

# Cambodia Agricultural Value Chain Program (CAVAC)

## CAVAC 2011 Annual Work Plan



**DRAFT**

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## ABBREVIATIONS AND ACRONYMS

|         |  |
|---------|--|
| ACIAR   | Australian Centre for International Agricultural Research    |
| AusAID  | Australian Agency for International Development              |
| AWP     | Annual Work Plan   |
| CARDI   | Cambodian Agricultural Research and Development Institute    |
| CARF    | Cambodian Agriculture Research Fund                          |
| CAVAC   | Cambodia Agricultural Value Chain Program                    |
| CIAT    | International Centre for Tropical Agriculture                |
| CSIRO   | Commonwealth Scientific and Industrial Research Organisation |
| FWUC    | Farmer Water User Committee                                  |
| GDA     | General Directorate of Agriculture                           |
| IRRI    | International Rice Research Institute                        |
| MAFF    | Ministry of Agriculture, Forestry and Fisheries              |
| MOWRAM  | Ministry of Water Resources and Meteorology                  |
| M&E     | Monitoring and Evaluation                                    |
| MTR     | Mid-term Review  |
| NSW I&I | New South Wales Industry and Investment                      |
| OC      | Operational Contractor                                       |
| O&M     | Operation and Maintenance                                    |
| PCC     | Provincial Coordination Committees                           |
| PDA     | Provincial Department of Agriculture                         |
| PDD     | Program Design Document                                      |
| PDWRAM  | Provincial Department of Water Resources and Meteorology     |
| POC     | Priority Operating Cost                                      |
| RGC     | Royal Government of Cambodia                                 |
| RUA     | Royal University of Agriculture                              |
| SAW     | Strategy for Agriculture and Water                           |
| SRI     | System of Rice Intensification                               |
| TWGAW   | Technical Working Group for Agriculture and Water            |



## **1 INTRODUCTION**

The Cambodia Agricultural Value Chain Program (CAVAC) Annual Work Plan (AWP) 2011 is presented for the 12-month period from January 1st 2011 to December 31st 2011.

This AWP was developed in collaboration with key counterparts and stakeholders through individual consultation and a stakeholder workshop. The Plan was also informed by the findings of the Sector Monitoring Group from their recent mission in June 2010.

The following plan will detail: the internal structures in place to ensure activities are in line with the AWP; implementation strategies; a description of the major activities planned for 2011; and a summary of expected results.

The AWP 2011 and its accompanying annexes are provided below for the information, review and approval of the National Steering Committee (NSC).

## **2 PROGRAM DESCRIPTION**

CAVAC aims to increase farmer incomes in the rice based farming systems of Cambodia through accelerating the value of agricultural production. The Program is implemented through four components: Agribusiness Development; Water Management; Research and Extension; and, Business Enabling Environment. All components work very closely together with staff working across a number of components. Responsibility for the implementation of the Program is shared between the Team Leader, Cardno Emerging Markets (Australia) Pty Ltd (the Operational Contractor) and the Australian Centre for International Agricultural Research (ACIAR) under the direction of AusAID.

### **2.1 Progress to date**

Key activities over the last seven months (since March 2010) include: hiring and training a core team of national and international experts; setting up systems; developing an AWP for 2010; writing an inception report; and developing a number of strategies. Staff have received initial training and conducted in depth assessments of the rice market, the input markets, as well as the vegetable and cassava value chain. Strategies for all the above markets have been developed. Progress has been made on the three large research projects and a fourth has been designed. Two irrigation canals have been constructed and are in operation, and assessments have been done for another eleven schemes. One intervention with a large input company has been signed with the aim to support the company's training of farmers. An M&E system has been developed and is being tested.

CAVAC has learned a lot and is on the edge of initiating a number of interventions within the rice, vegetable and cassava sectors. The Management Team is comfortable that the

Program is able to use the resources at its disposal to engage productively with the private and public sectors to conduct quality interventions in 2011.

Members of the NSC have requested details on how CAVAC will use its resources in this AWP to monitor and steer the CAVAC program. The 2011 AWP contains a higher level of detail than the previous AWP and in situations where details are not yet available it will explain the procedures which will be followed. The AWP will follow the structure of the Project Design Document (PDD).

### **3 STAKEHOLDER FEEDBACK IN THE DEVELOPMENT OF AWP 2011**

In the preparation for this AWP, CAVAC invited the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Water Resources and Meteorology (MOWRAM) to express their priorities for 2011 in a stakeholder workshop. Outcomes have been, where ever possible, included in this AWP.

A stakeholder workshop was conducted on 16 September 2010 to discuss: the overall direction of agriculture in Cambodia; how programs like CAVAC should fit in; and, specific feedback on the 2011 work plan proposal. The following recommendations were given. All recommendations have been taken into consideration though not all recommendations will be automatically fully incorporated.

It was clear through the discussions that Cambodia will continue to increase rice productivity, but the issue that remains unresolved is whether they will continue to export paddy or milled rice<sup>1</sup>. This is a consideration for CAVAC in future work plans. Counterparts also expressed an expectation that the Program take leadership in addressing gender issues in all areas of CAVAC's focus. Provincial government leaders were well represented during the day and were vocal with their expectations. They requested increased training to improve agricultural knowledge, and that training is linked to agricultural input availability. Specifically, government officials requested CAVAC's assistance to change growers' mindsets, and therefore, to increase the capacity building and facilitation skills of Provincial Department of Agriculture (PDA) and Provincial Department of Water Resources and Meteorology (PDWRAM) staff to support delivering a common goal. Lastly, CAVAC was charged to assist agribusinesses increase their business acumen in Cambodia. This can be achieved through supporting joint ventures.

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<sup>1</sup> This is not CAVAC's or the RGC's standpoint, but the comments given by the stakeholder workshop participants.

### 3.1 Agribusiness Development

Key points of discussion included:

- There was support for the choice of focus on rice and vegetable value chains, and the need for support to inputs in the rice sector was evident. CAVAC was encouraged to explore alternative export channels and the required processing for this. The Program was also encouraged to investigate alternative use of by-products.
- Cassava is considered to be a promising crop. Some participants raised concerns about the environment, especially soil degradation. An expert from the International Centre for Tropical Agriculture (CIAT) claimed that cassava is similar to other crops in this aspect and that with good management practices soil degradation can be effectively controlled.
- Some participants suggested that high value fruits and fodder maize might be two alternative value chains

### 3.2 Irrigation and Water Management

Key points of discussion included:

- There may not be a shortage of water overall, and effective water management is the main challenge in this area. *[This supports the water availability studies].*
- Farmers must be able to see and realise a benefit in order to be willing to pay the irrigation service fee. The management and disbursement of the fees collected must be transparent, and the operation and maintenance (O&M) effectively completed. *[This supports the agreed guidelines that the irrigation schemes selected must demonstrate feasibility upfront].*
- The capacity of farmers to pay the irrigation service fee is variable. CAVAC interventions must target schemes that deliver good returns. Factors such as agriculture (soils) and organisational issues can compromise benefits and therefore the willingness/ability of farmers to continue to pay.
- Where needed, Farmer Water User Committees (FWUCs) should be given training to ensure they can manage effective O&M.
- Ownership must be clear. Roles and responsibilities, particularly for O&M, must be documented and understood by all stakeholders throughout the system.
- PDWRAM capacity to manage and implement the whole project cycle needs to be increased. This should cover planning, studies, design, construction and implementation, plus the important post-construction phase supporting the communes and FWUCs. Some new equipment is required.



### **3.3 Research and Extension**

Specifically concerning research, the break out session for research had close to 35 participants from the PDA, the General Directorate of Agriculture (GDA), Cambodian Agricultural Research and Development Institute (CARDI), the Royal University of Agriculture (RUA), and some private companies. PDA requested better links to the modern rice production technologies and the research by CARDI. As such, CAVAC has adjusted its 2011 AWP to catalyse the linkages between PDA, GDA and CARDI to ensure, by the end of CAVAC, a more workable, sustainable and formal linkage of such research results, technological recommendations and growers' needs can continue in the future. No specific researchable issues were raised in the discussions.

### **3.4 Cross cutting issues**

The discussions supported the need for better representation of women with suggestions such as:

- Further encouragement for the involvement of women including provision of incentives to attend community meetings.
- A focus on increasing leadership roles for women in communities by providing training in locations, and at times, that encourage female participation.

Participants also provided the following suggestions, however these may be outside the scope of CAVAC:

- Promote small business and develop skills of women to encourage them to stay in rural areas.
- Improve living conditions (such as toilets, bathrooms, kitchens) to encourage women to stay in rural areas.

Further valuable cross-cutting issue suggestions for CAVAC from the workshop included:

- Share knowledge between men and women in value chains to expand gender roles.
- Communication with other ministries in cross cutting issues is recommended
- Rice is the basic crop to survive but CAVAC should promote diversification to promote higher yield while preserving the environment.
- CAVAC could look to tailor a specific package and funds to promote gender and environment within the Program.

### 3.5 Collaboration between development partners and the private sector

Discussions points / recommendations included:

- CAVAC should coordinate dialogue through existing groups, for example by identifying mechanisms to involve private sector and NGOs more in the Technical Working Group for Agriculture and Water (TWGAW).
- CAVAC should consider addressing potential risks, for example, through:
  - Working with the private sector to share risk at initial stages of activities and facilitate greater private sector engagement.
  - Providing seed capital.
- The private sector in Cambodia is large and diverse – there may be more opportunity for donor funded activities, including CAVAC, at the smaller end of the spectrum. [CAVAC partly agrees with this recommendation, but could be more efficient when not limiting the scope of the Program to the smaller end of the spectrum]
- When identifying key constraints in the rice value chain (many were discussed), CAVAC should consider:
  - Land titling including the critical question of security of tenure.
  - That there are no rice standard specifications.
  - The lack of rice storage facilities for local growers.
  - Microfinance including possible co-guarantees.
  - The role of provincial government institutions in coordinating activities.

*[CAVAC can and will address some of the constraints, but will have difficulties in addressing others, such as land titling]*

- CAVAC needs a broad range of partnerships. The Program should be responsive, flexible, and innovative and reflect the changing environment. *[CAVAC fully agrees with this recommendation].*

### 3.6 Conclusion

The stakeholder workshop provided valuable additional insight. Advice was, overall, consistent with ongoing feedback from CAVAC's team working on the ground.

Recommendations have been incorporated, wherever possible, into the 2011 AWP. Others will be included throughout the practical implementation of the AWP.

## 4 ROYAL GOVERNMENT OF CAMBODIA POLICY ON THE PROMOTION OF PADDY PRODUCTION AND RICE EXPORT

The design of CAVAC allows for a flexible reaction on government priorities. The most relevant development is the *Policy Paper on the Promotion of Paddy Production and Rice Export* as approved by the Council of Ministers on 25 July 2010.

The initial design of CAVAC already has much in common with the strategy, but the Program intends to adjust its AWP's further, to better align with the new government policy.

The three pronged strategy of – production enhancement, diversification and agricultural commercialisation - has seven subheadings:

Below is an overview of how CAVAC is enhancing, and will continue to enhance, its support to the Policy

| Policy Subheading  | Current CAVAC Design  | CAVAC additional efforts   |
|--|---|--|
| 1. Infrastructure  | <ul style="list-style-type: none"> <li>CAVAC intends to support the functioning of physical market places. CAVAC is currently testing how infrastructure can be best supported.</li> <li>CAVAC's 2011 AWP will include exploring the best ways to support new communication technologies.</li> </ul>    |  |
| 2. Improvement in extension services and agricultural inputs | <ul style="list-style-type: none"> <li>As explained in the 2010 AWP, CAVAC will focus much of its efforts towards well functioning input markets.</li> <li>Extension services are at the heart of CAVAC's design.</li> <li>Extensive support to CARDI, GDA and RUA in the Germplasm project.</li> </ul> | <ul style="list-style-type: none"> <li>The list of 10 rice varieties that the Royal Government of Cambodia (RGC) has selected for promotion will be actively supported by CAVAC in its seed support to CARDI, and in working with seed producers.</li> <li>CAVAC intends to support MAFF and the PDA's directly in financing extensive pilot activities to introduce the new varieties.</li> </ul> |
| 3. Land management reform                                    | <ul style="list-style-type: none"> <li>No activities planned in this area.</li> </ul>   |  |
| 4. Finance   | <ul style="list-style-type: none"> <li>CAVAC is not a (micro) finance institution but can give grants to agribusiness, or support them with access to grants.</li> </ul>  |  |
| 5. Marketing   | <ul style="list-style-type: none"> <li>CAVAC intended to support marketing efforts mainly for domestic trade.</li> </ul>  | <ul style="list-style-type: none"> <li>CAVAC will actively include international rice marketing in its portfolio of activities for 2011.</li> </ul>  |

| Policy Subheading         | Current CAVAC Design  | CAVAC additional efforts  |
|---------------------------|---|---|
| 6. Farmer organisations   | <ul style="list-style-type: none"> <li>Farmer organisations can receive support from CAVAC.</li> </ul>  | <ul style="list-style-type: none"> <li>Additional promotion of production of the 10 seed varieties is likely to happen partly through working with farmer associations</li> </ul> |
| 7. Institutional building | <ul style="list-style-type: none"> <li>CAVAC's Policy Facility can support institutional building activities of government institutions.</li> </ul> | <ul style="list-style-type: none"> <li>The Policy Facility can be focused even more towards the priorities in the Policy Paper.</li> </ul>  |

The RGC policy distinguishes two phases of support.

Phase One, for the short and intermediate term, recommends:

- Additional investment in irrigation and promotion of the use of seeds, fertilisers and appropriate technology;
- Encouragement of private sector participation; and
- Coordination and fast tracking of export procedures.

The first two points are at the centre of CAVAC's activities and areas where CAVAC can act fast and deliver early results. For the third point, CAVAC will need to find its comparative advantage with the government and other developing partners already active in this field.

Phase Two, for the medium and long run, is focusing on long term competitiveness through:

- Promotion of production technology;
- Management of soil fertility;
- Management of water, seed and fertiliser;
- Organization of farmer associations;
- Quality rice processing;
- Physical infrastructure
- Land use management; credit and
- Trade facilitation.

CAVAC's support to CARDI, GDA and RUA to establish best practices in production technology with its rice establishment program makes it very well placed to support this element of the policy. Its focus on extension and input markets also fits very well with points two and three. CAVAC will step up efforts in the other points, with the exception of land use management and credit where CAVAC does not propose to play a role in.

On 16 November MAFF organized a workshop to analyse how best MAFF and CAVAC can collaborate in promoting the Rice Policy. It was agreed that MAFF will prepare a number of proposals for CAVAC funding. The aim is to introduce new or better seed varieties. GDA, CARDI and the PDA's could be financially supported to introduce the varieties.

In parallel, CAVAC will investigate demand for rice export. It is essential that demand, in the long run, drives the production of improved varieties. This will lead to diversification and will increase the amount of paddy processed in Cambodia. CAVAC will examine possibilities to work with rice millers and exporters. If pilots are successful, CAVAC will continue to include the rice policy as an integral part of its program.

