カンボジア王国
農業資材（化学肥料および農薬）
品質管理能力向上計画
終了時評価調査報告書

平成 24 年８月
（2012年）

独立行政法人国際協力機構
カンボジア事務所

カン事
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12-003

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序　　文

「カンボジア王国農業資材（化学肥料および農薬）品質管理能力向上計画」は、2009年1月30日に署名・交換された討議議事録（R/D）及び協議議事録（ミニッツ）に基づき、カンボジア王国における化学肥料及び農薬の適切な使用と品質管理の促進を目標に掲げ、プロジェクトを実施してきました。

このたび、プロジェクト協力期間の終了を2012年3月に控え、国際協力機構は2012年2月9日から22日までの間、小林雪治JICAカンボジア事務所次長を団長とする終了時評価を実施し、これまでの活動実績の確認や目標達成等について総合的な評価を行いました。これらの評価結果は、調査団とカンボジア王国側関係者による協議を経て評価レポートとしてまとめられ、協議議事録の署名・交換を行いました。本報告書は、同調査団による協議及び評価調査結果等を取りまとめたものであり、関連する国際協力の推進に活用されることを願うものです。

最後に本調査の実施にあたり、ご協力とご支援を頂いた両国関係各位に対し、心から感謝の意を表します。

平成24月8月

独立行政法人国際協力機構

カンボジア事務所長　**鈴木　康次郎**

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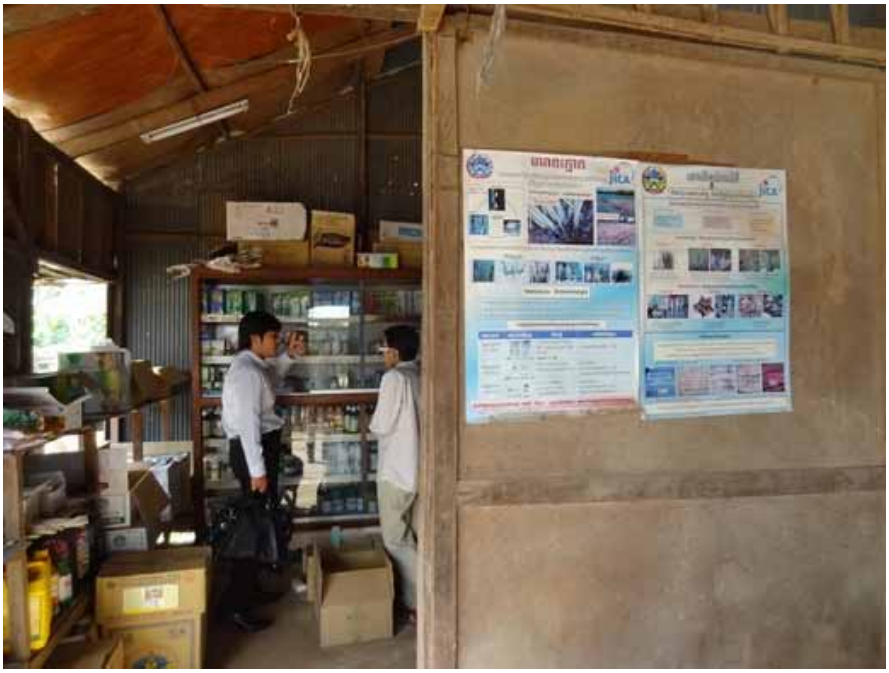

啓発活動実施状況確認（右側のポスターをQCAMで作成・配布）

ラボの様子

略　語　表

略称	名称（英語）	名称（日本語）
AAS	Atomic Absorption Spectrophotometer	原子吸光分析法
ADB	Asian Development Bank	アジア開発銀行
C/P	Counterpart	カウンターパート
CAMTA	Cambodia Agriculture Materials Traders Association	カンボジア農業資材販売業者連盟
DA	Department of Agriculture	フィリピン農業省
DAL	Department of Agricultural Legislation	農業法規局
FAO	Food and Agriculture Organization of the United Nations	国連食糧農業機関
FPA	Fertilizer and Pesticide Authority	肥料農薬庁（フィリピン農業省）
GDA	General Directorate of Agriculture	農業総局
JCC	Joint Coordinating Committee	合同調整委員会
MAFF	Ministry of Agriculture, Forestry, Fisheries	農林水産省
NAL	National Agriculture Laboratory	国立農業研究所
NPK	Nitrogen（N）, Phosphorus（P）, Potassium（K）	窒素、リン、カリウム
NSDP	National Strategic Development Plan	国家戦略開発計画
PDA	Provincial Department of Agriculture	州農業局
PDM	Project Design Matrix	プロジェクト・デザイン・マトリックス
PO	Plan of Operations	活動計画
QCAM	Capacity Building for Quality Standard Control of Agricultural Materials（Chemical fertilizers and pesticides）	農業資材（化学肥料および農薬）品質管理能力向上計画
RGC	Royal Government of Cambodia	カンボジア王国
SAW	Strategy for Agriculture and Water	農業と水戦略
SPS	Sanitary and Phytosanitary	衛生植物検疫

終了時評価調査結果要約表

１．案件の概要		
国名：カンボジア王国		案件名：農業資材（化学肥料および農薬） 品質管理能力向上計画（QCAM）
分野：農業		援助形態：技術協力プロジェクト
所轄部署：JICAカンボジア事務所		協力金額（評価時点）：1億7,000万円
協力期間	（R/D）：2009年3月1日～2012年3月31日（3年1カ月）	先方関係機関：農林水産省（MAFF）農業法規局（DAL）、MAFF農業総局（GDA）及びカンダール州農業局（PDA）
	（延長）：	日本側協力機関：
	（F/U）：	他の関連協力：
	（E/N）（無償）	

１－１　協力の背景と概要

カンボジア王国（以下、「カンボジア」と記す）においては、現在、化学肥料や農薬のほとんどがベトナムやタイなどの近隣諸国から不法かつ大量に流入しており、外国語表記のラベルのまま販売されているため、農民の多くは適切な使用方法を十分理解することなくそれらを購入・使用せざるを得ない状況にある。その結果、農作物の生産性の向上を妨げているばかりでなく、特に農薬については、その誤使用による健康被害や環境汚染及び食物の危険性の増加を引き起こす可能性もあり、カンボジア政府にとって化学肥料や農薬の適切な管理体制の構築及びこれら農業資材の販売業者や使用者への適切な情報提供が、経済・社会発展のために緊急に取り組むべき課題のひとつとなっている。

このように適切な管理が行われることなく大量に流通している化学肥料や農薬による各種被害を防ぐためにはカンボジア農林水産省（Ministry of Agriculture, Forestry, Fisheries：MAFF）がこれら農業資材に係る品質分析能力を向上させるとともに、その被害を最も受けやすい農民や一般市民に対して、化学肥料や農薬の適切な管理・使用方法に係る必要な情報を提供することが重要となってくる。

これらの状況を受け、カンボジア政府は「農業資材（化学肥料および農薬）品質管理能力向上計画」（以下、「本プロジェクト」と記す）の技術協力をわが国政府に要請し、JICAは2009年3月～2012年3月までの予定で本プロジェクトを実施するに至った。

１－２　協力内容

農業資材（化学肥料及び農薬）の適切な使用と管理体制を実現する。

（1）上位目標

カンダール州とその近隣州において、化学肥料及び農薬の適切な使用と品質管理が促進される。

（2）プロジェクト目標

パイロット地域において、化学肥料及び農薬の適切な使用と品質管理が促進される。

（3）成　果

1）プロジェクトのためのベースライン・データが蓄積される。

2）化学肥料及び農薬の分析に関するラボの能力が向上する。

3）化学肥料及び農薬の登録及び登録後業務基準の規則初稿の策定が促進される。
4）化学肥料及び農薬の適切な使用と品質に関する意識が向上する。

（4）投入（評価時点）（総投入額：1億7,000万円）

日本側：

長期専門家派遣	2名	機材供与	2,293万6,000円
短期専門家派遣	延べ2名	ローカルコスト負担	0円
第三国専門家派遣	延べ12名	その他	0円
研修員受入（第三国）	12名		

相手国側：

カウンターパート（Counterpart：C/P）配置	34名〔MAFF農業法規局（Department of Agricultural Legislation：DAL）、MAFF農業総局（General Directorate of Agriculture：GDA）及びカンダール州農業局（Provincial Department of Agriculture：PDA）〕
機材購入	なし
土地・施設提供	プロジェクト事務所（2部屋）及び事務機器
ローカルコスト負担	ラボの電気代、水道代等
その他	なし

２．評価調査団の概要

調査者	（担当分野　氏名　職位）		
	団長/総括	小林　雪治	JICA カンボジア事務所 次長
	農業資材	仲田　俊一	JICA 農村開発部 参事役
	評価分析/協力企画1	横井　博行	JICA カンボジア事務所員
	評価分析/協力企画2	Siv Cheang	JICA カンボジア事務所 プログラムアシスタント
調査期間	2012年2月9～22日		評価種類：終了時評価

３．評価結果の概要

３－１　実績の確認

３－１－１　プロジェクト目標の達成状況

プロジェクト目標「パイロット地域において、化学肥料及び農薬の適切な使用と品質管理が促進される」は、指標の達成度から、おおむね達成されたと判断できる。

指標1「化学肥料と農薬の適切な選択と使用を確保するため、パイロット地域の登録小売店の3分の2が、プロジェクトによって提供された農薬のクメール語ラベル及び化学肥料と農薬の適切な選択と使用のための参考資料を販売に使用する」は2011年12月に実施されたインパクト調査で、プロジェクト作成資料が85%の登録小売店に使用されており、目標を上回った。

指標2「パイロット地域で、禁止された農薬を売っていない登録小売店の数が倍増する」は2011年12月に実施されたインパクト調査で禁止農薬を売っていない登録小売店が3.07倍となっており、目標を大きく上回った。

３－１－２　成果の達成状況

4つの成果（Output）に対応して合計13の客観的指標（Indicator）については、ほぼ達成されており、この成果が生かされる形でプロジェクト目標「パイロット地域において、化学肥料及び農薬の適切な使用と品質管理が促進される」が達成された。

成果（Output）指標（Indicator）

1）プロジェクトのためのベースライン・データが蓄積される。

指標1：パイロット地域における登録済み化学肥料に関するベースライン・データがある。

指標2：パイロット地域における登録済み農薬に関するベースライン・データがある。

指標3：パイロット地域におけるクメール語表記のラベルに関するベースライン・データがある。

2）化学肥料及び農薬の分析に関するラボの能力が向上する。

指標1：ラボの機材・設備が適切に設置され、機能している。

指標2：DAL及びGDAにおける肥料のためのラボが、窒素、リン、カリウム〔Nitrogen（N）, Phosphorus（P）, Potassium（K）：NPK〕及びその他微量要素（鉄、マンガン、亜鉛、銅、カルシウム、マグネシウム）を分析できる。

指標3：農薬のためのラボが24の優先度の高い有効成分のうち、少なくとも60%を分析することができる。

指標4：化学肥料NPK及びその他微量要素（鉄、マンガン、亜鉛、銅、カルシウム、マグネシウム）及び、少なくとも24の優先度の高い農薬の有効成分のうちの60%を分析するためのマニュアルが作成される。

指標5：ラボの機材の使用及び維持管理のためのマニュアルが作成される。

指標6：登録小売店からインスペクターによって採取したサンプルの分析レポートが作成される。（その後、関係者の間で共有される）

3）化学肥料及び農薬の登録及び登録後業務基準の規則初稿の策定が促進される。

指標1：化学肥料及び農薬の登録及び登録後業務のための業務基準に関係した政策の選択肢が提供される。

4）化学肥料及び農薬の適切な使用と品質に関する意識が向上する。

指標1：一般の意識向上活動のために、パンフレット、ポスター及び視聴覚メディアのそれぞれのタイプで、少なくとも1つずつの道具を作成し、普及させる。

指標2：パイロット地域のすべての登録小売店に、農薬の選択と使用のためのクメール語ラベルと参考資料が配布される。

指標3：パイロット地域のすべての登録小売店に、化学肥料の選択と使用のための参考資料が配布される。

３－２　評価結果の要約

（1）妥当性：高い

わが国対カンボジア事業展開計画及びカンボジア国家戦略開発計画ではそれぞれ農業基盤の強化を優先課題に掲げており政策に合致している。特に、2011年12月に制定された農薬肥料管理法においてはプロジェクトが果たした役割は非常に大きく、カンボジアが推し進めようとする適正な農薬及び肥料に関する政策と合致している。

（2）有効性：高い

プロジェクトのストラテジーは、肥料及び農薬に関し、技術的なラボ能力の向上、行政的な手続きの改善、広報的な意識啓発から成り立つ。これらの3つの側面からなるアプローチが肥料及び農薬関連企業からの申請、MAFFにおける申請許可手続き及びそれに伴う成分分析、更に市場に流通している適切なモニタリングに必要な意識啓発により、新規肥料及び農薬申請の適正処理と市場流通製品の取り締まりの改善が、プロジェクト目標である「パイロット地域において、化学肥料及び農薬の適切な使用と品質管理が促進される」を達成

するのに必要十分なプロセスであったと思料される。

（3）効率性：極めて高い

専門家の役割分担として、アウトプット1及び4については日本人長期専門家が、アウトプット2はフィリピン人専門家が、アウトプット3は日本人短期専門家が担った。アウトプットの半分が少ない投入により実現されたのは、高く評価されるべきである。加えて、第三国専門家の活用は、専門家自身がもつ途上国としての経験及び語学運用力の面で、カンボジア側への技術移転を促したと考えられる。

（4）インパクト：強い正のインパクトがある

プロジェクト直接のインパクトとしては、禁止農薬の正規販売店がベースライン調査時（2009年7月）とインパクト調査時（2011年10月）を比して70%減っており、適切な農薬を農民が選択できるようになったことは、強いインパクトとして評価できる（なお農薬の正規販売店自体は約3倍となっている）。

また、官民連携という観点で、カンボジア農業資材販売業者連盟（Cambodia Agriculture Materials Traders Association：CAMTA）が設立され、公式に政府と民間業者が対話をできるチャネルがつくられたこと、また農薬ガイドブックパート2作成においては民間業者からの情報提供を踏まえガイドブックが作成されたことは、官民連携を強化するものとなった。

さらに、農薬肥料管理法の制定は、プロジェクトの直接的な成果に掲げられていないものの、専門家により側面的に支援され制定されており、カンボジアにおける適切な農薬使用という観点で強いインパクトを与えたものと思料される。

（5）自立発展性：中程度

ラボの自立発展性が担保されていないこと、また農薬登録行政の政策案は示されたもののその実施可能性が十分検討されていないことから低い評価となる。しかし、農薬肥料管理法の施行は農薬行政に対する政府の高い決意を示すものであることから、これらを勘案し、中程度と評価される。

組織面での持続性については、プロジェクトでは農薬肥料管理法の側面支援及び化学肥料及び農薬の登録及び登録後業務基準の初稿策定を行っているものの、組織が十分に機能するためには、農薬肥料管理法が実行されるようDALにおける省令の設置（2省令案はプロジェクトで作成済み）及びDALとGDAのラボの統合が必要である。

財政面では、ラボの運営予算が限られており、自立的な運営が困難な状況である。現在の組織規程上、業者からの申請料が国庫に納めることが決められているものの、ラボの自立運営を考えた場合、組織規程を再整備し、申請料をラボの維持管理費に充てることが不可欠である。

技術面では、プロジェクトにより化学肥料及び農薬ラボの技術者へのオンザジョブ・トレーニング（OJT）及びマニュアルの作成を通じて、技術的知見をDAL及びGDAに引き渡すことができた。しかし、今後技術が蓄積・普及されるためには、国内の化学ネットワークを整備し、知見が向上されるような枠組みが必要である。

３－３　効果発現に貢献した要因

（1）計画内容に関すること

中間レビュー段階でプロジェクト・デザイン・マトリックス（Project Design Matrix：PDM）の精査及びスコープの絞り込みが行われたことで、プロジェクトのターゲット及び狙いが明確化されたと判断できる。

（2）実施プロセスに関すること

第三国専門家及び第三国での研修を行うことで、C/Pが自国でも農薬・肥料の適正管理が実現可能であるという意識づけを行ったことは、C/Pのオーナーシップ醸成に寄与したものと判断される。

３－４　問題点及び問題を惹起した要因

（1）計画内容に関すること

プロジェクト開始時のPDMにおいて、実現可能性が困難な目標及び成果が示されており、特にプロジェクト初期から中期にかけてプロジェクト実施運営面で混乱を引き起こした。これは中間レビュー時においてPDMを大きく見直したことにより改善が図られた

（2）実施プロセスに関すること

専門家とC/Pのコミュニケーションマネジメントにおいて、特に執務室が日本人専門家とC/Pで別々であったことから、日常的なプロジェクト・マネジメントを共同で行うことが困難であった。プロジェクトではこれを解決するために、定例でC/P会議を実施していったものの、こうした日常的な共同マネジメント体制の欠如はC/Pのオーナーシップ醸成の阻害要因となったと判断される。

３－５　結　論

本プロジェクトは、カンボジア及び日本の政策に合致しており、ターゲットとなる小売店及び農民のニーズを的確に反映しており妥当性は高い。プロジェクトでは第三国専門家（フィリピン）を活用することにより、事業コストの低減と技術普及の浸透率を高めており、4つの成果の達成及びそれに基づくプロジェクト目標の達成がなされた。したがって、有効性は高いと評価され、効率性は主として第三国専門家の活用という点から非常に高いと評価される。さらに、インパクトについては、ガイドブック及びCAMTAによる官民連携の実現、第三国専門家及び研修を通じた南南協力の推進、農薬肥料管理法制定への側面支援など、強い正のインパクトが発現したものと評価できる。上位目標の達成のためには種々の条件を達成していく必要があるものの、農薬肥料管理法の制定が条件達成を支援するものであると評価されることから、自立発展性は中程度と評価できる。以上より、プロジェクト目標は達成しており、今後の上位目標の達成のためにはカンボジア側の自主的な制度改革が不可欠であることから、本プロジェクトは当初計画期間のとおり終了する予定である。

３－６　提言（当該プロジェクトに関する具体的な措置、提案、助言）

本プロジェクトではプロジェクト目標が達成されたものの、プロジェクト効果を持続させるためには、GDAによるラボ機能の維持及び向上、DALによる農薬行政手続きの改善及び強化、GDA及びDALによる国内外技術者ネットワークの構築、PDAによる啓発活動の推進が必要である。

３－７　教訓（当該プロジェクトから導き出された他の類似プロジェクトの発掘・形成、実施、運営管理に参考となる事柄）

本プロジェクトでは成果のひとつであるラボに関し、第三国専門家が当該成果達成に大きく寄与したものである。第三国専門家の活用は、プロジェクト実施者側にとっては事業費を削減させることが可能であり、C/Pまたは受益者にとってはより身近に技術を吸収しやすい素地をつくり出すことにつながる。今後は第三国のリソースをマッピングするなどし、組織的に第三国リソースを有効活用する体制を構築していくことが推奨される。

また、本プロジェクトでは、ガイドブックの作成や協会設立支援など民間業者との連携を深めた。カンボジアの特に農業分野では、政府のリソースが限られているなかで、いかに民間との連携度合いを強化し、民間のオペレーションにつないでいくかが自立発展性に関する大きな要素である。その観点で、本プロジェクトで行った民間団体の巻き込み方は類似プロジェクトにとっても有効に働くものであると判断される。

本プロジェクトでは中間レビュー時にプロジェクト目標及び成果の大幅な見直しを行っている。変更に際する主たる原因は、プロジェクト目標及び成果が投入に対して過大であったと判断される。当初、長期専門家が1名ですべての成果を達成する必要があり、加えて第三国専門家の招へいにあたり、事務的かつ技術的な調整事項が非常に多かったことが、プロジェクト活動の促進を阻んだものだといえる。今後、案件実施にあたり、他案件の事例を十分参照するとともに、プロジェクト目標及び成果に対する必要な投入量を慎重に検討すべきである。

３－８　フォローアップ状況

プロジェクトの効果の持続性を担保するため、MAFFによりラボ機能、農薬行政手続き、国内外ネットワーク、啓発活動の継続及び改善が必要である。ただし、農薬行政手続きにおける技術的困難性をMAFFが把握し、それが上位目標達成の阻害要因となる場合は、必要に応じて日本側によりフォローアップを行っていく必要がある。

Abstract of Terminal Evaluation Result

<table>
<tr><td colspan="3">I. Outline of the Project</td></tr>
<tr><td colspan="2">Country:
The Royal Government of Cambodia</td><td>Project title: Capacity Building for the Quality Standard Control of Agricultural Materials (Chemical Fertilizers and Pesticides)</td></tr>
<tr><td colspan="2">Issue/Sector:
Agriculture</td><td>Cooperation Scheme:
Technical Cooperation Project</td></tr>
<tr><td colspan="2">Division in charge:
JICA Cambodia Office</td><td>Total Cost: 171,961 Thousand Yen</td></tr>
<tr><td rowspan="2">Period of Cooperation</td><td rowspan="2">(R/D): March 1, 2009 – March 31, 2011 (3 years and 1 month)
(Extension):None
(F/U):None
(E/N) (Grant Aid):None</td><td>Partner Country’s Implementing Organization:
Ministry of Agriculture, Forestry, Fisheries (MAFF), Department of Agricultural Legislation (DAL), General Directorate of Agriculture (GDA), Provincial Department of Agriculture (PDA) in Kandal</td></tr>
<tr><td>Supporting Organization in Japan:
Japan International Cooperation Agency (JICA)</td></tr>
<tr><td colspan="3">Related Cooperation:</td></tr>
<tr><td colspan="3">1. Background of the Project

Agricultural sector has played an important role for economic growth of Cambodia with the fact that 80% of population is in rural areas and 60% lives on agriculture in the country. On the other hand, since the agricultural sector contributes only to 33.5% of Gross Domestic Product (GDP), enhancement of agricultural productivity has been set up as one of the main priorities in the national development strategies such as "Rectangular Strategy for Growth, Employment, Equity and Efficiency Phase II" and "Strategy for Agriculture and Water 2006-2010." Because most of chemical fertilizers and pesticides are illegally imported from the neighboring countries like Vietnam and Thailand and sold in local markets without the Khmer labels. As such, most end-users do not know how to select and use them properly. Improper use of pesticides may not only hinder enhancement of their agricultural productivity but also cause health and environmental problems and food insecurity. Therefore, it is essential for the Cambodian government to improve the management of agricultural materials and properly give necessary information on correct selection and use of agricultural materials for sound and sustainable economic and social development in this country. In order to achieve these, analytical capabilities for agricultural materials of Ministry of Agriculture, Forestry, and Fisheries (MAFF) must be enhanced. At the same time, necessary information on proper selection and use of agricultural materials must be provided for the end-users and the general public. Hence, the Cambodian government officially requested the Japanese government to implement the QCAM Project through Japan International Cooperation Agency (JICA).

