect and disease management for vegetable collectors and input retailers.
Achievements to Date:	▪ The first round of intervention activities were completed in August 2014. ▪ 191 field demonstrations were established with 31 cancelled midway due to i) demonstration farmers failing to abide by the terms and conditions of their contracts with the company, ii) lack of household labour to maintain the fields, iii) lack of water; and/or iv) pest and disease infestation. ▪ It was noticed that the remaining 160 field demonstrations experienced different profits depending on the type of crops they produced. 13 crops in total were demonstrated and out of 192 cases,[1] 150 had profited. The exact profit depended on the crops produced, and ranged from US$62 (sponge gourd) to US$423 (wax gourd) per 5 ares of production land. ▪ 85 field days were conducted with attendance of 2,388 farmers (640 females). ▪ 24 training sessions were conducted. Two of the 24 sessions were on pest and disease management by Filipino trainers. The other training sessions focused on seed characteristics, seed coating, and proper input usage including seedling tray, plastic mulch and trellis net. The participants for all training sessions included 35 input retailers (7 females) and 48 vegetable collectors (22 females). ▪ A mini-survey on the changes in knowledge, attitude and practice of vegetable collectors and demonstration farmers was conducted in June 2014. 10 out of 14 collectors have shared their knowledge on seed characteristics with an average of 24 farmers per collector. In the same survey, 35 demo farmers were interviewed. All of them knew the new techniques introduced by the company. 66% of those interviewed learned about the pesticide use, while some learned about the type of fertiliser and time to apply it as well as the prunning technique from the demonstration. However, 37% of those interviewed have not applied the knowledge yet because the interview was conducted in rainy season that is not a favorable time for farmers to grow vegetables. Among those who had a chance to apply the knowledge, 82% continued to use seedling tray, 73% plastic mulch, 86% trellis net and 100% used improved seed. When asked about the future plan, 97% farmers said they would continue to apply at least one of the four new techniques in their farming practice, while 80% of demo farmers have shared the knowledge from the field demonstration to vegetable farmers. ▪ In October CAVAC and East West started discussing the second round of intervention activities.
Next Steps:	▪ Start implementing new activities.
Lessons Learnt:	▪ Frequent and constant follow-up monitoring of the company's field staff is essential in ensuring successful implementation of field demonstrations. These activities can help solve farmers' problems in each cultivation season on time. ▪ Training sessions for input retailers and vegetable collectors should be topic specific, short, precise, and customised to fit the availability of participants. The longest duration should be one day, and training need informaiton should be gradually collected by the field staff when they do regular technical and other follow up to input retailers and vegetable collectors. The company should also target smaller-sized input retailers and vegetable collectors as these groups have more time to attend trainings and to advise and further promote technologies with their customers and farmers. ▪ Most vegetable collectors are unsure about the potential benefit of, and have no interest in, providing advice to farmers.Field staff must therefore be mindful of the importance of including the business case into their activities with collectors so that they are convinced about information sharing to farmers. ▪ Some failure in adoption was due to the misunderstanding by farmers that they have to apply all the techniques introduced by the company, which is not necessary and seemingly more

[1] The number of cases equals the number of crop cycles, rather than the number of field demonstrations, as each demo farmers can produce up to three crop cycles.

	expensive. Therefore, all farmers participated in field days must be made aware of the detailed information on cost and returns and the option of adopting the whole package or a single technology according to their own interest and needs.

INTERVENTION UPDATE: Int. No: Inp 12.3 (A) AWP No: 1.2 Date: 31 December 2014	
Name:	**Vegetable farmers' practice change – Pacific Seeds**
Summary:	The supply of locally-produced vegetables is often constrained due to several factors, including: the effects of seasonality; water shortage in the off-season; pest infestation; farmers' knowledge of inputs; production techniques; and the ability to access appropriate knowledge. With the purpose of helping farmers to increase productivity, CAVAC intends to help farmers gain knowledge on high-yielding crop varieties that adapt to the local climate; use of quality seeds; modern production techniques; proper use of fertiliser and pesticide; and harvest and postharvest handling techniques. To achieve this, CAVAC, is partnering with Pacific Seeds, in addition to partnering with East West Seed International. The activities with Pacific Seeds focus on the introduction of modern techniques and inputs through conducting model plot demonstrations. This activity is followed up by training sessions at harvest in Kandal, Battambang, Pailin and Banteay Meanchey, and the distribution of associated training materials. Pacific Seeds' model plots and training sessions are conducted in order to demonstrate to input suppliers, vegetable collectors, and farmers the best use of inputs (seed, fertiliser and pesticide) and cultivation techniques, and to demonstrate how improved use of inputs and cultivation techniques contribute to an increase of farmers' income. Trained participants are expected to pass on the information to farmers who are their clients and neighbours. Some farmers will also receive information through training materials disseminated by training participants. The activities will also allow the company to test the market (supply and demand) for vegetables and related inputs and contribute to the company's market entry plan.
Achievements to Date:	▪ The company has already set up its representative office in Battambang. ▪ The budget and contract amendment are being renegotiated. The project will be scaled down to suit the company's current capacity. The target locations to conduct demonstration plots will be changed from seven to four, and the target provinces of Siem Reap and Kampong Cham will be replaced by Pailin and Banteay Meanchey. The project end date will also be extended to July 2015. ▪ The company managed to select one competent field technician but the delay in implementation has caused the initial recruit to move to another company. Therefore, the company is still in the process of recruiting staff to manage the demonstration plots and training activities.
Next Steps:	▪ Start implementing the model plot demonstrations and training at the selected locations.
Lessons Learnt:	It is very important for CAVAC staff to gain a strong understanding of the local situation, especially within new target provinces. As such, it will be useful for the CAVAC team to accompany Pacific Seeds' field staff at the beginning of the implementation to ensure the effectiveness of the activities.

INTERVENTION UPDATE: Int. No: Inp 12.7 AWP No: 1.2 Date: 31 December 2014	
Name:	**Vegetable seed retailer outlet training**
Summary:	Cambodian vegetable farmers interested in purchasing quality seed rely on seed produced in neighbouring countries which are supplied through local market distributors. While seed production requires detailed agronomic knowledge, seed distribution requires logistical understanding. The support market has developed in such a way that there is limited information exchange between distributors and retailers, and information on new varieties and agronomic practices are not effectively shared. To improve this, CAVAC is showing seed companies the benefits derived from providing retailer training, and presenting these activities to the resident seed companies to encourage them to continue the improvements sustainably.
Achievements to Date:	▪ A vegetable value-chain study was conducted. ▪ TNAs were conducted in Takeo and Kampot, and a training module was developed and improved. ▪ Retailers' knowledge of vegetable seed was assessed. ▪ An irrigation study was conducted to understand the 'lack of water' in vegetable production and to determine feasible activities to be included in this intervention. ▪ Four training sessions were delivered (one in Kandal province, one in Takeo, and two in Kampot). Three vegetable seed companies attended three of the four training sessions. In the other training session, three companies and one NGO attended. Two companies showed an interest in partnering with CAVAC: East West Seed International and Pacific Seeds. ▪ Impact assessments at both the support provider (trained retailers) and farmer levels were completed. Based on assessments prior to the training, 90 per cent of retailers interviewed did not give any advice on vegetable seed and production techniques to farmers because they did not have any practical or theoretical knowledge. After the training, about 20 per cent of these retailers gave advice without being asked by farmers, and almost all of them gave advice when farmers asked. Questions that farmers asked included the expiration date, germination rate, type of variety with good yield, and pest management.
Next Steps:	Ensure that lessons learnt are used in other interventions.
Lessons Learnt:	Most vegetable seed retailers tend to give advice only when farmers ask. This tends to happen mostly to regular or long-term customers but not to new customers. A session on advising vegetable seed retailers to share information with farmers should be included in future training so that retailers know the importance of advising new customers, not just their long term customers. Evaluations have revealed that farmers do not ask seed retailers questions or seek advice because they assume that retailers are only committed to their core business, and do not have the agricultural background to answer questions. Farmers also assume that vegetable seed retailers do not have enough time to provide advice, particularly those for whom seed selling is not their core business. However, if farmers know that the retailers have joined technical training sessions, farmers are more likely to seek their advice. Therefore, increasing awareness among famers that retailers are a possible source of information should be considered as part of CAVAC's intervention activities. CAVAC has also learned that vegetable collectors are an effective channel of information.

INTERVENTION UPDATE: Int. No: Inp 13.7 AWP No: 1.2 Date: 31 December 2014

Name:	**Support to an integrated retailer UNI-MART**
Summary:	The vegetable market is complex and dynamic, and supply and demand can fluctuate. Vegetable growers tend to grow crops that they have the most experience in cultivating, or crops with expected high market value. In order for farmers to try and achieve good results in a new / unfamiliar crop, they must have access to good quality inputs and information on the appropriate use of those inputs. Currently vegetable producers cannot access quality information. Previous training on the use of vegetable seed provided to vegetable seed retailers increased the capacity of these retailers to inform producers. As the vegetable sector becomes increasingly professional, more specialised services and information will be required, including choices of varieties fitted for consumer preference and market prices. Currently these services are largely limited to inputs, but they will need to respond to the dynamics of the market. A UNI-MART is an integrated model of a retail store conceptualised in India, which acts as a training / advisory centre. The model benefits farmers whose first point of contact is a retail store. The UNI-MART handles seeds, other inputs and technologies (cultivation practices and control measures for major pests and diseases), in addition to other useful market information. In collaboration with CAVAC, Pacific Seeds started a pilot UNI-MART in Battambang province, with the intention of replicating the model in other provinces if successful. This approach allows the company to test its market and demand for new products, while promoting its branding through consultancy services. It will also enable easier access to quality inputs, improved agronomic practices and better market information for farmers through its one-stop solution centre.
Achievements to Date:	▪ The Ministry of Commerce granted approval for the registration of UNI-MART, under the official name of "UNI-MART AGRI SOLUTION CENTER Co., Ltd." in April 2014. ▪ The official launch of the UNI-MART was conducted on 21 June 2014, with participation from the Executive Director of the UPL Group (United Phosphorus Limited India and Vietnam), Pacific Seeds, local authorities, one local pesticide company, input retailers and cooperative farmers. ▪ A two-day training session on physiology and agronomic practice in sweet corn and sunflower cultivation, as well as agrochemicals was conducted for the UNI-MART staff by the experts from Pacific Seeds (Thailand) and UPL (Vietnam). ▪ By the end of November 2014, the UNI-MART team has completed: o 57 maize training sessions (33 in Battambang, 7 in Pailin, 1 in Pursat, 1 in Banteay Meanchey, 7 in Thboung Khmum, and 8 in Kandal). These include training sessions for farmer cooperatives, farmer groups and seed retailer groups. o Two training sessions in Battambang to introduce sunflower seed; o Two field days in Pailin; and o Over 5,000 copies of training materials were handed out. o In total, the company has reached 1,458 farmers and input retailers (681 females and 777 are males). ▪ Two staff members were assigned to attend training in Thailand for three weeks in September 2014. The important topics covered included design and development of promotional materials, marketing, sales, storage arrangement, financial management, and agronomy. ▪ In November 2014, the company started redesigning its maize production booklet to make it easier for farmers to use with better contents. ▪ CAVAC conducted interviews with some input retailers and farmers to check their knowledge and practice on maize production. These interviews showed that in general, the training conducted by UNI-MART served as a refresher to retailers, but also covered some new content relating to the seed characteristics and new crops such as sunflower. The interviews also highlighed that farmers were facing some challenges, such as corn borers in some locations. Based on these interventions, CAVAC provided recommendations to the company to improve its future training. ▪ A new UNI-MART was launched in Kampong Cham in December 2014. The field activities of the UNI-MARTs have now reached six provinces: Battambang, Pursat, Banteay Meanchey, Thboung Khmum, Kampong Cham and Kandal.
Next Steps:	▪ Continue observing Pacific Seeds' implementation of the UNI-MART and provide feedback for improvement. ▪ Finalise the maize production booklet and continue assisting the company in producing other extension materials. ▪ Follow up on the remodeling of the shop, including a functional library and a sales and advisory counter.
Lessons Learnt:	▪ Techical training should be provided to input retailers who sell directly to farmers. It has been observed that dealers - both big and small - who are located in the production areas do sell directly to farmers. However, retailers at provincial markets tend to distribute seed to their subdealers and only sell directly to big farmers. These province-based retailers usually are too busy to advise

	farmers. ▪ Corn borers usually appear in rainy seasons. The company needs to provide further training to farmers on borer control. ▪ Most farmers use foliar fertiliser while very few use granular fertiliser. The company already started to introduce the latter which proved to have a better effect on crop growth. However, there is still a need to emphasise the difference between these fertilisers to farmers during the company training. ▪ Maintaining availability of seed and introducing varieties that are suitable for different seasons is crucial to the company. So far, only one variety has been introduced. The supply of seed was not on time, causing one innovative farmer to spend much more money on seed from Thailand even though it was provided by the same company. This can be detrimental to a new company who is trying to penetrate the market and competing with other already well-established companies such as C.P. Cambodia and Pioneer. CAVAC can play a role in feeding this information back to the UNI-MART.

INTERVENTION UPDATE: Int. No: Ext 11.1 AWP No: 1.2 Date: 31 December 2014	
Name:	**Support to a media agency to produce a quality agricultural TV program (drama)**
Summary:	While economic growth in urban areas is more visible, rural growth - especially in agriculture - is largely neglected. Information relating to agricultural livelihoods is important and can at the same time attract a large portion of the rural audience. However, current Cambodian TV channels do not cater for rural audiences, instead focusing mostly on urban lifestyles. Advertisers have little choice but to sponsor existing TV programs. CAVAC has helped an entertainment management firm – Delight Cambodia – to produce a quality entertaining agricultural drama, which would service a rural audience interested in both agricultural information and entertainment. Through this national drama program, advertisers would have a chance to promote their products and build their brands, especially among rural customers, instead of sponsoring programs that feature the urban needs. At the same time, a production house like Delight Cambodia can generate income from the activity. Potentially, this business model could be replicated within Cambodia. CAVAC, therefore, expects to see a similar focus on the rural population from other production houses in the future. Ultimately, this will assist farmers to acquire additional agricultural information from a number of sources.
Achievements to Date:	**Support has been provided to Delight Cambodia through:** *Capacity building on agriculture knowledge* – In 2011 CAVAC supported Delight to conduct several field visits and meetings to acquire agricultural knowledge. This included: one exchange visit to model farmer training; a linking meeting with various stakeholders within the agricultural sector; the Second National Farmers' Forum Consultation; and an exchange visit to Vietnam to understand the technical use of pesticides and agricultural production. *Assistance with basic technical agriculture knowledge for script development* – In late 2011 the research team of Delight, with support from CAVAC, travelled to 10 provinces within Cambodia to undertake focus group discussions (FGDs) with different farmers to better understand their agricultural practices for script development. This included farmers who grew vegetables, rice and fruit trees, and raised chickens and pigs. In January 2012, the research team briefed the script writing team about the information that they had collected so that the writing team could script a pilot drama video. *Capacity building on media production* – In January 2012 two technical production staff from Delight enrolled in a five-week media training session in London from 25 January until 1 March 2012. This media training focused on media production techniques. *Production of two 20-minute pilot drama episodes* – The script for two pilot drama episodes was approved by the Department of Agricultural Extension (DAE) of MAFF in June 2012 and shooting was completed in October 2012. In December 2012, Delight showed these two pilot episodes to some farmers in six provinces of Cambodia for feedback. Delight, after getting feedback, finished the first two episodes successfully by the end of 2012. To ensure the reliability of the quality of Delight's drama, CAVAC hired an external company, TNS Global, to do an evaluation of the drama. In July 2013, TNS Global conducted FGDs in Takeo, Kampot and Battambang to seek feedback from farmers on the drama. The result showed full satisfaction from farmers. In October 2013, Delight finished writing storylines for 40 episodes. Delight also conducted an event to show the drama to potential sponsors. The TNS Global's evaluation results were also presented during the event. The turn-out to the event was smaller than expected, however attendees expressed significant interest in sponsoring the drama. Delight found several sponsors - including a microfinance institution, a pesticide company, a soft drink company and others – to finance part of the production costs for 27 episodes. Delight approached CAVAC to seek support for the outstanding costs. CAVAC has agreed to provide further support. In May 2014, Delight signed a contract with MyTV, a local TV channel, to air 27 episodes of the drama on Mon-Tue-Wed nights (6-7pm), starting from September 2014. MyTV is the most viewed Cambodian channel during the proposed time slot, according to TV program rating research conducted by Feedback Research. In June 2014, Delight started shooting additional episodes of the drama to get ready for the airing on MyTV. In September 2014, Delight started airing the drama on MyTV. As a result of the initial airing , there was an increase in the number of main sponsors (on MyTV side) from one sponsor to three. There was similarly an increase in the number of TV advertisements (loose spots) during commericial breaks from 22 to 25, which showed an improved level of interest in the drama from other advertisers.
Next Steps:	▪ Follow up on Delight's next wave of the drama (if any). ▪ Calculate outreach of the drama aired on MyTV. ▪ Keep monitoring 'crowding-in' to ascertain whether this business model has been copied by others.
Lessons Learnt:	Sponsors pay lower fees to place their advertisements in other TV dramas because of relatively lower production costs of those dramas compared to that of Delight's drama. It also appears that advertisers in Cambodia have not yet seriously considered the quality and popularity of different TV programs at this stage of the media market within the country; however, there are signs of increasing interests after the

	airing of Delight's drama. There should not be a boundary when defining prospective advertisers. Input companies are definitely targeted; however, they do not always have enough budget to cover the significant expense involved in TV publicity. Therefore, other big companies like Unilever or microfinance institutions deserve a significant focus especially when they also focus their sales in the rural areas. Deciding and processing intervention activities are very time consuming, due to many unplanned factors ranging from company's internal management to external factors like getting an approval from MAFF. Production and other costs should be seriously calculated and negotiated during early planning stages. The number of sponsors required to break even or make profits should be thoroughly scaled to avoid undesired problems along the way. MAFF approval processes should also be well communicated in advance to avoid long delays.