## 5 IMPLEMENTATION PROCESS AND PROCEDURES

The CAVAC PDD acknowledged that most agricultural constraints have a multidisciplinary character, for example: irrigation schemes will not be successful if not based on a solid agricultural analysis; embedded in existing social structures, in a conducive business enabling environment and with effective demand for the products. Sustainable extension must follow the same business incentives as agribusiness and dealing with agribusinesses requires extensive knowledge of farming.

CAVAC is staffed by a team of national and international technical and operational specialists. To apply the team's technical knowledge optimally to each intervention, program management, and as such the AWP, has been divided into tasks that will be executed by multidisciplinary teams. The tasks will be regularly updated. The clear responsibilities within the task force system will allow CAVAC to better serve and collaborate with public and private partners, and make CAVAC more accountable to PDWRAMs, PDAs, MAFF and MOWRAM. The Sector Managers remain the first point of communication for the government partners and have specific responsibilities for maintaining these relations.

Figure 1 shows the different internal procedures which will ensure that CAVAC's activities remain in line with the approved AWP.

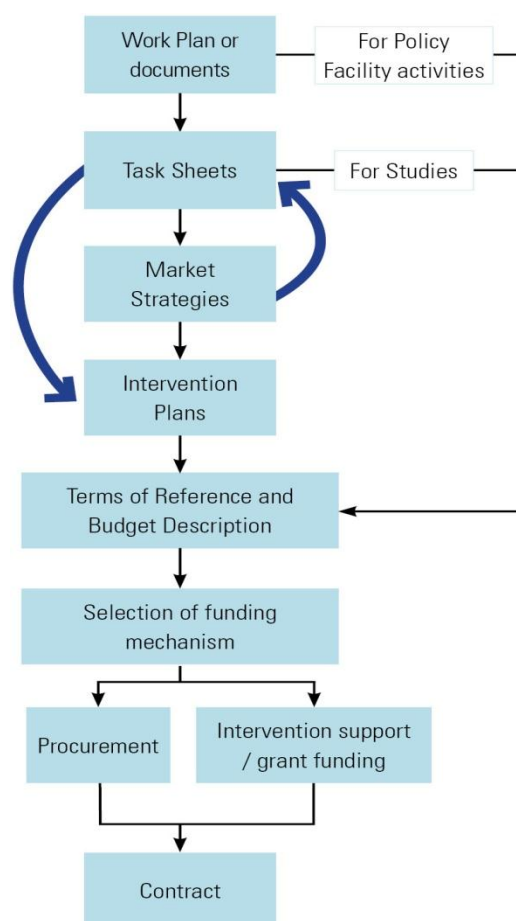


Figure 1: Process and Procedures

## **5.1 Market Strategies**

Market strategies are central in determining which activities CAVAC will undertake and which activities the Program should not support. For each market (such as dry season rice, rice for export, wet season rice, vegetables and cassava), CAVAC will first establish a market development strategy. Influenced by government strategies, external studies and internal assessments; a market development strategy will determine the key constraints in a value chain or market, and which constraints can and will be addressed. Strategies will focus interventions to the core issues and will avoid supporting interventions that do not address fundamental constraints in the markets. No activities will be undertaken outside of those approved within market development strategies. The strategies will be further discussed in the next chapter.

At a later stage, market reports will be drafted containing the main developments and impacts in each market.

## **5.2 Intervention Plans**

Once the market strategies determine what CAVAC should and should not address in each market, CAVAC will engage with public and private institutions and companies to establish where common interests lie and where the Program can support and strengthen these players. Each proposal will be explicitly outlined in an intervention plan that will be approved by both the respective Sector Manager and the Team Leader. CAVAC will only engage with public and private sector partners after intervention plans have been approved. This again ensures all activities are focused to address the fundamental constraints in each market and are fully in line with the approved AWP.

## **5.3 Intervention Reports / Activity Closure Reports**

Once interventions come to an end, the Program will produce intervention reports describing the activities. The reports will capture early results and impacts. Later on, higher level impacts will also be added.

## **5.4 Impact Logics and Monitoring Plans**

Each intervention or group of interventions will have a unique results chain or impact logic, combined with a monitoring plan. This will allow the Program to follow changes and impacts in a structured way.

## **5.5 Contracting**

CAVAC has developed a procurement and grant mechanism that will allow the Program to stimulate private and public sector partners with technical support and investments. The mechanism will ensure program activities comply with contractual and legal obligations. It will allow the Program to engage in a manner that makes it a credible partner to the public and

private sector. CAVAC will use both tender and grant mechanisms. The most commonly used grant mechanisms in 2011 will be the Agribusiness Innovation Fund and the Supplementary Irrigation Fund (PDD, Page 41).

## **6 IMPLEMENTATION STRATEGIES**

Below is a summary of the key areas where CAVAC will focus its support in the selected value chains:

### **6.1 Wet Season Rice Production**

- Improved seed varieties
  - adjusted to local taste
  - drought resistant
  - allowing for inputs
  - submergence tolerance
- Supplementary irrigation

The availability of improved seed varieties depends on progress in the R&E Component's Germplasm Research Project. Final results are not expected in 2011. However, expansion of existing CARDI varieties through demonstrations may be considered for CAVAC depending on the results of the general farmer survey which is part of the Germplasm Research Project. This is planned in the second half of 2010.

A focus on the availability of better and more suitable irrigation pumps will allow more wet season farmers to gain access to irrigation by the end of 2011. Although outreach will be low at the end of 2011, CAVAC expects that, in the longer term, this support could reach a very large number of farmers (possibly up to 50,000-100,000). CAVAC will investigate what the impact of potential improved electrification in the targeted provinces may have on the type and costs of irrigation with pumps.

### **6.2 All Types of Dry Season and Early Wet Season Rice production**

The dry season paddy and rice production will receive a strong focus from CAVAC in 2011 in the following areas:

- Irrigation;
- Farmer knowledge;
- Availability of high quality inputs;
- Farming practices and tools; and

- Alternative channels for export.

It is expected that another 4,000 to 5,000 farmers might be reached with irrigation interventions and several thousand with the other activities. These numbers are expected to increase to 50,000 to 100,000 by the end of CAVAC. Improving pumping and the potentially improved electrification will also be relevant for the dry season rice cultivators.

The expected results will be discussed in the specific components below.

### **6.3 Vegetables**

In 2011, CAVAC will work in four clusters in Takeo and Kampot, predominantly focusing on the availability of good quality inputs and improved farmer knowledge. This should lead to more, cheaper and better quality vegetables that can compete with products from Thailand and Vietnam. It could benefit between 1,000 and 2,000 farmers initially, but with the potential to grow more broadly.

In 2011, CAVAC will focus on:

- Farmer knowledge; and
- Availability of high quality inputs.

### **6.4 Cassava**

As approved in the AWP 2010, CAVAC has undertaken a value chain selection procedure to identify one to two additional value chains. The team selected and tested value chains that allow diversity for rice based farmers. Growth potential and impact on the poor, as both farmers and workers, were the major criteria. The limited potential for fruits and vegetables in Kampong Thom required a suitable additional value chain.

CAVAC strongly recommends the NSC endorse cassava as an additional value chain in 2011. Postponing a decision until after the Mid Term Review (MTR) will reduce the time available to productively interact. The requested approval will be conditional on a more detailed Environmental Impact Assessment that will be conducted in the second half of 2010.

Should cassava be approved as a priority value chain, CAVAC will conduct further research into the following areas:

- Inputs (especially availability of good quality cuttings); and
- Harvesting (especially harvesting in a way that meets the requirements of buyers).

More information on the cassava value chain is given in Attachment 2.



## 7 KEY ACTIVITIES FOR 2011

### 7.1 Component 1: Agribusiness Development

This component aims to ensure that agribusiness contributes to the strengthening of selected value chains and equitably shares benefits. Throughout 2011, CAVAC will ensure:

**Critical constraints to strategic value chains are identified and developed for business action.**

**Agribusiness partnerships are supported to innovatively address constraints.**

**Enhanced farmer services are embedded within agribusiness practices.**

**Improved availability and communication of market information between value chain stakeholders.**

**Participatory planning and construction of key infrastructure address value chain bottlenecks.**

#### 7.1.1 2011 Work Program

In 2011, CAVAC will conduct another one to two value chain analysis to allow for an optimal resource allocation in the MTR. Value chains will be identified through a selection procedure involving consultation with relevant government ministries and other stakeholders, as well as selected stakeholders along the proposed value chain. The recent stakeholder workshop did not identify any additional value chains.

Selection criteria will include the extent to which the value chain will generate income for poor smallholder farmers as well as other social and environmental impacts. Criteria will also look at growth potential of the sector and suitability for interventions

CAVAC's internal poverty analysis shows that farmers diversify risks by choosing every year from a number of crops depending on the price and experience of previous years. Cassava is one of them. This element of a 'package' of crops will be added to the selection criteria.

CAVAC will also further assess how it can contribute to the RGC's Policy Paper on the Promotion of Paddy Production and Rice Export. CAVAC will supplement or complement activities of other development partners. CAVAC needs to judge if other partners will make sufficient progress to alleviate constraints that CAVAC cannot address on its own.

The seed market for rice has one or two potentially new larger players. Formalisation and approval of the intellectual property is one of the major constraints that CAVAC will address. There are also a much larger number of small producer associations and small companies. CAVAC will need to find an effective mechanism to offer support to these groups. It may not be efficient to work with each of them separately.

The fertiliser market for compost is too fragmented to support individual suppliers. A few importers of organic fertiliser have established a market; however it appears that these importers do not need support from CAVAC. This is not the case in the mined fertiliser market, where there are very clear signs of low quality fertiliser. CAVAC is interested in financially and technically supporting MAFF to take this further, from a policy and control perspective. It also intends to support companies that are serious about quality in their efforts to build a quality chain in their distribution.

The use and misuse of pesticides, rodent control, herbicides and other crop enhancers potentially has both a large effect on yields as well as on the environment and health and safety of farmers. Presently, the market is dominated by products smuggled in. CAVAC has held initial talks with companies that have licenses. A few large companies, such as Bayer and Syngenta, are in the process of licensing products. If this happens, there is a good chance CAVAC will work closely with these companies to establish a quality choice for farmers. It will support the companies in establishing internal structures that ensure quality throughout the distribution chain and assist the companies to disseminate information on the proper use to farmers.

Herbicides are more and more commonly used and some of the herbicides have very limited environmental impact. Present activities in the Rice Establishment Research Project show potential for improving the use of herbicides. This may lead to an intervention in 2011.

A study on the efficiency of pumps will be finished by the end of 2010. Initial results confirm the expectation that many pumps are far from optimal and that the engine / pump combinations are not correct. One intervention may start in 2010, and another in 2011, where pump manufacturers are further educated on more optimal pump designs, types and combinations and better able to offer these products. Higher pump unit efficiencies will not only reduce the operation costs for smallholders, but are also likely to make it more feasible for those farmers who think it is too expensive now to use small pump units for irrigation. This will create new farming opportunities.

The Rice Establishment Research Program is investigating the best use of tools such as seed drills and levelling equipment. This knowledge will be evaluated and may turn into an intervention if the right partners, with the right interest, are found.

Subject to the approval of the 2011 AWP, including the choice of cassava as an additional value chain in CAVAC's portfolio, the Program will engage with buyers and machine producers to improve the harvesting of cassava. The initial value chain assessment revealed that optimal cutting and drying improves the quality and demand for cassava.

To date, the interaction with agribusiness experts in MAFF has been limited. This was mainly due to CAVAC not yet having fully defined its focus. In 2011, CAVAC will better align its agribusiness activities with agro tool experts in MAFF.

Initially, CAVAC expected that the role of traders would be essential in improving market access and production knowledge. So far, however, CAVAC has not seen the role of traders either as causing major constraints, or as major opportunities to solve other constraints.

All the above mentioned areas of the Agribusiness Development Component could lead to the provision of support to companies. In a number of cases this support will be extended to helping companies to improve the knowledge of their retailers and stimulating the retailers to share information with farmers.

The use of financial support by larger companies and their retailers' networks is less promising than initially hoped for. Banks and microfinance institutions are very active in some of the crops in CAVAC's target provinces – reducing the need for input markets and traders to give credit.

The use of mobile phones, text messaging, internet or other modern IT mechanisms are likely to be very significant in the near future. CAVAC has not yet analysed the opportunities here and the value chain analyses have not yet shown where the potential may be. CAVAC will revisit this potential in 2011, determining if this should be pursued. The relationship between the providers of information and the source of information is however an important focus for CAVAC's work in 2011. This will be discussed further below.

CAVAC will await a detailed study on the use of market space before it makes investments that will address these bottle necks in the trade of agricultural products. Initial engagements with market committees have been discouraging. Most markets visited rejected requests for meetings and some showed hostile behaviour towards CAVAC staff. It appears that there are fundamental issues with the ownership of some of the markets that CAVAC may not be able to address. Without addressing these however, it will be difficult for CAVAC to ensure the sustainability of the investments.

### **7.1.2 Expected Achievements**

At the end of 2011, the first signs of improved input markets will be visible, caused by the interventions detailed in Table 1.

**Table 1: Number of Interventions in 2011**

| Input Market                      | Continued from 2010 | To be initiated in 2011 | To be completed in 2011 |
|-----------------------------------|---------------------|-------------------------|-------------------------|
| Rice seed market                  | 2                   | 2                       | 1                       |
| Fertiliser market                 | 1                   | 2                       | 1                       |
| Pesticides and herbicides market* |                     | 1                       |                         |
| Vegetable seeds                   | 1                   | 1                       |                         |
| Cassava inputs                    |                     | 1                       |                         |

\* A few large companies with a good reputation are interested in collaboration but await registration.

Furthermore, the Program will aim to ensure:

- Cassava farmers also have access to better harvesting solutions;
- A number of pump sellers have better and more suitable pump units on offer; and
- A strategy paper on CAVAC's role in rice export is available in the first quarter of 2011.

## **7.2 Component 2: Water Management**

The Water Management component aims to achieve a sustainable increase in the area and yield of irrigated crops. Throughout 2011, CAVAC will ensure:

|  |
|--|
| <b>Improved capacity of MOWRAM and PDWRAM to participate in designing, developing, operating and maintaining irrigation schemes.</b> |
| <b>Improved capacity of FWUCs to efficiently and effectively operate and maintain their irrigation systems.</b>                      |
| <b>Selected irrigation schemes are rehabilitated and transferred to effective FWUCs.</b>   |
| <b>Improved models of water management are adopted in rain-fed areas.</b>  |
| <b>Increased use of hydrological data in the planning and management of irrigation systems.</b>                                      |

### **7.2.1 2011 Work Program**

The initial collaboration between the PDWRAMs and CAVAC in the selection, detailed design and supervision of two irrigation schemes in Takeo and Kampot was very positive. CAVAC intends to work with, and through, the PDWRAMs for further detailed design and supervision. The opening of provincial offices will certainly help this process. CAVAC will assess the needs of the PDWRAMs to further develop their capacity, both human capacity and the need for small equipment. The Policy Facility will be a demand led facility through which support for capacity building in MOWRAM and/or the PDWRAMs can be funded.