2. Project Overview

(1) Overall Goal
Proper usage and quality control of chemical fertilizers and pesticides is enhanced in Kandal and</td></tr>
</table>

neighboring provinces.

(2) Project Purpose
Proper usage and quality control of chemical fertilizers and pesticides is enhanced in pilot area.

(3) Outputs
Output 1: Baseline data for the Project is developed.
Output 2: Capability of laboratories is improved in terms of analyses of chemical fertilizers and pesticides.
Output 3: Development of Regulation related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is facilitated with the expectation of having the 1st draft.
Output 4: Awareness is raised on proper usage and quality of chemical fertilizers and pesticides.

(4) Inputs

Japanese side：

Long-term Expert	2	Equipment	22,936 Thousand Yen
Short-term Expert	2	Local cost	0Yen
Third Country Expert	12	Others	0Yen
Trainees received (third country)	12		
		Total Cost	171,961 Thousand Yen

Cambodian Side：

Counterpart	34	Equipment	0
Land and Facilities	2 Project office and office appliances		
Local Cost	Electricity and water charge for laboratories		
Others	None		

II. Evaluation Team

Members of Japanese Evaluation Team	Mr. Yukiharu Kobayashi	Leader	Senior Representative, JICA Cambodia Office
	Mr. Shunichi Nakada	Agriculture Input	Senior Advisor, JICA Headquarter
	Mr. Hiroyuki Yokoi	Evaluation and Analysis 1	Representative, JICA Cambodia Office
	Ms. Siv Cheang	Evaluation and Analysis 2	Program Officer, JICA Cambodia Office
Period of Evaluation	09/02/2011- 22/02/2011	Type of Evaluation: Terminal Evaluation	

III. Results of Evaluation

1. Achievement of Outcome

Output 1: Baseline data for the Project is developed.

Indicator 1-1: Baseline data on registered chemical fertilizers in the pilot area(s) is in hand.

Indicator 1-2: Baseline data on registered pesticides in the pilot area(s) is in hand.

Indicator 1-3: Baseline data on labeling in Khmer in the pilot area(s) is in hand.

The baseline survey was conducted and baseline data was made available by the Project. Furthermore, the counterpart personnel involved have acquired necessary skills along the process of carrying out the baseline survey. Therefore, it is concluded that the Output 1 was achieved.

Output 2: Capability of laboratories is improved in terms of analyses of chemical fertilizers and pesticides.

Indicator 2-1: Laboratory equipment/ facilities are properly set up and functioning.

Indicator 2-2: Fertilizer laboratory in the DAL and the GDA can analyze N, P, K and other elements (Fe, Mn, Zn, Cu, Ca, Mg).

Indicator 2-3: Pesticide laboratory can analyze at least 60% of 24 prioritized active ingredients.

Indicator 2-4: Manuals for analyses of N, P, K and other elements (Fe, Mn, Zn, Cu, Ca, Mg) for chemical fertilizers and at least 60% of 24 prioritized active ingredients for pesticides were developed.

Indicator 2-5: Manuals for operation and maintenance for laboratory equipment are developed.

Indicator 2-6: Analytical reports of samples collected by inspectors from licensed retailers are developed (to be shared among stakeholders)

It is noted that the pesticide samples for Indicator 2-6 were collected by the Project, not by inspectors because development of inspection protocol was under preparation. Judging from these observations, it is concluded that the Output 2 was achieved.

Output 3: Development of Regulation related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is facilitated with the expectation of having the 1st draft.

Indicator 3-1: Policy option(s) related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is provided.

With the three (3) Technical Information Exchange Programs (TIEP) and comments from the Project experts, the Law on The Management of Pesticides and Fertilizers was promulgated on 14 January 2012. In addition, the draft regulations on procedures and standard requirement on the management of pesticides and chemical fertilizers have been developed in Khmer and English. These are now in the process of finalization as “Prakas” (proclamation) and waiting for an approval from MAFF Minister. They are expected to be approved by the end of 2012. Therefore, it is concluded that the Output 3 was achieved.

Output 4: Awareness is raised on proper usage and quality of chemical fertilizers and pesticides.

Indicator 4-1: At least each type of materials; pamphlet, posters, and audio visual media is developed and disseminated for public awareness activities.

Indicator 4-2: Khmer labels and reference materials on selection and usage of pesticides are distributed to all of licensed retailers in pilot area.
Indicator 4-3: Reference materials on selection and usage of chemical fertilizers are distributed to all licensed retailers in pilot area.

All indicators in Output 4 have been attained, therefore, it is concluded that the Output 4 was achieved.

2. Summary of Evaluation Results

(1) Relevance: High
The project aligns the Japanese aid policy and national development policy of Cambodia such as NSDP, SAW, Rice Policy. Among others, the contribution to the Pesticide and Fertilizer Management Law, which was promulgated on Dec 2011, was remarkable.

(2) Effectiveness: High
The strategy of the Project is 1) enhancement of laboratory analytical skills in terms of technique, 2) improvement of procedure in terms of administrative point and 3) awareness raising in terms of public relations. These three aspects strategy will contribute to achieve the project purpose, which is expected to be achieved.

(3) Efficiency: Very High
In principle, the division of labor among experts was that 1) Output1 and 4 were responsible for Japanese long-term experts, 2) Output2 for Philippines experts, 3) Output3 for Japanese short-term experts. Achievement of the outputs by rather small amount of inputs was highly evaluated. In addition, the utilization of the third country experts was evaluated that the penetration rate of the techniques was heightened because of the experience as a developing countries and the language literacy.

(4) Impact: Very High
The direct impact caused by the Project is that the farmers can select the appropriately registered pesticide and fertilizers. The impact survey by the Project showed that the 70% of the banned pesticide selling retailers was decreased compared to the baseline survey on July 2009. (The number of the official registered retailers is tripled.)
In addition, the south-south cooperation heightened the penetration ration of technique absorption.
Furthermore, establishment of CAMTA made an great impact in terms of creation of dialogue channel between the Government and private entities.
Lastly, the promulgation of the Pesticide and Fertilizer Management Law should be highly evaluated.

(5) Sustainability: Medium
Sustainability is evaluated as not high since the sustainability of the laboratories is not ensured and the possibility of enforcement of the Pesticide and Fertilizer Management Law is uncertain. However, the promulgation of the Pesticide and Fertilizer Management Law shows the determination of the government to the administration to the pesticide. Thus, considering the above

positive and negative points, sustainability is evaluated as Medium.

3. Factors that promoted realization of effects

(1) Factors concerning to Planning
On account of elaboration and clarification of PDM at mid-rm review, it is juged that the target and objective of the Project was clarified.

(2) Factors concerning to the Implementation Process
By introducing third country expert and third country training, it has contributed to realizing ownership that C/P could enjoy similar appropriate management of pesticide and fertilizer as Philippines.

4. Factors that impeded realization of effects

(1) Factors concerning to Planning
It was written some unachievable purpose and objectives in PDM ver.1, which have caused difficulties and confusion in management and operation of the Project.

(2) Factors concerning the Implementation Process
As the offices of the experts and C/P were separated, it was difficult to communicate at a daily basis in terms of project management. It was judged that the regular communication with C/P had impeded creation of ownership from C/P.

5. Conclusion

Relevance is evaluated as high sice this Project aligns the Cambodian and Japanese policy and reflects the needs of the retailers and farmers. This Projet utilizes the third country expert from Philippines, which enables the project to decrease the project cost and to enhance the penetration ratio of the techniques. Therefore, the four outputs and followed project purpose were achieved. From these achievements, it was judged that Effectiveness is evaluated as High and the Efficiency is evaluated as Very High. Impact is evaluated as Very High in terms of realization of public and private partnership by producing guidebooks and set-up of CAMTA, drive for the south-soouth cooperation with utilization of third country experts and trainings, supplemental support for promulgation of the Law on The Management of Pesticides and Fertilizers. In order to achieve overall goal, it is necessary to achieve various conditions, however promulgation of the said law will considerably contribute to this, therefore Sustainability is evaluated as Medium.

6. Recommendations

Though the project purpose was achieved, it is essential to follow 1) maintenance and improvement of laboratories, 2) improvement and strengthening of administrative arrangements, 3) establishment of domestic and international technical network, 4) maintain and spread of awareness raising activities.

7. Lessons Learned

In order to achive the output for laboratories component, the third country experts significantly contribute to it. The utilization of the third country expert leads to decreasing project cost at the site of project implementating agency and to enhancing the learinig environment for the side of C/P or beneficieries. It is further recommended to establish the system to effectively utilize those third country resources. In addition to this, the project deepens the collaboration with the private sector in the area of production of guidebooks and set up of association. In Cambodia, the resources from the government are largely limited, thus it is a great factor to to strengthen the cooperation and involve with the private sector. In this point, the way of this projct to involve with the private sector will work for other projects.

8. Follow-up Situation

In order to secure sustainability of the Projet, it is indispensable for MAFF to continue to improve 1) laboratories, 2) administrative arrangement for pesticides, 3) domestic and international network and 4) awareness raising activities. In case MAFF finds the technical difficulties in administrative arrangement of pesticides and this migh be the impeding factor to achive the overall goal, it might be necessary that the Japanese side would support this area.

第１章　終了時評価調査の概要

１－１　調査団派遣の経緯と目的

カンボジア王国（以下、「カンボジア」と記す）においては、化学肥料や農薬のほとんどがベトナムやタイなどの近隣諸国から不法かつ大量に流入しており、外国語表記のラベルのまま販売されているため、農民の多くは適切な使用方法を十分理解することなくそれらを購入・使用せざるを得ない状況にある。その結果、農作物の生産性の向上を妨げているばかりでなく、特に農薬については、その誤使用による健康被害や環境汚染及び食物の危険性の増加を引き起こす可能性もあり、カンボジア政府にとって化学肥料や農薬の適切な管理体制の構築及びこれら農業資材の販売業者や使用者への適切な情報提供が、経済・社会発展のために緊急に取り組むべき課題のひとつとなっている。

このように適切な管理が行われることなく大量に流通している化学肥料や農薬による各種被害を防ぐためにはカンボジアMAFFがこれら農業資材に係る品質分析能力を向上させるとともに、その被害を最も受けやすい農民や一般市民に対して、化学肥料や農薬の適切な管理・使用方法に係る必要な情報を提供することが重要となっている。

これらの状況を受け、カンボジア政府は「農業資材（化学肥料および農薬）品質管理能力向上計画」（以下、「本プロジェクト」と記す）の技術協力をわが国政府に要請し、JICAは2009年3月～2012年3月までの予定で本プロジェクトを実施中である。現在、長期専門家2名（チーフアドバイザー、業務調整/意識向上のための啓発普及活動/モニタリング調査）を派遣中であり、更にフィリピン人短期専門家（化学肥料分析及び農薬分析）及び日本人短期専門家をこれまでに派遣してきた。

本プロジェクトでは、化学肥料と農薬の登録・認可及び検査・モニタリングに関し、C/P機関であるカンボジアMAFF DAL及びGDA職員の能力向上を支援してきた。また、化学肥料や農薬の適正使用に関する現場レベルでの啓発活動を通じて、カンボジアMAFF職員やパイロット地域（カンダール州）の農民、また農業資材販売店に対して、化学肥料や農薬の適切な管理と使用に関する意識向上に取り組んでいる。

今回実施する終了時評価調査は、2012年3月のプロジェクト終了を控え、以下の目的でプロジェクト終了時評価を実施するため調査団を派遣した。

1）プロジェクト終了を控え、プロジェクトの現状・実績・成果発現状況を確認する。なお、成果やプロジェクトの目標等の達成度評価については、PDM 2（ミニッツAnnex I）を基準とする。
2）JICAの評価ガイドライン（5項目評価）に従って、プロジェクトの評価をカンボジアと日本の合同で行う。
3）評価結果を踏まえ、本プロジェクトを通じて得られた教訓、提言をまとめる。
4）カンボジア側と協議の結果、合意した合同評価の結果をミニッツに取りまとめ、双方署名・交換する。

１－２　現地調査日程

現地調査期間は、2012年2月9～22日で、調査日程は以下に示すとおりである。

No	Date	Description
1	9-Feb-12	08：00-09：00　Kick-off meeting of evaluation team
2	10-Feb-12	Document preparation
3	11-Feb-12	--
4	12-Feb-12	Arrival of Mr. Nakada
5	13-Feb-12	08：30-09：30 Courtesy call to JICA
		09：45-11：45 Meeting with project experts
		15：00-16：00 Meeting with FAO
		16：15-17：15 Interview with CAMTA
6	14-Feb-12	08：00-09：00 Courtesy call and interview DAL Director
		09：00-10：00　Interview DAL regulatory officers（both inspection and registration）
		10：30-11：30 Courtesy call to H.E. San Vanty
		14：00-15：00：　Courtesy call and interview H.E Rithykun
		15：00-16：30：　Interview GDA laboratories（pesticide and fertilizer）
		16：30-17：30：　Interview project counterparts in charge of awareness raising
7	15-Feb-12	08：30 Interview PDA Kandal（Director & inspectors）
		10：00-11：00 Interview retailers in Kien Svay
		13：30-15：00 Interview a group of farmers at Kien Svay
		15：30-16：30 Travel back to PHN
8	16-Feb-12	08：00-09：30 Observe laboratories of DAL & interview lab staffs
		10：00-11：30 Continue interview GDA lab staff if necessary
		PM Meeting with project experts
9	17-Feb-12	08：00-09：00：　Visit MIME laboratory
		09：30-10：30：　Visit MOH laboratory
10	18-Feb-12	Arrival of Filipino members
11	19-Feb-12	Site visit to Kandal
12	20-Feb-12	08：30-09：15 Courtesy call to JICA Cambodia office
		10：00-10：30 Draft report explanation to H.E. San Vanty
		10：30-12：00 Filipino members's CC to DAL director and observe lab & interview lab staffs
		14：00-15：00 Visit to GDA's pesticide lab and discuss with laboratory staffs
		15：00-16：00 Visit to GDA's Fertilizer lab and discuss with laboratory staffs
		16：30-18：30：　Discussion and finalize draft report

13	21-Feb-12	AM： Discussion and finalize draft report
		15：00-16：00 Report to Embassy of Japan
14	22-Feb-12	9：00-12：00 Final JCC（including signing of M/M on Evaluation report）
		Report to JICA Cambodia office
15	23-Feb-12	Filipino members back to Philippines

１－３　終了時評価調査団の構成

No.	氏名	担当分野	所属
1	小林　雪治	団長/総括	JICA カンボジア事務所 次長
2	仲田　俊一	農業資材	JICA 農村開発部 参事役
3	横井　博行	評価分析/協力企画1	JICA カンボジア事務所員
4	Siv Cheang	評価分析/協力企画2	JICA カンボジア事務所 プログラムアシスタント

１－４　プロジェクトの概要

（1）プロジェクト期間

2009年3月～2012年3月（3年1カ月、R/D署名日：2009年1月30日）

（2）相手国実施機関

MAFF、DAL、GDA及びカンダール州PDA

（3）上位目標

カンダール州とその近隣州において、化学肥料及び農薬の適切な使用と品質管理が促進される。

（4）プロジェクト目標

パイロット地域において、化学肥料及び農薬の適切な使用と品質管理が促進される。

（5）成　果

1）プロジェクトのためのベースライン・データが蓄積される。
2）化学肥料及び農薬の分析に関するラボの能力が向上する。
3）化学肥料及び農薬の登録及び登録後業務基準の規則初稿の策定が促進される。
4）化学肥料及び農薬の適切な使用と品質に関する意識が向上する。

第２章　終了時評価の方法

２－１　評価の手順

評価は、「新　JICA事業評価ガイドライン　第1版」（2010年6月）に従い実施し、具体的には以下の手順に従った。

1）プロジェクトの現状把握と検証
2）評価5項目による価値判断
3）提言の策定と教訓の抽出

２－２　評価目的及び評価方針の確認

（1）評価目的の確認

評価調査に先立ち、専門家と団員の協議、対処方針会議を開催し、第1章第1項に記載した評価の目的を確認した。

（2）プロジェクト計画内容の把握

プロジェクトの事前調査結果（2009年2月）、中間レビュー報告書（2010年5月）、プロジェクト作成報告書を主たる情報源として、当初計画の内容、その後の変遷の把握に努めた。

（3）評価5項目に基づく評価

評価5項目、すなわち妥当性、有効性、効率性、インパクト、自立発展性の観点からプロジェクトを評価した。各評価項目の視点を以下に示す。なお、終了時評価のため、妥当性、有効性、効率性についてはこれまでの実績と現状に基づいて評価する。インパクトと自立発展性については、これまでの実績と活動状況から分析し、終了時評価時点の予測や見込みについて検証する。

妥当性	必要性、優先度、手段としての妥当性の観点から、プロジェクト実施の正当性・必要性を評価。 ・必要性（ターゲットグループのニーズとの整合性） ・優先度（カンボジアの開発政策・わが国の援助計画との整合性） ・手段としての妥当性（適用方法の妥当性、ターゲットグループ選定の適切性、日本の技術の優位性等）
有効性	プロジェクト目標の達成度を検証し、プロジェクトの効果を評価
効率性	投入（コスト）と成果の達成状況とを比較し、プロジェクトの実施の効率性を評価
インパクト	上位目標の達成見込み、その他の波及効果を評価
自立発展性	政策・制度面、組織・財政面、技術面等の観点から、総合的な自立発展性を評価

２－３　プロジェクトに関する情報収集

本調査に必要な事項を列挙し、評価グリッドにまとめて必要な情報・データを収集した。情報・データの収集は、以下の方法を適宜組み合わせた。

・文献調査：本プロジェクトに関する過去の各種調査団の報告書、プロジェクトで作成された各

種活動報告書等の文書等。
・面談調査：日本人専門家、C/P、関係機関におけるプロジェクト担当者を訪問し、面談調査を実施した。
・合同評価委員会：C/Pに対して、評価の目的、方法を説明するために合同評価委員会を開催した。
・現場視察：本プロジェクトで実施している啓発活動に係る現場視察を行った。

２－４　合同評価報告書の作成及びミニッツの作成

評価グリッドを基に団内協議により日本側調査団案をまとめ、カンボジア側評価委員と協議し、合同評価報告書を作成した。なお、合同評価チームの日本側メンバーは本調査団員により、またカンボジア側メンバーは以下により構成される。

また、合同評価委員会には、合同評価チーム以外にも、フィリピン側関係機関、カンボジア関係機関等の参加を得た（参加者リストは付属資料参照)。英文にて作成された合同評価報告書は、合同調整会議において合意を得たのち、ミニッツ（付属資料参照）として、カンボジア側・日本側の代表者により署名された。

■合同評価チーム（カンボジア側メンバー）

	氏名	役職	組織	担当分野
1	Dr. Dy Sam An	Deputy Director	Department of Agricultural Legislation	Vice Team Leader（tbc）
2	Mr. Op Pich	Deputy Director	Department of Planning and Accounting, General Directorate of Agriculture, MAFF	Evaluation & Analysis