INTERVENTION UPDATE: Int. No: Ext 13.1 AWP No: 1.2 Date: 31 December 2014	
Name:	**Support to media research companies**
Summary:	The potentiality of the rural media market is unknown because there is no research on the rural audiences' media consumption. This prevents media houses from investing in quality programs for the rural audiences and hinders potential sponsors from investing in advertising. The lack of information on rural audiences' media consumption also makes it hard for advertisers to effectively place their ads. There are many factors which have resulted in a lack of research into rural media consumption; however, one of the main barriers for many research companies is the high cost, given that there are few consumers interested in buying and using the research findings. To solve this, CAVAC was looking to share these risks so that one or more research companies could kick-start research services that disaggregated the urban and rural population. By making information available to TV stations, advertising agencies and potential advertisers, it is expected that the commercial media market for agricultural programs will become more functional and will assist in the creation of commercial programming. This will be more responsive to the needs of farmers and those of the agricultural input companies, allowing them to select programs and timeslots that are of interest to their target audience. Farmers will then have access to more relevant and improved agricultural information, which will lead to improving their knowledge and skills. CAVAC has found two interested research companies to partner with on media research. CAVAC has been working with Indochina Research (IR) and Feedback Research to conduct the media consumption research and TV ratings, respectively, in the rural areas.
Achievements to Date:	**IR – Indochina Research** Under a cost-sharing agreement, CAVAC supported IR to conduct media consumption research in Kampot, Prey Veng, and Svay Rieng, focusing on rural and remote areas for data collection. The agreement includes two waves of research, with the first wave of research conducted in June 2013. The results of the first wave of research were presented to potential buyers in September 2013, including input companies that were interested in the rural market and media outlets. The IR was able to sell the first wave of its research to at least seven buyers and use the results of that research to inform its other research activities and reports. In May 2014, the IR collected feedback from its clients to improve the next wave of research. In June 2014, the IR finalised its questionnaires for the second wave of research, and started the research process. In September 2014, the IR finished the second wave of the research and started selling the research immediately. Overall, IR believes the research is important and adds value to other research it conducts. Therefore, the IR said that it would continue conducting this kind of research, however, on an adhoc basis when there is no support from CAVAC. CAVAC understands the rationale behind this approach, since IR is not specialised specifically in media consumption research despite being a leading research company. The fierce competition will drive the company to focus on what it is best at. **Feedback Research** Under a cost-sharing agreement, CAVAC has been supporting Feedback Research to conduct TV rating research in Siem Reap, Kampong Cham, Preah Vihear, Kampot, Svay Rieng, and Battambang. This agreement includes four waves of research. In September and October 2013, Feedback Research completed the first wave of the TV rating research. When the data was ready for sale, Feedback Research boosted interest from the target clients on its first rural TV program rating by advertising on newspapers, magazines and the social media. In July 2014, Feedback Research launched an event to sell the research findings. Feedback Research also captured comments from participants to improve the next wave. In the launching event, Feedback also featured its new service of "branding" using the rural TV program rating. In September 2014, Feedback Research started the second wave of the TV program rating in the same provinces as the first one. The data collection was completed in November 2014. The company is currently processing the data.
Next Steps:	▪ Monitor Feedback research's second wave of TV program rating. ▪ Follow up with IR and Feedback on the sales of the second wave. ▪ Monitor the changes in sales between the two waves.
Lessons Learnt:	The sampling and methodology should remain the same from one wave of research to the next in order that the data collected can be easily compared through a series of time. This time-series data can be of significant value to buyers who need to compare different situations and timings. The mindset of "rural means poor" is rooted among many players in the market although there has been such an incredible increase of spending in the rural areas. Urban areas are still targeted by many advertisers although it means fighting harshly over a small pie. Therefore, a convincing proof of the

	rural market's potential is needed when negotiating with possible partners. Demonstrating the importance of the rural media research findings within the media market at this stage is critical for raising people's interests especially when the product (the media research findings) is still new to the market. Since there is not yet a law to protect research companies from buyers further selling the research, it is still a big risk for research companies to invest in big rural media research. Therefore, in order to tackle this issue, either the companies try to provide valuable consultancy services along with their research data to make their products unique, or the government tries to reinforce the Cambodia's law on Copyright and Intellectual Property Rights. There should not be a boundary when defining prospective advertisers. Input companies are definitely targeted; however, they are not always the key consumers of research. Therefore, other big companies like Unilever deserve a significant focus especially when they also focus their sales in the rural areas.

INTERVENTION UPDATE: Int. No: Ext 10.3 AWP No: 1.2 (Previously 3.2) Date: 31 December 2014

Name:	**Activities with model farmers to improve model farmers' roles and knowledge**	
Summary:	Through extensive literature review and field discussions / observations with farmers, CAVAC realises that innovations in farming communities start with innovative farmers who try new ideas and technologies; and their successful innovations are then passed down to other farmers. As an agricultural development program, CAVAC aims to support and stimulate innovation in rural communities throughout its three target provinces. To fulfil this objective, CAVAC has implemented model farmer training, through which CAVAC continues to learn from the process, thereby improving its implementation. A fertiliser KAP survey with 1,200 samples and a study to redefine CAVAC's strategy with model farmers were conducted in early 2013. These have informed a redesign of model farmer activities which tailored different training activities for different types of model farmers. CAVAC has designed several interventions for both wet and dry season model farmers. For wet season model farmers, the fertiliser KAP survey indicated that the yield of trained farmers was higher than that of non-trained farmers. This showed the importance of wet season model farmer training, and as such, CAVAC decided to continue implementing the training for wet season model farmers. The training is not intended to provide specific fertiliser recommendations, but rather basic knowledge for model farmers to try new ways of applying fertiliser through their own yield optimisation process. The content of the training is being made modular, enabling the content to readily reflect local requirements, including modules on fertiliser, pest and disease control and weed control. For dry season model farmers, the fertiliser KAP survey with 1200 samples showed that there were limitations to the previous training model. Findings indicated that a group of model farmers were intrinsically innovative when thinking of the future of farming. This group has been defined as Super Model Farmers. To support, stimulate and disseminate innovation within this group, CAVAC has a long-term plan to collect and disseminate their innovation stories through roadshows. To stimulate more innovation among these innovative farmers, CAVAC has developed 'challenge fund' and 'competition' activities. With the challenge fund, selected farmers with innovative ideas receive financial support from CAVAC to assist them in conducting their experiments. Input companies are engaged, in order to facilitate competitions among farmers who have innovative approaches to agriculture.	
Achievements to Date:	**Wet season** Nine model farmer household trainers were trained in participatory teaching and rice production techniques, enabling them to conduct day-to-day training in the three CAVAC target provinces. The team started implementing training for model farmer households in April 2011. In 2013, CAVAC started modifying the training content and tailoring it towards only wet season model farmers. The content on nutrient management was modified and shortened. The findings of the fertiliser KAP survey were incorporated in the training content. The information on the pesticide application was also included. The new training materials were tested several times and use of farmers' terminology was ensured. Between July and October 2014, 108 training sessions using modified content and methodology were conducted: 72 in Takeo, 6 in Kampot and 30 in Kampong Thom. As the Kampot training team finished conducting the training in all the wet season rice producing villages in Kampot, the team was assigned to move to Takeo to assist trainers there. Since the start of the model farmer training task, 1,432 training sessions were conducted: 545 in Takeo, 425 in Kampot and 462 in Kampong Thom. On average, members of 10 households attend each training session. So far, there have been 16,099 model farmer households attending the training. For each modified training session, pre and	**Dry season** *Roadshows:* By 31 December 2014, CAVAC has conducted 73 roadshows: 46 in Takeo, 4 in Kampot and 23 in Kampong Thom. Roadshows in Kampot were completed in September after all rice growing villages in Kampot were reached (Kampot has fewer villages compared to Takeo and Kampong Thom). 23 innovative stories have been collected. However, only 15 stories have been used frequently due to their relevance to most farmers' constraints and the abilities of super model farmers to present in the roadshows. In each roadshow, selected super model farmers act as agents of knowledge transfer to model farmers. Each roadshow's content and materials have been continuously modified and updated to maximise the knowledge captured by model farmers. For each roadshow, pre and post evaluations have been conducted to capture change in farmers' knowledge and to further adjust the content of the roadshows. Evaluation results are aggregated and analysed monthly. The evaluation in December 2014 indicated that at least 90% of the model farmers who attended the roadshows have increased knowledge. *Challenge Fund:* As an outcome from engaging with two external consultants, eight farmers were selected in May 2014 to implement activities from the 'challenge fund': three from Takeo, three from Kampot, and two from Kampong Thom. Two of the eight farmers

	post training evaluations are conducted to capture any increase in farmers' knowledge and to further inform adjustments in the training. Evaluation results are aggregated and analysed monthly. From June to October 2014, there were 943 model farmers taking part in the pre and post training evaluations. It is important to note that the 943 model farmers were not involved in the evaluations across all the training topics because the topics of each training were selected according to the actual needs of model farmers. Amongst all training topics, the most trained topics were fertiliser and weeds followed by rice blast and the least trained topic was leaf folders. From June to October 2014, the average increases in knowledge amongst model farmers were indicated as follows: ▪ Fertilizer: 76% ▪ Weed: 87% ▪ Brown Plant Hopper 95% ▪ Rice blast 91% ▪ Caseworm 91% ▪ Leaffolder 72% ▪ Stemborer 81% ▪ Safe use of pesticide 85%	were excluded from the activity in June 2014, due to non-compliance with the proposal and fund requirements. The 'challenge fund' topics revolved around rat control techniques during the dry-season rice cultivation season. Among the six remaining farmers, only two farmers had noticeable rat destruction in their areas. The other farmers reported that there were almost no rats in their areas this year. We found that rat control techniques employed by the two farmers facing rat destruction were effective when their fields were compared to their neighbours' fields. However, CAVAC could not conclusively ascertain whether their techniques were more cost effective because both farmers spent much more money and labor to control rats while their neighbours took almost no actions against rats. CAVAC produced a note describing rat control techniques of all farmers participating in the challenge fund. The challenge fund activities have concluded after the first round due to challenges in measuring the effectiveness and efficiency of the techniques. *Competition:* CAVAC has partnered with an input company, Nileda Co., Ltd, to conduct a competition among lead farmers to find effective ways to control blast and stemborer in Takeo and Kampong Thom. The intervention with Nileda commenced in October 2014. 18 farmers will be selected to join the competition and the result of the competition is expected to come out in April 2015.
Next Steps:	**Wet season** ▪ Continue conducting wet season training for model farmers in Kampong Thom from January to September 2015 and in Takeo from April to September 2015. ▪ Improve training materials, methodology and curriculum for wet season model farmer training and publish modified training materials if necessary. ▪ Measure the impact of wet season model farmer training and seek to understand knowledge transfer mechanisms from model farmers to farmers.	**Dry season** ▪ Continue collecting innovation stories of super model farmers, updating current innovation stories and conducting roadshows. ▪ Execute the 'competition' initiative with Nileda on blast and stemborer and monitor the fields of farmers selected to be in the competition. ▪ Measure the outcome and impact of the roadshows and competition.
Lessons Learnt:	The previous model farmer training for wet-season rice farming was designed based on the information CAVAC understood would be useful to farmers (supply-driven). The training has now been redesigned to incorporate farmers' demand for information. This has been done in a more radical manner for the dry season than the wet season due to the dynamic nature of dry season farming. Previously, CAVAC conducted training by giving visual presentations using posters as a guide. In the modified training, CAVAC gives presentations using A3 size posters with facilitators sitting close to trainees. The new approach seems to be more effective with participants more actively engaged in the discussion.	

INTERVENTION UPDATE: Int. No: Ext 11.2 AWP No: 1.6 (Previously 3.2) Date: 31 December 2014

Name: **Support to MAFF for extension materials**

Summary: The objectives of this intervention are to develop stronger linkages between permanent sources of information (GDA, DAE, and the Cambodian Agricultural Research and Development Institute [CARDI]) and input suppliers and agribusinesses through the publication of science-based materials to support stronger rice productivity.

Achievements to Date: CAVAC has continued to support MAFF in printing extension materials that MAFF considers as priorities. The DAE of MAFF has reported that the published materials have been distributed to relevant PDAs, district offices of agriculture, commune councils, non-governemental organisations, private companies, and farmers. The list of MAFF's extension material publications supported by CAVAC is indicated as below:

No	Extension material publication	Type	Quantity	Supported partners
1	Technology Package for Increasing Rice Productivity	Book	20,000	CARDI
2	Soil Profile	Banner	2,775	CARDI
3	Fertiliser Rate	Banner	2,775	CARDI
4	Growing Techniques for Rice Intensification	Book	10,000	Rice crop department, GDA
5	Farmers' Success Stories on Growing Fruit Crops	Leaflet	80,000	DAE, GDA
6	Rice Production of the Ten Varieties	Banner	450	DAE, GDA
7	Vegetable Production	Leaflet	80,000	DAE, GDA
8	Manual on Operation and Maintenance of Power Tiller	Book	1,000	DAE, GDA
9	Vegetable Production	Book	650	DAE, GDA
10	Use of Drum Seeder	Book	11,500	DAE, GDA
11	Pailin Longan Production	Book	1,500	DAE, GDA
12	Use of Ploughing Machine	Book	1,000	DAE, GDA

*Support to printing MAFF's magazines five times was not included on the list as magazines were not considered as extension materials.