Sustainable irrigation schemes will need well functioning O&M. They will also rely on water availability well into the future. The continued expansion of agricultural land under dry season irrigation may lead to insufficient water. The Water availability studies that aim to allow PDWRAMs and CAVAC to judge where investments in irrigation are justified and where there is a high risk of insufficient water in the near future will be conducted in 2011.

The water availability studies are also intended to be a useful tool for the PDWRAMs in coordinating investments. They will allow the PDWRAMs to better encourage investments by others as well as optimise their own investments. The PDWRAMs will also play an important role in determining future support to FWUCs through the Supplementary Investment Fund.

CAVAC will collaborate with the PDWRAMs in implementing activities that will reduce the costs of irrigation by improving pump efficiencies. The PDWRAMs' increased knowledge on the use of irrigation pumps will allow them to better support farmers, especially in the wet season.

CAVAC will separately submit a proposal to the NSC for investment in irrigation schemes in December 2010. Based on the advice and approval from the NSC, CAVAC will tender up to eleven construction and rehabilitation of schemes for which construction is expected to start in February 2011. Possible irrigation schemes for rehabilitation or construction are detailed in Table 2.

**Table 2: Possible irrigation schemes for rehabilitation or construction in 2011**

| Province     | Canal          | Length (km) | Command Area (ha) | Best Estimated Cost (US\$) | Approved Upper Limit (US\$) |
|--------------|----------------|-------------|-------------------|----------------------------|-----------------------------|
| Takeo        | Tumnub Lok     | 15.0        | 3,700             | \$500,000                  | \$600,000                   |
|              | Kveng Tayi     | 4.7         | 2,000             | \$120,000                  | \$150,000                   |
|              | Canal 19       | 2.8         | 450               | \$120,000                  | \$160,000                   |
| Kampot       | Sbove Andet    | 6.7         | 2,000             | \$220,000                  | \$250,000                   |
|              | O'Kak          | 4.6         | 1,000             | \$160,000                  | \$200,000                   |
|              | Tnoat          | 6.7         | 3,500             | \$250,000                  | \$300,000                   |
|              | Prey Tonle Two | 6.7         | 1,150             | \$220,000                  | \$250,000                   |
| Kampong Thom | Boeung KC/NC   | 6.5         | 750               | \$140,000                  | \$180,000                   |
|              | Dom Tom        | 3.8         | 460               | \$120,000                  | \$150,000                   |
|              | Thnoat Chum    | 6.0         | 1,400             | \$180,000                  | \$200,000                   |
|              | Angko          | 3.7         | 1,400             | \$180,000                  | \$220,000                   |

CAVAC will also test the Supplementary Investment Scheme in late 2010. This scheme will request proposals from FWUCS and other organisations for cost sharing in small investments. This should lead to one or two more small investments in the first months of 2011.

The main challenge for CAVAC remains the sustainability of schemes. The role of FWUCs, communities, districts, village chiefs and commercial water sellers in O&M has been an area of research for quite some time by organisations such as the Cambodia Development Resource Institute (CDRI). CAVAC will need to add its own experience and combine this in an approach towards sustainable irrigation. This approach, together with the knowledge from the water availability studies and the priority lists from the PDWRAMs, should lead to additional investment decisions. The decisions must fall within the financial and human capacity of CAVAC, as well as within the duration of CAVAC. Investments for which relocation is required may be more difficult.

The decisions will lead to a new series of feasibility studies and detailed designs in 2011 for construction and rehabilitation in 2012.

The importance of improved models for water management, both in the wet and dry season, has led to the decision to conduct research on 'on farm water use', subject to NSC approval of this ACIAR-led research project. This will ensure that Cambodia has access to the most up-to-date and accurate findings on optimal water management. The research project has been designed to release findings as early as possible, allowing CAVAC to use the findings in extension or other interventions. Interventions based on the findings are, however, not expected to take place in 2011.

Hydrological data will be included in the water availability studies. CAVAC will initiate one in 2010 and one in 2011, both to be finalised in 2011. The first one will be in Takeo. The second one is likely to be in Kampong Thom. The studies will be the cornerstone of CAVAC's Sustainable Water Strategy. CAVAC's latest stakeholder workshop reconfirmed the importance of managing available water. If the studies that are initiated in 2010 show the expected results, CAVAC will add one additional study in 2011.

A study on the efficiency of pumps will be finished by the end of 2010. Initial results confirm the expectation that many pumps are far from optimal and that the engine / pump combinations are not correct. One intervention may start in 2010 and another in 2011 where pump manufacturers are further educated on more optimal pump designs, types and combinations and better able to offer these products. Higher pump unit efficiencies will not only reduce the operation costs for smallholders, it is also likely to make it more feasible for those farmers who think it is too expensive now to use small pump units for irrigation. This will create new farming opportunities.

It is likely that the cost of electricity will be reduced in the near future in the targeted provinces and priority might be given to pumping. CAVAC will take this development into account.

Capacity building for PDWRAMs will enhance their ability to plan and implement effective irrigation systems. Short training courses will be conducted in water and catchment management, water distribution and scheduling, survey and design and construction supervision. In addition, a short duration regional study tour, possibly to Vietnam, will enable PDWRAM officials working in the operation and maintenance of irrigation systems, to learn from practices in areas relevant to Cambodia. Survey skills will be enhanced through the provision of survey equipment. PDWRAM officials will be trained in its effective use. Design skills will be improved through the purchase and training in software complementing AutoCAD, that will enable a more efficient design process, including the automatic and accurate calculation of construction materials quantities. CAVAC must ensure that rehabilitation of the canals is undertaken to acceptable quality, and to this end, PDWRAM construction supervisors will be provided with additional training prior to construction. In all irrigation system planning and design, CAVAC team members will continue to provide on-the-job training to PDWRAM.

### **7.2.2 Expected Achievements**

By the end of 2011, CAVAC expects the construction or rehabilitation of up to eleven irrigation schemes in the three provinces. Depending on the approved investments, the area under dry season irrigation will increase to up to 10,000 ha reaching more than 5,000 households.

Furthermore, the Program aims to deliver:

- a strategy on irrigation that better includes ownership, maintenance, water availability, gender and the environment;
- a separate strategy paper on O&M in irrigation;
- one to two co-investments with FWUCs through the Supplementary Investments Fund;
- improved capacity of up to 13 FWUCs to operate the new/rehabilitated schemes through support from PDWRAM and CAVAC;
- the finalisation of one or two water availability databases and PDWRAM trained in their use;
- availability of improved pump units and the accompanying improved advice and information; and
- a decision from a NSC in June 2011 that agrees on the number and type of feasibility studies for 2012 rehabilitation and construction and the feasibility studies and design for these.

### 7.3 Component 3: Research and Extension

The Research and Extension Component, implemented by ACIAR, aims to increase farmer and service provider capacity and alleviate key value chain constraints. Throughout 2011, CAVAC will ensure:

**Priority research and extension activities address constraints in selected value chains.**

**Enhanced capacity of formal and informal extension providers to transfer improved technologies and information to farmers.**

**Partnership programs linking researchers, extensionists, farmers and agribusiness are developed and implemented.**

**Budgetary support to CARDI is provided.**

#### 7.3.1 2011 Work Program

Three research projects will continue in 2011, augmented by one on 'on-farm water use.' A new round of Cambodia Agriculture Research Fund (CARF) funds will be awarded in the first part of 2011, followed by request for proposals in November 2011. The last round of proposals only led to four grants being awarded. This number is lower than the numbers in the past, partly because of the requirement that the proposals align CAVAC's priorities. The CAVAC team will now make available additional support to candidates in preparing the proposals to ensure eligibility. Where and when researchable issues arise that may require quick investment for appropriate research results, funds are available through the R&E Component.

The CAVAC team will sanction such research when and where needed to fulfil the 2011 AWP.

CAVAC will undertake at least six new interventions, in addition to the existing two interventions, to improve the capacity of the extension providers. The interventions will have a mix of providers including model farmers, input suppliers and larger companies. It is likely that FWUCs will also be targeted. Interventions will be related to the capacity of the provider, the development of the material, the interaction with farmers, and the link to permanent sources of information.

The Cambodian Journal of Agriculture will be supported as one of the few media that allow Cambodian researcher to publish. CAVAC will investigate ways to increase the likelihood of future sustainability.

New programs that facilitate linkages will focus on how expert knowledge in research institutes, in PDAs and in other government institutions, can best be accessed by extension



providers. CAVAC has developed a strategy to ensure knowledge centres can better interact with the extension providers. It will develop a number of linking events where retailers or model farmers can meet peers or sources of information such as PDA's, larger companies or research institutes. Personal contact and exchange of phone numbers is important.

The budgetary support to CARDI has been conditional to CARDI having a long term sustainability strategy. CARDI agreed to communicate this at the end of 2010 for their 2010 support. Depending on this strategy, CAVAC will examine how CARDI is implementing this strategy and make payments conditional to this in 2011.

### 7.3.2 Expected Achievements

Table 3 lists the research deliverables for this Component in 2011.

**Table 3: List of research deliverables in 2011**

| Research Type                    | Major Stakeholders   | Deliverables by the end of 2011  |
|----------------------------------|--|--|
| Rice Germplasm Project           | International Rice Research Institute (IRRI), CARDI, GDA   | <ol style="list-style-type: none"> <li>1. Selected germplasm from 2010 wet season advanced; dry season materials selected and advanced.</li> <li>2. Marker assisted selection of those above selected materials for quality at the now revitalised CARDI MAS laboratory begun.</li> <li>3. Advanced variety trials conducted within growers' fields using participatory selection.</li> </ol>  |
| Rice Establishment Project       | Led by New South Wales Industry and Investment (NSW I&I) and implemented locally by CARDI, RUA, GDA and the PDAs | <ol style="list-style-type: none"> <li>1. Agrotools/machinery built/imported and provided to research and grower communities for demonstration and testing (possibly line seeder, bed former, etc- to be determined from the 2010 survey results).</li> <li>2. From the first year's benchmark trial data, experiments and demonstrations for on-farm testing and of improved rice establishment techniques including weed, water and nutrient management further refined.</li> <li>3. Drum seeders upscaled in areas where soil conditions are appropriate for their use.</li> <li>4. Private sector educated in land levelling including laser levelling for improved rice productivity.</li> <li>5. Cambodian Country Almanac launched, demonstrated, and spatial databases acquired from RGC.</li> <li>6. CARDI soil testing lab upgraded for more precision.</li> </ol> |
| Horticulture Value Chain Project | Led by NSW I&I   | <ol style="list-style-type: none"> <li>1. The value chains for tomato, chilli and leafy vegetables completed.</li> <li>2. Trials for low cost postharvest technologies implemented then upscaled to vegetable growing communities.</li> <li>3. Field demonstrations of improved vegetable production strategically placed within grower training and field days.</li> <li>4. Cambodia's first National Vegetable Conference convened including all the partners in the value chain.</li> <li>5. Extension resources prepared for use by CAVAC among</li> </ol>   |

| Research Type  | Major Stakeholders  | Deliverables by the end of 2011  |
|--|---|--|
|  |   | <p>model vegetable growers and other service providers.</p> <p>6. Significant training of service providers conducted.</p>   |
| On Farm Water Management Project (to be submitted for NSC approval separately) | Led by Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) | <ol style="list-style-type: none"> <li>1. Benchmark trials of on farm water management completed for three study areas providing updated recommendations on interventions for CAVAC.</li> <li>2. 'Case Studies of Success' training materials available for use by CAVAC extension partners/service providers.</li> <li>3. Climate data collected and deposited in the Cambodian Country Almanac.</li> </ol>                         |
| CARF-6 (mostly ended in 2011)  | GDA, RUA, CARDI, NGOs   | <ol style="list-style-type: none"> <li>1. Improved on-farm rice storage and rice establishment technologies available.</li> <li>2. Improved waxy maize varieties released.</li> </ol>  |
| CARF-7   | GDA, RUA, CARDI, NGOs   | <ol style="list-style-type: none"> <li>1. Data on mango fruit fly allowing mango export to China or Japan. <i>Part of obtaining international certification is the requirement to know the number of fruit fly species in a country.</i></li> <li>2. Precise knowledge of BPH disseminated for better control by growers.</li> <li>3. Simple tools for on-farm water management disseminated to growers.</li> </ol>                  |
| CARF-8   | GDA, RUA and NGOs   | <ol style="list-style-type: none"> <li>1. Improved forages disseminated amongst private cattle farms in Kampot and Takeo.</li> <li>2. Alley cropped woody species identified and saplings disseminated to grower communities.</li> <li>3. Durian fungal disease studied and preventive methods tested.</li> <li>4. Cambodia sampled for nematode populations and data available for nematode control in high value crops.</li> </ol> |
| CARF-9   | GDA, RUA, CARDI, NGOs, private agribusinesses   | <ol style="list-style-type: none"> <li>1. 11-15 proposals approved and implemented in 2011 with greater emphasis on Public-Private Partnerships.</li> <li>2. CARF Coordinator to proactively monitor the results and quality of these projects as well as CARF 7 and 8.</li> </ol>   |
| Demand-driven Research   | Based on demand   | <ol style="list-style-type: none"> <li>1. Small research grants made available when there is a demand for such research results with immediate effects. CAVAC team to make the selection for these small grants.</li> </ol>  |

By the end of 2011, CAVAC will have tested all channels of extension. The emphasis will be on trial and learning allowing for the outreach numbers to be increased after the MTR. Table 4 lists the number of interventions related to knowledge in 2011.

**Table 4: Number of interventions related to knowledge in 2011**

| Knowledge channel                         | Continued from 2010 | Initiated in 2011 | Finished in 2011 |
|---|---------------------|-------------------|------------------|
| Village extension workers / model farmers | 1                   | 1                 |                  |
| Input suppliers                           |                     | 1                 |                  |
| Large companies                           | 1                   |                   |                  |
| Media                                     |                     | 1                 |                  |
| FWUCS                                     |                     | 1                 |                  |
| NGO with permanent funding                |                     | 1                 |                  |
| A channel related to the vegetable sector |                     | 1                 |                  |

During 2011, CAVAC will also finalise its strategy on how research and knowledge is linked to the specific dissemination channels, and will have initiated at least one intervention that supports this. Additionally, CAVAC will finalise a strategy paper on an approach to sustainable media in the first quarter of 2011.