■フィリピンオブザーバー

	氏名	役職	組織
1	Ms. Zenaida M. Villegas	Director	Project Development Service, Department of Agriculture（DA）
2	Dr. Silvino Q. Tejada, CESO III	Executive Director	Bureau of Soils and Water Management, DA
3	Atty. Gavino L. Barlin	Deputy Executive Director for Fertilizer	Fertilizer and Pesticide Authority, DA
4	Ms. Maria Lourdes De Mata	Office-in-charge	Laboratory Services Division, Bureau of Plant Industry, DA

第３章　プロジェクトの実績と実施プロセス

３－１　投入実績

３－１－１　日本側投入

(1) 専門家派遣

【日本人長期専門家】

・チーフアドバイザー、2010/4/1～2012/3/31

・プロジェクト運営管理/ベースライン調査/意識向上のための啓発普及活動、2009/4/27～2010/3/31

・業務調整/意識向上のための啓発普及活動/モニタリング調査、2010/4/1～2012/3/31

【日本人短期専門家】

・農薬管理・農薬適正使用推進分野、2010/12/6～2011/12/19

・農薬登録管理、2011/11/28～12/17

【第三国専門家（フィリピン)】

・Dr. Wilma N. Obcemea　肥料農薬庁（フィリピン農業省）（Fertilizer and Pesticide Authority：FPA)、肥料品質基準分析、2009/4/21～5/1

・Ms. Maria Lourdes De Mata　植物産業局（Bureau of Plant Industry)、農薬分析、2009/4/21～5/1

・Ms. Edna Lynn C. Floresca　土壌・水管理局（Bureau of Soils and Water Management)、化学肥料分析、2009/8/2～12/24、2010/2/14～7/14、2011/7/4～10/28

・Ms. Maria Esperanza De Guzman Uy　植物産業局（Bureau of Plant Industry)、農薬成分分析、2009/8/2～12/24、2010/2/14～7/14、2011/7/4～9/23

・Prof. Francisco C. Cornejo　前FPA長官、コンサルタント、1）化学肥料・農薬の登録・許可に関する行政の評価、品質基準の選定、2009/10/15～12/15、2）農業資材関連法にかかわる技術交換支援、2010/9/15～2011/2/28

・Ms. Elvira M. Bautista　土壌・水管理局（Bureau of Soils and Water Management)、化学肥料分析、2010/11/7～2011/3/7

・Ms. Laylo Erlinda　植物産業局（Bureau of Plant Industry)、農薬成分分析、2010/11/7～2011/3/7

(2) 調査団派遣実績

目的	人員	期間
中間レビュー	4	2010年4月18日～5月1日
運営指導調査	1	2010年12月13～22日
終了時評価	4	2012年2月9～22日

(3) 技術情報交換研修（フィリピン）

1）第1回　研修内容

①　化学肥料及び農薬の登録に係る法的枠組みと管理業務

② 化学肥料及び農薬の登録後に係る法的枠組みと管理業務
③ 上記業務にかかわる関係者・機関による支援業務
人数：5名（C/P4名、日本人専門家1名）
実施時期：2010年6月6～10日

2）第2回 研修内容
① 化学肥料の登録前及び登録後に係る法的枠組みと管理業務
② 関係機関との連携作業
人数：5名（C/P4名、日本人専門家1名）
実施時期：2010年9月19～25日

3）第3回 研修内容
① 農薬の登録前及び登録後に係る法的枠組みと管理業務
② 関係機関との連携作業
人数：6名（C/P4名、日本人専門家1名、JICAカンボジア事務所1名）
実施時期：2011年1月16～21日

（4）機材供与
以下のとおり、計2,293万6,000円（27万1,664.66USドル）の機材が供与された。付属資料3「Minutes of Meeting Annex5」参照。
- 機器：14万159.02USドル
- スペアパーツ：3万3,638.00USドル
- ラボ機器：4万6,787.64USドル
- 化学薬品・消耗品：5万1,080.00USドル
- 合計：27万1,664.66USドル

３－１－２ カンボジア側投入
（1）カウンターパート（C/P）配置
以下のとおり、計34名のC/Pが配置された。
- 共同プロジェクト・マネジャー：DAL及びGDAから1名ずつ配置
- DAL職員10名、GDA職員20名
- カンダール州PDAより2名配置

（2）ローカルコスト負担
MAFFによりプロジェクトオフィス2部屋とオフィス機材（机、椅子、キャビネット、プリンター等）が提供されており、プロジェクトオフィス及びGDAとDALの分析室の電気・水道代が負担されている。

３－２ プロジェクト実績
終了時評価実施時点での進捗状況の要約は以下のとおりである。

３－２－１　上位目標の発現度

プロジェクト要約	指標	達成見込み
上位目標： カンダール州とその近隣州において、化学肥料及び農薬の適切な使用と品質管理が促進される。	1．クメール語ラベルが添付された、登録されている化学肥料と農薬の流通が増加する。	農薬肥料管理法が的確に実行に移され、かつ啓発活動が継続されれば実現可能である。
	2．小売店が禁止された農薬を販売していない。	同上
プロジェクト目標レベルにおける外部要因達成状況		
MAFFがラボの機能を継続する。	ラボ技術者への技術移転は一定程度完了したものの、技術移転されたスタッフの実数が少ないこと〔GDA（農薬ラボ）3名、GDA（肥料ラボ）7名、DAL3名〕、ラボの運営資金が確保できていないこと、ラボが点在しており無駄な行政コストが多いこと、などから機能の継続については困難な点が多い。	
化学肥料及び農薬の不法取り引きに対し、法による取り締まりが実行される。	2011年12月に農薬肥料管理法が制定された。同法の実効性、特に手続き等についてはまだ不明であり、現段階では法執行の実現性は不明である。	
化学肥料及び農薬の取り扱い業者の意識と能力が継続的に向上する。	CAMTAによる業者及び政府のネットワークが確立され、かつ啓発活動が継続されれば、本外部条件は達成される可能性は高い。	
MAFFスタッフの能力向上が継続的になされる。	MAFFラボスタッフの能力向上には、MAFFがラボ運営経費を確保して各種分析業務を継続させるとともに、組織内だけでなく、研究者及び実務者のネットワークが必要である。このネットワークが整備されれば、実現可能性はあると考えられる。	
【上位目標の発現状況】	MAFFが法律執行を適切に行い、本プロジェクトのPDMで定めた上記外部条件が達成されれば、実現可能であると思料される。	

３－２－２　プロジェクト目標の発現度

プロジェクト要約	指標	達成状況
プロジェクト目標： パイロット地域において、化学肥料及び農薬の適切な使用と品質管理が促進される。	1. 化学肥料と農薬の適切な選択と使用を確保するため、パイロット地域の登録小売店の3分の2が、プロジェクトによって提供された下記の道具を販売に使用する。 （1）農薬のクメール語ラベル （2）化学肥料と農薬の適切な選択と使用のための参考資料	指標1（1）：農薬のクメール語ラベルをMAFF・JICAが商品に添付すると特定企業の商品の宣伝につながる可能性があることから、クメール語ラベルの代替として各商品の使用方法を解すことができるよう病虫害管理ガイドブックパート2を作成することとした。2011年12月に実施されたインパクト調査では、83%の登録小売店が病虫害管理ガイドブックパート1を有用と感じており、パート2は使用方法に言及しており更に有効であることは自明であることから、本指標は達成される見込みである。

		指標1（2）：2011年12月に実施されたインパクト調査において、85％の登録小売店がプロジェクトにより作成されたガイドブックが「非常に役に立つ」「役に立つ」と答えており、当該指標は達成されている。
	2. パイロット地域で、禁止された農薬を売っていない登録小売店の数が倍増する。	2011年12月の段階では67店舗のうち43店舗が禁止農薬の販売を行っていない。2010年8月時点では67店舗中14店舗が販売していないという状況であったことから、禁止農薬を売っていない登録小売店は3.07倍となった。よって、本指標は達成された。
【プロジェクト目標の全体達成状況】 プロジェクト目標は達成されている。		
成果レベルにおける外部要因達成状況		
外部要因なし	なし	

３－２－３　成　果

プロジェクト要約	指標	達成状況
1. プロジェクトのためのベースライン・データが蓄積される。	1-1パイロット地域における登録済み化学肥料に関するベースライン・データがある。	2009年7月にベースライン調査は完了している。
	1-2パイロット地域における登録済み農薬に関するベースライン・データがある。	2009年7月にベースライン調査は完了している。
	1-3 パイロット地域におけるクメール語表記のラベルに関するベースライン・データがある。	2009年7月にベースライン調査は完了している。
【成果1の全体達成状況】 成果1の指標はすべて達成されている。		
プロジェクト要約	指標	達成状況
2. 化学肥料及び農薬の分析に関するラボの能力が向上する。	2-1 ラボの機材・設備が適切に設置され、機能している。	（化学肥料分析分野）：分析に必要な機材はすべて適切に設置され、機能している。DALの肥料分析室については、アジア開発銀行（Asian Development Bank：ADB）より2003年に供与されたものの使用されずに放置されていた機材の梱包を解き、設置する作業を含む。 （農薬成分分析分野）：分析に必要な機材はすべて適切に設置され、機能している。

	2-2 DAL及びGDAにおける肥料のためのラボが、NPK及びその他微量要素（鉄、マンガン、亜鉛、銅、カルシウム、マグネシウム）を分析できる。	対象微量要素に加えSulfurについてDAL・GDAともに分析可能となった。Validationについては、GDAは原子吸光分析法（Atomic Absorption Spectrophotometer : AAS）を保有していないため6つの微量要素について確率できていないが、DALは4つの微量要素のValidationまで可能となった
	2-3 農薬のためのラボが24の優先度の高い有効成分のうち、少なくとも60%を分析することができる。	28成分のValidationが確立しており、目標値をはるかに超えている。
	2-4 化学肥料のNPK及びその他微量要素（鉄、マンガン、亜鉛、銅、カルシウム、マグネシウム）及び、少なくとも24の優先度の高い農薬の有効成分のうちの60％を分析するためのマニュアルが作成される。	（化学肥料分析分野）: すべての必要なマニュアルが整備された。 （農薬成分分析分野）: 32の有効成分分析に係るマニュアルが整備された。
	2-5 ラボの機材の使用及び維持管理のためのマニュアルが作成される。	（化学肥料分析分野）: 主要機材に関するマニュアルが整備された。 （農薬成分分析分野）: 主要機材に関するマニュアルが整備された。
	2-6 登録小売店からインスペクターによって採取したサンプルの分析レポートが作成される（その後、関係者の間で共有される）。	サンプルはプロジェクトにより購入されラボで分析され、関係者に共有されたが、インスペクターが採取する行政枠組みが整っていなかったため、採取されていない。
【成果2の全体達成状況】 成果2の指標はすべて達成されている。		
プロジェクト要約	指標	達成状況
3. 化学肥料及び農薬の登録及び登録後業務基準の規則初稿の策定が促進される。	3-1 化学肥料及び農薬の登録及び登録後業務のための業務基準に関係した政策の選択肢が提供される。	3回の技術交換研修及びプロジェクトの側面支援により、2011年12月に農薬肥料管理法が制定された。同法の実施のためにDALは3年間で25の規則を制定することにしているが、プロジェクトによりそのうちの2つに該当する化学肥料及び農薬管理に関する手続き及び業務基準の手続き案が作成された。今後Prakasとして最終化される予定である。
【成果3の全体達成状況】 成果3の指標はすべて達成されている。		

プロジェクト要約	指標	達成状況
4. 化学肥料及び農薬の適切な使用と品質に関する意識が向上する。	4-1 一般の意識向上活動のために、パンフレット、ポスター及び視聴覚メディアのそれぞれのタイプで、少なくとも1つずつの道具を作成し、普及させる。	2003年にMAFFにより作成された農薬リストはクメール語から英語に翻訳されて小売店に配布された。農薬・肥料に関するポスターが2種作成され対象州等に配布された。農薬適正管理に関するスポット番組コンテンツを作成し放映した。
	4-2 パイロット地域のすべての登録小売店に、農薬の選択と使用のためのクメール語ラベルと参考資料が配布される。	禁止農薬に関するポケットガイド（英語、クメール語）及び病虫害管理ガイドブックを作成し、登録小売店に配布した。なお、特定の商品を対象とした病虫害管理ガイドブックは、特定商品を含める是非について協議に時間を要したため、終了時評価時点では配布されていないが、プロジェクト終了時までに配布される予定である。
	4-3 パイロット地域のすべての登録小売店に、化学肥料の選択と使用のための参考資料が配布される。	化学肥料の適切な選択に関するポスターが作成、配布された。
【成果4の全体達成状況】 成果4の指標はすべて達成されている。		
前提条件達成状況		
1.ラボの運営にかかわる人材に大幅な変更がない。	ラボスタッフはDALが4名、GDAが19名として定められており、その人数に大きな変更はなかった。	
2. 既存の機材・設備が適切に機能する。	事前評価段階では、既存の機材・設備（ADBにより納入された機器を含む）をプロジェクト開始前にカンボジア側が機能させるよう合意がなされた。しかし、既存設備の更新のためには第三国から技師を呼び寄せ更新をする必要があることが判明するなど、主として予算面においてカンボジア側は本前提条件を満たすことができなかった。ただし、前提条件未達成はプロジェクト実施上の根幹にかかわることであることから、プロジェクト開始後に主にフィリピン人専門家の指導により、機材開梱や初期化、また不足機材の確認及びその調達・据え付けなど、プロジェクト開始後に前提条件達成のための対応が行われた。	

３－２－４　活動実績一覧表

【成果1】 プロジェクトのためのベースライン・データが蓄積される。	PDMに沿った活動の現状
1-1 選定基準に基づき、パイロット地域を選定する。	（完了） ・2009年6月に、C/P機関スタッフとともに、プロジェクトのパイロットサイト選定に係る準備会合を重ねた結果、カンダール州の2郡（キエンスバイ郡及びコットム郡）とすることで合意された。

1-2 質問票を作成する。	（完了） ・2009年6月に、C/P機関スタッフとともに、ベースライン調査のための2つの質問票（販売店用及び使用者用）（英語及びクメール語）が作成された。
1-3 取り扱い業者を対象とした聞き取り調査を行う。	（完了） ・2009年7月にパイロットサイトにおいて、33の農業資材販売店及び272人の農民を対象にインタビュー調査が行われた。
1-4 ベースライン・データに関する報告書を作成する。	（完了） ・2009年12月にベースライン調査報告書を作成された。
【成果2】 化学肥料及び農薬の分析に関するラボの能力が向上する。	PDMに沿った活動の現状
2-1 化学肥料及び農薬分析ラボをセットアップする。	（完了） ・2009年7月及び12月、2010年8月にそれぞれ分析機材の調達（総額24万2,593USドル）を行い、フィリピン人専門家により適切に設置された。
2-2 化学肥料及び農薬分析技術に関し、ラボスタッフのオンザジョブ・トレーニング（OJT）/フィリピンにおける第三国研修を実施する。	（完了） ・プロジェクト期間中、以下のOJTが実施された。 ・第1回OJT（化学肥料分析及び農薬分析分野）：2009年8月2日～12月24日。 ・第2回OJT（化学肥料分析及び農薬分析分野）：2010年2月14日～7月14日。 ・第3回OJT（化学肥料分析及び農薬分析分野）：2010年11月7日～2011年3月7日。 ・第4回OJT（化学肥料分析及び農薬分析分野）：化学肥料分析に関するOJTが2011年7月4日～10月28日まで、農薬分析に関するOJTが2011年7月4日～9月23日までの期間行われた。
2-3 パイロット地域で収集された化学肥料及び農薬のサンプルに関する品質を分析する。	（完了） ・中間レビュー調査の結果を受けて、2010年5月以降定期的にパイロット地域において化学肥料及び農薬サンプルを購入して、分析のうえ、その結果がプロジェクト関係者で共有された。
2-4 マニュアルを作成する。 1）化学肥料の分析（NPK及びその他の微量要素） 2）農薬の分析（優先度の高い幾つかの有効成分） 3）ラボの機材の使用及び維持管理）	（完了） ・化学肥料及び農薬分析に関する以下のマニュアルが完成した。 （化学肥料分析）： ・肥料分析マニュアル（クメール語及び英語） ・分析方法の有効化マニュアル（英語） ・分析機材の使用マニュアル（クメール語及び英語） ・肥料の品質管理マニュアル（英語） ・トレーニングマニュアル（英語） （農薬分析）： ・農薬成分分析マニュアル（クメール語及び英語） ・農薬成分分析手順マニュアル（クメール語及び英語） ・分析機器の維持管理ガイド（英語） ・農薬成分分析室管理マニュアル（英語）

【成果3】 化学肥料及び農薬の登録及び登録後業務基準の規則初稿の策定が促進される。	PDMに沿った活動の現状
3-1 化学肥料及び農薬に関する現在の行政業務書類と規則のレビューを行う。	（完了） ・2009年10月15日～12月15日の間、フィリピン人専門家が派遣され、現在の化学肥料及び農薬に関する行政業務書類と規則のレビューが行われた。
3-2 化学肥料及び農薬の登録及び登録後業務基準に関する規則について、関係するMAFF部局及びその他重要な関係者との意見交換を行う。	（完了） ・2010年7月14日にDAL主催による「農薬と農業資材法案」（その後「農薬肥料管理法案」に名称が変更）にかかわる関係機関との意見交換会議が行われた。その会議を受けて、同法案に関するコメントをプロジェクト関係者からも取り付けてまとめて送付された。
3-3 他ドナーを含む関係機関と協力して、新たな規則のために提言を行う。	（完了） ・これまでにFPAにおけるTIEPを以下のとおり計3回実施することにより、化学肥料と農薬の登録及び登録後業務基準に関する技術支援が行われている。 ・第1回TIEP（期間：2010年6月6～10日。主な内容：化学肥料及び農薬の登録と登録後に係る法的枠組みと管理業務） ・第2回TIEP（期間：2010年9月19～25日。主な内容：化学肥料の登録と登録後に係る法的枠組みと管理業務。関係機関との連携作業） ・第3回TIEP（期間：2010年9月19～25日。主な内容：農薬の登録と登録後に係る法的枠組みと管理業務。関係機関との連携作業）
【成果4】 化学肥料及び農薬の適切な使用と品質に関する意識が向上する。	PDMに沿った活動の現状
4-1 パンフレット、ポスター及び視聴覚メディアなどの意識向上のための道具を作成する。	（完了） ・これまでに啓発活動のための以下の教材が作成された（作成時期）。 ・禁止農薬ポスター（クメール語と英語）（2010年7～8月）。 ・禁止・制限農薬リスト（クメール語）（2010年8月）。 ・稲の害虫（トビイロウンカ）の適切な対処法に関するポスター（クメール語版と英語版）（2010年8～9月）。 ・FPAより提供された「適切な農薬管理」に係るビデオ番組の吹き替え版（クメール語と英語）（2011年1～2月）。 ・2011年4月に実施した「禁止農薬撲滅全国キャンペーン」のためのテレビスポット広告とテレビトークショー番組（クメール語と英語字幕付き）（2011年1～4月）。 ・肥料農薬法及び認可済み農業資材販売店における農業資材の購入を広報するための新たなテレビスポット広告（クメール語と英語字幕付き）（2011年11月）。

4-2 化学肥料と農薬の適切な選択と使用に関する、登録小売店のための道具を作成する。	（プロジェクト終了時までに完了予定） ・これまでに化学肥料と農薬の適切な選択と使用に関する、登録小売店のための以下の教材を作成された（作成時期）。 ・禁止・制限農薬ポケットガイド（2010年10～11月）。 ・病虫害管理ガイドブック（クメール語と英語）（2010年11月～2011年11月）。 ・病虫害管理ガイドブックパート2（クメール語）（2011年9月～現在）。 ・禁止・制限農薬リスト（クメール語と英語）（2011年5月～現在）。
4-3 一般のための意識向上活動を実施する。	（完了） ・これまでに以下の一般のための意識向上活動が実施された。 ・MAFF主催の「農業普及教材に係る展示会」への参加。（2011年2月23～24日） ・「禁止農薬撲滅全国キャンペーン」（2011年4月25日～5月1日） ・「禁止農薬撲滅全国キャンペーン」のためのテレビスポット広告とテレビトークショー番組の全国放映。（2011年4月25日～5月1日） ・肥料農薬法及び認可済み農業資材販売店における農業資材の購入を広報するための新たなテレビスポット広告の全国放映。（2011年12月3～18日）
4-4 小売店のための意識向上活動を実施する。〔この活動には、4-2において作成された道具の共有を通じての国連食糧農業機関（Food and Agriculture Organization of the United Nations : FAO）との協力を含む〕	（プロジェクト終了時までに完了予定） ・パイロット地域にある小売店のために、これまでに以下の内容に関する意識向上活動が実施された。 ・禁止農薬の販売と購入の禁止。（2010年8月18～25日） ・稲の害虫（トビイロウンカ）の適切な対処法。（2010年9月29日～10月6日） ・禁止農薬の販売と購入の禁止。（2011年1月18～31日） ・禁止農薬の撲滅。（2011年4月25日～5月1日、カンボジア全国） ・適切な化学肥料の選択と使用。（2011年6月10～30日） ・稲とハクサイに関する病虫害の同定及び適切な農薬（有効成分）の選択。（2011年8月30日～9月9日） ・稲とハクサイに関する病虫害の同定及び適切な農薬製品の選択と使用。（プロジェクト終了時までに完了予定）