Next Steps:

Lessons Learnt:

INTERVENTION UPDATE: Int. No: Ext 11.3 AWP No: 1.2 (Previously 3.2) Date: 31 December 2014	
Name:	**Assisting training and information system support providers with training materials, capacity building and promotion**
Summary:	Farmers' limited knowledge is a key constraint for rice productivity in Cambodia. Farmers access information through several channels: public, private, and NGOs. The quality and the capacity to deliver information are still limited. Changing government strategies towards improved agricultural information systems also requires adjustments of information system materials. The activities of this intervention include: ▪ CAVAC investigations into services that NGOs or public providers are likely to deliver, and whether CAVAC can support quality improvements. ▪ Sharing of CAVAC materials, and support for capacity building when requested, and when this support is likely to be sustainable. ▪ CAVAC's provision of start-up support to private institutions.
Achievements to Date:	Training materials and methodologies developed by CAVAC have been adopted by the PDAs of the three CAVAC provinces, a local school (ABC) and six development partners: including Srer Khmer, Minority Organisation for Development of Economy (MODE); Farmer Livelihood Development (FLD); Gesellschaft für Internationale Zusammenarbeit (GIZ); VVOB Cambodia working with Kandal PDA; and HARVEST. CAVAC has not provided any soft copies of information materials to NGOs over the period from July to December 2014.
Next Steps:	CAVAC remains open to requests from NGOs, agricultural technical schools, and other development projects to use CAVAC's information system materials.
Lessons Learnt:	

INTERVENTION UPDATE: Int. No: Ext 11.5 AWP No: 1.2 (Previously 3.2) Date: 31 December 2014

Name:	**Linking events**
Summary:	CAVAC's Linking Event intervention aims to develop stronger links between model farmer households and other permanent sources of information, such as: PDAs and CARDI; input suppliers; and agribusinesses. Through the links established, access to knowledge is likely to improve. Therefore, if the events succeed in creating these linkages, sustainable access to better support, markets and information may be achieved. CAVAC in 2011 and 2012 hosted three provincial events to create linkages between model farmer households and other sources of information in order to support stronger rice productivity within the farmer community. After conducting the first round of events, CAVAC had discussions with several private event organisers to negotiate the possibility of getting the events organised in a commercially viable way; to stimulate sustainable, systemic change. However, due to the high costs of the events, private event organisers were not willing to manage these events themselves. As such, CAVAC decided to continue paying for these activities as the purpose of the intervention was to build networks among all actors within agricultural input markets. A key output of the events is building strong networks. This output negates the need to conduct commercial events regularly. The strong relationships between model farmers and other permanent sources of information significantly contribute to the sustainability of the information channel from model farmers to other farmers. In early 2014 CAVAC decided to embark on a new program of linking events to strengthen linkages of model farmers in their information networks.
Achievements to Date:	A one-day linking event was held in each of the three CAVAC target provinces: in Kampot on 31 August 2011; in Takeo on 10 February 2012; and in Kampong Thom on 24 February 2012. Each linking event successfully attracted between 350-500 model farmers, 40-80 local retailers and 22-33 input supply companies. Lessons learned were recorded for future linking events. In the first half of 2013, CAVAC conducted a survey with 32 model farmers who had joined the linking events to understand their satisfaction with the events and interaction with companies. The result shows that 80 per cent of model farmers have contacted companies whom they had met at the event, and have requested further events. In November 2013, CAVAC conducted a discussion with 17 input companies on linking events. The discussion indicated that the events were viewed positively, and those input companies that had attended previous linking events gave several suggestions to consider for future events. After analysing various suggestions from input companies, CAVAC chose to conduct linking events in its target provinces and to add some new features to the events. The 2014 events focussed mainly on the interactions between trained model farmers and representatives of input companies. The interactions would be enforced through facilitators who encouraged discussions and networking. An event organiser, Hybrid Advertising, was contracted to conduct the event in 2014. CAVAC and Hybrid discussed and agreed that each participating company needs to cost-share/contribute US$50 for each booth at one event. A linking event in Takeo was held for one and a half days on 17-18 October 2014. The first full day (17th October) was designed for invited model farmers, and in the morning of the next day (18th October) the event was opened to the public. Based on the observation and feedback from the companies participating in the event in Takeo, the event in Kampot on 14 November 2014 was shortened into a one-day event with two sessions: one for the invited model farmers (morning until 4pm) and the other for the public (4-8pm). A discussion with input companies after the event in Kampot indicated that the event in Kampot has significantly improved compared to the first event in Takeo. Just after the event, a company, Malysan Group, mentioned that it would visit model farmers to look for a possibility to conduct field demonstrations as requested by model farmers visiting their booths. The event in Kampong Thom was conducted on 05 December 2014 with 21 companies and 348 model farmers attending. During each event, Hybrid conducted a survey to evaluate the success of the event and the willingness of model farmers to contact the companies after meeting with their company staff in person at the events. CAVAC has reviewed the data from these three surveys and has given feedback to Hybrid for report finalisation.
Next Steps:	Review and approve the final report from Hybrid and arrange a final payment to Hybrid according to the contract.
Lessons Learnt:	Linking event is potential in increasing the likelihood that model farmers will contact input companies and/or other permanent sources of information. CAVAC has learned from the 2014 linking events that facilitators played an important role in encouraging interactions between input company representatives and model farmers. Moreover,

	entertainment sessions were replaced by small sessions of questions and answers as provocative interaction between input company representatives and model farmers in addition to booth visits. Additional materials such as highlighters and envelopes were provided to participating model farmers to facilitate prioritisation of potential and interesting companies that each model farmer will be most likely to contact later. The 2014 linking events have also shown that events without a significant entertainment agenda could fulfil the main objective of linking model farmers with other permanent sources of information much more effectively. However, this lack of entertainment led to much less interest in the events from the public as CAVAC had anticipated.

INTERVENTION UPDATE: Int. No: Ext 11.6 AWP No: 1.2 (Previously 3.2) Date: 31 December 2014	
Name:	**Supporting a private call centre**
Summary:	CAVAC has implemented an intervention to support a Private Call Centre (Asia Master) in order to develop the agricultural content of its database; build capacity of its staff in agricultural knowledge; and promote the service to users. CAVAC initially expected that if the company could provide useful information and knowledge to farmers - and that if farmers adopted and applied this information successfully - more farmers would use the call centre service. The company would also make greater profits from this service and it would continue to improve and update the agricultural content of its database. However, after providing support, CAVAC conducted a study on callers' satisfaction with Asia Master's service. The study showed that the majority of the callers had not been satisfied with the information provided. The information they were predominantly seeking was related to pest control. In response to this feedback, CAVAC was developing a menu database equipped with a diagnostic tool to assist with pest control queries. The tool has been developed and introduced to Asia Master and various input companies.
Achievements to Date:	Following the completion of CAVAC's first round of support to Asia Master – and based on the study results indicating that callers were not satisfied with Asia Master's service - the call centre's information service on agriculture was halted. CAVAC subsequently signed a contract with the Biological Information Technology Group (QBIT) of the University of Queensland to develop a rice-based pest and disease diagnostic tool. This diagnostic tool will be provided through cost-sharing deals to pesticide companies, call centres and telecom companies to enable them to respond to farmers' queries on crop protection more effectively. After much hard work and many trial and errors, the tool has been developed in three configurations: a server version which can be accessed from various computers in an office at the same time; a stand-alone version; and finally a version for handheld android devices. This tool has received great interest from four enterprises who have now signed agreements with CAVAC to use this tool. To understand whether non-technical individuals (those without any/much background on pests and agriculture) can successfully use the tool, CAVAC conducted a two-day test with three non-technical operators in August 2014 with Takeo farmers. On the first day, the average success rate among the three operators was pretty low-39%. However, there was a significant increase in the success rate for one enumerator on the second day; it went from 27% to 88%. As this rate was based on only one operator, to really understand the likelihood of success, CAVAC is planning to conduct a further test with real call centre agents in a real call centre environment. CAVAC introduced the tool to Asia Master; the company was willing to invest in testing the tool and agreed to submit a plan to CAVAC. The main purposes of testing the tool are to establish the demand for information on pesticide from a call centre and to evaluate the correct rate of evaluation by call centre agents. In December 2014, CAVAC provided an orientation to Asia Master's call centre agents on how to use the tool as well as simple tips to interpret farmers' questions. In order to stimulate farmers' awareness and demand for a call centre service, Asia Master is going to conduct a promotional campaign on this service. Based on previous experience, the most effective method to promote a service was phone voicemail. However, CAVAC is concerned a risk of the information reaching a too large audience through voicemail when the quality of the information in the diagnostic tool is still uncertain. As such, CAVAC and Asia Master agreed to promote this call centre service via town criers in areas where farmers start broadcasting dry season rice in January 2015.
Next Steps:	To follow up with Asia Master on the promotional campaign. To conduct an accuracy test of the pest diagnosis by comparing the pest suggested by a call centre agent and that identified by a CAVAC model farmer trainer.
Lessons Learnt:	Given the complexity of the problems described by farmers, intensive training on how to use the tool and to provide the contexts of farmers for call centre agents is necessary. Success of a call centre depends on the willingness of farmers to proactively use the phone/call centre in gathering advice on how to control pests and the ability of call centre staff to learn in a real call centre environment. The test with non-technical individuals in August 2014 found out that the accuracy of pest diagnosis using the tool was higher when farmers have affected plant samples in hand while calling for the diagnosis compared to when farmers describe the pest symptomps from memory. The rate of diagnosis accuracy was 39% if a farmer has a sample of rice plants in hand while calling to describe the symptoms as opposed to 19% when he/she is describing the symptoms from memory.

INTERVENTION UPDATE: Int. No: Irr 10.1 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Krapum Chhouk canal, Takeo province**
Summary:	Before the commencement of this intervention, farmers in Krapum Chhouk typically grew a rice recession crop. Those close to the existing 'PRASAC' canal had limited access to water for a second rice crop. The Krapum Chhouk scheme was proposed to increase the potential command area of the main PRASAC canal. This proposed scheme included the development of a four (4) kilometre secondary canal (otherwise known as Canal 85), and was selected for implementation at the start of CAVAC in March 2010. Construction of the first phase was completed in June 2010. A 1.5-kilometre extension was constructed in 2011, and completed in June 2011. The construction of this secondary canal has improved access to reliable water for double cropping. To ensure the canal is managed and maintained effectively, a FWUG was established under the BANTIC (the FWUC of the PRASAC canal constructed in 1997) structure and capacity building activities for this FWUG were completed in July 2012.
Achievements to Date:	**Engineering** Construction commenced in April 2010 and was completed in June 2010. The community later requested the canal be extended for an additional 1.5 kilometres to serve a larger command area, and to connect the canal embankments with an existing road. The same contractor was engaged for the additional work in March 2011. In the first year, not all farmers could grow two crops due to soil acidity. When the soil became sufficiently flushed in the second or third year, all farmers started to grow two crops per year. **O&M** CAVAC commissioned the PDWRAM to establish and build the capacity of a FWUG for this canal. The FWUG was established in February 2012, and the capacity building was completed in July 2012. This FWUG is part of the structure of a FWUC called BANTIC. In April 2014, the PDWRAM was contracted to restructure BANTIC through a re-election, to conduct a landholding survey, and to strengthen the FWUC capacity. CAVAC and the PDWRAM agreed on these activities in order to help improve the performance of BANTIC, as this FWUC had been established for quite a long time. The PDWRAM completed the re-election to restructure BANTIC. BANTIC's new structure consists of only two layers: the committee and secondary canal groups (previously called sub-groups). Krapum Chhouk is treated as a secondary canal of the whole BANTIC system. The land holding survey for BANTIC was also completed and it is expected that the map from the survey will be used by the FWUC to collect the ISF. The Krapum Chhouk FWUG has collected the ISF twice. The ISF collected was approximately US$1,350 in 2013 and US$1,800 in 2014. This money was deposited into the BANTIC FWUC account to be used for the O&M of the whole scheme. These funds have been used for the maintenance of Canal 98 (PRASAC Canal) which is the main canal in order to ensure water supply. There are currently seven local PWSs operating in the area, who provide water supply to farmers in the surrounding areas. Three of the seven PWSs have already been registered with BANTIC.
Next Steps:	**Engineering** Follow up on the FWUC's maintenance activities. **O&M** BANTIC, with assistance from the PDWRAM and CAVAC, will use the map from the landholding survey to monitor and validate the fee collection from PWSs and farmers. Continue strengthening the capacity of BANTIC through follow-up visits and provision of technical support in order to ensure sustainability of the scheme.
Lessons Learnt:	**Engineering** Sediment in each canal silts up year after year due to several factors, including water waves from the wind and boats traveling along the canal, and disturbance of the canal banks. It is recommended that the level of siltation in each canal be checked once a year and that appropriate action is taken as needed. **O&M** Before integrating a new FWUG into an existing structure, it is necessary to get an in-depth understanding of the existing FWUC for the whole structure to function smoothly. Close follow-up activities to the newly established FWUG and FWUC are needed after their establishment. A land holding survey is a key tool to assist FWUG / FWUC to manage the fee collection. A three-layer organisational structure of a FWUC appears not to be practical and effective, as it is confusing to the sub-group (or now called secondary canal group) members about who to report to. This makes a two-layer structure more effective.

INTERVENTION UPDATE: Int. No: Irr 10.3 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Tumnub Lork canal, Takeo province**
Summary:	Prior to this intervention, farmers in the communes of Pech Sa and Krapum Chhouk were growing wet season paddy and some limited dry season paddy. Agricultural production was limited by unreliable access to water. The community expressed a need for canal rehabilitation that would improve access to water supply and increase the area for double cropping. The Tumnub Lork canal was selected for rehabilitation in 2011. A feasibility study was carried out and the canal was surveyed and designed. Construction of the canal commenced in March 2011. A contract amendment was signed with an alternate contractor for additional drainage and crossing structures along the canal. Improvements to the canal were completed in August 2013.
Achievements to Date:	**Engineering** Construction commenced in March 2011. Additional structures were requested by farmers and CAVAC agreed to include these structures by amending the construction contract. The first contractor's poor performance resulted in long delays and finally cancellation of the first contract. In 2013, CAVAC re-tendered the remaining works, and all works were completed in August 2013. Cropping has increased from one to two crops per year since the main part of the canal was rehabilitated. Upon request from the FWUC of this scheme, CAVAC contracted a construction company to install watergates under two bridges built in 2011 in order to retain the water after the tide. The installation of these watergates was completed in August 2014. **O&M** CAVAC commissioned the PDWRAM to establish and build the capacity of a FWUC for this canal. The FWUC was established in early February 2012, and the capacity building was completed in June 2012. CAVAC has continued following up with the trained FWUC to strengthen its capacity. In the first year after completion (2012), the FWUC started collecting the ISF. In the second year (2013) and third year (2014), the FWUC could collect about US$3,000 and US$3,500 respectively. The fees collected are used on the O&M of the scheme and stipends for FWUC committee members. For example, the FWUC spent some money to backfill the collapsed embankments. That has given the FWUC much confidence in managing the scheme. The FWUC has now started to take on more responsibilities in canal ownership. It now has a better understanding of how to deal with PWSs who do not pay ISF. The FWUC is now at a point where the PDWRAM and CAVAC only assist this FWUC in dealing with larger issues. The ISF at Tumnub Lork has been lowered from 140kg/ha to 75kg/ha. As the ISF has been lowered, it is hoped that PWSs will pay full ISF to the FWUC. This agreement was made through negotiations in the presence of Koh Andeth District Governor and Distrtict Council Members. The support from the local authorities to this FWUC has improved significantly in 2014. This is mainly due to the intervention from the PDWRAM. The PDWRAM recently completed a landholding survey to get accurate irrigated area data of this scheme and FWUC capacity re-strengthening activities.
Next Steps:	**Engineering** Follow up on the FWUC's maintenance activities. **O&M** Train the FWUC to use the data from the survey as it implements contracts with PWSs. This data will help the FWUC to manage its contracts with PWSs as well. Continue strengthening the capacity of the FWUC through close follow-up visits and provision of technical support, including financial management skills.
Lessons Learnt:	**Engineering** There are often several soil types found along long canals such as this Tumnub Lork. Although there was a soil investigation undertaken during the detailed design of the scheme, this was not enough for such a long scheme as Tumnub Lork. To deal with this kind of soil type variation, a site engineer needs to continuously observe the types of soil and determine an appropriate embankment slope for each soil type. For example, when a canal passes through unstable and erodible soil sections, a flatter slope needs to be adopted to avoid a slope or embankment failure. Daily construction supervision is important to ensure that the contractor's work meets the requirements of the design and technical specifications. Engineers need to take into consideration the changes of existing structures that might affect the functioning of the scheme. Types of water crossing structures should be discussed with farmers. Drainage should be well defined and added during construction. **O&M** Any existing structures taken out during the rehabilitation of a canal should be put back, as those structures are usually useful to farmers. A more fully developed scheme does matter to the participation of farmers in the O&M of the canal.