#### **7.4 Component 4: Business Enabling Environment**

The Business Enabling Environment Component aims to improve the business enabling environment in Cambodia to facilitate the development of selected value chains. Throughout 2011, CAVAC will ensure:

|  |
|--|
| <b>Improved research and understanding of the enabling environment surrounding key value chains.</b> |
| <b>Increased opportunity for public private dialogue around key enabling environment issues.</b>     |
| <b>Strengthened industry representative organisations.</b>   |
| <b>Increased use of Public Private Partnership investment model.</b>                                 |
| <b>Policy Support Funding Facility utilised to progress activities.</b>                              |

The Program has first focused on the value chain analyses before doing more in-depth studies on enabling environment issues. Initial issues that came up included:

- **Unlicensed input sellers:** Although by law input sellers, such as fertiliser and pesticide sellers, are required to have licenses before they can sell the products, many of the big wholesalers do not have licences; let alone the small retailers;
- **License fee transparency:** The cost of obtaining a license has a wide range: from 10-50 USD per year. For very small input dealers, their profit from selling fertiliser is not much more than the certification fee, which does not encourage them to obtain one;

- **Trademark or fake products:** Fake fertiliser is openly sold in the market and called grade two or three, implying they are certified products;
- **Labelling:** Many inputs, especially fertiliser and pesticide, are not labelled in Khmer;
- **Banned pesticides:** More than 50 products banned by MAFF are being sold in the market;
- **Seed producer certificate:** Although all seed producers in Cambodia are required by law to hold a seed producer certificate, almost none of them have one;
- **Illegal seed:** There is a large amount of seed illegally imported from Vietnam and Thailand without being checked by officers responsible for imported seed and without paying tax. This causes registered seed companies in Cambodia difficulties in terms of price competition; and
- **Management of output markets:** During the wet season vegetable sellers are often unable to sell their products as markets are flooded, or they are forced to sell in muddy areas. They also held responsible for their rubbish despite paying a rubbish fee to the market manager.

CAVAC will discuss with MAFF and MOWRAM how to best address some of them and activities will be undertaken.

CAVAC will support the TWGAW in the following ways:

- Translation, copying and dissemination of the harmonised Strategy for Agriculture and Water (SAW) document, possibly including sub-national workshops;
- Supporting a SAW roadmap exercise to develop improved approaches to joint RGC/DP planning, financing, implementation and monitoring and evaluation of the SAW;
- Providing additional technical assistance to assist in coordinating the implementation of a Priority Operating Cost (POC) scheme in MAFF and MOWRAM to implement the SAW (i.e. assistance to draft the POC Scheme ToRs and Management Contract);
- Supporting the costs of up to 4 TWGAW meetings per year; and
- Providing POC support for the Secretariat's TWGAW and SAW coordination work.

#### 7.4.2 Expected Achievements

- Throughout 2011, a number of policy issues will be addressed as part of Components 1-3 (such as the registration process for seeds companies); and
- Through the Policy Support Facility, the Program will contribute USD 100,000 to the multi-donor fund to support SAW implementation and will support MAFF and MOWRAM in specific requests, once approved by the NSC.

## **7.5 Cross-cutting Issues**

### Gender

Understanding gender equality and incorporating this into all of CAVAC's interventions has been a cornerstone of CAVAC's design and will continue to be so throughout implementation in 2011. CAVAC has drafted a Gender Strategy that it will finalise in 2010, incorporating input from the Sector Monitoring Group following their visit in November 2010. Effective representation of men and women in decision making, a focus on female headed households and applying the "do no harm principle" will be the three main focus areas.

CAVAC will also recruit a full time national Gender Specialist to assist in mainstreaming gender through all CAVAC activities.

### Disability

Similar to the Gender Strategy, CAVAC will conduct an assessment of how the Program can influence the lives of people living with disabilities in 2010. The study will help reveal where CAVAC can improve the lives of people living with a disability.

### Environment

CAVAC has been following the processes and procedures in its Disaster Risk Reduction and Environmental Strategy, and will continue to do so in 2011. CAVAC has recently received feedback from AusAID which endorses the general approach taken by the proposed Environmental Management Strategy Paper, and raises five issues for consideration. Four of those matters will be addressed in the short term, and this will include ensuring environmental assessments are reviewed as part of activity monitoring frameworks. In relation to the fifth matter, it is noted that AusAID intends to release new environmental marker questions at the end of 2010, and when they are available, CAVAC will review and amend its Strategy accordingly.

CAVAC will recruit a full time national Environmental Specialist to ensure all CAVAC activities are implemented in accordance with CAVAC's Environmental Strategy, AusAID guidelines and Cambodian law.

### Monitoring and Evaluation (M&E)

CAVAC has drafted an M&E framework that highlights the importance of M&E as a management tool. In October 2009, an internal M&E workshop listed deliverables. CAVAC will adhere to this including a first preliminary assessment of targets. CAVAC will draft impact logics for all interventions and will monitor progress using Monitoring Plans. For this, the Program will use a range of tools including observations, small surveys and, on occasions, larger surveys (with samples of greater than 200). Monitoring will be the responsibility of

every expert in CAVAC. CAVAC will outsource a number of studies. Data will be disaggregated by gender. Reporting on cross cutting issues will be part of the M&E system.

The hypothesis that higher yields will reduce poverty will be the focus of a more detailed study in 2011 for which external assistance will be required.

### **7.5.1 Expected Achievements**

- The Gender and Disability strategies will guide all CAVAC activities. Both will be mainstreamed in all activities. In addition to this, one to two dedicated interventions are planned;
- CAVAC's Environmental Strategy will be operational in 2011;
- M&E will be an integral part of all CAVAC activities. All experts will be involved. In 2011, CAVAC will conduct and commission a number of baseline and impact studies and a more extensive study on the linkage between growth and poverty;
- CAVAC will prepare a training needs assessment and training plan for its staff and government counterparts at national and provincial level. It is expected that gaps in knowledge and experience need a significant investment in 2011; and
- CAVAC will conduct a detailed study, based on both literature and fieldwork that will more clearly link CAVAC's activities to poverty reduction.

## **8 PROGRAM MANAGEMENT**

Over the last six month the CAVAC Management Team has worked together to further develop high quality program management systems. Given the complex nature of contractual relationships between the CAVAC Management Team, the Responsibilities Matrix has also been refined. Minor changes are made to reflect the present situation of financial reporting. See Annex 4 for the updated Matrix.

### **8.1 Staffing**

CAVAC has recruited a team of international and national experts with backgrounds in extension, agricultural knowledge, business knowledge, organisational knowledge, irrigation and policy. At the time of writing, however, CAVAC has not finalised its recruitment process. The Management Team is pleased with the selected candidates; however its decision to hire well-educated Cambodian experts with little working experience requires that the experts are exposed to the best practices in the field. The inexperience of the staff also shows some knowledge gaps in the team. 2011 will require significant investments in training. Internally CAVAC will design a training plan after the recruitment has been finalised.

In addition to the positions originally specified in the project design document, CAVAC seeks approval from the NSC for the reallocation of the Administrative Assistant positions to the following:

- Gender Specialist;
- Environmental Specialist;
- Office Manager;
- IT Officer;
- Finance Officer; and
- Translator.

The Gender and Environmental Specialist positions will ensure that CAVAC is better able to address cross-cutting issues throughout its technical implementation. The Office Manager, IT Officer and additional Finance Officer positions will further assist in the operational management of the Program. A permanent CAVAC Translator will better enable regular letters and short documents to be quickly and professionally translated and shared with counterparts.

The development of the Priority Operating Cost arrangements have led to a system that gives fewer incentives to government staff than expected in the design of CAVAC. Working with government staff will only be successful if staff can commit for longer periods of time. The Sector Monitoring Group recognised this, and raised concerns that CAVAC may be restricted by a lack of human resources and suggested addressing this. CAVAC therefore suggests some additional reallocations of specialised staff as specified in attachment 5.

## **8.2 Stakeholder Collaboration**

CAVAC's design is based on a close collaboration with MAFF, MOWRAM and their provincial offices. Close collaboration has been achieved to some extent. CAVAC's research programs are mainly executed by CARDI, GDA and the PDA's. To date, the selection, detailed design and monitoring of CAVAC's investments in irrigation have all been led by the PDWRAMs and MOWRAM. CAVAC expects these relations will continue to improve. With better knowledge on extension and agribusiness, CAVAC expects a higher collaboration with the specialised units within MAFF. However, collaboration at the provincial level was held back by the absence of the Provincial Coordination Committees. It is expected that 2011 will bring a change to this with the establishment of the Committees.

Initial ideas to design a 'human capacity building plan' for government support, has been replaced by a double strategy of 'close collaboration' on the one hand, and by bringing capacity building under the Policy Facility on the other. Requests for support from MAFF and

MOWRAM will be considered at all times, subject to approval from the Executive Committee of the NSC.

Both MAFF and MOWRAM have expressed concerns that the specialised national and provincial offices would not be able to execute their tasks properly without support in transportation, communication and equipment. CAVAC suggests the following approach to this:

- Detailed contractual arrangements between the specialised units including support for transport and equipment to be determined on a case by case basis. This means that the units will include costs for transportation in their bids for work;
- CAVAC supports communication means with key partners (for example internet access), both nationally and in the provinces. This will be achieved to improve collaboration;
- Each provincial office will have one dedicated car, managed by CAVAC, and available for use by staff of CAVAC, the PDA, the PDWRAM and provincial staff. Use will be restricted to CAVAC related activities only; and
- CAVAC use remaining funds in the transportation budget to allocate a motor bike for the use of each provincial PDWRAM and PDA office (six in total). Final ownership will remain with the program. Details over Fuel and Maintenance will still need to be worked out.

Initial comments on the AWP 2011 revealed concerns about the collaboration of PDAs in general, and specifically in relation to research programs. CAVAC will seriously consider these concerns while further developing working relationship with PDA offices.

During the consultations with PDWRAM Directors it became evident that more clarity is required on the roles and responsibilities of the PDWRAM offices, MOWRAM and CAVAC. A workshop was planned for 19 November but needed to be postponed. The workshop will clarify in more details how CAVAC, MOWRAM and the PDWRAMs will collaborate.

### **8.3 Provincial Coordination Committees and Provincial Offices**

The establishment of the Provincial Coordination Committees (PCCs) remains a priority for CAVAC.

PCCs will play an important role in ensuring local priorities are understood and implemented where appropriate. It is important to establish these Committees as soon as possible given the important role PCCs will play in forward planning.

CAVAC expects the PCCs to be operational by the end of 2010, allowing the Program to finalise the selection and establishment of the provincial offices.



## **8.4 Procurement**

It is anticipated that during 2011, expenditure will occur by tender, competitive quotation, or by grant, depending on the nature and scale of the activity.

All work-plan related expenditure will be made from the imprest account, and will be based on a number of approvals, and primarily, the approval of the National Steering Committee. It will also be subject to internal CAVAC approvals. Work plan related tasks and relevant documents such as Terms of Reference will be approved by the Team Leader, and on the basis of those approvals, expenditure from the account will be authorised by the General Manager.

A Procurement Manager has been appointed, and all CAVAC procurement will be managed by this Manager. A revised Procurement Manual has been prepared, and at the time of writing, has been submitted for approval. It is anticipated that by the time this AWP is implemented, the Manual will be finalised. This sets out in detail the processes and procedures relating to all CAVAC procurement.

A procurement risk assessment and fiduciary risk assessment were planned in 2010 but have not yet taken place. These assessments are expected to be conducted in 2011.

## 9 ANNUAL WORK PLAN BUDGET – 2011

Following is the AWP budget for 2011. The total budgeted expenditure equals US\$5,326,511. This total includes activities to be funded by ACIAR (\$1,684,511) as well as those to be funded under the CAVAC Imprest Account (\$3,642,000). The 2011 AWP budget includes an amount of approximately \$425,000 for activities committed to in 2010, and to be carried over into 2011.

|                           | Description   |   | Expected Milestones - 2011   | Budget (USD) | Other resources           |
|---------------------------|---|---|--|--------------|---------------------------|
| Component 1: Agribusiness |   |   |  | 365,000      |                           |
| 1.1                       | Critical constraints to strategic value chains identified and developed for business action     | Conduct 1 or 2 additional value chain analyses<br>Assess the role CAVAC can play in the RGC export strategy   | Selection of 2 value chains<br>Mapping and constraint analyses for 1 or 2 value chains<br>Position paper developed for Rice export | 5,000        | PDA                       |
| 1.2                       | Agribusiness partnerships supported to innovatively address constraints                         | Improve input markets in rice, vegetables and cassava; processing in cassava; tools in rice.<br>Improve availability of efficient and affordable pump units | 12 interventions started or ongoing.   | 250,000      | PDA, MAFF, MOWRAM, PDWRAM |
| 1.3                       | Enhanced farmer services embedded within agribusiness practices.                                | All companies of 1.2 will be encouraged to add extension activities. Activities will also be addressed in 3.2   | Interventions included in 1.2 and 3.2  | 50,000       | MAFF, PDA                 |
| 1.4                       | Improved availability and communication of market information between value chain stakeholders. | CAVAC to organise a number of linking events and will encourage companies to improve communication within their network.                                    | Included in 1.2 and 3.3  | 10,000       | PDA                       |

|   |   |  |   |                    |                     |
|---|---|--|---|--------------------|---------------------|
| 1.5   | Participatory planning and construction of key infrastructure to address value chain bottlenecks                    | Initial engagements with market managements have been discouraging. CAVAC therefore initiated public private dialogue pilots to assess potential for this approach. If successful, this initiative can be upscaled.  | Dialogue in at least 2 market places established and issues identified and partly addressed.  | 50,000             | Asia Foundation     |
| <b>Component 2: Irrigation and Water Management</b> |   |  |   | <b>\$2,420,000</b> |                     |
| 2.1   | Improved capacity of MOWRAM and PDWRAM to participatively design, develop, operate and maintain irrigation schemes. | Intense collaboration with MOWRAM and PDWRAMs in the construction of up to 11 schemes and outsourcing in the detailed design of another group of schemes. Involvement in the water availability studies  | Extensive collaboration and subcontracting with all 3 PDWRAMs. Support to PDWRAMs in training as chapter 7.2. Some material support | 120,000            | PDWRAM, MOWRAM, PDA |
| 2.2   | Improved capacity of FWUCs to efficiently and effectively operate and maintain their irrigation systems             | In 2011 CAVAC will finalise a position paper on how best to improve ownership of irrigation schemes. This will lead to a need assessment and support to all schemes where CAVAC will be involved with. CAVAC will also scale up the Supplementary Investment Fund. | Up to 13 FWUCS have received support and are better able to manage the irrigation schemes.  | 150,000            | MOWRAM, PDWRAM      |
| 2.3   | Selected systems rehabilitated and transferred to effective FWUCs   | Depending on the decision of the NSC in 2010, CAVAC will tender up to 11 schemes and commence construction in 2011. On top of that, one or two FWUCs will receive co-  | Up to 11 schemes transferred to FWUCs. 1or 2 additional FWUCs supported.  | 2,000,000          | MOWRAM, PDWRAM      |