３－３　プロジェクト実施プロセスにおける特記事項

（1）プロジェクト・デザイン・マトリックス（PDM）の改訂

2010年4月に実施された中間レビュー調査団において、プロジェクトは全体的に進捗しているものの、プロジェクト開始後に明らかになった各種状況に対応するため、PDMの改訂が必要と判断された。主なPDMの改訂点は以下のとおり。

1）スーパーゴール

PDM第1版　2009年1月30日	PDM第2版　2010年4月30日
国内消費用の食料の安全性が向上し、農産物の海外への輸出が促進される。	削除。
指標： 食用農産物が安全であり、高品質が確保されている。	削除。

（改訂理由）

衛生植物検疫（Sanitary and Phytosanitary：SPS）の課題に対して、本プロジェクトは直接的に貢献する活動を行っていないため、スーパーゴールを削除することが妥当である。

2）上位目標

PDM第1版　2009年1月30日	PDM第2版　2010年4月30日
国内市場に流通している化学肥料及び農薬の品質が向上し、農民がこれら化学薬品を適切に使用するようになる。	カンダール州とその近隣州において、化学肥料及び農薬の適切な使用と品質管理が促進される。
指標： 1. カンボジア国内に流通している化学肥料のうち、登録されているものの割り合いが年間X%増加する。 2. カンボジア国内に流通している農薬のうち、登録されているものの割り合いが年間X%増加する。 3. カンボジア国内に流通している化学肥料及び農薬のうち、クメール語表記のラベルが添付されているものの割り合いが増加する。 4. 登録業務及びそれにかかわる手数料からの収入が増加する。	指標： 1. クメール語ラベルが添付された、登録されている化学肥料と農薬の流通が増加する。 2. 小売店が禁止された農薬を販売していない。

（改訂理由）：

ベースライン調査結果により、「パイロット地域には、現在極めて多くの違法かつ低品質の農業資材が流通しており、政府に登録された農業資材は非常に少ないこと」が判明した。その結果、本プロジェクトが残りの期間に優先的に対応するべき課題は、PDM第1版のプロジェクト目標の指標にあった「登録されているものの割り合い」を増加させることではなく、現在流通している農業資材のなかから小売店及び農民が適切な商品を選択し、適切に使用する方法等の普及にあると判断された。

また、パイロット地域に流通している商品のほとんどは、クメール語にて記載されたラベルが添付されていないため、その誤使用が、使用者による健康被害、低い農業生産性、環境悪化をもたらしているため、何らかの早急な対応が求められていると判断された。

以上の理由により、中間レビュー調査団はプロジェクト目標を変更することが妥当であるという結論に至った。

3）プロジェクト目標

PDM第1版　2009年1月30日	PDM第2版　2010年4月30日
化学肥料及び農薬の品質管理メカニズムが強化される。	パイロット地域において、化学肥料及び農薬の適切な使用と品質管理が促進される。
指標： 1. パイロット地域内に流通している化学肥料のうち、登録されているものの割り合いが年間X%増加する。 2. パイロット地域内に流通している農薬のうち、登録されているものの割り合いが年間X%増加する。 3. インスペクションの過程で実施される分析業務の件数が増加する。 4. パイロット地域内に流通している化学肥料及び農薬のうち、クメール語表記のラベルが添付されているものの割り合いが増加する。	指標： 1. 化学肥料と農薬の適切な選択と使用を確保するため､パイロット地域の登録小売店の3分の2が､プロジェクトによって提供された下記の道具を販売に使用する。 （1）農薬のクメール語ラベル (2)化学肥料と農薬の適切な選択と使用のための参考資料 2. パイロット地域で､禁止された農薬を売っていない登録小売店の数が倍増する。

（改訂理由）

上記の上位目標の修正と同様の理由による。

4）アウトプット2

PDM第1版　2009年1月30日	PDM第2版　2010年4月30日
指標： 2-1 必要な機材・設備がすべて適切に設置されている。 2-2 実験室スタッフのX人がNPK及びその他微量要素を分析できる。 2-3 実験室スタッフのX人が優先度の高い幾つかの成分を分析できる。	指標： 2-1 ラボの機材・設備が適切に設置され、機能している。 2-2 DAL及びGDAにおける肥料のためのラボが、NPK及びその他微量要素（鉄、マンガン、亜鉛、銅、カルシウム、マグネシウム）を分析できる。 2-3 農薬のためのラボが24の優先度の高い有効成分のうち、少なくとも60%を分析することができる。 2-4 化学肥料のNPK及びその他微量要素（鉄、マンガン、亜鉛、銅、カルシウム、マグネシウム）及び、少なくとも24の優先度の高い農薬の有効成分のうちの60%を分析するためのマニュアルが作成される。 2-5 ラボの機材の使用及び維持管理のためのマニュアルが作成される。 2-6 登録小売店からインスペクターによって採取したサンプルの分析レポートが作成される（その後、関係者の間で共有される)。

（改訂理由）

ラボスタッフ個人ではなく、ラボ全体としての能力向上を図ることが必要とされ指標が改められた。また、ラボの業務とパイロット地域における活動とを連携させるための活動

と指標（2-6）も新たに追加された。さらに、優先的に分析する必要がある微量要素等を明確にした。

（改訂版の活動）

2-1 化学肥料及び農薬分析ラボをセットアップする。

2-2 化学肥料及び農薬分析技術に関し、ラボスタッフのOJT/フィリピンにおける第三国研修を実施する。

2-3 マニュアルを作成する。

1）化学肥料の分析（NPK及びその他の微量要素）

2）農薬の分析（優先度の高い幾つかの有効成分）

3）ラボの機材の使用及び維持管理

5）アウトプット3、4及び5

PDM第1版　2009年1月30日	PDM第2版　2010年4月30日
アウトプット3 化学肥料及び農薬の品質基準がMAFFの認可を受け、普及される。	アウトプット3 化学肥料及び農薬の登録及び登録後業務基準の規則初稿の策定が促進される。
アウトプット4 登録及び認可に関する行政業務能力が向上する。	
アウトプット5 パイロット地域において、登録後業務に関する能力が向上する。	
指標： 3-1 化学肥料及び農薬の品質基準が、プロジェクト中間時点にはMAFFに認可される。 3-2 プロジェクト終了時までに、化学肥料及び農薬の品質基準につき、パイロット地域のPDAの農業室、農業法規室及び取り扱い業者に普及されている。 4-1 手数料徴収に関する規則が正式に採用される。 4-2 登録及び認可に関する行政業務手続きが簡素化される。 5-1 インスペクターが、パイロット地域においてインスペクション業務を実施できる。 5-2 インスペクターが、マニュアルに沿ってサンプル採取を実施できる。 5-3 登録後業務に関する行政業務手続きが簡素化される。	指標： 3-1 化学肥料及び農薬の登録及び登録後業務のための業務基準に関係した政策の選択肢が提供される。 （注）「業務基準」とは「化学肥料及び農薬の登録及び登録後業務のための、技術標準及び行政手続きに必要なすべての要件」と定義する。

（改訂理由）

短期専門家による提言やベースライン調査結果等に基づき、アウトプット3～5の内容を整理したうえでより明確かつ簡潔な表現とした。また、FAO等の他ドナーとの連携により活動を推進することが有効であるため、新たな活動として加えた。

（改訂版の活動）

3-1 化学肥料及び農薬に関する現在の行政業務書類と規則のレビューを行う。

3-2 化学肥料及び農薬の登録及び登録後業務基準に関する規則について、関係するMAFF部局及びその他重要な関係者との意見交換を行う。

3-3 他ドナーを含む関係機関と協力して、新たな規則のために提言を行う。

6）アウトプット6

PDM第1版　2009年1月30日	PDM第2版　2010年4月30日
アウトプット6 パイロット地域において、化学肥料及び農薬の品質と適切な使用法に関する意識が向上する。	アウトプット4 化学肥料及び農薬の適切な使用と品質に関する意識が向上する。
指標： 6-1 パイロット地域において、特定の市場に流通しているもののうち、登録されている化学肥料及び農薬が増える。 6-2 パイロット地域において、登録されている化学肥料や農薬を使う農民が増える。	指標： 4-1 一般の意識向上活動のために、パンフレット、ポスター及び視聴覚メディアのそれぞれのタイプで、少なくとも1つずつの道具を作成し、普及させる。 4-2 パイロット地域のすべての登録小売店に、農薬の選択と使用のためのクメール語ラベルと参考資料が配布される。 4-3 パイロット地域のすべての登録小売店に、化学肥料の選択と使用のための参考資料が配布される。

（改訂理由）

意識向上活動はパイロット地域のみならず、より幅広い関係者に対しても行うべきであり、また、プロジェクト残り期間においては登録数増加をめざすことは現実的でないため、表現を修正した。

（改訂版の活動）

4-1 パンフレット、ポスター及び視聴覚メディアなどの意識向上のための道具を作成する。

4-2 化学肥料と農薬の適切な選択と使用に関する、登録小売店のための道具を作成する。

4-3 一般のための意識向上活動を実施する。

4-4 小売店のための意識向上活動を実施する（この活動には、4-2において作成された道具の共有を通じてのFAOとの協力を含む）。

(2) プロジェクト・マネジメント

本プロジェクトでは、プロジェクト事務所が日本人専門家及びプロジェクト・アシスタントのみが勤務する形となっており、C/Pと同じ部屋で勤務する状況とはなっていない。日常の連携を高めるために、プロジェクトではワーキンググループを構成し、月間の進捗管理を行うよう改善を図ったものの、日常的なオフィスコミュニケーションの欠如は、C/Pのオーナーシップの醸成への阻害要因として働いた。

(3) 第三国専門家の活用

本プロジェクトでは成果のひとつであるラボに関し、第三国専門家が当該成果達成に大き

く寄与したものである。第三国専門家の活用は、プロジェクト実施者側にとっては事業費を低減させることが可能となり、C/Pまたは受益者にとってはより身近に技術を吸収しやすい素地をつくり出すことにつながった。

（4）官民連携

本プロジェクトでは、病虫害管理ガイドブックパート2の作成やCAMTA設立支援など民間業者との連携を深めた。プロジェクト実施により、政府と民間業者が対話するチャネルを確立したことは特筆すべきに値することである。

第４章　5項目評価

４－１　妥当性

妥当性は高いと評価される。

(1) カンボジアの国家開発政策との整合性

カンボジアの開発目標は貧困削減と経済成長の実現である。この目的を達成するため、農業セクターを含む開発計画として以下の計画が策定されている。

- 国家戦略開発計画（National Strategic Development Plan：NSDP）Update（2009～2013年）
- 農業と水戦略（Strategy for Agriculture and Water：SAW）（2006～2010年）
- コメ生産輸出促進に係る政策書簡〔コメ政策Policy Paper on Promotion of Paddy Production and Rice Export：Rice Policy)〕（2010～2015年）

NSDPでは農業セクターの発展を主要な政策として定めており、SAWでは農業生産性向上、農産品の多様化、水資源開発及び管理を目標としている。また、Rice Policyでは2015年までに100万tのコメを輸出すること等を目標としている。これらの政策を実現するためには、化学肥料、農薬、飼料等の農業資材の品質の改善は不可欠であり、本プロジェクトは、カンボジア農業セクターの開発のために、化学肥料及び農薬の適正管理を目的としたものであり、カンボジア開発政策に合致するものである。

(2) ターゲットグループのニーズに対する妥当性

化学肥料及び農薬は農業生産性向上のための主要なインプットである一方、マーケットで販売されている化学肥料及び農薬には偽物等が含まれる品質が低い状況であった。また、それら製品にはクメール語ラベルがなく、外国語表記となっているため、農民は使用方法を理解できないでいる。2009年7月にプロジェクトにより実施されたベースライン調査においても、パイロット地域の2郡においてほとんどすべての農薬が登録されておらず、また外国語表記のラベルとなっていることが確認されている。このような状況を改善するため、プロジェクトでは販売店及び農民の意識啓発を図ってきていることから、ターゲットグループのニーズを十分満たしているものである。

(3) わが国の援助政策との整合性

わが国の対カンボジア国別援助計画においては、「持続的な経済成長と安定した社会の実現」という重点分野の援助方針として「農業・農村開発と農業生産性向上」が挙げられており、農村人口の約40％が貧困状態にあることからも、農業・農村開発は貧困削減の観点からも重要な協力分野と位置づけられている。

同様に、JICAはカンボジア国別事業実施計画において、「農業・農村開発」はカンボジアの経済基盤の強化に向けた主要な開発課題のひとつとして挙げており、同課題への対応として、「水資源・灌漑開発管理プログラム」及び「農業普及・流通改善プログラム」の2つが設定されていることから、本プロジェクトは「農業普及・流通改善プログラム」に位置づけられていることから妥当性は高いと判断できる。

(4) 日本及びフィリピンの技術の優位性

JICAではこれまで「農産物残留農薬検査体制・能力強化支援プロジェクト（エチオピア)」「北部タイ省農薬適正技術計画プロジェクト（タイ)」「農薬モニタリング体制改善計画（フィリピン)」など、農業資材関係のプロジェクトを実施しきており、その知見が蓄積されている。また、フィリピンではJICAの支援を受けたあとも、自国内で同分野の発展を遂げてきている。本プロジェクトには、フィリピンでJICAプロジェクトにより技術移転を受けた専門家が派遣されていることに加え、技術交換研修でフィリピンの当該分野発展過程における経験をカンボジアC/Pが学ぶ機会もつくられた。これらより、日本及びフィリピンの技術及び経験が適切にカンボジアに移転されたと考えられる。

４－２　有効性

有効性は高いと評価される。

(1) プロジェクト目標の達成度

本プロジェクトのプロジェクト目標「パイロット地域において、化学肥料及び農薬の適切な使用と品質管理が促進される」の成果指標は、「1. 化学肥料と農薬の適切な選択と使用を確保するため、パイロット地域の登録小売店の3分の2が、プロジェクトによって提供された下記の道具〔(1) 農薬のクメール語ラベル、(2) 化学肥料と農薬の適切な選択と使用のための参考資料〕を販売に使用する」「2. パイロット地域で、禁止された農薬を売っていない登録小売店の数が倍増する」の2点である。

指標1 (1) の「農薬のクメール語ラベル」については、一般商品である農薬ラベルは一般企業が責任をもって貼り付けるべきであり、JICA及びMAFFが直接介入すべきでない点がプロジェクト関係者間で合意されており、クメール語の農薬ラベル普及の推進またはクメール人がどのように適正な農薬使用に係る判断ができるように変化させることができたかが本指標の評価対象となると終了時評価調査チームで判断した。プロジェクトではパイロット地域の主要作物であるコメ及びチャイニーズキャベッジに関する病気の種類、それに有効な農薬成分、当該農薬成分が含まれている認可農薬を示した病虫害管理ガイドブックを作成しており、パイロット地域の全小売店に配布・活用されている。また、指標1 (2) の「化学肥料と農薬の適切な選択と使用のための参考資料」については、プロジェクトでは計5種のパンフレット、ポスター、ガイドブック類を作成しており、プロジェクトによりインパクト調査によりパイロット地域の全小売店で活用されていることが確認されている。

指標2については、2010年8月時点では67店舗中14店舗が販売していないという状況であったのに対し、2011年12月の段階では67店舗のうち43店舗が禁止農薬の販売を行っておらず、禁止農薬を売っていない登録小売店は3.07倍となった。以上より、プロジェクト目標は達成されたと判断できる。

(2) プロジェクト目標達成における貢献・阻害要因

化学肥料及び農薬の適切な使用及び管理のためには、ラボの分析技術の向上、登録及び登録後の行政手続きの改善、更に意識啓発が必要である。化学肥料及び農薬の適切な使用及び管理という性質から、本プロジェクトで設定したプロジェクト目標とアウトプットの論理関

係は極めて有効であった。

また、プロジェクト目標達成のための貢献要因としては以下の内容が挙げられる。

- 適材適所な人材配置（日本人及びフィリピン人専門家の配置、C/Pの配置）
- 現在の問題に応じた適切な計画策定
- 啓発活動用資料の作成と普及戦略

４－３　効率性

投入は成果に比して極めて効率的であったと評価される。

（1）アウトプットの達成度

PDMで設定されている4つの成果（Output）に対応して合計13の客観的指標（Indicator）については達成されている。

（2）アウトプット達成のための適切な投入

プロジェクト実施のための専門家間での業務分担は、アウトプット1及び4を日本人長期専門家（2名）が、アウトプット2をフィリピン人専門家（7名）が、アウトプット3を日本人短期専門家（1名）が担ったというものである。特に、フィリピン人専門家の活用は、農薬及び肥料の適切利用に係る開発経験や語学の面で技術の浸透率が非常に高かったことに加え、コストの低減にもつながっている。また、アウトプット達成のうえで、ラボにおけるOJT及びフィリピンへの技術交換研修が大きな効果をもたらしたと評価される。

（3）カウンターパート（C/P）の配置と前提条件の達成

適切な技術及び経験をもったC/Pが基本的には適時適切に配置されたが、ラボの技術者については十分な学術的専門性をもったC/Pがそれほど配置されなかった。しかしながら、プロジェクト実施期間中にC/Pの異動がほとんどなく、技術移転は適切に行われたものと判断できる。

PDMに示される前提条件のひとつに、「既存の機材・設備が適切に機能する」が定められているが、国内の技術者の不在及び財政的な不足によりカンボジア側により本前提条件は達成されなかった。よって、日本側が追加的な支援をすることにより当前提条件を達成することとなった。

（4）他ドナー等との連携

中間レビュー時のPDMの改訂及びその後の活動において、FAOと協議をしながらプロジェクト運営方針を検討している。また、「禁止・制限農薬ポケットブック」はFAO専門家の提案により作成方針を決めており、「病虫害管理ガイドブック」についても同専門家にコメントを得ながら作成しており、効果的な連携が図られている。

４－４　インパクト

強い正のインパクトが発現したと評価される。

本プロジェクト実施により、適切な化学肥料及び農薬の使用と管理に関して、以下の点で直

接的なインパクトが発現した。

1）化学肥料及び農薬の適切な使用に関して、登録小売店が顧客に対して適切な指導ができるようになった。

2）登録小売店により販売されていた禁止農薬の数が著しく減少した。

3）プロジェクトにより作成された啓発活動の資料が他のNGOsやドナー〔VVOB（ベルギー）、World Vision、CARITAS、FAO、GIZ/REDP〕によって活用された。さらに、禁止農薬ポスター及び禁止・制限農薬ポケットブックが24州に配布された。

以上より、特に啓発活動において強いインパクトが生じたと考えられる。また、間接的なインパクトは以下のとおりである。

1）農民へのインパクト：インタビューを受けた多くの登録小売店において、化学肥料及び農薬の使用に関し、使用方法や使用頻度の観点で農民の習慣が変化したことが確認された。その一方で、農民の一部では、禁止農薬の即効性からいまだに禁止農薬を好んで使う嗜好があることも確認された。

2）小売店へのインパクト：プロジェクトにより提供された資料により化学肥料及び農薬に関する知識が向上した小売店の数が増加したことが確認された。

3）CAMTA：フィリピンへの技術交換研修での経験に基づき、MAFFは政府と民間企業との対話のチャネルをCAMTAを通じて導入することとなった。

4）農薬肥料管理法：フィリピンへの技術交換研修での経験に基づき、MAFF及びプロジェクトからのインプットに基づき、法律が制定された。

４－５　自立発展性

自立発展性は中程度と評価される。

（1）国家開発政策との整合性

カンボジア政府は農業セクターを中心とした貧困削減に係る政策を優先しており、今後も同政策は継続すると見込まれる。また、2012年1月に施行された農薬肥料管理法の関係では、法律の実行性を高めるため25の規程を定める予定であり、これにより国家として農薬及び肥料の適切な使用と管理について実行性が高まる見込みである。

（2）ラボの持続性

プロジェクト実施前はGDA及びDALの農薬及び肥料ラボはセットアップされていなかったが、プロジェクトにより、ラボスタッフの技術向上も含め、これらが適切に立ち上げられ運用されている。しかしながら、GDA・DALのラボすべてにおいて、ラボの運営計画、質の高いスタッフの確保、また運営費において課題が多い状況である。各ラボにおける持続性について、ラボごとに異なることから、以下個別に記載する。

1）肥料ラボ（DAL）

DALスタッフは規制監督分野で雇用され勤務してきている。現在の分析業務は本来の規制監督業務に付加した業務となっており、業務負荷が増大しているものと思料される。また、技術的なバックグラウンドを有しているスタッフもGDAに比して少なく、このような状況のなかで行うラボでの分析業務は効果及び効率性の観点から改善されるべき事象であ

る。

2）肥料ラボ（GDA）

GDAにおける肥料ラボは、比較的長いラボの経験をもつ複数のスタッフを有しており適切なラボの運営が期待できるが、AAS等の微量元素を分析するための機器が不足している（AASはDAL肥料ラボにあり）。また、GDAの肥料ラボは国立農業研究所（National Agriculture Laboratory：NAL）の一部として指定されている。さらに、GDAはラボスタッフのキャパシティを向上させるためのプログラムを有している。