	Working closely with each FWUC in the first few years is essential to guide the FWUC in dealing with various issues related to O&M. It builds up the FWUC's capacity and confidence through all sorts of experiences. The best way to build the capacity and confidence of the FWUC is not to work with it every day, but to connect it with different stakeholders and intervene when needed and possible. The PDWRAM's intervention to get the local authorities to support each FWUC is necessary for good FWUC performance and canal sustainability.

INTERVENTION UPDATE: Int. No: Irr 10.4 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Kveng Tayi canal, Takeo province**
Summary:	Prior to this intervention, farmers in the commune of Prey Yutka were growing recession and early wet season paddy and some limited dry season paddy close to the PRASAC canal. Agricultural production was limited by unreliable access to irrigation water from the main canal. Before the construction, farmers found it difficult to get enough water for their second crop. The water was not reliable as farmers had to negotiate to buy water from Vietnam, and prices fluctuated yearly. The community expressed a need for canal construction to increase the area with access to reliable water for double cropping. The Kveng Tayi canal was selected for rehabilitation in 2011. A feasibility study was carried out and the canal was surveyed and designed. Construction commenced in April 2011 and was completed in June 2012.
Achievements to Date:	**Engineering** Construction commenced in April 2011. The original work was completed in early 2012. Additional structures (two bridges and one drainage structure), requested by the community, were added to the contract through a contract amendment, and the construction of these structures was completed in mid-2012. Farmers started using water from the Kveng Tayi canal immediately after the canal completion for one or two crops per year. Following a request from the community, CAVAC supported dredging work along 1,300 meters of the canal. This work was completed in July 2014. There had been some erosion around the wing walls of two bridges due to the difference between the length of the wings and the height of each bridge. It was suggested that the FWUG put wooden poles around that area to strengthen the soil and prevent the erosion. In this reporting period, the FWUG filled up soil in that area as an acceptable, temporary solution. **O&M** As this scheme is also under BANTIC (the FWUC of the PRASAC canal), CAVAC commissioned the PDWRAM to establish and build capacity of a FWUG for this canal. The FWUG was established in February 2012, and the capacity building was completed in July 2012. CAVAC has been following up with the trained FWUG to strengthen its capacity. As mentioned in the Intervention Number Irr 10.1, the PDWRAM was contracted to carry out a landholding survey in order to ascertain accurate irrigated area data for BANTIC. In this reporting period, both the restructuring of BANTIC and landholding survey were completed. Kveng Tayi is currently treated as a secondary canal of this BANTIC system. The Kveng Tayi FWUG has so far collected about US$2,750 in 2013 and US$1,950 in 2014. These fees have been used for the maintenance of CAVAC 98 (main canal for Krapum Chhouk and Kveng Tayi) and stipends for FWUG committee members.
Next Steps:	**Engineering** Follow up on BANTIC's work to fix the erosion at the wing walls of the bridges. Continue considering the community's request for a bridge at the head of the canal. **O&M** Monitor and assist the FWUC's efforts preparing contracts with PWSs, based on the map from the landholding survey. Closely follow-up with the FWUG to continue strengthening its capacity in financial management and maintenance planning.
Lessons Learnt:	**Engineering** The designs of structures should include sufficient erosion protection. The function of each structure significantly determines its design. The design engineer needs to collect information from farmers and incorporate farmers' practices into each design. Good and regular construction supervision is important to ensure that the quality of the work meets the required standards. **O&M** The FWUC and FWUG do not have accurate irrigated area data. The data that they have is from PWSs. Given the fact that PWSs are entrepreneurs who are profit-oriented, most of them tend not to reveal actual irrigated data. A land holding map is essential for the FWUG and FWUC to manage the contracts with PWSs more effectively.

INTERVENTION UPDATE: Int. No: Irr 12.3 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: So Hang canal, Takeo province**
Summary:	Prior to this intervention, farmers in the communes of Borey Chulsa, Daung Kpos, Romenh, and Kork Po grew traditional wet season rice and / or some limited dry season rice with very limited access to reliable water supply. The community expressed a need for rehabilitation of the So Hang canal to improve water supply and increase access to a reliable water source. The So Hang canal was then selected for rehabilitation. A feasibility study was done and the canal was surveyed and designed. Construction commenced in April 2012, but it was not completed as planned due to several required modifications. The construction was completed in August 2013.
Achievements to Date:	**Engineering** Construction commenced in April 2012. Some modifications have been done on structural and earth works to improve water reliability of the scheme. The construction was completed by the end of August 2013. The repairs during the defects liability period were finished in June 2014. **O&M** CAVAC commissioned the PDWRAM to establish and build the capacity of a FWUC for this canal. The FWUC establishment was completed in May 2013, and the capacity building was completed in October 2013. Some meetings between the FWUC, PWSs, and the local authorities took place during and after the FWUC establishment process to discuss the water price for farmers and other issues surrounding the water business. The local authorities intervened in the process of setting the water price. Some PWSs chose not to register with the FWUC because the price was too low for them to profit from the business. Without PWSs in some sections of the canal, some farmers had to pump water using their own pumps with limited capacity. As of the completion of construction (recession rice season of 2013), only about 10 percent of the total command area was irrigated. This was due to a number of reasons: first, the local authorities (Borey Chulsar commune and Borey Chulsar district) did not welcome PWSs; second, farmers used other water sources to irrigate their fields, and; third, farmers used their own pumps with limited capacity. However, during the early wet season of 2014, about 80 percent of the total command area was irrigated. This significant increase was largely due to the drying up of a nearby water source, resulting in farmers realising the importance of getting the water service from PWSs.
Next Steps:	**Engineering** Continue observing the possibility to support PWSs in further developing this scheme. **O&M** Continue conducting follow-up visits to this FWUC to provide capacity building support as needed and feasible. Work with this FWUC has been assigned a lower priority for now, due to political interference.
Lessons Learnt:	**Engineering** A canal deeper than four meters should be avoided, due to: large land losses; high pumping costs; and high maintenance costs for the FWUC. The coffer dams installed at the canal for structure construction must be properly removed in order not to block the water flow. Each structure side slope needs to be built and checked according to the specifications. **O&M** The effectiveness of O&M work largely depends on the involvement and interventions of the local authorities. The quality and appropriateness of these interventions largely influence the success of the scheme O&M.

INTERVENTION UPDATE: Int. No: Irr 12.4 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Prey Rumdeng canal, Takeo province**
Summary:	Farmers in the communes of Prey Rumdeng and Ta O in Kirivong district requested that the Prey Rumdeng canal be rehabilitated to improve the irrigated water supply, and therefore increase the number of crops per year. CAVAC conducted a feasibility study and the canal was surveyed and designed. Construction commenced in March 2012. Some additional structures were added, and all work was completed in December 2012.
Achievements to Date:	**Engineering** Construction commenced in March 2012 and was completed in December 2012. Initially there was an agreement with the authorities in Vietnam to connect the Prey Rumdeng scheme to the Vin Te canal in Vietnam – this would ensure a continuous supply of irrigation water. CAVAC's Environmental Expert recommended that without a comprehensive environmental impact assessment in Vietnam, the canals should not be connected. Therefore, the canal construction was stopped two kilometres from the Vietnamese border to avoid any cross border negative environmental impacts that could not be sufficiently investigated. Upon a request from the FWUC, some off-take structures were adjusted to the current practices of farmers. The improvements of these structures were completed in July 2014. **O&M** CAVAC commissioned the PDWRAM to establish and build the capacity of a FWUC for this canal. The FWUC establishment commenced in September 2012 and was completed in April 2013. Capacity building for the FWUC was completed in October 2013. Several meetings between the FWUC, PWSs, and the local authorities took place. Political interference has weakened the authority of the FWUC in negotiating contracts with PWSs. The FWUC is yet to undertake fee collection. As a result, the PDWRAM/CAVAC intervention has had limited impact. Some farmers want to form a group to pump water from the canal instead of taking the service from PWSs. The FWUC, with support from CAVAC, will help those farmers determine the costs and benefits of pumping on their own so that they can make a better informed decision on running this pumping group.
Next Steps:	**O&M** Follow up on the farmers' intention to form their own pumping group, and provide support to ascertain the feasibility of this option. Work with this FWUC has been assigned a lower priority for now, due to political interference.
Lessons Learnt:	**Engineering** The off-take structures are the last things required to take water from the canal to the field level. Engineers should consult with farmers about their practices and incorporate them in the designs. Environmental issues need to be considered during the feasibility study or detailed design to avoid any conflict during the construction phase. **O&M** This canal is directly connected to the Thnoat canal in Kampot province. The fee system at Thnoat was set up differently and is much cheaper than the fees paid at Prey Rumdeng. This has created some issues with farmers' participation in paying the ISF. Therefore, the extension of a canal across the provincial border should be carefully considered before construction, as it creates challenges for FWUC operation at a later stage. The political relationship between PWSs and local authorities (communes and districts) can create contractual difficulties for the FWUC to manage – i.e. PWSs not paying O&M fees to the FWUC.

INTERVENTION UPDATE: Int. No: Irr 12.5 AWP No: 2.2 Date: 31 December 2014	
Name:	**SIF: Support to BANTIC and PLOVIC in rehabilitating two secondary canals in Takeo**
Summary:	**BANTIC – Banteay Thleay** Prior to the intervention, farmers in Krapum Chhouk commune, Koh Andeth district, grew recession paddy and some limited dry season paddy along the PRASAC canal. Agricultural production was limited by unreliable access to water. The community requested a secondary canal from the PRASAC canal to be rehabilitated to improve water supply and increase the area with reliable water for double cropping. **PLOVIC – Plov Touk** Prior to the intervention, farmers in Kirichong Koh commune, Soam district, and Phnom Den commune, Kirivong district grew recession paddy and some limited dry season paddy along the PRASAC canal. Agricultural production was limited by unreliable access to water. The community requested rehabilitation of a secondary canal branching from the PRASAC canal to improve water supply and increase access to reliable water for double cropping. CAVAC agreed to support these two schemes, which were funded through the SIF mechanism on a cost-sharing basis with the community.
Achievements to Date:	**Engineering** The canal construction started in April 2012 and finished in June 2012. **O&M** The two FWUCs were very active in monitoring the construction progress. Farmers have been irrigating their paddy rice fields using water from these two canals rehabilitated through the SIF grants. The FWUC has also been collecting the ISF since the rehabilitation. Below is the fee collection data for the whole BANTIC and PLOVIC. BANTIC: The fee collection is around US$15,770 (2013); and US$13,450 (2014). PLOVIC: The fee collection is around US$31,820 (2013); and US$14,875 (2014). The PDWRAM had been contracted to conduct a landholding survey, re-election, capacity building, and monitoring for BANTIC. The BANTIC FWUC was re-elected on 14 November 2014. The FWUC has been restructured from three to two organisational layers: the FWUC committee and the secondary canal leaders. The landholding survey and capacity strengthening activities were also completed in this reporting period.
Next Steps:	**Engineering** Follow up on the FWUC's maintenance activities. **O&M** Continue regular visits to the FWUC. These visits are required, even after the re-election in order to ensure continuity between past committee members and those who are newly elected.
Lessons Learnt:	**O&M** A landholding survey is needed to help a FWUC better manage its fee collection.

INTERVENTION UPDATE: Int. No: Irr 13.1 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Rokar Chhouk canal, Takeo province**
Summary:	Farmers in the commune of Char in Prey Kabas district requested rehabilitation of Rokar Chhouk canal to improve the water supply from a depression area. This would enable rice farmers to produce two crops per year. The Rokar Chhouk canal was selected for rehabilitation in 2013. A feasibility study was conducted and the canal was surveyed and designed. Construction commenced in March 2013. Some structures were added, and all work was completed in June 2014.
Achievements to Date:	**Engineering** Construction commenced in March 2013. Work could not be completed before the floods came in 2013. In 2014, some structures were added. Some parts of the embankment were shifted at the depression area to enable the canal to retain more water. A 100-meter local road was also built upon the request from the community. All work was completed in June 2014. **O&M** CAVAC signed a contract with the PDWRAM to establish and build the capacity of a FWUC for this canal. The FWUC establishment process was completed in November 2013 and the capacity building for the FWUC was completed in February 2014. A land holding survey for this scheme, which is part of the FWUC establishment and capacity building contract, was also completed by the PDWRAM. This FWUC is quite active. There was a siltation issue at the head of this canal causing some problems to the water flow into the main canal. This FWUC gathered farmers and collected some money from them to do dredging work at the head of the canal.
Next Steps:	**O&M** Conduct follow-up visits to the FWUC to strengthen its capacity. Sign a contract with the PDWRAM to conduct FWUC monitoring work.
Lessons Learnt:	The construction company's focal person needs to have good technical and communication skills. Otherwise, work may continue to be delayed due to miscommunication and disagreement between CAVAC and the construction company.

INTERVENTION UPDATE: Int. No: Irr 13.2 and 13.3 AWP No: 2.2 Date: 31 December 2014	
Name:	**SIF: Support to BANTIC and PLOVIC in dredging their main canal in Takeo**
Summary:	**BANTIC – Banteay Thleay** Prior to the intervention, farmers in Prey Khla, Krapum Chhouk, and Prey Yuthka communes (Koh Andeth district) grew paddy along the PRASAC canal. This canal has been heavily affected by siltation. The community requested for the scheme to be dredged to improve water supply and increase the area with reliable water for double cropping. **PLOVIC – Plov Touk** Prior to the intervention, farmers in the Communes of Kamnob and Phnom Den communes (Kirivong district) grew paddy along the PRASAC canal. This part of the canal has also been significantly affected by siltation. Farmers in this community have requested that this part of the canal be dredged to improve water supply and increase the area with reliable water for double cropping. CAVAC supported both communities to rehabilitate the canal through dredging. These two projects were funded through the SIF mechanism on a cost-sharing basis with the community.
Achievements to Date:	**Engineering** Work on these two SIF projects commenced in May 2013 and was completed in August 2013. At Plov Touk, work was done on the ground using a regular excavator and a long-arm excavator. At Banteay Thleay, work was done during high tide using a crane excavator standing on a barge. **O&M** The FWUCs of both schemes were active in monitoring the construction progress. CAVAC showed them how to measure canal depths using depth sounders and tape measures. The FWUCs have used this knowledge to monitor the construction work. The scheme was ready to be used when water started receding in December 2013. The PDWRAM had been contracted to conduct a landholding survey, re-election, and capacity building for BANTIC. Re-election, landholding survey and capacity building activities were all completed in this reporting period.
Next Steps:	**Engineering** Follow up on the FWUC's scheme maintenance activities. **O&M** Continue regular visits to the FWUC. These visits are required even after the re-election in order to ensure continuity between past committee members and those who are newly elected.
Lessons Learnt:	**O&M** CAVAC has learned from this project the benefits in handing over construction monitoring work to the FWUC. Not only does this build the FWUC's ownership of the canal, but it also builds the capacity of the FWUC in using equipment such as a depth sounder to measure the level of excavation needed to dredge a canal under water. The longer the committee members of a FWUC stay in their positions without re-election, the higher the chance of built-in nepotism networks becomes.