|  |   |   |   |                    |         |   |
|--|---|---|---|--------------------|---------|---|
|  |   | funding for improvements.   |   |                    |         |   |
| 2.4  | Improved models of water management adopted in rain fed areas                           | If approved by the NSC, ACIAR will initiate a large research project on water management.   | Better knowledge of water management available for extension  |                    | see 3.1 | Cambodian research institutes, MAFF, MOWRAM                 |
| 2.5  | Increase use of hydrological data in the planning and management of irrigation systems  | One water availability study that has been tendered in 2010 will be finalised in 2011. PDWRAMs will be trained on the use of it. If successful, one more study will be undertaken in 2011   | 2 water availability studies finalised. PDWRAMs trained.  | 150,000            |         | MOWRAM, PDWRAM  |
| <b>Component 3: Research and Extension</b> |   |   |   | <b>\$1,684,511</b> |         |   |
| 3.1  | Priority research and extension activities address constraints in selected value chains | 3 large research studies are ongoing focussing on vegetables and rice and considering input markets and agritools.<br>A fourth is planned on water use (for separate approval by the NSC Executive Group)<br>CARF activities will be ongoing<br>Small additional research may be commissioned, if needed. | Details are given in the AWP main text. A summary is as follows:<br>For the 3 approved large research projects, the baselines and trials will have been analysed leading to further research activities. The water use project will have delivered its literature research and first results from the pilots. CARF-9 will have awarded a number of research grants. | CARF               | 197,808 | MAFF (CARDI, GDA, RUA), MOWRAM, IRRI, Australian institutes |
|  |   |   |   | Pool B - approved  | 683,174 |   |

|     |   |  |   |                                    |         |          |
|-----|---|--|---|------------------------------------|---------|----------|
|     |   |  |   | Pool B - to be approved            | 337,529 |          |
|     |   |  |   | Small research                     | 92,000  |          |
| 3.2 | Enhanced capacity of formal and informal extension providers to transfer improved technologies and information to farmers | CAVAC has collected and further developed materials for extension. In 2011, the Program will adjust the form to the needs of the extension provider. It will support extension providers in the following categories: village extension workers, input suppliers, large companies, media, FWUCs and NGOs. The Cambodian Journal of Agriculture will receive support. | 8 interventions that support a range of extension service providers will have started or continued, leading to improved capacity of the providers to reach farmers. | Support knowledge base development | 66,000  | DAE, PDA |
|     |   |  |   | Material production                | 54,000  |          |
|     |   |  |   | Support providers                  | 55,000  |          |
|     |   |  |   | Media assessment                   | 55,000  |          |
| 3.3 | Partnership program linking researchers, extensionists, farmers and agribusinesses developed and implemented              | The extension providers from 3.2 will be linked to sources of knowledge, either directly or via linkage events.  | Extension providers from 3.2 will have access to sources of knowledge   |                                    | 63,000  | DAE, PDA |

|   |  |  |  |                |                  |              |
|---|--|--|--|----------------|------------------|--------------|
| 3.4   | Budgetary support to CARDI   | Payment to CARDI conditional to an agreement reached and development of a strategic resource plan for the next 5 years.      | Operational support to CARDI including the Cambodian Journal of Agriculture  | Budget support | 81,000           |              |
| <b>Component 4: Business Enabling Environment</b> |  |  |  |                | <b>\$452,000</b> |              |
| 4.1   | Improved research and understanding of the enabling environment surrounding key value chains | Additional studies and analyses of issues related to activities undertaken by CAVAC. See AWP text for details.               | At least one issue addressed   |                | 30,000           | MAFF, MOWRAM |
| 4.2   | Increased opportunity for public private dialogue around key enabling environment issues     | Integrated with 1.5  |  |                | 20,000           |              |
| 4.3   | Strengthened industry representative organisations   | Activities will emerge from other activities.  |  |                | 2,000            |              |
| 4.4   | Increased use of Public Private Partnership investment model                                 | Integrated with 1.5 and 2.3  |  |                | see 1.5 and 2.3  |              |
| 4.5   | Policy Support Funding Facility  | This facility will support activities initiated by MAFF / MOWRAM / AusAID with approval from the Executive Group of the NSC. | MAFF supported for rice policy activities.<br>TWG supported with basket funding.<br>Other RGC initiatives supported. |                | 400,000          | MAFF, MOWRAM |

| Cross Component Activities |  |   |  |         | \$405,000 |
|----------------------------|--|---|--|---------|-----------|
| 5.1<br>/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.  | 10,000  |           |
| 5.3                        | Environment and Disaster Risk Reduction        | Environmental strategy will be operational in 2011. Update and provide training on AusAID's revised Environmental Management Strategy. Undertake Environmental Impact Assessments on approximately 10 irrigation schemes                              | All interventions will have been screened for environmental impacts  | 100,000 |           |
| 5.4                        | M&E  | M&E will be an integral part of the work activities of CAVAC. All experts will be involved. In 2011, CAVAC will conduct and commission a number of baselines and impact studies and a more extensive study on the linkage between growth and poverty. | All interventions will have impact logics and monitoring plans. General baseline surveys will have been analysed and shared. | 75,000  |           |
| 5.5                        | Training/seminars/capacity development support | CAVAC will prepare a training needs assessment and training plan for its staff and government counterparts. It is expected that gaps in knowledge and experience need a significant investment in 2011  | CAVAC and RGC staff better able to implement activities  | 200,000 |           |

|     |                   |  |   |        |  |
|-----|-------------------|--|---|--------|--|
| 5.6 | Poverty reduction | CAVAC will conduct a detailed study, based on both literature and fieldwork, that will more clearly link CAVAC's activities to poverty reduction | A study to link growth to poverty will be finalised | 20,000 |  |
|-----|-------------------|--|---|--------|--|

|  |  |   |  |                    |  |
|--|--|---|--|--------------------|--|
| <b>Total Budgeted Expenditure (including ACIAR funded activities):</b> |  |   |  | <b>\$5,326,511</b> |  |
| <b>Total Budget ACIAR:</b>   |  |   |  | <b>\$1,684,511</b> |  |
| <b>Total Budget CAVAC Imprest Account Expenditure:</b>                 |  |   |  | <b>\$3,642,000</b> |  |
|  | Financial commitments carried over from 2010 (included in the above) | <ul style="list-style-type: none"> <li>* Water availability studies</li> <li>* TAF</li> <li>* Gender study</li> <li>* Disability study</li> <li>* Environmental assessment</li> <li>* CISIS</li> <li>* Fiduciary risk assessment</li> </ul> |  | 425,000            |  |



## ATTACHMENT 1: DESCRIPTION OF SECTORS AND STRATEGIES

### Rain-fed wet season rice production

#### ***Situation summary:***

Interviews with farmers showed clearly that the harvest from rain-fed fields is the basis for families' food security and income, but is rarely their only source of income. Most farmers do not show a profit-maximising behaviour, but rather a traditional low risk approach. For example, the rice seed that is used is kept from previous years or locally traded. The varieties that are suitable for the wet season conditions are meeting local tastes but generally have low yields and are less responsive to inputs. Use of chemical fertilisers and pesticides is not common and, in the case of fertiliser, probably is perceived by growers as not always profitable for the local varieties that they use. However, more and more farmers use small irrigation pumps to protect the paddy from dry periods during the wet season.

The local variety paddy grown during wet season is milled in small local mills which can be found in every village. There is some local trade and some export to Vietnam. These local wet season varieties are not suitable for large scale re-export and therefore are consumed in Vietnam.

Cultivation of 'floating rice' in flood plains has become less and less common. The risk is perceived too high and the returns on labour too low.

#### ***Potential:***

It is unlikely that large numbers of farmers will turn into commercial profit-maximising farmers in the next five to 10 years. Thus, that will not be the aim of CAVAC. Presently, yields vary from less than one to close to three tons of paddy per hectare. It is possible and feasible to increase rice yields substantially. A key starting point will be the introduction of improved varieties. Some improved varieties are already available in Cambodia, others will need to be developed and introduced.

The improved varieties should have a similar taste to current varieties but should respond better to inputs, whether organic or chemical fertilisers. Drought, submergence tolerance, and pest resistance are three other desirable qualities; characteristics that will reduce risk for farmers. Stimulating local institutions' identification, development, production and introduction of better varieties with quality seeds can and should be a first step for CAVAC.

In parallel, access to water for irrigation and promoting access to better pest control could improve yields and reduce risks of rain-fed farming.

Driving through CAVAC's provinces during the rainy season makes the importance of rain-fed paddy unambiguously clear—all farmable land seems to be green rice fields. This means that small changes in yields can have a significant impact given the potential outreach.

## **Dry season rice cultivation.**

### ***Situation summary:***

Cambodian farmers have developed several mechanisms to use available water for irrigation of rice in the dry season. The wide variety of dry season irrigated rice cultivation again makes generalisations dubious, but, for the purpose of this document, useful.

On the floodplains of Takeo and Kampot, farmers use fertiliser at rates close to the economical optimal. Interviews with farmers and traders have demonstrated that at present, most farmers have a commercial orientation towards rice cultivation. Varieties are chosen for export demand with high yields (IR 66 / IR504) or high value. Close to the border with Vietnam, farmers use large amounts of pesticides; they control rodents and experiment with other yield enhancers – not always those recommended by research findings. Yields in these areas are on average between five and seven tons per hectare. This gives a good income to rural families. Incomes are even better if available water allows for a second dry season crop. Observations show that these dry season rice farmers invest more heavily in farm mechanisation.

There is also a large group of farmers that choose another way of farming, hereby influenced by a number of NGO's. When these dry season growers follow the elements of SRI, a system of rice intensification (such as using only organic fertiliser combined with elements of botanical pest management), they have reduced input costs, but also more limited yields (often yields will be less than 3 ton / ha).

Use of inputs is, in general, significantly lower in Kampong Thom compared to the other two CAVAC target provinces. This is likely caused by Kampong Thom's weaker links with Vietnamese traders and different but more fertile soil types.

'Recession rice', a particular type of irrigated dry season rice cultivation method, is commonly used in Kampong Thom. Recession rice method involves retaining/storing flood water and continuing to use the moisture after the water retracts. Sediments left by the floods keep the soil fertile, allowing for yields up to four tons per hectare even without the use of fertiliser.

Recently more and more farmers with access to sufficient water have moved to early wet season cultivation combined with a shorter wet season crop. These are among the most commercial farmers.

Direct export of rice is still very small compared to the overall production. Recent investment in milling capacity and the Government's rice export policy show clear intentions. Developing a reliable high quality value chain from uniform seeds to reliable quantities shipped will require efforts at different stages of the chain.

**Potential:**

High rice demand from Vietnam is both an opportunity and a risk. It offers an inelastic market where Cambodia can increase production without reducing the price. As such, in the short-term it would be wise for Cambodia to profit from this, whilst also developing alternative export channels to mitigate the risk of a single channel and to increase the tax base.

An average farming family with a first dry season harvest of six to seven tons per hectare and a second rice crop of four tons per hectare is well off. Takeo Province has thousands of farmers like this. The key challenge for dry season rice production is to learn from these farmers and disseminate their successes to similar farmers with much lower yields in a way that creates sustainable agricultural practices.

In an ideal situation all farmers would have access to unbiased and full information to allow them to choose the best solution for their situation. Farmers should also be able to purchase good quality inputs in well-functioning input markets that respect the law and thus, the environment. If on top there are well functioning markets for paddy or rice then yields and profits would increase to levels that significantly reduce poverty. This ideal situation is not a dream, but an achievable aim.

**Irrigation*****Situation Summary:***

Irrigation in Cambodia is complex and describing this is beyond the scope of this document. While recognising the risk of simplification, this report will give some major observations on which CAVAC will initially base its strategies.

Irrigation is used as a supplementary water source in early wet season and in wet season rice crops, and as the main source of water during the dry season. The sources of water are rivers and canals, large reservoirs, and all kinds of smaller dams and pools of water.

Groundwater use is still rare in CAVAC's target provinces. Many irrigation systems are interdependent or sometimes multifunctional, like dams that both protect against floods as well as retain water for the dry season.

Where gravity was the main force of distributing water in the past, the current availability of cheap small pumps has opened new potentials, especially in the flat provinces of CAVAC. Large parts of the cultivated land in the dry season depend on these pumps.

The Government and donors have invested heavily in rehabilitation of gravity based systems that were often constructed under the Khmer Rouge regime. The systems are, in principle, cheaper for farmers and still have potential for improvements, but also have general shortcomings. These include suboptimal design, organisational weakness, insufficient funds for maintenance and operational issues. In summary, the main constraints include:

- Most farmers refuse to pay water fees in the wet season and many schemes do not have enough water in the dry season to serve more than 15 to 20% of the farmers. Hence with only 15 to 20% of the farmers using water in the dry season, there are not sufficient funds recovered to cover operational and maintenance costs;
- Most gravity based schemes have simple distribution systems that do not allow for need-based irrigation and farmers are reluctant to give up land to improve this;
- Farmers' ownership through FWUC's is an essential element in a well-functioning irrigation scheme, but has so far been problematic in most cases; and
- A realistic agricultural potential analysis based on growers' requirements should be the starting point of a successful irrigation scheme. This is often not the case.

***Potential:***

Discussions with PDWRAMs have indicated that land under cultivation in the dry season has doubled over the last 10 years. These dynamics are very interesting and may show the way for further cost effective investments. Changes like: the improved financial position of communes; the increasing ownership of small pumps that allow for non-gravity based irrigation; and, increased interest of the private sector to invest, especially in pumps from the main canals, are opening up potential for new forms of irrigation. These new forms will, of course, face new constraints that need to be addressed. These new constraints could be related to infrastructure as well as organisational, legal and agricultural challenges.

**Vegetables and other crops*****Situation summary:***

Thirty to 40 years ago, the surrounding countries of Lao PDR, Thailand and Vietnam had agricultural systems similar to that of Cambodia. Agriculture was mainly rice based. Some neighbouring countries, such as Vietnam and Thailand, went through a diversification process. The production of more profitable cash crops grew quickly. It can be expected that Cambodia will go through a similar process over the next decade. Crops like maize, cashew nuts, cassava, vegetables and fruits are likely candidates for this change. However, currently there is solid international demand for rice as well as a strong domestic demand for local rice varieties; this is unfortunately not the case for most other cash crops. The urban fruit and vegetable market is dominated by good quality imports from Vietnam and Thailand. Cambodian producers are also not yet competitive in most other cash crop markets.

Local producers of vegetables however are gaining ground for the crops that grow well in Cambodia, especially the green leafy vegetables. Insufficient farmer knowledge and availability of suitable inputs keep yields and quality low. With better inputs and knowledge,

yields, quality and overall volume is likely to increase, regaining some of the demand now served by Vietnamese and Thai products.

***Potential:***

The potential for vegetables probably lies in increasing availability of suitable inputs, water and knowledge.

Solutions for other crops are likely to require a package of interventions that include most steps of the value chain and that will require time.

Value chain analyses can identify other crops with potential, and strategies for how to utilise this potential. A fast growing, well-educated and entrepreneurial middle class forms both a demand and innovative spirit for this.