3）農薬ラボ（GDA）

農薬ラボでは成分分析が可能になったが、内部的な行政手続きが整備されておらず、分析自体が実施されていない。農薬ラボにおいても、ラボスタッフのキャパシティを向上させるためのプログラムを有している。

（3）登録及び登録後業務の持続性

適切な農薬及び肥料の管理のためには、登録業務、検査、啓発活動が調和よく連携しあうことが不可欠である。プロジェクト開始前には非常に多くの違法製品が市場に溢れており、これらは民間業者が製品を登録する意欲を削いでいた状況である。しかし、農薬肥料管理法の施行によって、適切な管理のための体制が整えられたことは特筆に値する。しかし、この法律を実行していくためには、以下のような中長期の戦略及び実行が必要である。

1）規程の策定：法律施工後、MAFFは25の規程を策定する計画である。MAFFでは既にこれら規程を策定するためにワーキンググループを設立しているものの、本調査団に対しDALはこれらを実行するために、①農薬及び肥料のデータベース作成、また②登録プロセスの改善に係る技術支援を要望している。

2）登録の数の増加：農家及び小売店への調査において、農薬及び肥料の登録に対する高いニーズが確認された。MAFFはこれらすべての製品を再登録する必要がある。

3）検査：現在、検査業務はFAOで支援しているカンダール州での限られたエリアにおいてのみ実施されている。限られた法的権限及び検査官の能力を考慮するとこれらの検査制度の改善が必要である。

4）啓発活動：以下で記載のとおり。

（4）啓発活動の持続性

多くの有用な資料がプロジェクトにより作成され、配布されてきており、非常に大きなインパクトを与えている。MAFFでは現在のところこれらの普及戦略を策定していない。

４－６　評価5項目による評価の結論

本プロジェクトは、カンボジア及び日本の政策に合致しており、ターゲットとなる小売店及び農民のニーズを的確に反映しており妥当性は高い。プロジェクトでは第三国専門家（フィリピン）を活用することにより、事業コストの低減と技術普及の浸透率を高めており、4つの成果の達成及びそれに基づくプロジェクト目標の達成がなされた。したがって、有効性は高いと評価され、効率性は主として第三国専門家の活用という点から非常に高いと評価される。さらに、インパクトについては、ガイドブック及びCAMTAによる官民連携の実現、第三国専門家及び研修を通じた南

南協力の推進、農薬肥料管理法制定への側面支援など、強い正のインパクトが発現したものと評価できる。上位目標の達成のためには種々の条件を達成していく必要があるものの、農薬肥料管理法の制定が条件達成を支援するものであると評価されることから、自立発展性は中程度と評価できる。

第５章　提言と教訓

５－１　提　言

上記の分析に基づき、「ラボ業務」「農薬及び肥料の登録・検査」「政府及び民間セクター間のネットワーク」「啓発活動の継続及び促進」について以下のとおり提言する。

５－１－１　ラボ業務

1）DALの肥料ラボは以下の理由からNALに統合されるべきである。

- 運営費及び人的資源の有効活用するため
- DALを登録と検査業務により特化させるため
- AAS等の限られたラボの機材及び消耗品を最大限活用するため

2）統合されたラボは以下の理由から半官半民の組織（Public EnterpriseまたはSpecial Operating Agency）に移管させるべきである。

- 政府保有のラボでは登録及び検査費用を国庫返納せざるを得ない。運営費を捻出するためには、登録及び検査費用を回転資金として活用することが重要であり、そのためには半官半民の組織に移管する必要がある
- 給料や福利厚生等を改善することによるラボスタッフへのインセンティブが与えられるようにするため
- スタッフ管理を柔軟に行うため
- 分析結果の信頼性を強化するため

これらを達成するために、MAFFは①ラボの運営計画の策定、②MAFF大臣からの強いコミットメントの確保、③半官半民組織になるための法的手続きを取ることが必要である。この実行のためには、鉱工業エネルギー省のラボや保健省のラボ、またはフィリピン農業省（Department of Agriculture：DA）のラボの経験が有用であることから、これらから情報収集を行い、計画をまとめる必要がある。

3）統合されたラボは以下の方法を通じて能力を高めるべきである。

- 「Chemical Society of Cambodia」等の既存国内ネットワークを活用した技術改善及び技術情報交換
- 2015年ASEAN統合を見越したASEANとの連携強化
- 国際純正・応用化学連合（IUPAC）等への参加

4）統合されたラボは成分分析及びパターン分析を継続すべきである。

５－１－２　農薬及び肥料の登録・検査

適切な農薬及び肥料の管理のためには、登録、検査、マーケティングの連携が不可欠である。これに基づき、MAFFは以下のアクションを取るべきである。

（1）登録業務

1）既存の技術情報を用いた安全性評価の導入

2）農薬肥料管理法実施のための3年計画にある25の基準の策定

3）猶予期間の導入も含む農薬及び肥料の再登録の実施

4）登録した製品のデータベース（MAFF内部向け及び外部公開）の構築及びその更新

5）再登録プロセスに合わせた農薬リストの更新

6）中長期的なASEAN統合に合わせた登録プロセスの再設計

7）中長期的な効能試験及び環境影響評価の実施

（2）検査業務

1）検査業務に必要な実施規則及び規程の策定

2）検査官への研修の実施

3）登録業務に悪影響を及ぼさないよう市場に応じたクリーンアップキャンペーン及び検査業務の実施

4）罰金を含む検査業務の実施

５－１－３　政府及び民間セクター間のネットワーク

農薬及び肥料の適切な管理に係る持続性を促進するため、すべてのステークホルダーに便益が生じる手法を取っていく必要がある。特に民間セクターに規制だけでなく便益を生じさせることは不可欠であり、そのためにはCAMTAを可能な限り早期に設立し、政府と民間セクター間で定期的な対話を行う体制を構築すべきである。MAFFは登録された農薬及び肥料に関し民間セクターと共同キャンペーンを行うなど、継続して民間との連携を強化すべきである。

５－１－４　啓発活動の継続及び促進

禁止・違法農薬や肥料の使用・販売をやめさせるため、MAFFはプロジェクトにより作成された啓発活動用の資料を用いて全国レベルで啓発活動を継続実施していく必要がある。また、同資料は対象2地区での現状に基づいて作成されているため、MAFFは啓発活動を展開するなかで、これらの資料を改訂していく必要がある。

５－２　教　訓

５－２－１　プロジェクト・オフィス・マネジメント

専門家とC/Pのコミュニケーションマネジメントにおいて、特に日本人専門家とC/Pの執務室が別れていたことから、日常的なコミュニケーションを実践することが困難であった。日常的なコミュニケーションの欠如はC/Pのオーナーシップ醸成の阻害要因となったと判断される。オフィス・マネジメントはプロジェクト・マネジメントにおいて、プロジェクトの一体感やコンセプト醸成に非常に大きな役割を担っていることから、C/Pと日常的に議論や意識の共有ができるよう専門家及びC/Pによる共同オフィスが不可欠である。

５－２－２　官民連携

本プロジェクトでは、ガイドブックの作成やCAMTA設立支援など民間業者との連携を深めた。

カンボジアの特に農業分野では、政府のリソースが極めて限られており、そのなかでいかに民間との連携を強化し、民間セクターに移管していくかが自立発展性に関する大きな要素である。その観点で、本プロジェクトで行ったように民間セクターにインセンティブを与えつつ民間セクターを巻き込んでいく方法は類似プロジェクトにとっても有効に働くものであると判断される。

５－２－３　第三国専門家の有用性

本プロジェクトでは成果のひとつであるラボに関し、第三国専門家が当該成果達成に大きく寄与したものである。第三国専門家の活用は、プロジェクト実施者側にとっては事業費を低減させることが可能であり、C/Pまたは受益者にとってはより身近に技術を吸収しやすい素地をつくり出すことにつながる。今後はJICAや他機関が育成した第三国のリソースをマッピングするなどし、組織的に第三国リソースを有効活用する体制を構築していくことが推奨される。

付　属　資　料

１．面談者リスト

２．合同評価委員会出席者リスト

３．Minutes of Meeting

１．面談者リスト

氏名	所属	役職
H.E. San Vanty	MAFF	Under Secretary of State
H.E. So Khan Rithykun	MAFF, GDA	Director General
Mr. Ouk Syphan	MAFF, DAL	Director
Mr. Buntuon Simona	MAFF, PDA Kandal	Director
Mrs. Khuon Vilavann	Ministry of Health National Health Product Quality Control Center	Director, Pharmacist Specialist
Mr. In Sambo	Ministry of Industry, Mines and Energy, General Department of Industry, Industrial Laboratory Center of Cambodia (ILCC)	Director
Mr. David B Parsons	ADB Sanitgary & Phytosanitary Standards Management Systems Project	Team Leader
八木　和彦	プロジェクト専門家	チーフアドバイザー
濱口　俊典	プロジェクト専門家	業務調整/意識向上のための啓発普及活動/モニタリング調査
鈴木　康次郎	JICAカンボジア事務所	所長
玉光　慎一	在カンボジア日本国大使館	一等書記官
杉山　裕秀	在カンボジア日本国大使館	二等書記官

２．合同評価委員会出席者リスト

No.	Name	Position	Organization
1	H.E. San Vanty	Under secretary of state	MAFF
2	H.E. So Khan Rithykun	Direct-general	GDA
3	Mr. Ouk Syphan	Director	DAL
4	Mr. Phum Ra	Deputy Director	DAL
5	Mr. Chea Chanveasna	Deputy Director	DAL
6	Mr. Pheav Chintheng	Vice Chief, NAL	GDA
7	Mr. Buntuon Simona	Director	PDA Kandal
8	Mr. Sok Sarou	Vice Chief, BAMS	DAL
9	Mr. Be Seakmeng	Vice Chief, BAMS	DAL
10	Mr. Lorn Socheata	Staff, NAL	GDA
11	Mr. Ros Pan	Staff, BAMS	DAL
12	Dr. Dy Sam An	Deputy Director (Member of the Joint Evaluation)	DAL
13	Mr. Op Pich	Deputy Director of Planning and Accounting Department (Member of the Joint Evaluation)	GDA
14	Mr. Ros Soden	Staff	DAL
15	Mr. Kong Sarin	Staff	DAL
16	Mr. Chheng Vibolrith	Deputy director	DIC (MAFF)/ Observer
17	Mr. Kry Sydo	Deputy director	DPS (MAFF)/ Observer
18	Mr. Toeung Savann	Asia department staff	CDC/ Observer
19	Ms. Zenaida M. Villegas	Director, Project Development Service	DA, Philippines/ Observer
20	Dr. Silvino Q. Tejada, Ceso III	Executive Director	BSWM, Philippines/ Observer
21	Atty. Gavino L. Barlin	Deputy Executive Director for Fertilizer	FPA, Philippines /Observer
22	Ms. Maria Lourdes De Mata	Chief, National Pesticide Analytical Laboratory	BPI, Philippines/ Observer
23	Mr. Yukiharu Kobayashi	Senior Representative (Leader of the Joint Evaluation)	JICA
24	Mr. Shunichi Nakada	Senior Advisor (Member of the Joint Evaluation)	JICA Headquarters
25	Mr. Hiroyuki Yokoi	Representative (Member of the Joint Evaluation)	JICA

26	Ms. SIV Cheang	Program Officer (Member of the Joint Evaluation)	JICA
27	Dr. Kazuhiko Yagi	Chief Advisor of the QCAM Project	JICA
28	Mr. Toshinori Hamaguchi	Project Coordinator of the QCAM Project	JICA
29	Mr. Chin Dimanche	Project	Assistant
30	Ms. Sok Sreynin	Project	Assistant

3 . Minutes of Meeting

THE FINAL JOINT COORDINATION COMMITTEE (JCC) MEETING
FOR
THE PROJECT OF CAPACITY BUILDING FOR THE QUALITY STANDARD CONTROL OF AGRICULTURAL MATERIALS
(CHEMICAL FERTILIZERS AND PESTICIDES) (QCAM)

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), dispatched the Japanese Terminal Evaluation Team headed by Mr. Yukiharu Kobayashi to the Royal Government of Cambodia (hereinafter referred to as "the RGC") from 9th February to 22nd February, 2012 for the purpose of conducting Joint Terminal Evaluation on the Project of Capacity Building for the Quality Standard Control of Agricultural Materials, hereinafter referred to as "the Project", together with the concerned Cambodian authorities.

The Joint Terminal Evaluation Team, which consists of experts from the Japanese and the Cambodian sides, with the Filipino experts as observers, was jointly organized for the purpose of conducting an assessment on the overall achievement of the Project and drawing recommendations and lessons learned from the course of project implementation.

After intensive discussions and analysis of the activities and achievements of the Project, the Joint Terminal Evaluation Team prepared the Joint Terminal Evaluation Report (hereinafter referred to as "the Report"), and presented to the representatives of Japanese and Cambodian sides.

The representatives from each side discussed the major issues pointed out in the Report, and agreed to recommend to the respective governments the matters referred to in the documents hereto attached.

Phnom Penh, February 22, 2012

Mr. Yukiharu Kobayashi
Leader
Japanese Terminal Evaluation Team
Japan International Cooperation Agency
Japan

H.E. San Vanty
Under Secretary of State
Ministry of Agriculture, Forestry and Fisheries
Royal Government of Cambodia

Attachment

1. Director of Department of Agricultural Legislation expressed his opinion that integration of laboratories may not be suitable considering the legal and social aspects.

2. JCC concluded that the Joint Terminal Evaluation Report is acceptable. The recommendations stated in the Report will be further discussed within MAFF.

3. The chairperson from MAFF also mentioned the followings;

   1) Integration and transformation of the laboratories is subject to the decision of MAFF Minister. If Minister agrees to conduct this reform, the transitional period with a pilot project is necessary to verify the feasibility of the integration of laboratories with support by Developing Partners.

   2) Effectiveness of South-South cooperation can be achieved only through the tripartite cooperation.

4. Both parties shared the common understanding that laboratories reform should be commenced with the integration of laboratories before transforming laboratories into semi-autonomous entity.

JOINT TERMINAL EVALUATION REPORT ON THE PROJECT OF CAPACITY BUILDING FOR THE QUALITY STANDARD CONTROL OF AGRICULTURAL MATERIALS (CHEMICAL FERTILIZERS AND PESTICIDES) (QCAM)

Phnom Penh, 22 February 2012

Mr. Yukiharu Kobayashi
Leader
Japanese Terminal Evaluation Team
Japan International Cooperation Agency
Japan

Dr. Dy Sam An
Deputy Director of Department of Agricultural Legislation
Ministry of Agriculture, Forestry and Fisheries
Royal Government of Cambodia

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1. Terminal Evaluation of the Project

1-1 The Purpose of Terminal Evaluation

Based upon the Record of Discussions (hereinafter referred to as "the R/D") signed on 30 January 2009, the Government of Japan (hereinafter referred to as "the GOJ") and The Royal Government of Cambodia (hereinafter referred to as "the RGC") have been implementing the Project of Capacity Building for the Quality Standard Control of Agricultural Materials (Chemical Fertilizers and Pesticides). The Project duration is three (3) years and one (1) month from 01 March 2009 to 31 March 2012. In order to evaluate the achievements of the Project, a joint evaluation is to be conducted by concerned Cambodian authorities and JICA, as was stated in the R/D.

The purpose of the terminal evaluation is to make an assessment on the overall achievement of the Project including the implementation process; identifying remaining issues and recommending appropriate measures that need to be taken by appropriate government agencies in the remaining period and after the completion of the Project; and drawing lessons learnt from the course of project implementation.

1-2 The Method of Terminal Evaluation

The Project was jointly evaluated by the Cambodian, Filipino and Japanese evaluation members based on the Project Design Matrix (PDM) agreed upon in the Joint Mid-term Review carried out in April 2010. More specifically, the performance of the Project was studied based on the Objectively Verifiable Indicators identified in the PDM based on the five evaluation criteria, namely relevance, effectiveness, efficiency, impact and sustainability. Other relevant information was collected before and during the visit of the Joint Terminal Evaluation through field surveys and inter-personal interviews and through the use of questionnaire with relevant Project counterpart personnel at central and provincial levels, Japanese and Filipino experts, beneficiaries, and other relevant projects.

The Project has received technical inputs from the Department of Agriculture in the Philippines as the input of Japanese side. Therefore, the officials from expert-dispatching agencies in the Philippines also participated in the evaluation as observers. With this connection, their assessment on the Project and any recommendation on

technical cooperation scheme are also important for the final evaluation.

1-2-1 The criteria of Terminal Evaluation

The terminal evaluation was conducted based on the following five (5) criteria, which are the major points of consideration when assessing the value of development of the Project, and as stipulated in JICA's regulation:

1) Relevance

This refers to validity of the purpose and the Overall Goal of the Project in connection with the national development policy of the RGC, sector development policy as well as the needs of beneficiaries.

2) Effectiveness

This refers to the extent to which the expected benefits of the Project have been achieved as planned, and examines if the benefit was brought about as a result of the Project.

3) Efficiency

This refers to the productivity of the implementation process, examining if the Input of the Project was efficiently converted into the Output.

4) Impact

This refers to direct and indirect, positive and negative impact caused by implementing the Project, including the extent to which the Overall Goal has been attained.

5) Sustainability

This refers to the extent to which the recipient country can develop the Project further, and the benefits generated by the Project can be sustained under the recipient country's policies, technologies, systems and financial state.

1-3. Members of Joint Terminal Evaluation Team

1-3-1.Cambodian Terminal Evaluation Team

Dr. Dy Sam An	Deputy Director, Department of Agricultural Legislation, MAFF
Mr. Op Pich	Deputy Director, Department of Administration, Planning, Accounting and International Cooperation, General Directorate of Agriculture, MAFF

1-3-2.Japanese Terminal Evaluation Team

Mr. Yukiharu Kobayashi	Senior Representative, JICA Cambodia Office (Leader of the Joint Evaluation)
Mr. Shunichi Nakada	Senior Advisor, JICA Headquarter
Mr. Hiroyuki Yokoi	Representative, JICA Cambodia Office
Ms. Siv Cheang	Program Officer, JICA Cambodia Office

1-3-3.Philippines Observer Team

Ms. Zenaida M. Villegas	Director, Project Development Service, Department of Agriculture (DA)
Dr. Silvino Q. Tejada, CESO III	Executive Director, Bureau of Soils and Water Management, DA
Atty. Gavino L. Barlin	Deputy Executive Director for Fertilizer, Fertilizer and Pesticide Authority, DA
Ms. Maria Lourdes De Mata	Office-in-charge, Laboratory Services Division, Bureau of Plant Industry, DA

2. Outline of the Project

2-1. Background of the Project

In order to achieve the goal of poverty reduction and economic growth, one of the priority areas in the national development policy of the RGC is enhancement of agricultural development. This is evident in the Rectangular Strategy for Growth, Employment, Equity and Efficiency Phase II and the National Strategic Development Plan update 2010-2013. Based on these national development strategy and policy, a sector development strategy entitleds "Strategy for Agriculture and Water 2006-2010" was developed.

Agriculture sector is recognized as one of the main driving forces in the economic growth of Cambodia. The sector employs about 70% of rural workforce and contributes about 35% of GDP growth. Despite the important role agriculture sector has played, the sector has not developed to its full potential yet. One of the main issues need to be addressed is agricultural inputs such as pesticides and chemical fertilizers. Most of the chemical fertilizers and pesticides are illegally imported from neighboring countries and

sold in local markets without registration and licensing. As a result, low quality and improper use of pesticides and chemical fertilizers are generally observed. Such situation may not only hinder the enhancement of agricultural productivity but also cause health and environmental problems and food insecurity.

Understanding the problems and the need of the proper management of pesticides and chemical fertilizers for agricultural enhancement, the RGC through Ministry of Agriculture, Forestry, and Fisheries (MAFF) and the Government of Japan through Japan International Cooperation Agency (JICA) has jointly implemented the Project for Capacity Building for the Quality Standard Control of Agricultural Materials (Chemical Fertilizers and Pesticides) based on the official request from MAFF and the Project framework agreed upon by both sides.

2-2. Project Design Matrix (PDM)

The Project has been implemented based on the PDM as attached as ANNEX-I. The PDM has three (3) major items called Overall Goal, Project Purpose, and Outputs of the Project as stated below.

1) Overall Goal

Proper usage and quality control of chemical fertilizers and pesticides is enhanced in Kandal and neighboring provinces.

2) Project Purpose

Proper usage and quality control of chemical fertilizers and pesticides is enhanced in pilot area.

3) Outputs

Output 1: Baseline data for the Project is developed.

Output 2: Capability of laboratories is improved in terms of analyses of chemical fertilizers and pesticides.

Output 3: Development of Regulation related to Standard Requirementfor registration and post-registration of chemical fertilizers and pesticides is facilitated with the expectation of having the 1st draft.

Output 4: Awareness is raised on proper usage and quality of chemical fertilizers and pesticides.