INTERVENTION UPDATE: Int. No: Irr 14.1 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Wat Thmey pumping scheme, Takeo province**
Summary:	Prior to the intervention, farmers in the communes of Snoa, Kampong Reap, and Prey Lvea in Prey Kabas district and the commune of Prek Ambil in Sa-ang district, Kandal province relied on limited water supply from a depressed area and wells within their communities for their rice cultivation. They have requested rehabilitation of Wat Thmey pumping scheme to enable them to produce two to three crops per year. The Wat Thmey scheme was subsequently selected for rehabilitation in 2014. A feasibility study was conducted and the canal was surveyed and designed. The water source for this scheme is from Stung Prek Ambel. The construction for this scheme commenced in January 2014. Some additional structures were added and designs were revised. It is expected that the construction work will be completed by February 2015.
Achievements to Date:	**Engineering** Due to the large size of this project, the construction was tendered in two packages. The first package covers the main canal and pump house, and the second package contains the distribution canals and related structures. The initial contracts were both cancelled due to the contractor's poor performance. The contracts were later awarded to the second cheapest and qualified contractor. Several design revisions were made due to some unforeseen issues, such as the soil condition, land loss issues and safety. By the end of December 2014, the first and second work packages have been completed to 80% and 100%, respectively. Much rain in November led to water needing to be drained out of the field at this scheme. Lack of drainage structures resulted in severe damage of the crop. The construction team had to conduct a study to figure out solutions to the problem. The team is currently adding more drainage structures to help solve the problem. **O&M** CAVAC signed a contract with the PDWRAM to establish and build the capacity of a FWUC for this scheme. The FWUC establishment has been completed. The FWUC election was held on 12 November 2014. The training on O&M is being provided by the PDWRAM with technical support from CAVAC. As this scheme crosses Kandal and Takeo provinces, the FWUC for this scheme is a joint structure between the two provinces. Much consultation has been conducted with farmers in every village on the functioning of the scheme, the ISF collection and other issues that farmers face. A lot of issues arise due to delayed pump installation and lack of drainage system in place. CAVAC's water management consultant will work closely with the FWUC and PDWRAM staff at Wat Thmey on the scheme O&M plan.
Next Steps:	**Engineering** Complete construction work by February 2015. Drainage and irrigation PVC pipes will be added. **O&M** Enhance the FWUC capacity in operating the electric pump house and managing the scheme. Close follow-up with the FWUC is required by the team from CAVAC (engineering and O&M) to ensure that the scheme can be well-operated. Work closely with the PDWRAM to ensure that the FWUC will have sufficient capacity to operate and maintain the scheme. PDWRAM staff members assigned to work with the FWUC of this scheme will need to stay in the community to get clear understanding of the scheme operation and related issues.
Lessons Learnt:	**Engineering** Soil investigations and collecting monthly climatic data including river water levels are needed during the detailed design stage. A hydrological study is an absolute requirement for such a large scheme as Wat Thmey. Consultation with local people is needed because not all hydrological information is available from the Local Office of Hydrology. Full consideration of drainage structures is required in the design stage. **O&M** It is important to consult with farmers during the design stage and the early stages of scheme construction. By doing this, farmers feel informed and involved and therefore are willing to provide support and cooperation.

INTERVENTION UPDATE: Int. No: Irr 14.1 AWP No: 2.2 Date: 31 December 2014	
Name:	**SIF: Support to BANTIC, PLOVIC and KRIC in dredging their main canal in Takeo**
Summary:	**BANTIC – Banteay Thleay** Farmers in Prey Khla, Krapum Chhuk, and Prey Yuthka communes (Koh Andet district) grow paddy along the PRASAC canal. This canal was heavily affected by siltation. The community requested for the scheme to be dredged to improve water supply and increase the area with reliable water for double cropping. The siltation did not only affect the surrounding area but it also blocked water that flowed into Krapum Chhouk, Kveng Tayi and Tumnub Lork canals. Therefore, the canal rehabilitation of the last section of BANTIC (6,443m) would ensure water supply to the above mentioned canals. It would also benefit farmers in Krapum Chhouk, Prey Yuthka and Pech Sar communes, Koh Andeth district. **PLOVIC – Plov Touk** Farmers in the Communes of Kamnob and Phnom Den (Kirivong district) grow paddy along the PRASAC canal. The length of this canal is 5,080m. This part of the canal was also significantly affected by siltation. Farmers in this community requested that this part of the canal be dredged to improve water supply and increase the area with reliable water for double cropping. The dredging of this canal would benefit farmers in Kamnob and Phnom Den communes, Kirivong district. **KRIC – Kampong Krasang** This canal is located in Kampong Krasang commune, Borey Chulsar district, along the the head of the PRASAC canal. This canal also benefits farmers in Thlea Prochum commune, Koh Andeth district. 2,100m of this canal required dredging. This part of the canal was affected by siltation from the water source, Steung Takeo. The dredging of this canal would not only serve the needs of farmers in the upstream areas but would also play a crucial role in providing a reliable water source for BANTIC and PLOVIC. CAVAC was supporting the three communities to rehabilitate the canal through dredging. These three projects were funded through the SIF mechanism on a cost-sharing basis with the community.
Achievements to Date:	**Engineering** Work on these three SIF projects commenced in April 2014, and was completed in May, June and July at Banteay Thleay, Plov Touk, and Kampong Krasang, respectively. **O&M** The FWUCs of these schemes were active in monitoring the construction progress. CAVAC showed them how to measure canal depths using depth sounders and tape measures. The FWUCs have used this knowledge to monitor the construction work.
Next Steps:	**O&M** Continue conducting follow-up visits to these FWUCs, especially BANTIC, as it has been restructured only recently.
Lessons Learnt:	**Engineering** The method of construction must be fitted for each site condition. Crane excavators are rarely used, but it is the only solution for dredging the siltation at the canal sections of BANTIC and KRICI. This method should not be applied for natural solid soil. **O&M** CAVAC has learned from this project the positive significance of handing over construction monitoring work to the FWUC. Not only does this build the FWUC's ownership of the canal but also builds the capacity of the FWUC in using equipment such as a depth sounder to measure the level of excavation needed to dredge a canal under water. The longer the committee members of a FWUC stay in their positions, without being re-elected, the higher the chance of built-in nepotism networks will be.

INTERVENTION UPDATE: Int. No: Irr 10.2 AWP No: 2.3 Date: 31 December 2015	
Name:	**Development and Construction of an Irrigation Scheme: Prey Tonle canal, Kampot province**
Summary:	Prior to this intervention, farmers of Prey Tonle grew a wet season paddy crop. Agricultural production was limited by unreliable access to irrigation water, and the community expressed a need for the construction of a run-off-river canal that would improve water supply and increase access to water for double or triple cropping. CAVAC therefore selected the 3.2-kilometer Prey Tonle canal for implementation in March 2010. Construction work was completed in June 2010. A FWUC was established and capacity building was completed in June 2012.
Achievements to Date:	**Engineering** The detailed design was undertaken by the PDWRAM under an agreement with CAVAC. CAVAC ran a tender process and construction was awarded to Taing Cheng Oing, Co., Ltd. Construction commenced in April 2010, and was completed in June 2010. Construction supervision was conducted by the PDWRAM, under an agreement with CAVAC. **O&M** CAVAC commissioned the PDWRAM to establish and build the capacity of a FWUC for this canal. The FWUC was established through community meetings and elections, and the capacity building for this FWUC was completed in June 2012. Village meetings were facilitated by the FWUC, CAVAC, local authorities, and the PDWRAM staff to provide fee collection information to farmers in June 2013. CAVAC continued to conduct follow-up visits to this FWUC to strengthen its capacity in scheme O&M until October 2013. In October 2013, CAVAC decided to suspend work on this FWUC, as most committee members of this FWUC had shown low interest and commitment. Moreover, collecting a fee for this scheme had proven very challenging because parallel to the CAVAC canal, another canal of 6.5 km in length was constructed by the government and farmers were not required to pay any fees for using water from the government canal.
Next Steps:	**Engineering** No further action. **O&M** No further action.
Lessons Learnt:	**O&M** Fee collection is very challenging at a scheme close to another scheme where water is provided for free.

INTERVENTION UPDATE: Int. No: Irr 10.6 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Sbov Andeth canal, Kampot province**
Summary:	Prior to this intervention, farmers in Sdach Kong Khang Cheung grew wet season paddy and some limited dry season paddy close to the Stung Touk Meas perennial river. Agricultural production was limited by unreliable access to irrigation water. The community expressed a need for canal construction and some rehabilitation to improve water supply and increase the area with reliable water to enable double cropping. The Stung Touk Meas is influenced by high water levels downstream from Vinte canal which is part of the Lower Mekong / Bassac River systems. The Sbov Andeth canal was selected for rehabilitation in 2011. A feasibility study was carried out and the canal was surveyed and designed by Kampot PDWRAM. Construction commenced in April 2011 and was completed in mid-April 2012. A FWUC was established in February 2012 and capacity building was completed in June 2012.
Achievements to Date:	**Engineering** Construction commenced in April 2011. Some additional structures were added to improve drainage and canal functionality. All work was completed by mid-April 2012. This canal has achieved significant success to date. Before canal rehabilitation, farmers only grew wet season paddy which was very unpredictable and low yielding. Currently, almost 100% of farmers have increased production from one to two crops, and about 20% of farmers also grow a third crop per year on rice fields in upper land areas which are unlikely to flood. In 2013, CAVAC and Kampot PDWRAM agreed to construct two lined secondary canals within the scheme. Construction of these two secondary canals started in January 2014 and was completed in May 2014. **O&M** A FWUC for this scheme was established in February 2012, and the capacity building for it was completed in June 2012. As the Hay Saun extension 2 canal links to Sbov Andeth, one group and three subgroups were established under the management of the Sbov Andeth FWUC to manage this Hay Saun extension 2 section. The sub-group and group leaders were trained by the PDWRAM on scheme O&M. The FWUC has encouraged farmers to construct secondary/tertiary canals to increase the irrigated area. So far, 58 small secondary/tertiary canals have been dug. After prolonged negotiations, the FWUC and a PWS agreed to set the price of water at which the PWS would charge farmers at US$87.5 per ha, with the PWS paying 50% of the full ISF to the FWUC (full ISF=150 kg of paddy equivalent to US$30 per hectare). The FWUC and the PWS were planning to implement this agreed procedure at three secondary canals. However, during a meeting, farmers did not show much interest in the service from the PWS for the wet season of 2014, believing they could rely on the rain over the wet season. Farmers at this scheme are still reluctant to depend on the PWS's service as they never used it before. They prefer to wait and see how the service will go at the nearby Hay Saun scheme. The construction of an office for this FWUC was completed in September 2014, and can now be used for FWUC related work.
Next Steps:	**Engineering** No further action **O&M** Continue to strengthen the capacity of the FWUC committee, especially in fee collection, financial management, maintenance plan, through follow-up visits from CAVAC and PDWRAM. Conduct more meetings between the FWUC, PWSs and farmers to boost farmers' interest in the water service. Encourage the FWUC to regularly meet with the local authorities to boost its cooperation and understanding with the authorities.
Lessons Learnt:	**Engineering** Proper irrigation water management at the watershed level is essential to ensure a long-term access to water for irrigation purposes. **O&M** Regular FWUC meetings are very important and should be conducted preferably every two months. Engagement of PWSs in water management might be very beneficial for this scheme, especially in fee collection. However, there needs to be strong cooperation between all parties in order to ensure that they all work well together.

INTERVENTION UPDATE: Int. No: Irr 10.7 AWP No: 2.3 Date: 31 June 2014	
Name:	**Development and construction of an irrigation scheme: O'Kak canal, Kampot province**
Summary:	Prior to the intervention, farmers in Touk Meas Khang Lech grew wet season paddy and some limited dry season paddy close to the Stung Touk Meas perennial river. Agricultural production was limited by unreliable access to water. The community expressed a need for canal rehabilitation to improve water supply and increase reliable water access for double or triple cropping. The O'Kak canal was selected by CAVAC for rehabilitation in 2011. A feasibility study was carried out and the canal was surveyed and designed. Construction commenced in April 2011 and was completed in May 2012. A FWUC was established in November 2011 and capacity building was completed in June 2012.
Achievements to Date:	**Engineering** Construction commenced in April 2011. Some additional drainage and crossing structures were needed, and by May 2012 all work was completed. Due to sandy soil conditions, parts of the canal embankments collapsed, blocking the flow of water in the canal. Several options were reviewed for stabilisation of canal embankments. It was finally decided to provide concrete lining at the section where the embankment had collapsed. This scheme improvement work commenced in early 2013 and was postponed during the wet season. The construction was resumed in early December 2013 and was fully completed at the end of June 2014. **O&M** A FWUC for this scheme was established in November 2011, and further capacity building was completed in June 2012. Farmers are now able to access the water in the canal, following completion of the scheme improvements. However, most farmers are still cultivating wet season rice and vegetables, and have not yet moved to dry season farming. The farmers therefore predominately rely on rainfall. The construction of an office for this FWUC was completed in October 2014. The FWUC can now work and hold meetings there.
Next Steps:	**Engineering** No further action **O&M** The FWUC, in cooperation with the local authorities, will conduct awareness meetings to re-inform farmers about the ISF for the upcoming seasons. Conduct follow-up visits to the FWUC to strengthen its capacity especially in fee collection, financial management and maintenance plan.
Lessons Learnt:	**Engineering** Sandy soil in a scheme area necessitates substantial investment in canal lining. Alternative options should be studied at the feasibility study stage. These skills are limited at the PDWRAM level. For this specific scheme, the construction of a pumping scheme would have been a more feasible option. **O&M** Farmers were not particularly enthusiastic about construction of a pump house at the intake site of the canal. CAVAC should have been more active in providing information regarding land loss, gravity fed irrigation, and the ease of operating pumping equipment.

INTERVENTION UPDATE: Int. No: Irr 10.8 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Thnoat canal, Kampot province**
Summary:	Prior to the intervention, farmers of Thnoat Chong Srang grew wet season paddy and some limited dry season paddy close to the Prek Ansar perennial river. Agricultural production was limited by unreliable access to water. The community expressed a need for canal rehabilitation to improve water supply and increase the area with access to reliable water for double or triple cropping. The Thnoat canal was selected by CAVAC for rehabilitation in 2011. A feasibility study was carried out and the canal was surveyed and designed. Construction commenced in April 2011 and was completed in May 2012. A FWUC was established and the capacity building was completed in March 2012.
Achievements to Date:	**Engineering** Construction commenced in April 2011. Some drainage and soil erosion protection structures were added to the contract, with construction completed in May 2012. In December 2013, a contract was awarded for the construction of a pilot secondary canal (3.5 km) at this scheme site. The construction of this pilot secondary canal started in early February 2014, and was completed in June 2014. **O&M** The FWUC was established through community meetings and elections. The capacity building was completed in March 2012. CAVAC has continued conducting follow-up visits to the FWUC to strengthen its capacity in scheme O&M. There had been no PWSs in the area before the canal was rehabilitated. After the canal rehabilitation, PWSs came from nearby areas to start investing in water delivering services for farmers by taking water from the Thnoat canal. Currently, there are five PWSs doing business at this scheme, all of whom have been registered and signed contracts with the FWUC. During this reporting period, the FWUC has collected the ISF of about 500,000 riels from PWSs. So far, US$1,725 has been collected. The FWUC has spent about US$500 of the collected ISF to repair the road access on some parts of the canal embankments. Construction of the FWUC office has also been completed.
Next Steps:	**Engineering** No further action. **O&M** Conduct meetings regularly between the FWUC and PWSs to strengthen the relationships between them, to share workplans, and to solve any outstanding problems. Continue conducting follow-up visits to the FWUC to strengthen its capacity. Encourage the FWUC to hold regular meetings with the local authorities to build cooperation between the FWUC and local authorities.
Lessons Learnt:	**O&M** The relationship between PWSs and the FWUC should be formalised. The local authorities, especially the commune councils, should be involved to facilitate the formalisation process through effective contract management.