## ATTACHMENT 2: CASSAVA VALUE CHAIN ANALYSIS

For CAVAC, sustainable income improvement within the context of environmental sustainability is the ultimate objective and the choice to work in the cassava sector must be seen in the context of its potential to increase income to the rural poor while ensuring that there are no detrimental environmental impacts.

There are two main characteristics of cassava that ensure that it is an important crop for the rural poor:

- It is a fairly labour intensive crop with CAVAC estimating that there are about 75 man days (md) involved in the cultivation of one hectare of Cassava while Howeler in 2008 estimated that there were 100 md<sup>2</sup>. involved in cultivating one hectare of cassava in Cambodia. As the rural landless are amongst the poorest of the poor, potential as an income generating opportunity is significant; and
- The ability of cassava to be stored in the ground by delaying the harvest allows it to be used as a food bank<sup>3</sup> for the food insecure.

The combination of these two aspects points to an opportunity for labour inputs that is distributed throughout the year which allows labour income to the landless outside of peak season(s). The potential impact therefore on rural incomes of the poorest is estimated to be significant.

### Introduction

The Cambodian cassava (starch) value chain has access to three terminal markets: Thailand, Vietnam and the domestic market. The supply of these markets is organised from two main clusters/areas of production. The Thai market is supplied from Battambang, Pailin and Banteay Meanchey while the Vietnamese and domestic markets are supplied from the cluster around Kampong Cham (including Kampong Thom).

The supply to Vietnam is steadily increasing while the supply to Thailand has been erratic based on the price and the state of the conflict between Cambodia and Thailand. It is estimated, for instance, that the exports to Thailand in 2009 were 21% of the export volume to Thailand in 2008.

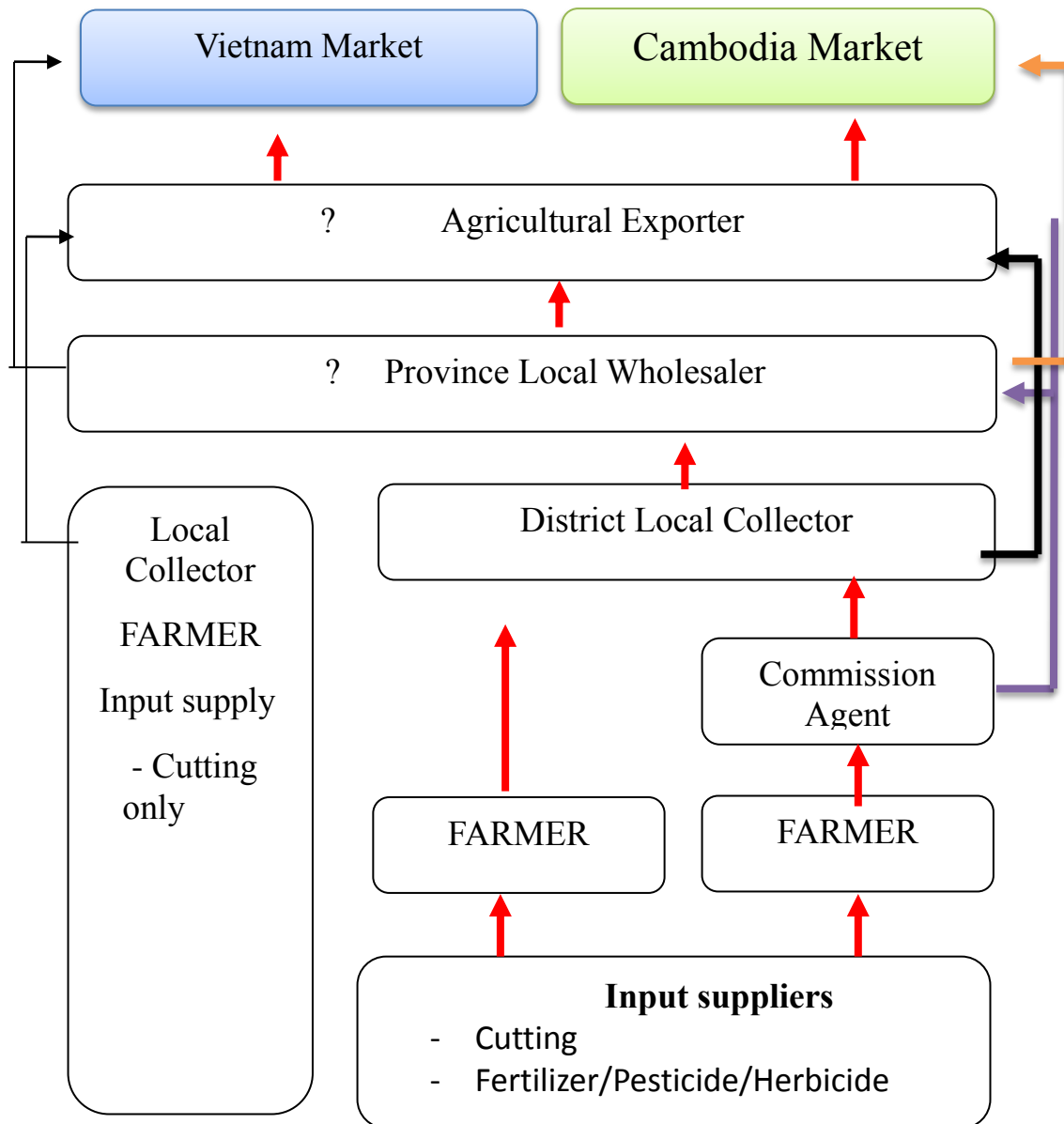
Within the context of CAVAC, an understanding of the total market is important but, in particular, it is important to understand how the producers in Kampong Thom access the market. Kampong Thom is a target province for CAVAC and uses the same distribution channels as Kampong Cham. The share of the market accessed through the cluster around

<sup>2</sup> Howeler R.H., Cassava in Asia: A potential new green revolution in the making, 2008

<sup>3</sup> Fahrney K., et al, Opportunities for improving Livelihoods and intensifying production by linking smallholders to Cassava Agro-industries, 2008

Kampong Cham was about 1.6 million tons in 2009. This was 60% of the total market, while in 2008 it was less than 45%.

Figure 2: Value Chain Map for Cassava in Kampong Thom



## Constraints

Currently the cassava sector is experiencing rapid expansion with demand from three basic industries: starch, bio-fuel and animal fodder. All indicators show that demand for cassava is increasing and securing supplies is one of the key constraints for all domestic businesses in the cassava value chain. Further evidence is that the increasing price in some cases, such as the MH (ethanol plant), caused the plant to stop operations until the cassava price decreased.

Domestic consumption is currently small compared to the export volumes with only two main export destinations (Thailand and Vietnam). The impact of closing of either market can be disastrous as was the case in 2008 when Thailand closed its border with Cambodia. A summary of all constraints found in the value chain analysis is presented in Table 5.

**Table 5 Cassava Value Chain Constraints per Actor**

| Constraint  | Farmers  | Collectors/<br>Traders  | Industries (Domestic) |        |             |
|---|--|---|-----------------------|--------|-------------|
|   |  |   | Ethanol               | Starch | Animal Feed |
| Inputs (Cuttings)<br>(Fertiliser)<br>(Pesticides) | <ul style="list-style-type: none"> <li>Unavailability of inputs</li> <li>Unavailability of specialised dealers in cassava inputs</li> <li>Active discouragement from PDA for farmers to use agro-chemicals</li> <li>No source of new planting material (varieties)</li> <li>Poor knowledge on storage of cuttings</li> </ul> |   |                       |        |             |
| Post Harvest                                      | <ul style="list-style-type: none"> <li>Unaware of proper drying technique.</li> </ul>  |   |                       |        |             |
| Legal Issues                                      | <ul style="list-style-type: none"> <li>Land titling (Sandán District)</li> </ul>   | Informal Transportation Fees  |                       |        |             |
| Storage/Transport                                 |  | Quality loss  |                       |        |             |
| Working Capital                                   |  | Buyers have long credit periods especially in the export to Vietnam |                       |        |             |
| Increasing Competition                            |  | More buyers in the market make it more difficult to secure supply   | XX                    | XX     | XX          |
| Low Starch Quality                                |  |   |                       |        | XXX         |



| Constraint                                   | Farmers | Collectors/<br>Traders | Industries (Domestic) |        |             |
|--|---------|------------------------|-----------------------|--------|-------------|
|  |         |                        | Ethanol               | Starch | Animal Feed |
| Lack of Supply/Under utilisation of capacity |         |                        | XXX                   | XXX    | XXX         |
| Insufficient Contract Farming                |         |                        | X                     | X      | x           |
| High Price/<br>Unprofitable to Operate Plant |         |                        | XX                    |        |             |

*X stands for the severity of the problems. More Xs is more severe.*

Currently the market for starch cassava is exceptionally dynamic. The Cambodian cassava sector is the fastest expanding cassava sector in the world with an annual growth rate of 17%<sup>4</sup>. Growth however is reliant on only a few markets and an incident at any of these markets can have dramatic consequences for the cassava sector in Cambodia. In 2009 the total demand for cassava was 2.4 million tons of which 17% was from domestic demand. In 2008, total demand had been in the vicinity of 3.4 million tons of which about 10% was from domestic sources. The sudden decline in 2009 was caused by Thailand closing its borders with Cambodia.

**Table 6 Composition of the Market in 2009**

| Market       | Industry                  | Quality     | Sale of Cassava (tons) |
|--------------|---------------------------|-------------|------------------------|
| Cambodia     | Starch                    | +           | 124,000                |
|              | Ethanol (Bio-Fuel)        | ++          | 200,000                |
|              | Ethanol (Consumption)     | ++          | 30,000                 |
|              | Feed                      | +++         | 30,000                 |
|              | <b>Total</b>              |             | <b>384,000</b>         |
| Vietnam      | Unspecified (Dried Chips) | Unspecified | 1,236,740              |
| Thailand     | Unspecified (Dried Chips) | Unspecified | 374,400                |
| <b>Total</b> |                           |             | <b>2,379,140</b>       |

In 2009, the exports to Thailand were only 20% of the import demand of Thailand in 2008. This caused the price to decline on the domestic market to US \$40/ton in 2009. Currently the price has recovered to US \$ 165/ton. Exports to Thailand have recovered to an estimated 40% of 2008 levels.

<sup>4</sup> UNDP report

**Table 7: Thai Market development from 2008 to 2010**

| Year                         | Thailand market (Rourn Vancy) |            |                 |
|------------------------------|-------------------------------|------------|-----------------|
|                              | 2008                          | 2009       | 2010 (estimate) |
| Area under cultivation       | 130,000                       | 26,000     | 52,000          |
| Average Yield                | 36 tons/ha                    | 36 tons/ha |                 |
| Total Yield (Wet)            | 4,680,000                     | 936,000    |                 |
| Total Yield (Dry) (t/ha:0.4) | 1,872,000                     | 374,400    |                 |

Most of the domestic industries have reported a shortage of supplies with processing plants only open for part of the year; thus, their capacity is under-utilised. This is especially true of the MH (biofuel plant) and the starch factories in Kampong Cham, while the animal feed industry is struggling to get the required quality of produce required. Private companies have indicated an interest in increasing the capacity of local processing and are researching innovative means to access more stable supplies. Some are considering providing specialised extension services with inputs while others are considering improving reliability of supplies through contract farming

Production practices show a wide range in productivity from 40 tons per hectare in Pailin to five to eight tons per hectare in less productive provinces such as Kampong Thom. Improved availability of inputs and production advice should allow for doubling of production in a province such as Kampong Thom.

The current method of production leads to soil nutrient depletion due to the lack of use of fertiliser whether organic or inorganic. In many cases, fields are abandoned after three years of cultivation, and new land is cleared for the next cycle of cassava cultivation. Improved management of existing fields will allow for more sustainable production and less environmental impact.

## Strategy

The focus will be on providing access to more differentiated markets for cassava. This will comprise of two approaches:

1. Increasing the size of the domestic market relative to the export market.
2. Gaining access to more export markets to reduce reliance on Vietnam and Thailand.

Mechanisms to achieve this include:

- Enhancing yields: There is a significant potential in Kampong Thom to increase yield from the current 7.5 tons/ha to at least twice as much with yields of up to 40 tons/ha reached in Pailin. This is not an unrealistic vision. Improved yields will allow existing

processing plants to work closer to optimal capacity increasing the Cambodian cassava industry competitiveness. It will also provide an incentive for further investment in the domestic Cassava market. An expanded domestic market would provide more price stability due to smaller reliance on exports; and

- Developing other export markets: This will reduce the reliance on only Thailand and Vietnam and will enhance demand stability in the cassava sector. The key to accessing more export markets is to improve the quality of Cambodian cassava through working on the drying of the harvested cassava chips.

These interventions have the capacity to make a significant impact on the national level. It will be likely that improved production practices and improved handling will be adopted in neighbouring provinces such as Kampong Cham and Siem Reap.