3. Achievements of the Project

The Team reviewed the performance of the Project including input and output indicators that could measure the achievement of the Project Purpose as well as the implementation process of the Project, the results of which are described in the following:

3-1 Achievement of the Inputs

3-1-1 Inputs by the Japanese side

The Team confirmed that the Project has availed the inputs along with the plan stated in the PDM and Plan of Operation as attached in ANNEX-II.

1) Dispatch of Japanese Experts

Both sides confirmed the record of the Japanese experts as shown in ANNEX-III.

2) Dispatch of Mission Teams

Both sides confirmed the record of the mission teams as shown below:

Mission	Number of staffs	Durations
Mid-term review mission	4	18 April to 01 May 2010
Technical guidance mission	1	13-22 December 2010
Terminal Evaluation	4	09 February to 22 February 2012

3) Technical Information Exchange Program (TIEP) in the Philippines

In the original plan, the Project was supposed to implement the On-the-Job training (OJT) in the Philippines by Fertilizer and Pesticide Authority (FPA). Due to the lack of resources, OJT was changed into TIEP instead. Both sides confirmed the record of TIEP as shown in ANNEX-IV.

4) Provision of Machinery and Equipment

Both sides confirmed the record of machinery and equipment provided by the Japanese side for the Project activities as shown in ANNEX-V.

5) Local activities cost:

The local activity cost incurred is indicated in USD as the next table:

Expense Item		Japanese Fiscal Year			Total ($)
		2009 ($)	2010 ($)	2011 ($)*	
1	Overseas Activities Cost	28,117	68,188	77,718	174,023
	(Details)				
	Miscellanneous	18,134	28,412	64,181	110,727
	Air Fare	433	8,450	0	8,883
	Travel Allowance	3,734	21,209	4,826	29,769
	Fees and honorarium (non-staff)	5,758	8,230	8,711	22,699
	Refreshments	58	1,886	0	1,944
2	Equipment Cost	84,766	167,823	24,334	276923.71(**)
3	Portable Equipment Cost	508	865	1,474	2,847
Total		113,391	236,876	103,526	453,793

*As of January 2012.

**Total Equipment Cost = Total Equipment Cost in Appendix 6 ($271,664.66)+Copy Machine in the Project Office ($6,430) − Total Discount in the Procurements ($1,171.15).

3-1-2 Inputs by the Cambodian side

1) Appointment of Counterpart Personnel and Other Staff

A total of thirty seven (37) counterpart personnel of relevant fields have been assigned to the Project. Thirty six of them are currently working at the same positions, while a new Chief of National Agriculture Laboratory has been assigned recently. The details of the counterpart personnel are found in ANNEX VI.

2) Office spaces and facilities

Both sides confirmed that the Cambodian side provided offices, facilities, electricity, and water.

3-2 Achievement of the Outputs

The Team found that Output 1 was achieved based on PDM version 1. The Team also found that Outputs 2, 3 and 4 were achieved based on the revised PDM and PO. (The detailed information on the output indicators and achievements are found in ANNEX VII).

3-2-1 Output 1: Baseline data for the Project is developed.

Indicator 1-1: Baseline data on registered chemical fertilizers in the pilot area(s) is in hand.

Indicator 1-2: Baseline data on registered pesticides in the pilot area(s) is in hand.

Indicator 1-3: Baseline data on labeling in Khmer in the pilot area(s) is in hand.

Achievement:
The baseline survey was conducted and baseline data was made available by the Project. Furthermore, the counterpart personnel involved have acquired necessary skills along the process of carrying out the baseline survey. Therefore, it is concluded that the Output 1 was achieved.

3-2-2 Output 2: Capability of laboratories is improved in terms of analyses of chemical fertilizers and pesticides.

Indicator 2-1: Laboratory equipment/ facilities are properly set up and functioning.

Indicator 2-2: Fertilizer laboratory in the DAL and the GDA can analyze N, P, K and other elements (Fe, Mn, Zn, Cu, Ca, Mg).

Indicator 2-3: Pesticide laboratory can analyze at least 60% of 24 prioritized active ingredients.

Indicator 2-4: Manuals for analyses of N, P, K and other elements (Fe, Mn, Zn, Cu, Ca, Mg) for chemical fertilizers and at least 60% of 24 prioritized active ingredients for pesticides were developed.

Indicator 2-5: Manuals for operation and maintenance for laboratory equipment are developed.

Indicator 2-6: Analytical reports of samples collected by inspectors from licensed retailers are developed (to be shared among stakeholders).

Achievement:

[Indicator 2-1] The 3 laboratories for analysis of chemical fertilizers and pesticide at GDA and DAL have been properly equipped and set up, including the setting up of equipment provided by Asian Development Bank (ADB) project to DAL in 2003, and have become operational.

[Indicator 2-2] The fertilizer laboratories at GDA and DAL can analyze the target elements. In addition, they can also analyze sulfur. However, GDA laboratory could not establish validation methods for 6 trace elements due to unavailability of the Atomic Absorption Spectrophotometer (AAS), while DAL established validation methods for 4 trace elements.

[Indicator 2-3] The pesticide laboratory has established validated analytical methods for 28 active ingredients which exceeded the target of 60% of 24 prioritized active ingredients.

[Indicator 2-4] All necessary manuals for analysis of targeted elements of chemical

fertilizers have been developed. Manuals for analysis of 32 active ingredients of pesticides have also been developed.

[Indicator 2-5] Manual for operation and maintenance of major equipment for chemical fertilizers and pesticides have been developed.

[Indicator 2-6] Samples should have been collected by the inspectors and submitted to laboratories. In practice, fertilizer samples were submitted to laboratories for analysis, however, pesticide samples were purchased and analyzed by the laboratory. The analytical results were shared among all counterpart personnel of the Project.

Please refer to the Summary of Training on Analysis of Chemical Fertilizer and Pesticide as attached in ANNEX-VIII.

It is noted that the pesticide samples were not collected by inspectors because development of inspection protocol is still in progress. Judging from these observations, it is concluded that the Output 2 was achieved.

3-2-3 Output 3: Development of Regulation related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is facilitated with the expectation of having the 1st draft.

Indicator 3-1: Policy option(s) related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is provided.

Achievements:

With the three (3) Technical Information Exchange Programs (TIEP) and comments from the Project experts, the Law on The Management of Pesticides and Fertilizers was promulgated on 14 January 2012. In addition, the draft regulations on procedures and standard requirement on the management of pesticides and chemical fertilizers have been developed in Khmer and English. These are now in the process of finalization as "Prakas" (proclamation) and waiting for an approval from MAFF Minister. They are expected to be approved by the end of 2012. Therefore, it is concluded that the Output 3 was achieved.

3-2-4 Output 4: Awareness is raised on proper usage and quality of chemical fertilizers and pesticides.

Indicator 4-1: At least each type of materials; pamphlet, posters, and audio visual media is developed and disseminated for public awareness activities.

Indicator 4-2: Khmer labels and reference materials on selection and usage of pesticides are distributed to all of licensed retailers in pilot area.

Indicator 4-3: Reference materials on selection and usage of chemical fertilizers are distributed to all licensed retailers in pilot area.

Achievements:

[Indicator 4-1] Pesticide list developed by MAFF in 2003 was translated into Khmer language and distributed to retailers. Two types of posters were developed and distributed to the project target group and beyond. A video program on proper management of pesticides developed by FPA was translated into Khmer language and distributed to all PDAs for their use. TV spot and TV talk show were also produced and aired.

[Indicator 4-2] The Project produced (1) pocket guide on banned pesticide in Khmer and English and distributed to all licensed retailers and PDAs all over the country as a reference material, and (2) Guide Book for Pest Management, as a Khmer label material, was also distributed to licensed retailers in pilot area. Originally, the Project had planned to develop labels to explain how to use each registered pesticide product. However, MAFF, as a government entity, found it difficult to produce any materials that contain any name of private product, the plan was changed to indicate only names of applicable active ingredients of pesticides for every identified pest in the material entitled as Guide Book for Pest Management. In addition to the Guide Book for Pest Management Part I, the Project supported private sectors (five licensed distributors) to develop a Guide Book for Pest Management Part II, which compiles information on products name and usage among others, to be distributed to the licensed retailers in the pilot area. The distribution is planned to be completed before the project phases out.

[Indicator 4-3] Poster on proper selection of chemical fertilizers was developed and distributed to all license retailers, commune and district agricultural offices and other public places.

The detailed list of the awareness raising activities is found in ANNEX VIII.

All indicators in Output 4 have been attained, therefore, it is concluded that the Output 4 was achieved.

3-3 Achievement of the Project Purpose

Project Purpose: Proper usage and quality control of chemical fertilizers and pesticides is enhanced in pilot area.

Indicator 1: Two thirds of licensed retailers in pilot area utilize the following materials provided by the project on their sales in order to secure proper selection and usage of chemical fertilizers and pesticides;

(1) Khmer labels on pesticides

(2) Reference materials on proper selection and usage of chemical fertilizers and pesticides.

Indicator 2: Number of licensed retailers who do not sell banned pesticides is doubled in pilot area.

Achievements:

The indicators to measure the achievement of the Project purpose were verified based on the result of the impact assessment survey in October 2011 and interviews conducted during this evaluation.

[Indicator 1-1]

For this indicator, the Project had planned to develop Khmer labels for pesticide, i.e. to translate foreign labels of popularly used pesticides products into Khmer to enable users to understand how to use each registered pesticide product. However, the Project has found it difficult because there are very few registered products in the market. Under this circumstance, different approach was taken while maintaining the same objective. Instead of making Khmer label, Guide Book for Pest Management Part I and Part II are developed. The Part I has been developed to introduce applicable active ingredients for pests so that it can cover products in the market as many as possible, while the Part II introduces trade names of registered products and their dosage.

The impact assessment conducted in October 2011 showed that 83 % of total licensed retailers were using the first material "Guide Book for Pest Management Part I", and some of the retailers mentioned that they needed more information in order to facilitate the proper use of pesticides, which will be introduced in the "Guide Book for Pest Management Part II" and distributed before the end of the Project.

This indicator will not be achieved its target until the "Guide Book for Pest Management Part II" is distributed and survey is conducted to see how it is utilized. However, the Team anticipated that this indicator will be achieved based on the findings that (1) 83% of total licensed retailers being interviewed in Impact assessment and

during this mission are using the "Guide Book for Pest Management Part I" for their daily business in advising farmer to properly select the pesticide, (2) the Guide Book for Pest Management Part II is an important complimentary to the Part I for usage of each pesticide, (3) 83% licensed retailers being interviewed said they were looking forward to receiving the material that helps them how to recommend farmers for appropriate usage of each product.

[Indicator 1-2]

According to the Impact assessment, 85% of licensed retailers mentioned that all information materials provided by the Project were 'useful' or 'very useful' not only for themselves, but also for their customers. In particular, the Guide Book for Pest Management (Part I) was very useful as those licensed retailers said that the Guide Book was very useful for their business. The field observation and interview to seven licensed retailers during this evaluation has also testified this finding.

[Indicator 2]

The number of licensed retailers who do not sell banned pesticides has been doubled in October 2011 (43 retailers out of 67) compared to August 2010 (14 out of 44 in both districts) This remarkable increase, more than 2 times, can be concluded as a result of the Project intervention through awareness raising activities. The field interview by the Team also verified this finding as banned pesticides were not found on the shelves of licensed retailers being interviewed and it was perceived that the interviewed licensed retailers fully understand the illegality of trading the banned pesticides. Table below shows the total number of licensed retailers in the 2 pilot districts (Koh Thom and Kien Svay) and the number of licensed retailers who do not sell banned pesticides.

	August 2010	October 2011
(1) Total number of licensed retailers in 2 pilot districts	44 (13 in Kien Svay, 31 in Koh Thom)	67 (26 in Kien Svay, 41 in Koh Thom)
(2) Total number of licensed retailers not selling banned pesticides	14 (4 in Kiean Svay, 10 in Koh Thom)	43 (21 in Kien Svay, 22 in Koh Thom

Source: Impact Assessment Survey in October 2011 and Monitoring survey in August 2010.

In addition, there were only five banned pesticide products by trade name found in October 2011, largely decreased from 13 in August, 2010. Only four banned pesticides by common name (Methamidophos, Mevinphos, Monocrotophos, and Paraquat) were

identified in October 2011, compared to six (Methamidophos, Methidathion, Methomyl, Mevinphos, Monocrotophos, Paraquat) in August, 2010.

By achieving the respective Objectively Verifiable Indicators 1-(2), and 2, and the indicator 1-(1) expected to be achieved by the end of the Project, the Team anticipated that the purpose of the Project would be achieved.

3-4 Achievement of the Overall Goal

Overall Goal: Proper usage and quality control of chemical fertilizers and pesticides is enhanced in Kandal and neighboring provinces.

Indicator 1: Distribution of registered chemical fertilizers and pesticides with Khmer label are increased.

Indicator 2: No retailers sell banned pesticides.

The Overall goal is expected to be achieved when certain measures are taken by the RGC. In order to achieve the overall goal, the important assumptions stated in the PDM have to be fulfilled.. Please refer to 5-5 for detailed explanation.

4. Implementation Process of the Project

The Project has been implemented based on the R/D, M/M, PDM (of M/M) Version1 dated 30 January 2009 and PDM Version 2 dated 30 April 2010.

4-1 Revision of PDM

History of PDM is as follows;

PDM (M/M) Version 1 was agreed for revision into PDM Version 2 based on the recommendation by the Mid-term Review mission, which was then officially approved at the JCC meeting held on 30 April 2010. Based on the revision of PDM, the PO was revised and approved accordingly.

4-2 Decision making and monitoring mechanism

The Project has been implemented and monitored by a Joint Coordination Committees (JCC) for overall supervision and decision making while monitoring and implementation of daily activities was executed by an Executive Committee and thematic Groups. In addition to the regular or adhoc meetings, the experts and counterparts made field monitoring visits according to the need. The Project conducted a baseline survey and impact assessment surveys during the Project period. With these

various means, the project monitoring was performed adequately. List of each meeting is attached in ANNEX IX.

4-3 Relationship and communication during the Project implementation

4-3-1 Relation and communication among project members

There were no major issues which prevented the smooth communication and relation between the Project Experts and their counterparts.

4-3-2 Relationship and communication between Project and JICA Offices

The relationship and communication between Project and JICA Office was conducted smoothly. However, since the Project involved a South-South Cooperation scheme, more frequent communication was necessary.

4-4 Approach taken for the Project implementation

The project has deployed both Japanese experts, Filipino experts and a Filipino consultant under the South-South Cooperation.. The Filipino experts who are in charge of trainings on laboratory analysis are those experts whose capacity are upgraded through the JICA Technical Cooperation project in similar area in the Philippines more than 10 years ago. Participation in this Project has provided them a chance for technical transfer to the needs in Cambodia. Since the situation of laboratories of MAFF was similar to those of the Philippine more than 10 years ago, it made the technical transfer very practical, efficient and effective. Another point to be highlighted is that the Project has focused on retailers since the retailers were major source of technical information on agricultural inputs, which was found out during the baseline survey.

5. Results of Terminal Evaluation by Five (5) Criteria

5-1. Relevance:

The relevance of the Project is evaluated as high based on the following confirmations.

Consistency with the national development policies and strategies of the RGC

- The main development goal of the RGC is poverty reduction and economic growth. To achieve this goal, the RGC has developed the following policy and strategy.
  1. National Strategic Development Plan (NSDP) Update 2009-2013.

cif

2. Strategy for Agriculture and Water (SAW) 2006-2010
3. Policy Paper on Promotion of Paddy Production and Rice Export (2010-2015) (commonly called "Rice Policy")

- While the NSDP puts main priority on enhancement of agriculture sector among others;
- While the main goal of SAW is "enhancing agricultural productivity and diversification and improving water resources development and management";
- While, the Rice Policy targets the achievement of 1 million ton official rice export by 2015;

To achieve these goals, improving qualities of agricultural input materials which include chemical fertilizers, pesticides, seeds, animal feed, etc. is indispensible.
Under these situations, the Project has supported MAFF in proper use and management of chemical fertilizers and pesticides through capacity building activities related to analysis of the agricultural input materials, development of legal framework and awareness raising activities. Hence, the Team concluded that the Project is well consistent with the development policies and strategy of the RGC.

Consistency with Japan's Aid Policies

As stated in the Japan's Country Assistance Policy, the Japanese government regards implementation of sustainable economic development and social stability as one of the most significant goals in its official development assistance, and considers agricultural and rural development as one of the most important sectors to achieve that goal. Likewise, JICA Country Assistance Strategy has put agricultural and rural development as one of the 3 priorities in its development assistance to Cambodia, and therefore sets up two programs for Agricultural Extension & Distribution and for Water Resources and Irrigation Development Management. Considering these facts, it was concluded that the Project is consistent with the development policies of Japanese government and JICA.

Relevance with the Needs of the Target Groups

While chemical fertilizers and pesticides are the main inputs for enhancing agricultural productivity, most of chemical fertilizers and pesticides sold at local markets are of low quality products, including fake and adulteration. Most farmers do not know how to properly utilize them because almost all labels are written in foreign languages. Such situation was observed as more serious in provinces along the borders such as Kandal. In Kandal province, Koh Thom and Kien Svay districts were more seriously affected by

these illegal chemical fertilizers and pesticides from Phnom Penh and Vietnam. According to the baseline survey in the pilot areas in July 2009, it was confirmed that the majority of pesticides were not registered and attached with foreign-language labels. Most interviewees including retailers and farmers replied that they could not understand what was written on the labels.

To improve these situations, the Project has been designed to support the MAFF in properly managing the chemical fertilizers and pesticides, while helping the licensed retailers and farmers to enhance their awareness on proper sales and use of the chemical fertilizers and pesticides. Thus, the relevance of the Project is concluded as very high.

Superiority of Japanese and Filipino technology

The Government of Japan has implemented various chemical fertilizer and pesticides projects similar to the Project. Beside Japanese experts, this Project also deployed third-country experts from the Philippines who used to get support from JICA technical cooperation projects in the same area to take advantages of the accumulated technologies and experiences. The Project also sent the counterpart personnel at both central and provincial level to the Philippines for technical exchange. This technical transfer has thus contributed to the enhancement of South-South Cooperation framework in parallel. The execution of the Project as a Japanese aid program is, therefore, considered to be advantageous as Japan and the Philippines are in the position of applying their past experiences in chemical fertilizer and pesticide managements in the region.

5-2. Effectiveness:

The Team evaluated the effectiveness of the Project as high as it was confirmed that the Project would achieve the Project Purpose with some surpassing performances within the intended timeframe.

Achievement level of Project Purpose

As mentioned in 3-3 above, the OVI of 1-(1) will be achieved once the Guide Book for Pest Management (Part II) is finalized and distributed to the licensed pesticide shops in the pilot areas. The book has practical information in Khmer language on the use of registered pesticide products which will be very useful and beneficial for licensed retailers and farmers in the target area. Concerning the OVIs of 1-(2) and 2, it was confirmed in the field survey on impact assessment that they have been achieved.

Therefore, the Project purpose is anticipated to be achieved.

Contribution of the Outputs in achieving the Project purpose

Proper usage and quality control of chemical fertilizers and pesticides require various efforts in parallel such as technical enhancement of laboratory analytical skills, improvement of administrative procedure and awareness raising for stakeholders and public in general. With the said natures of the quality and market of chemical fertilizers and pesticides, the Team concluded that cause-effect relationship between the Outputs and accomplishment of the Project purpose was justified.

Factors promoting the achievement of the Project purpose

Promoting factors for the Project Purpose are as follows:

1) Encouraging technical supports from Filipino implementing partners, quality experts, determination and commitment of a certain number of counterpart personnel both at central and provincial levels, and competent Project assistants.
2) Clear activity plan developed based on the real situation and needs.
3) Materials development and good strategy for dissemination. All stakeholders involved such as MAFF, retailers, NGOs all appreciated and were very satisfied with the materials developed by the Project both for laboratory and awareness raising activities. It is recommended that those materials can be used as reference for similar projects. List of materials and manuals is attached in ANNEX X.

5-3. Efficiency:

The efficiency of the Project is considered to be very high based on the following evidence.

1) Achievement level of the Outputs

As stated in 3-2, all the Project outputs have been achieved.

2) Appropriateness and utilization of Inputs for accomplishing the Project Outputs

Dispatch of Japanese experts, Third-country-expert (TCE) and Counterparts training

In the process of the Project implementation, JICA and MAFF felt a need to modify some Project activity and to dispatch one more long term expert which was approved in the JCC in 2010. In principle, the demarcation of roles among experts was that 1) Outputs 1 and 4 were responsible by Japanese long-term experts, 2) Output 2 by TCEs,

3) Output 3 by short-term Filipino and Japanese experts. The dispatch of two long-term Japanese experts, one short-term Japanese expert and seven short-term TCEs is considered appropriate to achieve the Project outputs considering the extensive technical expertise necessary for the Project. In particular, the utilization of the TCEs was evaluated as that the penetration rate of the technical transfer was heightened because of the experience and the English language proficiency. This has made the Project outputs achieved with less financial input. The implementation of OJT for laboratory analysis and Technical Information Exchange Program in the Philippines is also evaluated as highly efficient to get the Project output achieved.