INTERVENTION UPDATE: Int. No: Irr 12.1 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of irrigation scheme: Spean Touch canal, Kampot province**
Summary:	Prior to the intervention, farmers of Prey Kroeus grew traditional wet season rice and / or short-term dry season rice with limited access to reliable water. The community expressed a need to rehabilitate the Spean Touch canal to improve water supply and increase the command area with access to a reliable water source for double or triple cropping each year. The Spean Touch canal was then selected by CAVAC for rehabilitation in 2012. A feasibility study was carried out and the canal was surveyed and designed. Construction commenced in late April 2012 and was completed in August 2013. A FWUC was established, and capacity building for the FWUC was completed.
Achievements to Date:	**Engineering** Construction of this scheme commenced in late April 2012 and was completed in August 2013. In June 2013, additional off-take PVC pipes were placed to provide farmers with ease in pumping water from the main canal. Using these pipes farmers can reduce pumping costs and the risk of damaging the embankments. **O&M** A FWUC for this scheme was established in February 2013, with capacity building completed in September 2013. The FWUC's committee meets regularly every month to discuss its monthly plans, particularly on fee collection. Besides FWUC committee meeting, the FWUC committee also hold village general meeting to disseminate the fee collection plan. The FWUC is planning on collecting the ISF in January 2015 from farmers who use water from the canal for their paddy farming. A landholding survey for this scheme was completed in 2013. A map resulting from this survey has proven to be very useful in assisting the FWUC in its O&M work. The construction of an office for this FWUC was completed in July 2014. There is one PWS doing business at this scheme. This PWS pumped and irrigated about 15 ha of rice fields during the early wet season of 2014 (April-July 2014). However, because the rice fields were destroyed by a pest outbreak, this PWS has reduced the water price or did not collect any fees at all from some farmers, following an agreement not to pay the ISF to the FWUC. However, this PWS will provide the service again for the upcoming early wet season if farmers need his service.
Next Steps:	**Engineering** No further action. **O&M** Continue conducting follow-up visits to the FWUC to strengthen its capacity in terms of fee collection, financial management and maintenance plan.
Lessons Learnt:	**Engineering** Soil containing acid sulphate, when exposed, creates additional challenges for the design and construction of canals and structures.

INTERVENTION UPDATE: Int. No: Irr 12.2 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of irrigation scheme: Prey Leu canal, Kampot province**
Summary:	Prior to this intervention, farmers of Banteay Meas Khang Lech grew traditional wet season rice and some limited dry season rice with very limited access to reliable water supply. The community expressed a need for rehabilitation of Prey Leu canal to improve the water supply and increase access to a reliable water source. The Prey Leu canal was then selected by CAVAC for rehabilitation. A feasibility study was completed and the canal was surveyed and designed. Construction commenced in March 2012 and was completed in October 2012. A FWUC was established successfully, with capacity building undertaken from December 2012 to September 2013.
Achievements to Date:	**Engineering** Construction commenced in March 2012 and finished in October 2012. Both the PDWRAM and CAVAC were satisfied with the overall progress and quality of the construction undertaken by the selected contractor. Some minor defects were identified by CAVAC's engineer in charge of Kampot and were corrected by the responsible contractor (Daun Penh Construction) in May 2014. **O&M** A FWUC for this scheme was established in November 2012, and the capacity building for it was completed in October 2013. A landholding survey for this scheme was completed in 2013. A map resulting from this survey has proven very useful in assisting the FWUC in its O&M work. The construction of an office for this FWUC was completed in August 2014. The FWUC has signed contracts with PWSs conducting water business at this scheme. The FWUC committee meets regularly to discuss O&M work for the scheme. So far, the FWUC has collected the ISF of about US$800. It has also spent some of the ISF collected on scheme O&M, including canal cleaning and minor maintenance on road access. More farmers have started doing early wet season rice cultivation and some have enlarged their farming areas following their experience since 2013 which has shown that water at this canal was reliable. Thus some PWSs, in agreement with the FWUC, have started improving subsidiary canals to ensure that they have enough water in their canals to irrigate farmers' fields where it is needed. It is expected that more farmers will cultivate early wet season rice in 2015. The FWUC will undertake a fee collection from PWSs again after the harvest of early wet season rice in August 2015.
Next Steps:	**Engineering** No further aciton. **O&M** Continue conducting follow-up visits to the FWUC to strengthen its capacity.
Lessons Learnt:	To ensure good cooperation between the FWUC and PWSs, it is important that CAVAC and the local authorities facilitate this cooperation at an early stage.

INTERVENTION UPDATE: Int. No: Irr 13.1 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Hay Saun canal, Kampot province**
Summary:	Prior to this intervention, farmers of Banteay Meas Khang Cheung grew traditional wet season rice and some limited dry season rice with very limited access to reliable water supply. The community expressed a need for rehabilitation of Hay Saun canal to improve the water supply and increase the area with access to a reliable water source. The Hay Saun canal was then selected by CAVAC for rehabilitation in 2013. A feasibility study was carried out and the canal was surveyed and designed. Construction commenced in February 2013. In response to the community's request through Kampot PDA and MAFF, the Hay Saun canal has been extended further to the south to increase its command area over an additional 500 ha through two construction contracts (Hay Saun Extension 1 and 2).
Achievements to Date:	**Engineering** Construction of the original design of the scheme commenced in February 2013 and was completed in June 2014. Unexploded Ordnances (UXOs) were found in the canal area during construction in 2013. The Cambodian Mine Action Centre (CMAC) was then engaged to investigate and clear the surrounding areas. The construction work was suspended for approximately two weeks during this work. The topographical surveys and detailed designs for the extension parts of the canal were undertaken in 2013. The construction of the two extension canals started in early January 2014, and were completed in July 2014. **O&M** CAVAC commissioned the PDWRAM to establish and build the capacity of a FWUC for this scheme. A FWUC establishment and capacity building contract was signed between Kampot PDWRAM and CAVAC in October 2013. The FWUC was established in May 2014. The training to build up the capacity of this FWUC committee was completed in August 2014. This FWUC is managing the Hay Saun canal (earthen part) and the Hay Saun extension 1 (a concrete lined canal) which is served by water pumped from the earthen canal. A landholding survey for this scheme was completed. The map resulting from the survey will be useful to the FWUC to carry out O&M work especially in water delivery and fee collection. For the earthen canal, the FWUC is planning to do the first fee collection after the harvest of the early wet season rice in August 2015 and the fee collection will be done once a year. For the concrete canal with a pumping station, the ISF is collected after the harvest of every season. During the early wet season of 2014, this pumping scheme served around 40 ha for 51 farmer households. Some other farmers used only rainfall to irrigate crops. During the first season, US$275 was collected as the ISF. This money has been used for the electricity payments, maintenance, and stipends for FWUC committee members. Farmers are currently cultivating a second season, and the ISF for this pumping scheme is expected to be collected in January 2015. An office for this FWUC has been built and it is now being used by the FWUC to work and hold meetings.
Next Steps:	**Engineering** ▪ Fix the land slides at two locations along the embankment of the Hay Saun canal. ▪ No more further action is required, besides monitoring Hay Saun exension 1 and 2 during their remaining defects liability periods. **O&M** ▪ Continue conducting follow-up visits to the FWUC to strengthen its capacity on scheme O&M and financial management. ▪ Encourage the FWUC and farmers to construct field channels to ensure that water can be delivered far away from the concrete canals in order to enlarge the irrigated areas.
Lessons Learnt:	**Engineering** Presence of UXOs should be thoroughly investigated during the Environmental Impact Assessments (EIAs) of all new schemes. When reported, immediate actions need to be taken.

INTERVENTION UPDATE: Int. No: Irr 13.1 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Chamlong Chrey canal, Kampot province**
Summary:	Prior to the intervention, farmers of Sdach Kong Khang Lech grew traditional wet season rice and some limited dry season rice with limited access to reliable water supply. The community expressed a need for rehabilitation of Chamlong Chrey canal to improve the water supply and increase the area with access to a reliable water source. The Chamlong Chrey canal was selected as a scheme to be rehabilitated by CAVAC in 2013. A feasibility study was carried out and the canal was surveyed and designed. The construction commenced in October 2013 and was completed in July 2014.
Achievements to Date:	**Engineering** The survey and detailed design of the canal including a pump house were undertaken by CAVAC as a model scheme for PDWRAM. The construction of this scheme commenced in October 2013. The electricity line for the pump station was installed, with construction of the scheme completed in July 2014. **O&M** CAVAC commissioned the PDWRAM to establish and build the capacity of a FWUC for this canal. A FWUC establishment and capacity building contract was signed between Kampot PDWRAM and CAVAC in December 2013. The FWUC was established in June 2014, and the capacity building for this FWUC was completed at the end of this reporting period. The landholding survey was completed. It will be very useful to the FWUC, especially for water delivery and fee collection. After the canal completion, the FWUC started to use the canal to irrigate farmers' early wet season rice. So far, the scheme has served 70 ha for 186 farmer households. The irrigated area remains small as most farmers are still cultivating only wet season rice. It is expected that from next year, more farmers will cultivate early wet season and dry season rice and will use the water from the canal. The FWUC will be collecting the ISF after the harvest of every season. For this early wet season, US$1,200 has been collected as ISF and it is used to pay for electricity, reserve funds and stipends for the FWUC committee. Farmers are currently cultivating wet season rice as the second season and the next ISF is expected to be collected in January 2015. In order to ease the process of getting water from the canal as well as to enlarge the irrigated areas, the FWUC in cooperation with farmers have constructed five field channels. It is likely that more field channels will be constructed. The construction of an office for this FWUC was completed in September 2014.
Next Steps:	**Engineering** Monitor the functions of the scheme, identify what needs to be corrected in the event of any observed irregularity, and improve the scheme. **O&M** Work with the PDWRAM to finish capacity building for this FWUC. The PDWRAM will conduct regular capacity building activities. Provide follow up support, especially in scheme O&M, fee collection and financial management. Encourage the FWUC and farmers to construct more field channels.
Lessons Learnt:	High level of involvement with the community is very important for the scheme design and construction, especially for a scheme such as Chamlong Chrey where the scheme needs to comply with farmers' needs in order for it to function well. A complete scheme – such as Chamlong Chrey (a scheme with secondary canals) – provides farmers ease in getting water and therefore contributes to efficient and sustainable scheme O&M.

INTERVENTION UPDATE: Int. No: Irr 13.1 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of irrigation scheme: Reservoir 77, Kampot province**
Summary:	Prior to this intervention, farmers of Sre Cheng commune in Chum Kiri district grew mainly one rain feed rice crop (wet season rice) per year with unreliable water supply. Often their crops were destroyed by droughts which occur in the late wet season. Crop damage can also occur during dry spells in the middle of the wet season. The local authorities of Sre Cheng have expressed a need for rehabilitation of Reservoir 77 to improve water supply and increase access to a reliable water source. In conjunction with Kampot PDWRAM, CAVAC's irrigation team conducted a number of visits to the site in order to collect socio-economic and engineering data. A commitment has been made to rehabilitate the existing reservoir scheme.
Achievements to Date:	**Engineering** A detailed topographical survey for this scheme was conducted by Kampot PDWRAM, and detailed designs for this reservoir and distribution system were conducted by CAVAC. As the survey work was implemented, CAVAC commissioned CMAC to clear UXOs within a defined boundary of this scheme. Around twenty (20) UXOs were found within a 30-meter buffered zone along the dam of Reservoir 77. In December 2013, a contract was awarded for the construction of distribution canals in this Reservoir 77 scheme. The construction works of Reservoir 77 were fully completed at the end of January 2014. The construction works of Reservoir 77 distribution canals commenced in early January 2014 and finished at the end of May 2014. **O&M** CAVAC commissioned the PDWRAM to establish and build the capacity of a FWUC for this scheme. A FWUC establishment and capacity building contract was signed between the PDWRAM and CAVAC in December 2013. The FWUC was established in May 2014, followed by the completion of capacity building and training of the FWUC committee. A landholding survey for this scheme was completed. It is expected that a map resulting from this survey will become a useful tool to assist the FWUC in its O&M work. As this scheme was completed in the wet season, most farmers have not yet used the water from the scheme. However, it is likely that they will need the water for the next cropping season. The FWUC has been developing water management guidelines to make sure that the water will be used effectively and to avoid conflicts which may occur as a result of water distribution. An office for this FWUC has been constructed, and now the FWUC can work and hold meetings there.
Next Steps:	**Engineering** The stone masonry on the reservoir dam needs to be fixed. **O&M** Continue to strengthen the capacity of this FWUC committee, especially in financial management and maintenance planning, through follow-up visits from CAVAC. Continue working with the FWUC to develop internal rules for water management and use.
Lessons Learnt:	

INTERVENTION UPDATE: Int. No: Irr 10.12 AWP No: 2.3 Date: 31 December 2014	
Name:	**Development and construction of an irrigation scheme: Thnoat Chum canal, Kampong Thom province**
Summary:	The January 1 canal from the Stung Chinit reservoir was constructed about 10 years ago. Under an Asian Development Bank (ADB) loan project, a secondary canal was constructed in 2010 to connect to the January 1 canal. As farmers in Thnoat Chum (a commune close to the ADB canal) grew only wet season rice, Kampong Thom PDWRAM requested CAVAC to extend the ADB canal to increase the command area for double cropping. This Thnoat Chum scheme was then selected for rehabilitation in 2011. A feasibility study was carried out and the canal was surveyed and designed. Construction commenced in April 2011 and was completed in August 2012. Some repairs were later needed, with the contractor completed these repairs in July 2013. To further ensure that this canal serves as a reliable water source for farmers and helps expand the command areas, CAVAC commissioned a contractor to undertake major improvement works to the scheme, commencing in January 2014. Works included adding an intake structure at the head of the ADB canal; providing more hydraulic structures (cross structures and pipe culverts); and improving the canal embankments with laterite pavement. A FWUC for this scheme was established by the PDWRAM and the capacity building for this FWUC was completed in September 2012. After analysing the FWUC performance in 2013, CAVAC learned that additional training on scheme O&M was necessary in order to further strengthen the FWUC's capacity . The ISC has been contracted to carry out this training.
Achievements to Date:	**Engineering** The construction of the original design commenced in April 2011. Some structures were added and all works were completed in late 2012. Additional works were needed to improve the existing scheme to enable it to serve all farmers within the command area and supply sufficient water. The construction of the improvement works at Thnoat Chum commenced in January 2014 and was completed by mid-July 2014. **O&M** CAVAC contracted the PDWRAM to establish and build the capacity of a FWUC for this scheme. The FWUC was established in April 2012 and the capacity building was completed in September 2012. CAVAC has been following up with the FWUC to further strengthen its capacity on scheme O&M. To ensure that the FWUC has sufficient capacity to implement its roles and responsibilities, CAVAC has contracted the ISC to further strengthen the FWUC capacity. The ISC's training activities will be completed in September 2015. During this reporting period, CAVAC also supported the FWUC to build an office. By June 2014, the construction of this FWUC office was completed and it has subsequently been equipped with some office furniture.
Next Steps:	**Engineering** Continue monitoring the scheme in the remaining defects liability period. **O&M** Continue monitoring the ISC's FWUC capacity building and the FWUC's performance in the ISF collection. Work will concentrate on financial management, conflict resolution, and implementation of its O&M plan.
Lessons Learnt:	**Engineering** It is essential that farmers and local authorities participate during the conceptual design and construction stages. Careful review of conceptual designs by CAVAC's engineering team is necessary for the success of schemes. **O&M** A poorly designed scheme will be unable to serve farmers to a satisfactory level. In such cases, the FWUC of that scheme will not function properly.