## ATTACHMENT 3: RESPONSIBILITY MATRIX

| Team Leader (TL)   | Operational Contractor (OC)  | ACIAR   | RGC   | AusAID  |
|--|--|---|---|---|
| <b>Contract Management</b>   |  |   |   |   |
| The TL will advise AusAID regarding contract management issues related to the delivery of goods and services through the Operating Contractor SoS and the ACIAR RoU Schedule.  | The OC will manage contracts with entities sub-contracted by the OC to supply goods and services related to the OC's Scope of Services.<br>The OC will nominate a General Manager to coordinate OC activities and represent the OC on contractual matters. | ACIAR will manage contracts with entities sub-contracted by ACIAR to supply services related to the ACIAR MoU Schedule. | As required, the RGC will advise AusAID on contract management issues through the National Steering Committee, which be co-chaired by MAFF and MOWRAM and will meet at least six monthly. | AusAID will delegate an A-based officer to oversee all aspects of CAVAC contract management, including contracts with the TL and OC, and the RoU Schedule with ACIAR. This officer will also manage contracts with individuals on the SMG and the ARD Advisor. The delegated A-based officer at Post will ensure that the TL, OC and ACIAR deliver their Scope of Services and Schedule to an acceptable quality, considering advice from the TL, the AusAID ARD Advisor and the SMG. |
| <b>Performance Management</b>  |  |   |   |   |
| The TL will assess the management performance of the OC and ACIAR and report on this in the six-monthly progress reports or monthly exception reports if required. The TL will manage the performance of OC and ACIAR program staff on a day-to-day basis and advise the | The OC will support and manage the performance of its program personnel, responding to advice from the TL.   | ACIAR will support and manage the performance of its program personnel, responding to advice from the TL.               | RGC will manage the performance of its personnel seconded to the program, responding to advice from the TL.   | AusAID will manage the performance of the TL, considering advice from the AusAID ARD Advisor and the SMG. AusAID will conduct an annual performance assessment of both the TL and OC. AusAID will manage the performance of the AusAID ARD  |

| Team Leader (TL)   | Operational Contractor (OC)  | ACIAR   | RGC   | AusAID  |
|--|--|---|---|---|
| OC, ACIAR and AusAID of any major performance management issues. In cases of dispute, the TL (reporting to the NSC) will have authority in relation to the selection and performance management of all project personnel, whether they are engaged by the OC or ACIAR or seconded from the RGC.                                |  |   |   | Advisor and the SMG.  |
| <b>Reporting</b>   |  |   |   |   |
| The TL will report operationally to the National Steering Committee. The TL is responsible for finalising the inception report, annual work plans, six-monthly progress and financial reports, monthly exception reports, technical reports and the program completion report, with support from the OC and ACIAR as required. | The OC and its personnel will report operationally to the TL. The OC will provide the TL with inputs to the inception report, annual work plans, six-monthly progress and financial reports, monthly exception reports, technical reports and a program completion report. | ACIAR and its personnel will report operationally to the TL. ACIAR will provide the TL with inputs related to the Research and Extension Component for the inception report, annual work plans, six monthly progress and financial reports, monthly exception reports, technical reports and a program completion report. | The RGC representatives on the National Steering Committee will consider reporting provided by the TL and provide guidance/approval as necessary. | The AusAID representative on the National Steering Committee will consider reporting provided by the TL and provide guidance/approval as necessary. |
| The TL will coordinate regular internal planning and review meetings involving Program staff from all components and levels.   | All OC program staff will participate in regular internal planning and review meetings and provide secretariat support to these meetings, including the  | All ACIAR program staff will participate in regular internal planning and review meetings.  |   |   |

| Team Leader (TL)  | Operational Contractor (OC)   | ACIAR   | RGC  | AusAID  |
|---|---|---|--|---|
|   | production of minutes.  |   |  |   |
| <b>Procurement</b>  |   |   |  |   |
| The TL will approve detailed specifications regarding required goods and services provided by the OC and ACIAR through the annual planning process.           | The OC will provide detailed specifications regarding required goods and services to the TL for approval through the annual planning process. The OC will manage the procurement of goods and services in accordance with Australian Commonwealth Procurement Guidelines, Cambodian Law and the recommendations made by the Procurement Assessment. | ACIAR will provide detailed specifications regarding required goods and services for the management of the Research and Extension Component (e.g. office facilities, computers, mobile phones, vehicles) to the TL for approval through the annual planning process. ACIAR will manage the procurement of goods and services related to the implementation of Research and Extension Component in accordance with Australian Commonwealth Procurement Guidelines and Cambodian Law. | The RGC representatives on the National Steering Committee and the CAVAC focal points will provide advice on procurement processes, particularly where RGC systems are utilised. They will collaborate with the personnel conducting the Procurement Assessment, briefing them and providing them with additional information as required. | In cases where the use of RGC procurement systems is being considered, AusAID will commission a detailed assessment of Partner Procurement Capability and Capacity and Associated Procurement Risk (Procurement Assessment) prior to final agreement on the use of these systems. If the Procurement Assessment determines that the use of RGC procurement systems is feasible, then final approval to utilise these systems will be sought from Minister Counsellor, Mekong Program and ADG, Operations Policy and Support Branch. |
| <b>Logistical Support</b>   |   |   |  |   |
| The TL will approve requests for logistical support through the annual planning process and verify the adequacy of the logistical support provided by the OC. | The OC will provide logistical support to the entire Program, including the Research and Extension Component managed by ACIAR, in accordance with the requirements  | ACIAR will consult with the OC on its logistical support requirements related to the management of the Research and Extension Component.  | RGC will consult with the OC on logistical support requirements for the PMO and PCC and NSC.   | AusAID will consult with the OC on logistical support requirements for the SMG.   |

| Team Leader (TL) | Operational Contractor (OC)  | ACIAR  | RGC | AusAID |
|------------------|--|--|-----|--------|
|                  | specified in the approved annual work plan.  |  |     |        |
|                  | The OC will procure and maintain adequate office facilities, computers, mobile phones and vehicles for the use of all Program personnel (including those working on the Research and Extension Component).   |  |     |        |
|                  | The OC will provide general administrative support (e.g. assistance with travel arrangements) to all Program personnel, including those working on the Research and Extension Component.   |  |     |        |
|                  | The OC will recruit, contract and pay all International and National personnel working on the Agribusiness Development, Water Management and Business Enabling Environment Components and provide finance, procurement, administrative support to the Program. They will collaborate | ACIAR will recruit, contract and pay all International and National personnel working on the Research and Extension Component. They will collaborate with the OC to ensure that all national staff working on the Program are contracted under similar terms and conditions. |     |        |

| Team Leader (TL)     | Operational Contractor (OC)  | ACIAR  | RGC     | AusAID         |
|----------------------|--|--|---------|----------------|
|                      | with ACIAR to ensure that all national staff working on the Program are contracted under similar terms and conditions.                                       |  |         |                |
|                      | The OC will manage the administrative and financial arrangements (including disbursements) for the smaller, non-program defined research programs (pool A).  | ACIAR will manage administrative and financial arrangements (including disbursements) for the larger, program defined research programs (pool B) from ACIAR Head Office in Canberra. The administrative costs of this will be borne by ACIAR as part of its contribution to CAVAC. |         |                |
|                      | The OC will ensure that the PMO and PCC offices have adequate logistical support capacity.   |  |         |                |
|                      | The OC will provide logistical support to the National Steering Committee and the Sector Monitoring Group as required and specified in the annual work plan. |  |         |                |
|                      | As directed by AusAID, the OC will manage the Policy Support Facility.   |  |         |                |
| <b>Policy Advice</b> |  |  |         |                |
| The TL will          | The OC will  | ACIAR will   | The RGC | The AusAID ARD |



| Team Leader (TL)   | Operational Contractor (OC)  | ACIAR  | RGC   | AusAID   |
|--|--|--|---|--|
| <p>provide regular advice to AusAID and the RGC regarding relevant policy issues that impact CAVAC's implementation and progress. The TL will report to the National Steering Committee regarding these policy issues through the six monthly progress report.</p> | <p>provide ongoing advice to the TL regarding relevant policy matters that impact CAVAC's implementation and progress.</p> | <p>provide ongoing advice to the TL regarding relevant policy matters that impact on the Research and Extension Component's implementation and progress.</p> | <p>representatives on the National Steering Committee will consider relevant policy issues impacting on CAVAC's implementation and progress in a collaborative manner. Urgent policy issues impacting on CAVAC's implementation and progress will be considered collaboratively by the RGC representatives in the NSC Executive Group.</p>                        | <p>Advisor and SMG will provide ongoing advice to AusAID and the RGC regarding relevant policy issues that impact CAVAC's implementation and progress in a collaborative manner. The AusAID representative on the National Steering Committee will consider relevant policy issues impacting on CAVAC's implementation and progress.</p>   |
|  |  |  | <p>Broader policy issues impacting government and development partner progress in the agriculture and water sector will be addressed through the Technical Working Group for Agriculture and Water. It is expected that the Co-Chairs of the National Steering Committee will also be the Co-Chairs of the Technical Working Group for Agriculture and Water.</p> | <p>Urgent policy issues impacting on CAVAC's implementation and progress will be considered collaboratively by the AusAID representative in the NSC Executive Group. Broader policy issues impacting government and development partner progress in the agriculture and water sector will be addressed through the Technical Working Group for Agriculture and Water. It is expected that the AusAID representative on the National Steering Committee will also be the AusAID representative in</p> |

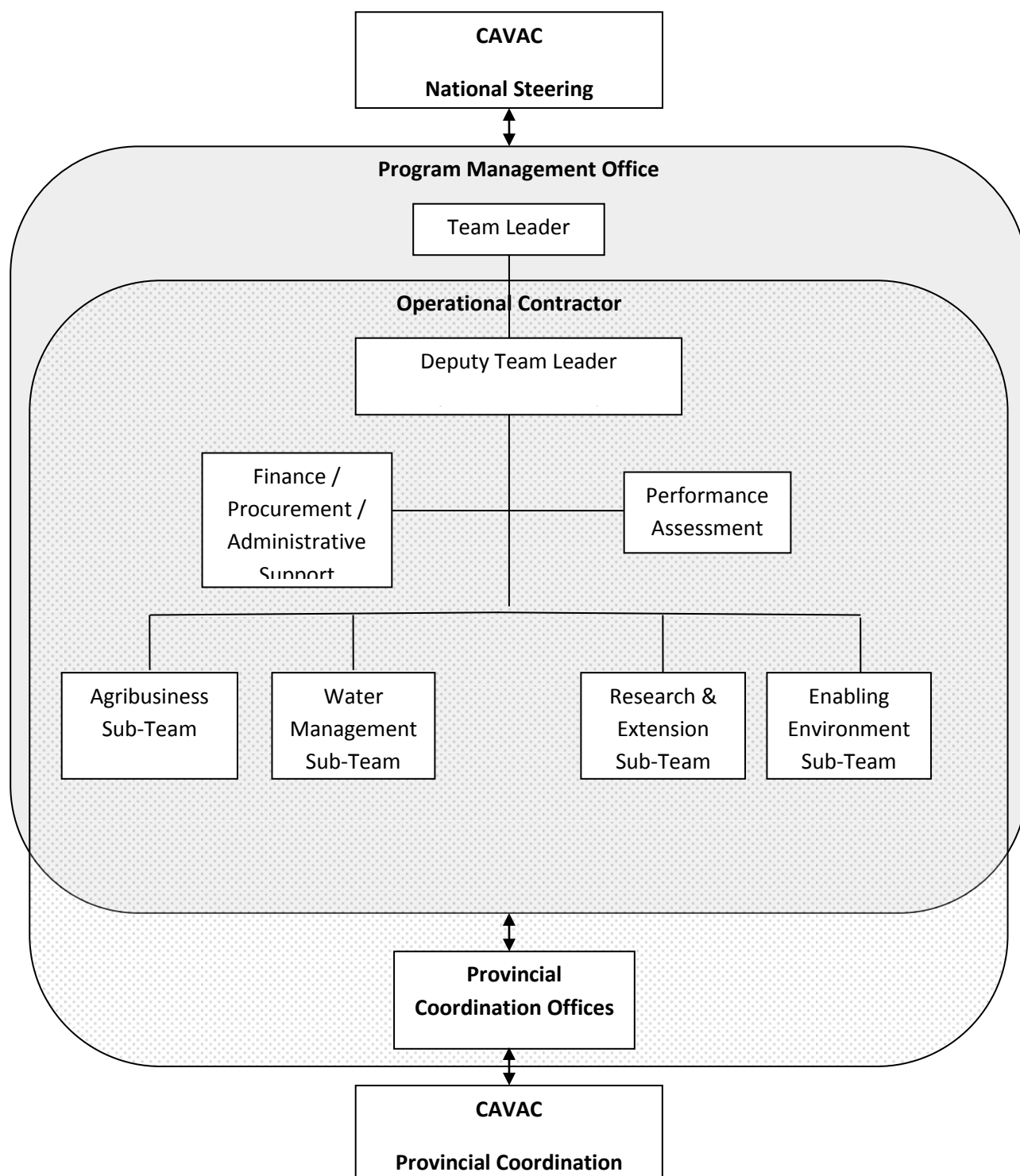
| Team Leader (TL)  | Operational Contractor (OC)  | ACIAR  | RGC   | AusAID  |
|---|--|--|---|---|
|   |  |  |   | the Technical Working Group for Agriculture and Water.  |
| <b>Policy Representation</b>  |  |  |   |   |
| As delegated by AusAID, the Team Leader will have the authority to represent AusAID and its contractors in policy matters.  |  |  |   | Unless delegated to the TL, AusAID will represent itself in policy matters.   |
| <b>Monitoring and Evaluation</b>  |  |  |   |   |
| The TL, with the assistance of the Monitoring and Evaluation Manager and Specialist, will oversee and coordinate the development and implementation of a CAVAC M&E Framework (to be included in the Inception Report), Annual Quality Assurance Audit, Annual Work plans, Six-Monthly Progress Reports. | The OC will ensure that high quality input is provided to the TL by the Monitoring and Evaluation Manager and the Agribusiness Development and Water Management Component Managers for the development and implementation of the CAVAC M&E Framework (to be included in the Inception Report), Annual Quality Assurance Audit, Annual Work plans and Six-Monthly Progress Reports. | ACIAR will ensure that high quality input is provided by the Research and Extension Component Manager to the Monitoring and Evaluation Manager and Specialist and the TL for the development and implementation of the CAVAC M&E Framework (to be included in the Inception Report), Annual Quality Assurance Audit, Annual Work plans and Six-Monthly Progress Reports. | The RGC representatives on the National Steering Committee will review and approve the CAVAC M&E Framework (to be included in the Inception Report), Annual Quality Assurance Audit, Annual Workplans and Six-Monthly Progress Reports. | The AusAID representative on the National Steering Committee will review and approve the CAVAC M&E Framework (to be included in the Inception Report), Annual Quality Assurance Audit, Annual Workplans and Six-Monthly Progress Reports. |
| The TL will be responsible for ensuring that the CAVAC M&E Framework is aligned and integrated with the M&E processes developed for the SAW.  | The Monitoring and Evaluation Manager and Specialist will assist the TL in ensuring that the CAVAC M&E Framework is aligned and integrated with the M&E processes developed for the  |  | The RGC focal points for CAVAC will support the Program Implementers in ongoing assessment of the alignment and integration of CAVAC's M&E framework with the M&E processes   |   |

| Team Leader (TL)  | Operational Contractor (OC)   | ACIAR  | RGC  | AusAID   |
|---|---|--|--|--|
|   | SAW.  |  | developed for the SAW.   |  |
| The TL will collaborate with the Sector Monitoring Group, briefing them and providing them with additional information as required.   | The OC will collaborate with the Sector Monitoring Group, briefing them and providing them with additional information as required.   | ACIAR will collaborate with the Sector Monitoring Group, briefing them and providing them with additional information as required.   | The RGC representatives on the National Steering Committee and the RGC focal points for CAVAC will collaborate with the Sector Monitoring Group, briefing them and providing them with additional information as required. | AusAID will establish the Sector Monitoring Group to provide independent performance monitoring and strategic advice to AusAID on CAVAC and AusAID's broader support to agriculture and rural development in Cambodia. AusAID will mobilise the SMG on a periodic basis (approximately six monthly) each year. AusAID will collaborate with the Sector Monitoring Group, briefing them and providing them with additional information as required. The SMG will report to AusAID and the NSC who will consider the SMG's recommendations and direct the TL accordingly |
| The TL will collaborate with the Independent Review Team for the Mid-Term Review and Independent Completion Report, briefing them and providing them with additional information as required. | The OC will collaborate with the Independent Review Team for the Mid-Term Review and Independent Completion Report, briefing them and providing them with additional information as required. | ACIAR will collaborate with the Independent Review Team for the Mid-Term Review and Independent Completion Report, briefing them and providing them with additional information as required. | The RGC representatives on the National Steering Committee and the RGC focal points for CAVAC will collaborate with the Independent Review Team for the Mid-Term Review and Independent Completion                         | AusAID will commission an independent Mid-Term Review to assess management performance, progress to-date against agreed annual targets, alignment with RGC policies and programs, harmonisation with other donor-  |