Assignment of Counterparts Personnel and fulfillment of the pre-condition

Counterpart personnel with appropriate background and experience were assigned to the necessary positions for the implementation of the Project in appropriate timing although some counterpart in the laboratories did not have necessary academic chemistry background. Most of them have remained at the same positions throughout the project period. The pre-condition set in the PDM is "The existing equipment/facilities is properly functioning". This pre-condition was not fully fulfilled due to the financial shortage in RGC and domestic specialists. The Japanese side had to put additional efforts in order to achieve the Project Outputs as planned. Despite the weak funding base of RGC, MAFF has contributed some in kind such as counterpart personnel, electricity and water for the smooth implementation of the Project.

Coordination with other projects

FAO's expertise on pesticide management helped the Project in the modification of the Project PDM and following activities.

The Pocket Guide on Banned and Restricted Pesticides was produced based on suggestion by the FAO project expert, while the content of the Guide Book for Pest Management was also partly modified upon the comments of the FAO experts.

5-4 Impact:

Impact of the Project is considered to be high as the Project affected positively on various aspects of the appropriate usage and management of chemical fertilizers and pesticides as discussed in the following analyses:

Prospect to achieve the Overall Goal

The direct impacts caused by the Project are:

1) Licensed retailers are able to provide appropriate instruction to their clients for proper use of chemical fertilizers and pesticides;
2) The number of banned pesticides being sold by the licensed retailers was decreased remarkably compared to the time before the awareness raising activities was carried out. ;
3) Two separate Prakas (Proclamation) on the regulations on procedures and standard requirements for management of pesticides and fertilizer have been drafted and expected to be approved by MAFF within 2012.
4) The materials developed by the Project have been utilized by other projects in and beyond the target districts of the Projects such as by the projects supported by NGOs, donors and MAFF namely VVOB (Belgium), World Vision, CARITAS, FAO, GIZ/REDP in Siem Reap province, etc. Moreover, the posters on banned pesticides and the Pocket Guide on Banned and Restricted Pesticides were distributed to the 24 PDAs and pesticide shops across the nation during the nation-wide campaign on eradicating the banned pesticides in April 2010.

Therefore, the Team concludes that positive impacts by the awareness raising activities has reached not only to the target groups but also to other areas, PDAs, shops and farmers across the country.
In addition to the direct impacts above, the Team has received the following comments from retailers and farmers being interviewed, which could be assumed as indirect impacts of the Project.

1) Impact on farmers: Most licensed retailers being interviewed have mentioned that some farmers started to change their habit in using pesticides and fertilizers and some farmers understood about banned pesticides. However, there remains some farmers who still prefer banned pesticide due to their immediate effect in application.
2) Impact on retailers: There are some retailers who said they have increased the number of clients because of their improved technical knowledge owing to the materials provided by the Project. Meanwhile, there are also some retailers who said that their income have decreased due to the increase in number of retailers.
3) Cambodia Agriculture Materials Traders Association (CAMTA): From the learning during the TIEP, MAFF decided to introduce a mechanism in order to create dialogue channel between the government and private sector through CAMTA.

4) Law on the Management of Pesticides and Fertilizers: The TIEP in the Philippine conducted by the Project has contributed to this law development and its promulgation on 14 January 2012.

5-5. Sustainability:

The sustainability of the Project is considered to be medium based on the following evidence.

Compliance to the national development policy

The RGC remains keeping the policy of reducing rural poverty through enhancing agriculture sector, in which pesticides and chemical fertilizers play important roles. The newly promulgated Law on Management of pesticides and fertilizers followed by subsequent 25 regulations (sub-decree, Prakas, joint Prakas) to be developed for enforcing the Law will enhance the activities in the management of pesticides and chemical fertilizers upon recognition of the achievements of this Project. Therefore, it is expected that the compliance between this project objectives and the government policy on the management of pesticide and fertilizer will be held in future.

Sustainability of laboratories

Before the Project, the pesticide laboratory and the fertilizer laboratories at GDA and DAL were not set up. Currently, the laboratories have been properly set up and operational. Technical capacity of laboratory staff has been improved. However, operational plan, number of quality staff, financial capacity is limited.

For both financial and technical sustainability, all laboratories need a mechanism to ensure constant flow of samples for analysis, which requires inter-ministerial and inter-department arrangement. Therefore, necessary measures are need by the RGC. The above observation is common to the three laboratories. The following explains fact on each laboratory.

1) Fertilizer laboratory at DAL:

The staff were recruited and trained as regulatory staff. Current analytical work gives extra workload to their regulatory activities. The number of staff who has chemistry background is limited. The Team perceived that this situation could jeopardize the sustainable operation of the laboratory. The summary of finding are as attached in ANNEX-XI.

2) Fertilizer laboratory at GDA:

Fertilizer laboratory at GDA enjoys more number of technical staff with longer laboratory experience but lacks important equipment, AAS, to cover micro nutrient. In addition, the fertilizer laboratory is designated as part of the National Agriculture Laboratory with good facility. GDA has a program to improve the capacity of its laboratory staff. The summary of findings is attached in ANNEX-XII.

3) Pesticide laboratory:

Pesticide laboratory becomes operational for formulation analysis, but the analysis was not carried out because of financial and technical constraints. Internal arrangement has to be made to fully utilize the laboratory for pesticide registration and post-registration. GDA also has a program to improve the capacity of its laboratory staff. In addition, the laboratory staff seems committed to laboratory work.

The summary of findings is attached in ANNEX-XIII.

Sustainability of Regulatory component

The appropriate management of pesticide and fertilizer requires harmonious implementation of registration, inspection and awareness raising. Before the Project, too many illegal products hindered strict law enforcement, which in turn demotivated private sector to get their product registered. The recent promulgation of the Law and the Project achievement have create a strong momentum for the appropriate management. However, to achieve the objective of the Law, medium to long term strategy and good implementation is required.

The summary of finding on the regulatory components is attached in ANNEX-XIV.

1) Development of regulation: After promulgation of the Law, MAFF has a plan to develop 25 regulations. The capacity of staff is expected to be improved in the course of developing a series of regulation to enforce the Law because a working group is established to undertake this exercise. In order to develop the regulations, DAL expressed a need in technical support in the area of (1) database for pesticide and fertilizer and (2) enhancement of registration process.
2) Increase number of registration: Based on the field survey and interviews to farmers and retailers, the Team observed that demand for registered and quality pesticides and fertilizers is increasing. MAFF plans to have all the products re-registered.

3) Inspection: Currently, inspection activities is being conducted with FAO's supporting Kandal province but coverage area and penalty measure are still limited due to legal authority and inspectors' capability.
4) Awareness raising activities: please refer to "(3). Awareness raising" in below part.

Sustainability of Awareness raising activities:

Various useful materials have been developed by the Project and distributed to limited area. Together with Nation-wide campaign, these awareness raising activities, collaborating with NGOs and private sector including CAMTA, have made significant impacts to the target areas. MAFF's strategy to extend and expand these activities is yet to be established. Please refer to the finding as attached in ANNEX-XV.

6. Conclusion

The objective and aim of the Project aligns the policy and strategy of both Cambodia and Japan and captures the needs from retailers and farmers to appropriately use the agricultural inputs, thus RELEVANCE is evaluated as HIGH. The project, utilizing the TCEs, has achieved the Project Purpose and the four outputs, therefore EFFECTIVENESS is evaluated as HIGH and EFFICIENCY is evaluated as VERY HIGH because of the cost superiority of TCEs. In terms of IMPACT, it is evaluated as VERY HIGH because of realization of public and private cooperation through the Guide Book for Pest Management Part II and preparation in the establishment of CAMTA, implementation of south-south cooperation and indirect support for promulgation of the Law on Management of Pesticides and Fertilizer. Promulgation of the Law on Management of Pesticides and Fertilizer expressed the RGC's determination to properly manage and regulate the appropriate use of pesticides and fertilizers, however it was found uncertain to enforce the law in order to accomplish the overall goal. Therefore, SUSTAINABILITY is evaluated as MEDIUM.

7. Recommendations and Lessons Learned

7-1.Recommendations

Based on the above findings, the Team recommends followings.

7-1-1.Laboratory operation

1) Fertilizer laboratory of DAL should be integrated into NAL for the following reasons:
   - Improving efficiency and effectiveness in terms of operational cost and human capitals
   - Enabling DAL to concentrate more on improving its registration and inspection activities
   - Making the best use out of limited laboratory consumables and equipment, especially the AAS

2) The integrated laboratory should be transformed into semi-autonomous entity (Public Enterprise or Special Operating Agency) for the following reasons:
   - Retaining collected fee for its own operational cost
   - Being able to provide incentive for its staff
   - Gaining more flexibility in management of human resources
   - Reducing the cost for laboratory operation by MAFF
   - Enhancing and ensuring the credibility of analytical results

   In order to attain this status, MAFF has to (1) establish laboratory operation plan, (2) secure strong commitment from MAFF Minister and (3) take legal procedures to become a semi-autonomous entity.

   For such practice, it is recommended to learn from the experiences of Industrial Laboratory Center of Cambodia of MIME, National Health Product Quality Control Center of MOH and Department of Agriculture of the Philippines.

3) The integrated laboratory should update its technical knowledge through:
   - Domestic laboratory network, such as "Chemical Society of Cambodia", involved by member from Royal University of Cambodia, Cambodia Institute of Technology, Royal University of Phnom Penh, National Agriculture Vocational Training College, Royal Agriculture University in Kampong Cham, Royal Academy of

Cambodia, laboratories of Ministry of Health, laboratory of MIME among others.

- In the medium and long term view, it is recommended to strengthen the coordination among ASEAN member states taking into consideration the ASEAN integration in 2015.
- In order to maintain and acquire the latest information, an appropriate organization in Cambodia should participate in the International Union of Pure and Applied Chemistry (IUPAC) among others.

4) The integrated laboratory should sustain the established formulation analysis and implementation of pattern analysis.

7-1-2.Registration and inspection of pesticides and fertilizers

A smooth and positive flow among registration, post-registration and marketing is the key to enhance the sustainable improvement of pesticides and fertilizers management. Based on this concept, the Team recommends MAFF to take the following actions:

Registration:

1) Introduction of safety assessment by full utilization of existing technical information
2) Development of the 25 regulations stated in the 3-year work plan for enforcement of the Law on Management of Pesticides and Fertilizer.
3) Facilitation and acceleration of the re-registration of the pesticides and fertilizers with possible introduction of grace period
4) Development and updating of databases on registration and make it accessible to the public and for internal use for registration.
5) Updating pesticide list in accordance with re-registration process
6) In the medium and long term mode, registration process need to be re-designed in accordance with the harmonization process of ASEAN taking into consideration the ASEAN integration in 2015.
7) Enhancing the capacity to conduct efficacy test and environmental impact analysis in the long run.

The MAFF expressed to the Team that JICA should continue to provide support in the development of databases and facilitation of registration process. The Team also recommends to JICA to consider such request.

Inspection:

1) Development of implementing rules and regulations necessary for inspection activities;
2) Conducting training for inspectors in other areas;
3) Carrying out clean-up drive and inspections depending on the market situation in order not to have negative impact on registration
4) Conducting full inspection including imposing penalty.

7-1-3.Networking (government and private sector)

To promote sustainability of proper management of pesticide and fertilizer, an appropriate method to secure benefit for all stakeholders is necessary. Thus, it is recommended that CAMTA be established and regular dialogues be conducted as soon as possible. MAFF should coordinate and ensure the participation of the private sector by providing registration assistance and joint promotion of activities for registered pesticides and fertilizers.

7-1-4.Continuation and promotion of awareness raising activities

In order to stop the use and sale of banned and illegal pesticides and fertilizers, MAFF must continue to conduct regular awareness raising activities nationwide by utilizing the materials developed by the Project in the two pilot districts, Koh Thom and Kien Svay. Updating of the materials is a continuous process by MAFF.

7-2. Lessons Learned

7-2-1. Project Office Management

During the implementation of the Project, the Japanese experts and C/Ps found it inconvenient to confer with each other because their offices are located separately. It would be ideal if both parties were housed in one big office so that the exchange of ideas and communication is convenient and easy.

7-2-2. Public and private sectors collaboration

The Project has deepened the relationship between the public and the private sector (potential members of CAMTA) to cope with the limited government resources. As a result, the Guide Book for Pest Management Part II was developed. It is significantly necessary and important to involve private sector for sustainability of the Project.

7-2-3. Effectiveness and Efficiency of the South-South Cooperation

In the implementation of the Project, utilization of the South-South Cooperation significantly contributed to the achievement of the outputs. The Project utilized the TCEs and TIEP under South-South Cooperation. The TCEs who have the various fields of expertise on laboratory operation and management transferred the technology to the Cambodian counterparts. The TIEP in the Philippines has promoted and improved the awareness raising activities and administrative management for pesticides and fertilizers.

Finally, the introduction of South-South Cooperation also further strengthened the friendship between and among Cambodia, Japan and the Philippine governments.

ANNEX-I Project Design Matrix (PDM)

Project Title: Capacity Building for the Quality Standard Control of Agricultural Materials (Chemical Fertilizers and Pesticides)
Project Period: 01 March 2009 to 31 March 2012 (3 years & 1 month)
Pilot Area: Kandal Province (Kien Svay, Koh Thom district)
Target Group: Beneficiary (1) DAL and GDA staff of the MAFF
(2) PDA staff of the MAFF in the pilot area
(3) Retailers dealing with chemical fertilizers and pesticides in pilot area
(4) Farmers using the chemical fertilizers and pesticides in pilot area
Implementing organization: DAL & GDA

Version 2: 30 April 2010

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTION
Overall Goal (w/in 5-10 years after the project) Proper usage and quality control of chemical fertilizers and pesticides is enhanced in Kandal and neighboring provinces.	1. Distribution of registered chemical fertilizers and pesticides with Khmer label are increased. 2. No retailers sell banned pesticides.	- Survey and interview	
Project Purpose Proper usage and quality control of chemical fertilizers and pesticides is enhanced in pilot area.	1. Two thirds of licensed retailers in pilot area utilize the following materials provided by the project on their sales in order to secure proper selection and usage of chemical fertilizers and pesticides; (1) Khmer labels on pesticides (2) Reference materials on proper selection and usage of chemical fertilizers and pesticides. 2. Number of licensed retailers who do not sell banned pesticides is doubled in pilot area.	1. Report of baseline survey 2. Survey and interview	- MAFF keeps laboratories functioning. - Law is enforced against the illegal trade and sales of chemical fertilizers and pesticides. - The awareness and capacity of retailers dealing with chemical fertilizers and pesticides is continuously raised. - Capacity of MAFF staff is further and continuously improved.

Outputs 1 Baseline data for the Project is developed. 2 Capability of laboratories is improved in terms of analyses of chemical fertilizers and pesticides. 3 Development of Regulation related to Standard Requirement [1] for registration and post-registration of chemical fertilizers and pesticides is facilitated with the expectation of having the 1st draft. 4 Awareness is raised on proper usage and quality of chemical fertilizers and pesticides.	1-1 Baseline data on registered chemical fertilizers in the pilot area(s) is in hand. 1-2 Baseline data on registered pesticides in the pilot area(s) is in hand. 1-3 Baseline data on labeling in Khmer in the pilot area(s) is in hand. 2-1 Laboratory equipment/ facilities are properly set up and functioning. 2-2 Fertilizer laboratory in the DAL and the GDA can analyze N, P, K and other elements (Fe, Mn, Zn, Cu, Ca, Mg). 2-3 Pesticide laboratory can analyze at least 60% of 24 prioritized active ingredients. 2-4 Manuals for analyses of N, P, K and other elements (Fe, Mn, Zn, Cu, Ca, Mg) for chemical fertilizers and at least 60% of 24 prioritized active ingredients for pesticides are developed. 2-5 Manuals for operation and maintenance for laboratory equipment are developed. 2-6 Analytical reports of samples collected by inspectors from licensed retailers are developed (to be shared among stakeholders). 3-1 Policy option(s) related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is provided. 4-1 At least each type of materials; pamphlet, posters, and audio visual media is developed and disseminated for public awareness activities. 4-2 Khmer labels and reference materials on selection and usage of pesticides are distributed to all of the licensed retailers in pilot area. 4-3 Reference materials on selection and usage of chemical fertilizers are distributed to all of the licensed retailers in pilot area.	1. Report of baseline survey 2.1 Laboratory inventory 2.2 Manuals 2.3 Records of laboratory works 3.1 Project activity reports 4.1 Awareness raising materials 4.2 Reports of survey and interview	

[1] Standard Requirement is defined as "all the requirements covering technical specifications and procedures for registration and post-registration of chemical fertilizers and pesticides."

Activities	Inputs	
1-1 Select pilot area based on the criteria 1-2 Prepare questionnaire. 1-3 Conduct interviews with traders. 1-4 Develop baseline data report. 2-1 Set up of laboratories for analyses of chemical fertilizers and pesticides. 2-2 Carry out On-the-Job-Trainings (OJT) and/or training in the Philippines for the laboratory staff to analyze chemical fertilizers and pesticides. 2-3 Analyze the quality of samples for chemical fertilizers and pesticides collected in pilot area (results are shared through awareness raising activities under Output4) 2-4 Develop manuals for: 1) Analyses of Chemical fertilizers (N, P, K and some other elements) 2) Analyses of Pesticides (some prioritized active ingredients) 3) Operation and maintenance of laboratory equipment 3-1 Review the present administrative documents and regulations for chemical fertilizers and pesticides. 3-2 Exchange views on regulations related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides with relevant departments in MAFF and other key stakeholders. 3-3 Provide recommendations for the new Regulation through the collaborative efforts with relevant authorities including other donors. 4-1 Develop materials for public awareness raising such as pamphlet, posters, and audio visual media. 4-2 Develop materials for retailers on proper selection and use of chemical fertilizers and pesticides. 4-3 Conduct awareness raising activities for public. 4-4 Conduct awareness raising activities for retailers. (Activities include collaboration with FAO through sharing materials developed under 4-2.)	**1. Cambodian side** 1) Counterpart personnel (C/Ps): thirty two(32) staff: - Co-project managers: from DAL and GDA - Ten (10) DAL staff and twenty (20) GDA staff Assistants of co-project manager, 4 members 2) Office space (DAL and GDA) and facilities (in kind) 3) Local expenses – cost for electricity, water, and other available miscellaneous **2. Japanese side** 1) Dispatch of Experts - Cost for the Philippines short-term experts - Japanese long-term experts: (1) one chief advisor and (2) one expert on baseline survey and awareness raising/coordinator 2) Provision of equipment/facilities 3) Cost for Trainings in the 3rd countries including the Philippines 4) Project activity cost **3. Philippines side** 1) Nomination of short-term experts - Short-term experts in the fields of chemical fertilizers analyses, pesticide formulation analyses, and administration work of chemical fertilizers and pesticides. 2) Trainings in the Philippines	

		Preconditions 1. There are no major changes in personnel and human resources for laboratory management. 2. The existing equipment/facilities is properly functioning.

Plan of Operation

Version 2 on 30 April 2010

Project Title: Capacity Building for the Quality Standard Control of Agricultural Materials (Chemical Fertilizers and Pesticides)

Project Purpose: Proper usage and quality control of chemical fertilizers and pesticides is enhanced in pilot area.