INTERVENTION UPDATE: Int. No: Irr 10.13 AWP No: 2.3 Date: 31 December 2014

Name:	**Development and construction of irrigation scheme: Angko canal, Kampong Thom province**
Summary:	Prior to the intervention, farmers in Kampong Ko grew wet season rice and some limited dry season rice. Agricultural production was limited by unreliable access to water. The community expressed a need for rehabilitation of the Angko canal to improve water supply for double cropping. The Angko canal was selected for construction in April 2011. In 2012, CAVAC and the PDWRAM agreed to extend the Angko Canal two kilometres further. The extension work was completed. In 2013, CAVAC and the PDWRAM discussed the potential to improve this scheme and decided to undertake additional work in order to enable the scheme to become a more complete scheme that could cover a larger command area and require lower O&M costs. Additional work includes: developing a concrete canal with a pumping station along the existing canal; constructing secondary earth canals connecting to the concrete canal; adding hydraulic structures; and converting the existing main earth canal to a drainage canal. Improvement works for the Angko scheme commenced in January 2014. Due to slow progress of the construction work, about 20% of the workload has been removed from the contract. The remaining work under the contract was temporarily suspended during the 2014 flood season, but resumed in November 2014 and is expected to be completed by February 2015. A FWUC was established in January 2012 and capacity building was completed in September 2012. The FWUC signed a contract with a PWS in October 2012 for a period of two years, concluding in October 2014. CAVAC has also commissioned the ISC to help strengthen the FWUC's capacity on O&M.
Achievements to Date:	**Engineering** The initial design of this scheme was undertaken by the PDWRAM. The construction work on the original length of the canal and the extension was completed in August 2012. Repair work was completed in June 2013. In 2013 the CAVAC design team worked for almost a year in order to come up with an improved design agreeable to farmers, local authorities and the PWS who had an on-going contract with the farmers. The team decided to design a complete scheme with the objective to lower the pumping costs for farmers. The improved design includes a pump house to serve the whole command area and lined canals to reduce seepage. The scheme will enable farmers to irrigate their fields by gravity. These major improvement works commenced in January 2014. Due to early rising of the water level of the Stung Sen river, the contractor had to postpone the improvement works for a few months and only resumed works in early November. By the end of this reporting period, 90% of the work was completed. **O&M** CAVAC contracted the PDWRAM to establish and build the capacity of a FWUC for this canal. These activities were completed in September 2012. An assessment of the FWUC in 2013 showed that the FWUC was dysfunctional and needed further capacity building. The ISC has been contracted to carry out further capacity building for this FWUC. The ISC's training activities will be completed in September 2015. CAVAC also supported the FWUC in building an office. This FWUC office has now been built and will be used to hold meetings and collect the ISF. The FWUC signed a contract with a PWS for a three-year period in 2012 to ensure adequate water delivery for double cropping. So far, the FWUC has collected the ISF for four cultivation seasons. It has collected about US$ 20,000, with this money spent on the O&M of the scheme. Once the construction of the pump house is completed, it will be managed and operated by the FWUC. It is expected that with completion of the pump house, farmers' pumping costs will be reduced by 50%.
Next Steps:	**Engineering** Monitor the remaining construction works and pump installation. **O&M** Continue monitoring the ISC's FWUC capacity building and the FWUC's performance.
Lessons Learnt:	**Engineering** The scheme has proven to be too complex to be designed by PDWRAM staff. Daily construction supervision is important to ensure that the contractor's work meets the requirements of the design. **O&M** A scheme that is not well designed and constructed cannot be well managed by a FWUC.

INTERVENTION UPDATE: Int. No: Irr 13.1 AWP No: 2.3 Date: 31 December 2014	
Name	**Development and construction of Tang Krasang irrigation schemes: Secondary Canals 1, 2 and 3 of the 6 January Canal, Kampong Thom province**
Summary	Previously, farmers in the Taing Krasang commune only cultivated rain-fed wet season rice, and as a result, faced risks from both flood and drought. Farmers in this commune and the PDWRAM expressed an interest in CAVAC supporting the rehabilitation / construction of the Taing Krasang irrigation scheme. CAVAC selected this scheme for implementation in 2013 and 2014. CAVAC's Tang Krasang irrigation scheme has three secondary canals (SCs), namely SC1, SC2 and SC3 which connect to the main canal (6 January canal). The 6 January canal gets water from the Tang Krasang reservoir, which is known as a reliable water source. The Taing Krasang scheme has been designed to be a complete scheme with a gravity-fed system. The scheme has a main drainage canal and each SC has several tertiary canals and hydraulic structures. Construction of SC2 and SC3 started in February 2013 and was completed in April 2014. Construction of SC1 started in late December 2013 and was completed in June 2014. In 2013 CAVAC signed a contract with the PDWRAM to help establish and provide capacity building for a FWUC. CAVAC also commissioned the ISC to strengthen the capacity of this FWUC.
Achievements to Date:	**Engineering** Construction of SC2 and SC3 commenced in February 2013, and was completed in April 2014. Construction of SC1 commenced in late December 2013, and was completed in June 2014. **O&M** The PDWRAM completed FWUC establishment and capacity building in June 2014. The ISC was contracted by CAVAC and started capacity building work for the FWUC in September 2013. The ISC work will continue until June 2015. CAVAC also supported the FWUC by building an office. This FWUC office has been built and handed over to the FWUC.
Next Steps:	**Engineering** Continue to support the FWUC and the general operation of the scheme, as well as assisting in the construction of additional field canals. CAVAC has found that on some blocks, water does not easily drain into the main drainage canal. Some improvements are still needed to improve the drainage capacity of those blocks. Construct a pilot block to use as an example for farmers on how best to irrigate and manage water in their fields. **O&M** Continue monitoring the ISC's FWUC capacity building and the FWUC's performance.
Lessons Learnt:	**Engineering** Strict supervision of the quality of construction is essential to reach the standards required for farmers to operate a scheme well. This is especially true with regard to contractors whose construction quality is not up to a high standard. Supervision of such contractors has proven to be a very challenging task. In some cases structures need to be corrected or replaced. **O&M** Farmers in this scheme do not have experience in rice cultivation using irrigation water. Transformation from rain-fed rice cultivation to intensive irrigated rice cropping takes time. The training given by the PDWRAM staff to the FWUC was not sufficient. Follow-up training is essential and may take longer than originally foreseen. Conflicts of interest, participation of local authorities and relations with the PDWRAM related to upstream management of water in the main canal took a significant amount of time to address.

INTERVENTION UPDATE: Int. No: Irr 14.1 AWP No: 2.3 Date: 31 December 2014	
Name	**Development and construction of an irrigation scheme in Boeung Leas pumping scheme, Kampong Thom province**
Summary	Prior to this intervention, farmers around the Boeung Leas scheme grew limited double cropping of recession rice and early wet season rice. These farmers typically achieved low productivity due to seasonal floods and droughts. Limited access to water was known to be a major constraint to improving rice productivity for farmers in this community. The existing FWUC of this scheme requested support from CAVAC and Kampong Thom PDWRAM to rehabilitate the Boeung Leas scheme, in order to increase the cultivation areas for double cropping. A feasibility study, topographical work, detailed design and tender process were conducted in 2013. Construction of the Boeung Leas scheme commenced in January 2014. Several hydraulic structures (off-take, crossing, and check structures, etc.), concrete lining and earthen canals, and a pump station were constructed and completed in June 2014. By the end of December 2014, 95% of the project was completed. CAVAC contracted the ISC to reactivate and strengthen the existing FWUC of Boeung Leas. The ISC started its work in September 2013 and completed it in June 2014. CAVAC also supported the FWUC in building an office, which was completed in July 2014.
Achievements to Date:	**Engineering** Construction started in January 2014. High water levels of the Stung Sen river resulted in delays in completion of the pump house constructed along the river. By the end of this reporting period 95% of the work was completed. **O&M** CAVAC engaged the ISC to reactivate the existing FWUC with the aim of strengthening the FWUC's capacity on scheme O&M. The ISC completed its work in June 2014. An office was constructed for the FWUC of this scheme. The construction of the FWUC office was completed in July 2014.
Next Steps:	**Engineering** Continue monitoring the remaining construction works. **O&M** Work closely with the trained FWUC to ensure the FWUC is able to manage the scheme sustainably, collect ISF, resolve conflicts and allocate water equitably.
Lessons Learnt:	**Engineering** Daily construction supervision is important to ensure that the contractor's work meets the requirements of the design. **O&M** The coordination between the FWUC, farmers and local authorities is critical to improving scheme O&M.

ANNEX 2: DETAILS ON IRRIGATION SCHEMES AS AT DECEMBER 2014

			Scheme Detail		Command Area in ha Before			Irrigated Area in ha at Present			Command Area in ha Potential			Crop Intensity		Yields in T/ha							Landholdings		FWUC		
No	Name	Type	Year of construction	Main Canal length in km	Rainfed Rice (RFR)	Early Wet Season Rice (EWSR)	Wet/ Recession Rice (WSR/RR)	Dry Season Rice (DSR)	Early Wet Season Rice (EWSR)	Wet/ Recession Rice (WSR/RR)	Dry Season Rice (DSR)	Early Wet Season Rice (EWSR)	Wet/ Recession Rice (WSR/RR)	Flooded/Non-flooded (F/N)	No of Rice crops	Before: Constr. Rainfed EWS	Before: Constr. Rec.	After: Dry season irrigated	After: Early wet season Irrigated	After: Recession with suppl. Irr	Yield increase at present in Ton	Yield increase potential in Ton	No of HH's	Average landholding/HH in ha	Established Y/N	Training Completed/Ongoing	Landholding Survey Y/N
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	Krapum Chouk	Canal	2010	5.5	50		500		247	336		590	590	F	2	2.5	3.0	6.0	4.0	6.0	1,329	4,275	278	2.12	Y	C	Y
2	Kveng Tayi	Canal	2011	5.2	600		600		553	669		1,000	1,000	F	2	2.5	3.0	6.0	4.0	6.0	2,326	6,700	336	2.98	Y	C	Y
3	Tumnob Lork	Canal	2011/12/13	14.8			1,200		702	1,267		2,000	2,000	F	2	2.5	3.0	5.5	4.5	5.5	7,128	16,400	1,293	1.55	Y	C	Y
4	Prey Rumdeng	Canal	2012	6.9		428	1,616		1,616	1,616		1,980	1,980	F	2	2.5	3.0	5.5	4.5	5.5	11,478	13,668	1,625	1.22	Y	C	Y
5	So Hang	Canal	2011/2012	8.7			1,476		738	1,476		1,480	1,480	F	2	2.5	3.3	5.5	4.5	5.5	8,192	9,929	1,062	1.39	Y	C	Y
6	Rokar Chhouk	Canal	2013/2014	2.3			428		600			690	700	F	2	2.5	3.5	6.0	4.5	5.5	1,844	5,457	1,024	0.68	Y	C	Y
7	Wat Thmey	Pump	2014	7.0			1,334	under construction			900	820	1,880	N/F	2/3	2.5	3.5	6.0	4.5	5.5		14,761	1,880	1.00	Y	O	N
1	Prey Tonle	Canal	2010	3.2	218				284	284		460	460	F	2	2.5	4.0	7.0	6.0	6.5	2,569	5,205	460	1.00	Y	C	N
2	O Kak	Canal	2011/12/14	2.9	315	50		24	90	240	240	240	240	N	3	2.0	3.5	6.5	5.5	6.0	574	3,515	240	1.00	Y	C	N
3	Sbov Andet	Canal	2011/14	9.7	1,700	100		184	1,224	1,224	500	1,723	1,720	N/F	2/3	2.0	3.5	6.5	5.5	6.0	7,422	19,297	1,720	1.00	Y	C	N
4	Thnoat	Canal	2011/14	6.8	1,650			140	817	817		2,000	2,000	N/F	3	2.5	4.0	7.0	6.0	6.5	3,768	20,875	2,000	1.00	Y	C	N
5	Spean Touch	Canal	2012/13	6.6			1,250	60	271	1,250	1,700	1,700	1,700	F	3	2.5	4.0	7.0	6.0	6.5	7,046	28,150	1,815	0.95	Y	C	Y
6	Prey Leu	Canal	2012	3.9	850			120	306	900	900	900	900	N	3	2.0	3.5	6.5	5.5	6.0	4,038	14,500	942	0.66	Y	C	Y
7	Hay Saun	Pump	2013	5.2	677	17		104	570	540	760	760	760	N	3	2.5	3.5	4.5	3.5	4.0	3,269	7,368	724	0.86	Y	C	Y
8	Chamlong Chrey	Pump	2013/14	1.7	350				72	275	350	350	350	N	3	2.5	3.0	4.5	3.5	4.0	652	3,325	225	1.33	Y	C	Y
9	Reservoir 77	Reservoir	2013/14	1.5	500					200			500	N	1	2.0			3.0		1,000		280	0.89	Y	C	Y
1	Thnoat Chum	Canal	2011/2014	7.3	900	15	50	350	450	1,200		1,200	1,200	F	2	2.5	4.0	6.0	5.5	5.5	7,928	10,690	1,117	1.07	Y	O	Y
2	Angko + improvement	Pump	2011/12/14	5.1		50	600		348	1,060		1,100	1,100	F/N	2/3	3.0	5.0	7.0	5.5	6.5	7,879	9,950	1,100	1.00	Y	O	Y
3	Boeung Leas	Pump	2013/14	0.5		25	300		130	340		350	350	F/N	2/3	3.5	4.0	7.0	5.5	6.5	2,138	2,900	292	1.43	Y	C	Y
4	6 January SC1,2 and 3	Canal	2013/14	NA	1,187	5	15	50	45	1,187	1,187	1,187	1,187	N	3	2.0	3.5	5.0	4.5	5.0		14,768	1,779	0.80	Y	O	Y
20	**TOTALS/AVERAGE**			**104.7**	**8,997**	**690**	**9,369**	**1,032**	**9,063**	**14,881**	**6,537**	**20,530**	**22,097**			**2.5**	**3.6**	**6.1**	**4.8**	**5.7**	**80,577**	**211,732**	**20,192**	**1.20**			

ANNEX 3: EXPENDITURE AGAINST WORK PLAN

Component breakdown		Description	Interventions and activities 2014	Budget (USD)	Total Expenditure to Date (USD)	Total Commitment to Date* (USD)
Component 1: Agribusiness				**$1,905,000**	**$1,345,232**	**$2,052,819**
1.1	Critical constraints to strategic value chains identified and developed for business action.	Completed		$0	$0	
1.2	Agribusiness partnerships supported to innovatively address constraints.	Improve input markets in rice and vegetables. All companies will be encouraged to add extension activities. CAVAC to organise a number of linking events and will encourage companies to improve communication within their network.	*Fertiliser market*	$1,080,000	$678,815	
			Support to fertiliser companies to improve its information service delivery			
			Pesticide market			
			Support to pesticide companies to improve its information service delivery			
			Implementation of a rice pest and disease diagnostic tool			
1.3	Enhanced farmer services embedded within agribusiness practices.		Joint training with PDAs			
			Rice Pest Management Manual			
			Media:			
			Continued support to media company			
			Support to media research companies			
			Model farmers			
			Wet season model farmer training			
			Dry season model farmers: roadshows, challenge fund, competition			
			Rice Export promotion:			
			Support to a seed production and rice milling company			
1.4	Improved availability and		Support to FCRMA			

Component breakdown		Description	Interventions and activities 2014	Budget (USD)	Total Expenditure to Date (USD)	Total Commitment to Date* (USD)
	communication of market information between value chain stakeholders.		*Vegetables:* Continued support to vegetable seed companies			
1.5	Participatory planning and construction of key infrastructure to address value chain bottlenecks.	On hold until opportunities have been found.		$0	$0	
1.6	Government led rice policy activities	Activities led by the three PDAs	Continuation of activities as related to the Policy Paper on the Promotion of Paddy Production and Rice Export.	$600,000	$666,417	
		Activities led by the GDA	Completion of current contract and GDA priorities as required	$200,000		
		GDA materials production and dissemination	Support to materials production and information dissemination of GDA technical material as required.	$25,000		
Component 2: Irrigation and Water Management				**$5,584,593**	**$10,013,056**	**$11,520,840**
2.1	Improved capacity of MOWRAM and PDWRAM to participate in design and develop, operate and maintain irrigation schemes.	Intense collaboration with MOWRAM and PDWRAMs in the construction of schemes and in the detailed design of schemes.	Extensive collaboration and subcontracting with all 3 PDWRAMs including survey and design and construction supervision.	$123,000	$100,487	
2.2	Improved capacity of FWUCs to efficiently and effectively operate and maintain their irrigation systems.	CAVAC and PDWRAMs will support FWUCs and other players to improve likelihood of the sustainability of schemes.	Training and other support to FWUCS and other players in the O&M market. Research/studies looking at O&M issues in Cambodia.	$700,000	$901,688	