| Team Leader (TL)                       | Operational Contractor (OC)                | ACIAR                                       | RGC  | AusAID  |
|--|--|---|--|---|
|  |  |   | Report, briefing them and providing them with additional information as required. The RGC representatives on the NSC will consider the Mid Term Review and Independent Completion Report recommendations and take action accordingly | funded activities, and the need for design modifications. The MTR will form the basis for a recommendation on whether to proceed with the fourth and fifth years of CAVAC's implementation. AusAID will commission an Independent Completion Report during the final year of implementation which will include an overall assessment of results achieved and will make a recommendation about whether to extend for a further 5 years. AusAID will collaborate with the Independent Review Team for the Mid-Term Review and Independent Completion Report, briefing them and providing them with additional information as required. AusAID and the NSC will consider the Mid Term Review and Independent Completion Report recommendations and take action accordingly |
| <b>Risk and Fiduciary Management</b>   |  |   |  |   |
| The TL will ensure the development and | The OC, under the guidance of the TL, will | ACIAR will contribute to the fiduciary risk | RGC will monitor and respond to risk management  | AusAID is responsible for ensuring that risk  |

| Team Leader (TL)   | Operational Contractor (OC)  | ACIAR   | RGC  | AusAID   |
|--|--|---|--|--|
| <p>implementation of risk and fiduciary management by the Program and advise AusAID on this through the Inception Report, Annual Plan and Six-Monthly Progress Reports. The TL will ensure The TL will monitor and report any instances of corruption to AusAID and the NSC.</p> | <p>prepare a preliminary fiduciary risk assessment and detailed risk management strategy as part of the Inception Report. The OC will report and update risk management information through the Annual Plan and Six-Monthly Progress Reports. The OC, under the guidance of the TL, will establish guidelines and procedures that meet GoA and RGC requirements for: procurement; financial management and accounting; management of partnership activities; performance monitoring and evaluation; and personnel and physical assets management. These guidelines and procedures will apply for all of CAVAC's components and will be detailed in the CAVAC Procedures Manual, which will be developed during the Inception Period. The OC will assure financial management systems and processes for funds managed</p> | <p>assessment and detailed risk management strategy as part of the Inception Report. ACIAR will report and update risk management information related to the Research and Extension Component through the Annual Plan and Six-Monthly Progress Reports. ACIAR will assure financial management systems and processes for funds managed under CAVAC's Research and Extension Component (Component 3). This will include program funds spent through any subcontracted Commissioned Organisations or Contractors, and through the Partner Government. ACIAR will receive 6monthly tranche payments and will acquit them in accordance with the procedures outlined in the AusAID-ACIAR umbrella Record of Understanding. ACIAR will provide financial reporting in the required format to the OC for input into the consolidated Six-</p> | <p>and fiduciary issues raised in the six-monthly progress reports through discussions at the National Steering Committee.</p> | <p>management and fiduciary issues raised in the six-monthly progress reports, through discussions at the National Steering Committee and more regular discussions with the Program Implementers and RGC are acted upon. AusAID will provide advice to the TL and OC on risk management requirements and appropriate assessment instruments.</p> |

| Team Leader (TL) | Operational Contractor (OC)  | ACIAR   | RGC | AusAID |
|------------------|--|---|-----|--------|
|                  | under CAVAC, apart from the Research and Extension Component (Component 3). This will include program funds spent through any subcontracted Commissioned Organisations or Contractors, and through the Partner Government. The OC, under the guidance of the TL, will prepare consolidated | Monthly Financial Reports. ACIAR will review the financial management system in place for CARF, to ensure it is consistent with CAVAC requirements outlined in the Procedures Manual. |     |        |

**ATTACHMENT 4: CAVAC ORGANISATIONAL STRUCTURE**

## ATTACHMENT 5: CAVAC STAFFING STRUCTURE

| Position  | Name            | Period of Engagement                      | Notes  |
|---|-----------------|---|--|
| <b>AusAID</b>   |                 |   |  |
| Team Leader   | Peter Roggekamp | Full Term of CAVAC                        |  |
| <b>Operational Contractor (Cardno Emerging Markets)</b> |                 |   |  |
| <b>Administration and Finance</b>                       |                 |   |  |
| Operational Contractor General Manager                  | Roger Bednall   | Full Term of CAVAC                        |  |
| Procurement Manager                                     | Trevor Parris   | Full Term of CAVAC                        |  |
| Procurement Officer                                     | Sok Sokha       | Full Term of CAVAC                        |  |
| Finance Officer   | Pann Kim Hoeun  | Full Term of CAVAC                        |  |
| Admin Assistant 1                                       | Chhun C. Tate   | Full Term of CAVAC                        |  |
| Admin Assistant 2                                       | Sok Phally      | Full Term of CAVAC                        |  |
| <i>Provincial Administrative Assistant (x6)</i>         |                 |   | <i>These positions have been re-designated (see below)</i> |
| Office Manager  |                 | Full Term of CAVAC                        | New position – to be recruited                             |
| Environmental Specialist                                |                 | Full Term of CAVAC                        | New position - to be recruited                             |
| Gender Specialist                                       |                 | Full Term of CAVAC                        | New position - to be recruited                             |
| Finance Officer   |                 | Full Term of CAVAC                        | New position - to be recruited                             |
| IT Officer  |                 | Full Term of CAVAC                        | New position - to be recruited                             |
| Translator  |                 | Full Term of CAVAC                        | New position - to be recruited                             |
| <b>M&amp;E</b>  |                 |   |  |
| M&E Manager   | Gary Woller     | 150 days between March 2010 and June 2012 |  |
| M&E Officer   |                 | Full Term of CAVAC                        | Candidate under consideration                              |



| Position   | Name            | Period of Engagement | Notes  |
|--|-----------------|----------------------|--|
| M&E Assistant 1  | Thorn Riguen    | Full Term of CAVAC   |  |
| M&E Assistant 2  |                 | Full Term of CAVAC   | Yet to be recruited                              |
| <b>Provincial Coordinators</b>                         |                 |                      |  |
| Provincial Team Leader 1                               |                 | Full Term of CAVAC   | Interviewed, offers being made                   |
| Provincial Team Leader 2                               |                 | Full Term of CAVAC   | Interviewed, offers being made                   |
| Provincial Team Leader 3                               |                 | Full Term of CAVAC   | Interviewed, offers being made                   |
| <b>Agribusiness Development</b>                        |                 |                      |  |
| Agribusiness Development Manager                       | Pieter Ypma     | Full Term of CAVAC   |  |
| Rice Value Chain Development Specialist                | Sovathara Heng  | Full Term of CAVAC   |  |
| Horticultural Value Chain Development Specialist       | Ty Sopheavy     | Full Term of CAVAC   |  |
| Provincial Agribusiness Coordinator 1                  | Saint Srey      | Full Term of CAVAC   |  |
| Provincial Agribusiness Coordinator 2                  | Ping Sodavy     | Full Term of CAVAC   |  |
| Provincial Agribusiness Coordinator 3                  |                 | Full Term of CAVAC   | Re-advertised                                    |
| <b>Water Management</b>                                |                 |                      |  |
| Irrigation Water Management Manager                    | Robert Anscombe | Full Term of CAVAC   |  |
| Irrigation and Water Management Specialist             | Phai Sok Heng   | Full Term of CAVAC   |  |
| Irrigation and Water Management Specialist             |                 | Full Term of CAVAC   | Applications received, short listing in progress |
| Provincial Irrigation / Water Management Coordinator 1 | Khiev Daravy    | Full Term of CAVAC   |  |
| Provincial Irrigation / Water Management Coordinator 2 | Chhim Sophea    | Full Term of CAVAC   |  |
| Provincial Irrigation / Water Management Coordinator 3 | Soeur Sophorn   | Full Term of CAVAC   |  |

| Position                                 | Name             | Period of Engagement | Notes                                   |
|--|------------------|----------------------|---|
| <b>Business Enabling Environment</b>     |                  |                      |   |
| Business Enabling Environment Specialist |                  | Full Term of CAVAC   | Interviews completed. Offer being made. |
| <b>ACIAR</b>                             |                  |                      |   |
| <b>Research and Extension</b>            |                  |                      |   |
| Research and Extension Manager           | Dr Craig Meisner | Full Term of CAVAC   |   |
| Research and Extension Specialist        | Kang Sideth      | Full Term of CAVAC   |   |
| Regional R&E                             | Sourn Sophoan    | Full Term of CAVAC   |   |
| Regional R&E                             | Tin Mola         | Full Term of CAVAC   |   |
| Regional R&E                             | Keo Chenda       | Full Term of CAVAC   |   |
| CARF Coordinator                         | Nin Charya       | Full Term of CAVAC   |   |

## ATTACHMENT 6: MONITORING SHEET FOR RGC

*Following requests from both MAFF and MOWRAM for tangible and measurable target, the following list has been prepared. The list is not exhaustive.*

### Overall:

|   |    |
|---|----|
| Number of interventions initiated or continued: | 29 |
|---|----|

### Agribusiness:

|  |   |
|--|---|
| Number of additional value chains assessed | 1 |
|--|---|

|                                    |    |
|------------------------------------|----|
| Number of agribusinesses supported | 10 |
|------------------------------------|----|

### Water management:

|  |   |
|--|---|
| Number of water availability studies completed | 2 |
|--|---|

|  |       |
|--|-------|
| Number of farmers reached with better irrigation (depending approval from NSC <sup>6</sup> ) | 5,000 |
|--|-------|

|   |        |
|---|--------|
| Number of ha able to cultivate with dry season irrigation (depending approval from NSC <sup>6</sup> ) | 10,000 |
|---|--------|

|   |    |
|---|----|
| Number of FWUCS supported (depending approval from NSC <sup>5</sup> ) | 13 |
|---|----|

|   |     |
|---|-----|
| Number of farmers having access to better pump units: | 100 |
|---|-----|

### Research and extension:

|  |     |
|--|-----|
| Number of trainings conducted by CAVAC or its partners | 200 |
|--|-----|

|                           |       |
|---------------------------|-------|
| Number of farmers trained | 4,000 |
|---------------------------|-------|

|  |     |
|--|-----|
| Number of trials for new varieties conducted | 150 |
|--|-----|

|  |   |
|--|---|
| Number of companies educated in land levelling | 1 |
|--|---|

|   |   |
|---|---|
| Number of relations with companies involved in drum seeders | 3 |
|---|---|

|  |   |
|--|---|
| Number of improved waxy maize varieties released | 1 |
|--|---|

### BEE:

|   |   |
|---|---|
| Number of supports to improved policies | 2 |
|---|---|

---

<sup>5</sup> Will be corrected depending on NSC decisions.

## **ATTACHMENT 7: SUMMARY OF THE PROPOSAL FOR ON-FARM WATER USE RESEARCH PROJECT.**

### **Issue:**

Rice is the staple food in Cambodia and accounts for 70% of the daily calorie intake. Cambodia is lagging behind its Asian neighbours in rice production, yields in Vietnam and Laos being 25 to 50% higher. Poverty in Cambodian rice farming communities is high largely due to low yields (2.4t/ha), but evidence shows that with improved water management and increased use of inputs, yields could be doubled.

This project aims at enhancing the livelihood of rice farmers through increased water productivity and reduced yield variability leading to increased water security and hence reduced agronomic investment risk. A number of basin scale studies have determined that overall Cambodian water resources are adequate now and into the future. However, temporal and spatial water availability is variable, the rice crop often suffering from stress related to drought periods during the wet season and poor irrigation management. Rice production in Cambodia can be greatly enhanced by an improved understanding of crop water requirements and how to plan, schedule and manage water and fertiliser at a field scale to maximise production.

Within that context, irrigation water management has been identified as a key constraint in the businesses enabling environment by the Cambodian Agricultural Value Chain Program (CAVAC). This project will operate in close collaboration with the program to provide it with an in-depth understanding of water management and fertiliser issues in rice farming communities, improved water management practices and an enhanced skill base at scientific, extension and community level.

### **Objectives:**

1. Develop an improved understanding of farm-level water management constraints and opportunities;
2. Research and develop adapted water management and agronomic interventions at a farm and district level to increase productivity; and
3. Support CAVAC extension efforts by providing timely, practical on-farm water management information and more trained irrigation specialists.

### **Methods:**

The research will be undertaken in the three CAVAC priority provinces; Kampong Thom, Takeo and Kampot. These provide a representative coverage of the varied irrigation and on-farm water management systems used in Cambodia.

Surveys of the communes will be undertaken to understand irrigation and agronomic practices and constraints. The surveys will be followed by scoping of improved water management approaches through a participatory process which will then be tested in field trials. The use of laser leveling to provide ideal conditions for direct seeding of rice will be tested with farmers and when irrigation areas are redeveloped. Field studies will be designed to measure on-farm water and fertiliser use under the current management practices identified in the initial surveys and under the options for improved water and fertiliser management. An analysis of groundwater quality and suitability for irrigation will be

undertaken. Weather data for agricultural purposes will be compiled. These field studies and data gathering will together with water balance and crop growth modelling, will lead to the development of improved agronomic practices for increased productivity. Remote sensing will be used to provide an insight into water use/stress across larger areas of Cambodia.

**Partnerships:**

The research proposed here will be conducted in collaboration with CAVAC which is funded by AusAID and ACIAR under the Food Security Program. The communication and extension programs CAVAC has developed will be used as pathways to adoption. The main collaborating agencies will be the Ministry of Water Resources and Meteorology (MOWRAM) through their Training Services Centre (TSC) at Phnom Penh and their Provincial Departmental staff in the regions and the Cambodian Agricultural Research Institute (CARDI) who with the Provincial Department Agriculture (PDA) staff will undertake farmer surveys and water management trials. The Institute of Technology Cambodia (ITC) will provide undergraduate and postgraduate students to help build future capacity in on-farm water management research.

**Outputs:**

This project will provide:

- Consolidated and up to date information on farm-scale crop water use and irrigation management in Cambodia;
- An enhanced understanding of the relationships between water management (amount and timing), fertiliser and yield, which will assist farmers to implement improved crop planning and management strategies;
- Farm level water management recommendations designed for use by farmers, extension officers and others in the value chain e.g. water pumpers;
- Recommendations on laser land leveling to provide improved conditions for establishment of direct seeded rice;
- Improved decision making around water availability (surface and groundwater) and improved ability to undertake water use and needs assessments to ensure planted areas match the water available;
- Maps of groundwater quality;
- A compilation of weather data for agriculture;
- Improved information that allows farmers, water user groups and private water suppliers to make improved business plans and enter into partnerships;
- Information to CAVAC at frequent intervals for integration into their on-going farmer and water manager training programs; and
- Training in conjunction with CAVAC, TSC, ITC.

This project, through the above listed outputs, will result in benefit to the socio-economic conditions of Cambodian farmers by providing strategies to achieve increased yields and hence income.