Component breakdown		Description	Interventions and activities 2014	Budget (USD)	Total Expenditure to Date (USD)	Total Commitment to Date* (USD)
			Supplementary Investment Fund will have a new round.	$100,000		
2.3	Selected systems rehabilitated and transferred to effective FWUCs.	Construction of new schemes and improvement works for existing schemes	Finalising assessments of final schemes as required. Construction of new schemes.	$4,661,593	$9,010,882	
2.4	Improved models of water management adopted in rain fed areas.	Completed		$0	$0	
2.5	Increase use of hydrological data in the planning and management of irrigation systems.	Completed		$0	$0	
Component 3: Research and Information Systems				**$50,000**	**$35,178**	**$43,835**
3.1	Priority research and extension activities address constraints in selected value chains.	Four large research studies are no longer under CAVAC's scope of work		$0	$0	
		Action Research fund	Round two of research grants provided to local organisations in areas of interest for CAVAC.	$50,000	$35,178	
3.2	Enhanced capacity of formal and informal extension providers to transfer improved technologies and information to farmers.	Included in 1.2		$0	$0	
3.3	Partnership program linking researchers, extensionists, farmers and agribusinesses developed and implemented.	Included in 1.2		$0	$0	
3.4	Budgetary support to CARDI.	No longer under CAVAC's scope of work		$0	$0	
Component 4: Business Enabling Environment				**$350,000**	**$70,163**	**$70,163**

Component breakdown		Description	Interventions and activities 2014	Budget (USD)	Total Expenditure to Date (USD)	Total Commitment to Date* (USD)
4.1	Improved research and understanding of the enabling environment surrounding key value chains.	CAVAC will assess impacts of a number of new regulations for agriculture and specifically CAVAC activities.	Issue studies to be undertaken and where possible activities will be initiated.	$0	$0	
4.2	Increased opportunity for public private dialogue around key enabling environment issues.	Activities with both RGC and the private sector to increase understanding and wider discussion around enabling environment issues	Seminars, workshops, studies, study tours and other activities which promote the understanding of enabling environment issues within Cambodia.	$100,000	$70,163	
4.3	Strengthened industry representative organisations.	Activities may emerge from other activities.		$0	$0	
4.4	Increased use of Public Private Partnership investment model.	Integrated with 2.2 and 2.3.		$0	$0	
4.5	Policy Support Funding Facility	This facility will support activities initiated by MAFF / MOWRAM /DFAT with approval from the Executive Group of the NSC.	RGC initiatives supported	$250,000	$0	
Cross Component Activities				**$400,000**	**$140,999**	**$140,999**
5.1 /5.2	Gender and Disability**	The gender and disability strategies will guide activities. Both will be mainstreamed in all activities. On top of this one or two dedicated interventions are likely.	Gender and disability are mainstreamed in all activities.	$0	$0	
5.3	Environment and Disaster Risk Reduction***	Revised Environmental Strategy will be continued in 2014	All interventions will have been screened for environmental impacts. Management plans prepared and activities implemented and monitored.	$0	$0	
5.4	M&E	M&E will be an integral part of the work activities of CAVAC. All experts will be involved.	All interventions will have impact logics and monitoring plans. Cross cutting issues will be integrated.	$175,000	$8,462	
5.5	Training/seminars/capacity development support	CAVAC will prepare a training needs assessment and training plan for its staff and government counterparts.	CAVAC and RGC staff better able to implement activities.	$200,000	$128,837	

Component breakdown		Description	Interventions and activities 2014	Budget (USD)	Total Expenditure to Date (USD)	Total Commitment to Date* (USD)
5.6	Equipment	Support to MAFF, MOWRAM, PDA and PDWRAM for office equipment and communication	RGC partners to be better able to execute their CAVAC related activities	$25,000	$3,700	
			Total	**$8,289,593**	**$11,604,629**	**$13,828,656**

*Total Commitment to Date includes outstanding values of contracts supporting activities being conducted until December 2015.

**Expenditures on gender and disability are included in agribusiness expenditures.

***Expenditures on environmental work are included in irrigation expenditures.

ANNEX 4: RISK MANAGEMENT PLAN

Cambodia Agricultural Value Chain Program (CAVAC)

Manual of Operations
CAVAC Risk Management Plan

December 2014

Abbreviations and Acronyms

CAVAC	Cambodia Agricultural Value Chain Program
FWUC	Farmer Water User Community
MAFF	Ministry of Agriculture, Forestry and Fisheries
MOWRAM	Ministry of Water Resources and Meteorology
NSC	National Steering Committee
O&M	Operation and Maintenance
RGC	Royal Government of Cambodia
UXO	Unexploded Ordinance

Risk Matrix

This Risk Matrix provides a detailed analysis of the risks associated with the Cambodia Agriculture Value Chain Program (CAVAC). The Matrix: analyses key risk events, and their potential adverse impact; identifies effective containment measures; and assesses the level of risk. The Matrix is broken into the five key areas in which CAVAC operates: 1) Agribusiness Development; 2) Irrigation and Water Management; 3) Research and Information Systems; 4) Business Enabling Environment; and 5) Operational Management. The risks identified against each of CAVAC's components (1 – 4) refer to the major uncertainties that could reduce the intended impact of the program. Operational Management risks (5) are those which affect the ability to manage the program effectively, and deliver outputs on time and on budget.

To compare risks, a priority ranking mechanism has been used. A priority listing of risks is a simple instrument for ranking risks and is based on scaling and then combining the likelihood of a risk and the severity of its impact. A risk will be high if it is likely to occur or its consequences are large, and will be highest if both are present. Diagram 1 illustrates the method used for calculating the risk ratings of the program. The Overall Risk level has been used to develop appropriate containment measures, with the focus in particular on higher level risks which have been given specific actions that require control, monitoring, and the appropriate level of management attention.

Analysing and Ranking Risk Levels

Likelihood	Consequences				
	1. Negligible	2. Minor	3. Moderate	4. Major	5. Severe
5. Almost certain	Moderate	Moderate	High	Extreme	Extreme
4. Likely	Moderate	Moderate	High	High	Extreme
3. Possible	Low	Moderate	High	High	High
2. Unlikely	Low	Low	Moderate	Moderate	High
1. Rare	Low	Low	Moderate	Moderate	High

The scales used to analyse and rank the risk levels are:

Likelihood

5. Almost certain expected to occur in most circumstances
4. Likely will probably occur in most circumstances
3. Possible might occur at some time
2. Unlikely could occur at some time
1. Rare may occur only in exceptional circumstances

Consequences

5. Severe	would stop achievement of functional goals and objectives
4. Major	would threaten goals and objectives; requires close management
3. Moderate	would necessitate significant adjustment to the overall function
2. Minor	would threaten an element of the function
1. Negligible	routine procedures sufficient to deal with the consequences

Overall Risk Level

E: Extreme risk	most likely to occur and prevent achievement of objectives, causing unacceptable cost overruns or schedule slippage.
H: High risk	could substantially delay the activity schedule or significantly affect technical performance or costs, and requires a plan to handle.
M: Medium risk	requires identification and control of all contributing factors by monitoring conditions and reassessment at activity milestones.
L: Low risk	normal control and monitoring measures sufficient.

Risk Matrix

Risk Event	Potential adverse impact	Likelihood	Consequence	Overall Risk	Containment measures (risk treatment)
Agribusiness and Information Systems Development					
Other donor programs have a negative influence on sustainability by offering non-market based subsidisation in target provinces.	Agribusiness and farmers undertake opportunistic behaviour, focusing on short term gains over long term, more sustainable options.				There have been a few incidences of overlap with other donor programs however, so far these have had a very limited impact on the program. The pipeline of other donor interventions does not indicate any potenital issues.
Significant increase in the cost of farmer labour or reduction in the price of paddy adversely impacts farm innovation.	Farmers are disinclined to invest in farm based innovation reducing the impact of CAVAC. Further consolidation in the farming sector occurs.	3	3	H	Broader economic changes cannot be predicted however farmers and input suppliers can be flexible and responsive to changes: ▪ Continue to support systemic change in the market system; ▪ Monitor changing environment and support public and private partners to adjust to changes.
Changing rules and regulations affect supported markets.	Impacted sector or market support is no longer viable.	2	2	L	Interventions are screened for the likelihood of expected changes. As interventions are nearing completion the risk is significantly reduced. The main potential policy changes are unlikely to have a negative effect.
Gender imbalance in program activities	Ineffective interventions by ignoring existing roles, responsibilities and practices in agriculture				All interventions have been screened and are currently in progress. This is no longer a significant risk.
Government partners supported by CAVAC to work on their priorities, seek reimbursement from CAVAC for work already funded through another donor.	Financial management fundamentally compromised, potential mismanagement of Australian tax payer dollars. Relationship with government partners compromised.	2	4	M	▪ Work with government partners to ensure understanding and compliance with CAVAC financial management requirements. ▪ Ensure contracts or agreements outline the program approach to financial management. ▪ Continue to liaise with the donor community on support provided to government counterparts.
Irrigation and Water Management					
Communities and government agencies are insufficiently resourced to establish and sustain the management of improved systems.	Low service charge recoveries is unlikely to affect operation of the schemes, but may reduce the likelihood of long term sustainability. Some schemes may not continue to function in 7 to 10 years' time.	4	2	M	▪ Work only on schemes where there is strong commitment to forming a functional FWUC. ▪ Work intensively with the FWUC to build O&M capacity.
O&M budgets misappropriated by FWUCs.	Loss of faith. Budget unavailable to support O&M.	2	3	M	▪ Provide advanced training and capacity-building for FWUC executive. ▪ Construct FWUC offices to support a more transparent basis for FWUC activities.

Risk Event	Potential adverse impact	Likelihood	Consequence	Overall Risk	Containment measures (risk treatment)
Canal / irrigation system rehabilitation requires loss of land.	Involuntary loss of land with associated social problems and adverse media coverage.				With all construction being finilised and the proven ability to solve small issues, this risk is no longer relevant.
Potential drowning at canal sites due to construction activities.	Adverse social problems with commune councils and adverse media coverage.				There will only be repairs and minor improvements taking place in 2015 eliminating risk of drowning during constuction.
Potential excavation of UXO's at canal sites.	Adverse social problems with commune councils and adverse media coverage. Potential injury and / or loss of life				No longer an issue as no major escavation will take place.
Negative environmental impacts during and following the construction of the canals	Adverse social problems with commune councils and adverse media coverage. Detrimental impact to the environment and associated ecosystems Economic impacts to program beneficiaries. CAVAC's monitoring system may reveal suboptimal water conditions in or downstream of the canal	1	3	L	No major construction taking place so this risk is significantly lower.
Severe flooding events	Damage to construction works and equipment, and increases in program costs	1	2	L	▪ All procurement and tender processes for major irrigation construction is now complete. Construction is due for completion prior to the wet season. ▪ Construction to take into account flood mitigation measures, including: improved erosion control, coffer dams and better drainage.
Quality and timeliness of completion of construction for irrigation schemes	Delays in construction by contractors lead to incomplete schemes as defects liability periods become set at the end of the program. Additional work required on schemes if contractors are unable to produce the quality required to complete the scheme successfully.	2	2	L	▪ No new major construction in the last year before the end of the program. ▪ Reinforce financial penalties for contractors who work over their allotted work schedule. ▪ Ensure sufficient site supervision resources are available at each site to ensure issues are caught and dealt with quickly. ▪ Procurement processes for contractors have focused on availability of resources for construction, past experience and include approval of site managers. All construction is on time and due to be completed before April 2015.
Business Enabling Environment					
Implementation of CAVAC becomes disconnected from on-going evolution of the	Disconnect occurs between government policy and CAVAC, and opportunities to influence RGC policy,	2	2	L	▪ On-going engagement with MAFF and MOWRAM to monitor development of, and alignment with RGC policy; ▪ Adopt a flexible programmatic approach;

Risk Event	Potential adverse impact	Likelihood	Consequence	Overall Risk	Containment measures (risk treatment)
Cambodian policy.	framework and scale-up and sustain the benefits of CAVAC are lost.				▪ Continue dialogue with RGC to support further development of the RGC policy.
Operational Management Risks					
Significant fall in AUD exchange rates result in contracted works exceeding Imprest limits.	Funds are not available to meet contract commitments at the end of the program.	3	3	H	▪ Clear work plan developed and agreed with budget and commitments quantified. ▪ Monthly review of expenditure by team.
Conflicting and changing directions from the NSC.	Deterioration of the relationship with government partners.	2	2	L	▪ Working closely with MAFF and MOWRAM, including with the DTLs, has facilitated a smooth working relationship. In this final year of the program any change in direction would have little if any affect on the program.
Inadequate consideration and integration of key cross-cutting issues, including gender, sustainability, environment and anti-corruption.	Reduced effectiveness of program and delivery of long-term impact.	2	2	L	▪ Ensure that there is continued understanding of these policies ▪ Enhance the involvement of women in all key management and decision-making structures. ▪ Continue to emphasise the importance of environmental preservation in CAVAC activities. ▪ Enhance local ownership by national staff and partners. ▪ Ensure contracts or agreements outline the program approach to cross-cutting issues and that there is consistent understanding of these issues. ▪ Any negative impact of Gender issues is minor in the final year of the program
Staff turnover	Corporate memory is lost through staff movement. Towards the end of the program uncertainties may cause staff to leave prematurely leading to a reduced capacity to implement.	2	2	L	Conitinue to provide clarity on career opportunities and transition arrangements that may be available in CAVAC Phase 2
Procurement Risks					
Program funds are used for corrupt or fraudulent purposes	Otherwise sound procurement is disrupted and / or invalidated. Perceptions of broader program procurement is damaged.	2	2	L	▪ All major procurement is complete and has been carried out strictly in accordance with processes and procedures in the procurement manual. ▪ All staff clearly understand processes and procedures and actively implement the same with contractors, communities and FWUC alike. ▪ Tight budgetting and monitoring of expenditure required in the final year limits any potential for loss of funds. ▪ Regular auditing of procurement and financial systems continues.
Undeclared conflicts of interest.	Integrity of procurement processes	1	2	L	▪ All major procurement processes for civil works and consultancies complete. Risk

Risk Event	Potential adverse impact	Likelihood	Consequence	Overall Risk	Containment measures (risk treatment)
	fundamentally compromised.				is virtually eliminated.
Program procurement procedures are not adhered to.	Procurement activities fundamentally compromised.	2	2	L	▪ All major procurement is complete. ▪ Detailed clear procurement processes and procedures in the procurement manual and ensure adherence to these processes through consistent monitoring and clear delegation channels.
Misappropriation of CAVAC funds by staff and / or counterpart agencies.	Financial management fundamentally compromised, potential mismanagement of Australian tax payer dollars, damage to programs reputation with client, reduced impact of program and negative impact on staff morale.	2	2	L	▪ All major procurements have been completed and final budget for remaining activities is clear and monitored tightly. Current procedures and processes to manage program finances / administration severely restrict all staff from misapproriating funds. ▪ Payment to counterpart agencies for field trips will be paid strictly in accordance with CAVAC policy with signed receipt at time of payment. These regulations are outlined in contracts with partner agencies and have been adhered to with very few contracts still active in the final year of the program.