Activities for Output 1		Expected Outcome	2009				2010				2011				2012	Responsible Department	Remarks
			1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3		
1	Baseline data for the project is developed																
1-1	Select pilot area based on the criteria.	Pilot area is selected														DAL & GDA	
1-2	Prepare questionnaire.	Questionnaire sheet														DAL & GDA	
1-3	Conduct interviews with traders.	Questionnaire sheet														DAL & GDA in cooperation with PDA	
1-4	Develop baseline data report.	Baseline data on registered chemical fertilizers Baseline data on registered pesticides Baseline data on labeling in Khmer														DAL & GDA	

Activities for Output 2		Expected Outcome	2009				2010				2011				2012	Responsible Department	Remarks
			1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3		
2	Capability of laboratories is improved in terms of analyses of chemical fertilizers and pesticides.																
2-1	Set up of laboratories for analyses of chemical fertilizers and pesticides.	Properly set-up laboratories														DAL & GDA	
2-2	Carry out On-the-Job-Trainings (OJT) and/or training in the Philippines for the laboratory staff to analyze chemical fertilizers and pesticides.	Training reports/records of training														DAL & GDA	
2-3	Analyze the quality of samples for chemical fertilizers and pesticides collected in pilot area (results are shared through awareness raising activities under Output 4).	Samples are analysed														DAL & GDA	
2-4	Develop manuals for analyses of:																
	1) Chemical fertilizers (N, P, K and some other elements)	Manual for analyses of chemical fertilizers														DAL & GDA	
	2) Pesticides (some prioritized active ingredients)	Manual for analyses of pesticides														GDA	
	3) Operation and maintenance of laboratory equipment	Operation and maintenance manual														DAL & GDA	

Activities for Output 3		Expected Outcome	2009				2010				2011				2012	Responsible Department	Remarks
			1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3		
3	Development of Regulation related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is facilitated with the expectation of having the 1st draft.																
3-1	Review the present administrative documents and regulations for chemical fertilizers and pesticides.	Documents and regulations are reviewed														DAL	
3-2	Exchange views on regulations related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides with relevant departments in MAFF and other key stakeholders.	Views are exchanged														DAL	
3-3	Provide recommendations for the new Regulation through the collaborative efforts with relevant authorities including other donors.	Recommendations are provided														DAL	

Activities for Output 4		Expected Outcome	2009				2010				2011				2012	Responsible Department	Remarks
			1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3		
4	Awareness is raised on proper usage and quality of chemical fertilizers and pesticides																
4-1	Develop materials for public awareness raising such as pamphlet, posters, and audio visual media.	Materials are developed														DAL & GDA	
4-2	Develop materials for retailers on proper selection and use of chemical fertilizers and pesticides.	Materials are developed														DAL & GDA	
4-3	Conduct awareness raising activities for public.	Conduct activities for public														DAL & GDA in cooperation with PDA	
4-4	Conduct awareness raising activities for retailers (Activities include collaboration with FAO through sharing materials developed under 4-2).	Conduct activities for retailers														DAL & GDA in cooperation with PDA	

ANNEX-III List of Japanese Experts

Name	Organization	Area	Period
1. Japanese Long-term Experts			
(1) Dr. Kazuhiko Yagi	CDC International	Chief Advisor	April 1st, 2010～March 31st, 2012
(2) Mr. Toshinori Hamaguchi	N/A.	a. Project Management/Baseline Survey/Awareness Raising Activities b. Project Coordination/ Awareness Raising Activities/Monitoring	a. April 27th, 2009～March 31st, 2010 b. April 1st, 2010～March 31st, 2012
2. Japanese Short-term Expert			
(1) Dr. Keiji Tanaka	MC-Ryokka Co., Ltd.	a. Pesticide Management and Promotion on Proper Use of Pesticides b. Registration and Management of Pesticides	a. December 6th, 2010～December 19th, 2010 b. November 28th, 2011～December 17th, 2011
3. Philippine Short-term Experts			
(1) Dr. Wilma N. Obcemea	Fertilizer and Pesticide Authority	Fertilizer Quality Standard Analysis	April 21st, 2009～May 1st, 2009
(2) Ms. Maria Lourdes De Mata	Bureau of Plant Industry	Formulation Analysis of Pesticides	April 21st, 2009～May 1st, 2009
(3) Ms. Edna Lynn C. Floresca	Bureau of Soils and Water Management	Analysis of Chemical Fertilizers	1) August 2nd, 2009～December 24th, 2009 2) February 14th, 2010～July 14th, 2010 3) July 4th, 2011～October 28th, 2011
(4) Ms.Maria Esperanza De Guzman Uy	Bureau of Plant Industry	Formulation Analysis of Pesticides	1) August 2nd, 2009～December 24th, 2009 2) February 14th, 2010～July 14th, 2010 3) July 4th, 2011～September 23rd, 2011
(5) Prof. Francisco C. Cornejo	1) Former Executive Director of the FPA 2) Consultant	1) Review of administrative work related to registration and licensing of chemical fertilizers and pesticides as well as adoption of quality standards for chemical fertilizers and pesticides 2) Support on coordinating Technical Information Exchange Programs in the FPA.	1) October 15th, 2009～December 15th, 2009 2) September 15th, 2010～February 28th, 2011 (Worked as a consultant in the Philippines.)
(6) Ms. Elvira M. Bautista	Bureau of Soils and Water Management	Analysis of Chemical Fertilizer	November 7th, 2010～March 7th, 2011
(7) Ms. Laylo Erlinda	Bureau of Plant Industry	Formulation Analysis of Pesticides	November 7th, 2010～March 7th, 2011

ANNEX-IV List of Technical Information Exchange Programs in the Philippines

No	Name	Period	Host Organization	Major trainng themes	Participants	Organization and Position
1	First Technical Information Exchange Program	June 6th, 2010～ June 10th, 2010	・FPA ・BPI ・BSWM	(1) Legal framework and administrative work on registration of chemical fertilzers and pesticides. (2) Legal framework and administrative work on post-registration of chemical fertilzers and pesticides. (3) Supportive work by stakeholders who are involved in (1)&(2)	1) Mr. Phum Ra 2) Mr. Sok Sarou 3) Mr. Pheav Chintheng 4) Mr. Kim Savoeun 5) Dr. Kazuhiko Yagi	1) Deputy Director, DAL 2) Vice Chief, Bureau of Agricultural Materials Standard (BAMS) 3) Vice Chief, National Agricultural Laboratory (NAL) of the GDA 4) Deputy Director, PDA Kandal 5) Chief Advisor
2	Second Technical Information Exchange Program	September 19th, 2010～September 25th, 2010	・FPA	(1) Legal framework and administrative work on pre-and post-registrations of chemical fertilzers (2) Collaborative work with other stakeholders.	1) Mr. Ouk Syphan 2) Mr. Be Seakmeng 3) Mr. Seang Sin 4) Mr. Lorn Socheata 5) Mr. San Voeurn 6) Dr. Kazuhiko Yagi	1) Director, DAL 2) Vice Chief, BAMS 3) Vice Chief, Legislation and Law Extension Office 4) Staff, NAL of the GDA 5) Vice Chief, Legislation Office 6) Chief Advisor
3	Third Technical Information Exchange Program	January 16th, 2011 ～January 21st, 2011 (January 16th, 2011 ～January 19th for H.E. San Vanty and Ms. SIV Cheang)	・FPA	(1) Legal framework and administrative work on pre-and post-registrations of pesticides (2) Collaborative work with other stakeholders.	1) H.E. San Vanty 2) Mr. Phum Ra 3) Mr. Chea Chanveasna 4) Mr. Lorn Socheata 5) Ms. SIV Cheang 6) Mr. Toshinori Hamaguchi	1) Under secretary of state, MAFF 2) Deputy Director, DAL 3) Deputy Director, DAL 4) Staff, NAL of the GDA 5) Program Officer, JICA Cambodia 6) Project Coordinator

ANNEX-V List of Machinerry and Equipment provided by JICA (Laboratory of Chemical Fertilziers in the DAL)

Note R/P:Route of Procurement: (J: from Japan, L: local purchase, E: for Expert)
Frequency of Use: (A: Always - B: Often - C: Sometimes)
Condition: (A: Good - B: Fair - C: Bad)

Laboratory of Chemical Fertilziers in the DAL

No	Date of Arrival	Description			R/P	QTY	Price US$		Place of Storage	Frequency of USE	Condition	Remarks
		Name of Equipment	Maker	Model			Unit	Total				
Lot A: Equipment												
1	04/Mar/2010	Blower assembly	Perkin Elmer/UK	Blower Assy	L	2	1515.00	3030.00	DAL	A	A	
2	04/Mar/2010	Exhaust hood	Perkin Elmer/UK		L	2	598.00	1196.00	DAL	A	B	
3	04/Mar/2010	pH meter	IKA/Germany	pH Mmeter, Cosist with : 827 pH Lab Meter including Primatrode, Combined pH Glass electrode with NTC Temperature sensor	L	1	1099.00	1099.00	DAL	B	A	
4	15/Mar/2010	Hot plate	IKA/Germany	C-MAG HS10	L	2	1012.00	2024.00	DAL	B	B	
5	04/Mar/2010	Laboratory cart	Design Alternative/ Thailand	Trolleys	L	1	1986.00	1986.00	DAL	B	A	
6	04/Mar/2010	Flexible tube	Perkin Elmer/UK	OD 4 Inches for Hood	L	2	324.00	648.00	DAL	C	A	
7	15/Mar/2010	Vortex mixer	Scientific Industries/USA	Vortex-genie 2 mixer	L	1	643.00	643.00	DAL	A	A	
8	16/Nov/2010	Shaker	IKA/Germany	HS260 Basic	L	1	3568.00	3568.00	DAL	B	A	
9	16/Nov/2010	Ashing Furnace	Nabertherm/Germany	LV9/11/B180	L	1	7317.00	7317.00	DAL	B	A	
				Sub Total A				**21511.00**				
Lot B: Spareparts												
1	04/Mar/2010	Single Element Hollow Cathode Lamps for Mn. (AAS spare part)	Perkin Elmer/UK	Mn Lumina HCl, HCl Lamp for AAnalyst200	L	1	751.00	751.00	DAL	B	B	
2	04/Mar/2010	Single Element Hollow Cathode Lamps for Ca. (AAS spare part)	Perkin Elmer/UK	Ca Lumina HCl, HCl Lamp for AAnalyst200	L	1	751.00	751.00	DAL	B	B	
3	04/Mar/2010	Nebulizer Assembly	Perkin Elmer/UK	AA 200/400 Nebulizer kit	L	2	578.00	1156.00	DAL	B	B	
4	04/Mar/2010	Flash back arrestor	Alpha (Conco)/USA	Flash back arrestor for Acetylene gas line, bronze	L	1	180.00	180.00	DAL	A	B	
				Sub Total B				**2838.00**				
Lot C: Lab. Apparatus/Glasswares												
1	05/Mar/2010	Mortar and Pestle	Wagtech/CE	Porcelain, diameter 160mm	L	1	25.92	25.92	DAL	B	C	Broken. Borrowing one from the GDA
2	15/Mar/2010	Stirring rod	BSP/Thailand	Stirring rod, glass 12 inches in length	L	10	5.00	50.00	DAL	B	B	
3	04/Mar/2010	Tongs	Usbeck/Germany	Tongs, Strainless steel, 30cm length	L	2	60.00	120.00	DAL	C	B	
4	15/Mar/2010	Weighing Boat	Kartell/Germany	Weighing Boat, square shapes, 78.5×78.5× 23, 100ml,pkg of 1000	L	1	274.00	274.00	DAL	A	B	
5	15/Mar/2010	Pipette bulb	Kartell/Germany	Pipetter filler with adapter three glasses ball valve	L	2	69.00	138.00	DAL	A	B	
6	05/Mar/2010	Laboratory goggles	Wagtech/CE	Laboratory Safty Goggles Soft PVC frame with adjustable	L	5	41.46	207.30	DAL	A	A	
7	12/Nov/2010	Cuvette 10mm, COMECTA	Selecta-CE	10mm	L	1	98.00	98.00	DAL	A	B	
8	12/Nov/2010	Graduated pipette	Wagtech/CE	10 ml, Class A, Soda glass	L	5	24.00	120.00	DAL	A	B	
9	12/Nov/2010	Pipette rack	Selecta-CE	For 112 pipettes	L	2	71.10	142.20	DAL	A	A	
10	12/Nov/2010	Porcelain Crucible	Wagtech/CE	Medium form, Capacity: 45ml,	L	2	76.00	152.00	DAL	B	A	
11	12/Nov/2010	Lid for Crucible	Wagtech/CE		L	2	67.20	134.40	DAL	B	A	
12	12/Nov/2010	Volumetric Flask, 25 mL	Wagtech/CE	Class A with stopper.	L	10	34.65	346.50	DAL	A	B	
13	12/Nov/2010	Volumetric Flask, 250 mL	Wagtech/CE	Class A with stopper.	L	25	32.50	812.50	DAL	A	B	
14	12/Nov/2010	Volumetric Flask, 50 mL	Wagtech/CE	Class A with stopper.	L	12	36.25	435.00	DAL	A	B	
15	12/Nov/2010	Volumetric pipette, 15 mL	Wagtech/CE	Soda lime glass, class A.	L	3	57.85	173.55	DAL	A	B	
16	12/Nov/2010	Volumetric pipette, 20 mL	Wagtech/CE	Soda lime glass, class A.	L	3	55.30	165.90	DAL	A	B	

17	12/Nov/2010	Wire basket with cross dividers	Selecta-CE	240 diam × 180mm.	L	2	85.00	170.00	DAL	A	B	
18	12/Nov/2010	Borosilicate glass fume tube	Selecta-CE	For macro kjeldahl digestion	L	1	414.00	414.00	DAL	B	B	
19	12/Nov/2010	Heating Mantle Banks for macro kjeldahl digestion	Selecta-CE	6 places of 300-500ml flasks. Come with 3 bars and bar clamps. Fume extractor tube clips.	L	1	2600.00	2600.00	DAL	B	B	
20	16/Dec/2010	Volumetric pipette, 3 mL	Fisher Scientific USA	Glass, class A.	L	1	180.00	180.00	DAL	A	B	
21	16/Dec/2010	Volumetric pipette, 4 mL	Fisher Scientific USA	Glass, class A.	L	1	180.00	180.00	DAL	A	B	
22	16/Dec/2010	Kjeldahl flask	Fisher Scientific USA	500 mL	L	4	280.00	1120.00	DAL	A	B	
23	30/Sep/2011	Accessory Stirrer Bars, Magnetic	Brand/Germany	Pivot ring, dimensions, 45x8mm	L	1	67.00	67.00	DAL	A	B	
24	30/Sep/2011	Magnetic Retriever	Brand/Germany	Dimensions, mm 350x10	L	2	30.00	60.00	DAL	A	B	
25	30/Sep/2011	Volumetric flask , 100 mL	Duran/Germany	Class A, glass with stopper	L	50	17.00	850.00	DAL	A	B	
26	30/Sep/2011	Graduated pipette, 5 mL	Brand/Germany	Type 2, Class A	L	1	83.00	83.00	DAL	A	B	
27	30/Sep/2011	Graduated pipette, 1 mL	Brand/Germany	Type 2, Class A	L	1	91.00	91.00	DAL	A	B	
28	30/Sep/2011	Watch glasses, Ground edges diameter 70 mm	Duran/Germany	Part No. 2332138	L	20	3.00	60.00	DAL	B	A	
29	30/Sep/2011	Spatula, stainless steel	Usbeck/Germany	Spoon end , other flat, length 150 mm	L	10	7.00	70.00	DAL	B	A	
30	30/Sep/2011	Crucibles	Assitent/Germany	Porcelain, medium form, supplied with lid 50mmdia height 4	L	20	38	760.00	DAL	B	A	
31	17/Oct/2011	Watch glasses, Ground edges diameter 90 mm	Duran/Germany	Part No. 2332143	L	20	3.00	60.00	DAL	B	A	
32	17/Oct/2011	Beakers, 250 mL	Duran/Germany	Tall form, with spout Duran, Borosilicate glass	L	20	4.00	80.00	DAL	A	B	
				Sub Total C				**10240.27**				
Lot D: Chemicals & Consumables												
1	15/Mar/2010	Bromcresol green	Merck/Germany	BROMOCRESOL GREEN INDICATOR ACS, REAG.PH EUI	L	1	667.00	667.00	DAL	B	A	
2	15/Mar/2010	Copper sulfate tetrahydrate	Merck/Germany	COPPER(II) SULFATE PENTAHYDRATE GR FOR ANALYSIS ACS, ISO, REAG.PH EUR, 250g	L	1	119.00	119.00	DAL	B	A	
3	15/Mar/2010	Filter Paper	Albet/Spain	Filter paper, slow, dia. 150mm, box of 100	L	3	43.00	129.00	DAL	A	B	
4	15/Mar/2010	Lanthanum oxide	Merck/Germany	LANTHANUM(III) OXIDE LAB, 100g	L	0.5	242.00	121.00	DAL	B	A	
5	15/Mar/2010	Potassium sulfate	Merck/Germany	POTASSIUM SULFATE GR FOR ANALYSIS ACS, ISO, REAG. PH EUR, 1Kg	L	1	142.00	142.00	DAL	A	A	
6	15/Mar/2010	Salicylic Acid	Merck/Germany	SALICYLIC ACID EXTRA PURE PH EUR, BP USP, 1Kg	L	0.5	265.00	132.50	DAL	A	A	
7	15/Mar/2010	Selenium dioxide	Merck/Germany	SELENIUM DOXIDE (SUBLIMED) FOR SYNTHESIS, 50g	L	1	120.00	120.00	DAL	B	A	
8	15/Mar/2010	Sodium Thiosulfate Pentahydrate	Merck/Germany	SODIUM THIOSULFATE PENTAHYDRATE GR FOR ANALYSIS ACS, ISO, REAG. PH EUR, 500g	L	1	88.00	88.00	DAL	A	A	
9	15/Mar/2010	Spillage Absorption granules	Merck/Germany	CHEMIZORB GRANULES ABSORBENT FOR SPILLED LIQUIDS, 1Kg	L	1	121.00	121.00	DAL	C	A	
10	15/Mar/2010	Standard solutions, 1000 ppm: Mn	Merck/Germany	MANGANESE STANDARD SOLUTION TRACEABLE TO SRM FROM NIST MN(NO3)2 IN HNO3 0,5 MOL/L 1000MG/L	L	5	62.00	310.00	DAL	A	A	
11	26/Nov/2010	Nitric Acid, 68%	Merck/Germany	2.5 L, Analytical Reagent (AR).	L	6	71.00	426.00	DAL	A	A	
12	26/Nov/2010	Phenolphthalein indicator	Merck/Germany	100g, AR.	L	1	169.00	169.00	DAL	A	A	
13	26/Nov/2010	Potassium hydrogen phthalate	Merck/Germany	250 g, AR.	L	1	156.00	156.00	DAL	A	A	
14	26/Nov/2010	Silver Nitrate, AR	Merck/Germany	100g, AR.	L	1	296.00	296.00	DAL	A	B	
15	27/Dec/2010	Sulfuric Acid, 95-97% AR	Merck/Germany	2.5 L, AR.	L	10	50.00	500.00	DAL	A	B	
16	27/Dec/2010	Hydrochloric Acid, 37% AR	Merck/Germany	2.5 L, AR.	L	20	48.00	960.00	DAL	A	B	
17	05/Aug/2011	Ethanol, 96 %	Merck/Germany	2.5L	L	1	64.00	64.00	DAL	B	B	
18	31/Aug/2011	Sulfuric Acid, 98 %	Merck/Germany	Reagent grade, 2.5 L	L	10	36.00	360.00	DAL	A	A	
19	31/Aug/2011	Sodium Hydroxide	Merck/Germany	Reagent grade, 1Kg	L	10	26.00	260.00	DAL	A	A	
20	31/Aug/2011	Nitric acid	Merck/Germany	Reagent Grade, 2.5 L	L	10	54.00	540.00	DAL	B	A	
21	30/Sep/2011	Parafilm	Whatman/UK	4"x125 ft roll	L	2	63.00	126.00	DAL	A	A	
22	30/Sep/2011	Test tube rack	Kartell/Italy	Plastic made, 40 hoids	L	6	22.00	132.00	DAL	A	A	
23	26/Nov/2011	Barium Chloride dihydrate, AR	Merck/Germany	1 kg, AR.	L	2	111.00	222.00	DAL	B	A	
				Sub Total D				**6160.50**				
				Total				**40749.77**				

ANNEX-V List of Machinerry and Equipment provided by JICA (Laboratory of Chemical Fertilziers in the GDA

Note R/P:Route of Procurement: (J: from Japan, L: local purchase, E: for Expert)
Frequency of Use: (A: Always - B: Often - C: Sometimes)
Condition: (A: Good - B: Fair - C: Bad)

Laboratory of Chemical Fertilziers in the GDA

No	Date of Arrival	Description			R/P	QTY	Price US$		Place of Storage	Frequency of USE	Condition	Remarks
		Name of Equipment	Maker	Model			Unit	Total				
Lot A: Equipment												
1	29/Sep/2009	Distillation Unit in the Kjeldahl distribution set-up for total Nitrogen (N)	Selecta/CE	Steam distillation unit Kjeldahl "Pro-Nitro M"	L	1	7866.00	7866.00	GDA cf	A	B	
2	29/Sep/2009	Water recirculation vacuum unit in the Kjeldahl distribution set-up for total Nitrogen (N)	Selecta/CE	Water recirculation vacuum unit in the Kjeldahl distribution set-up for total Nitrogen (N)	L	1	1935.38	1935.38	GDA cf	B	B	Please refer to the note below.
3	28/Sep/2009	Air compressor for flame photometer	Wagtech/CE	Corning 410	L	1	3521.96	3521.96	GDA cf	A	B	
4	04/Mar/2010	Blower assembly	Perkin Elmer/UK	Blower Assy	L	1	1515.00	1515.00	GDA cf	A	B	
5	04/Mar/2010	Analytical Balance	Sartorius/Germany	Analytical Balance-Extend series Model: ED224S	L	1	2575.00	2575.00	GDA cf	A	A	
6	04/Mar/2010	Exhaust hood	Perkin Elmer/UK		L	1	598.00	598.00	GDA cf	A	B	
7	04/Mar/2010	Flexible tube	Perkin Elmer/UK	OD 4 inches for Hood	L	1	324.00	324.00	GDA cf	A	B	
8	15/Mar/2010	Vortex mixer	Scientific Industries/USA	Vortex-genie 2 mixer	L	1	643.00	643.00	GDA cf	A	A	
9	13/Mar/2010	Scrubber unit	Selecta/CE		L	1	1897.82	1897.82	GDA cf	B	B	Attachment for No.2
10	06/Jan/2011	Shaker	IKA/Germany	HS 260 Basic	L	1	3568.00	3568.00	GDA cf	A	B	
Sub Total A								**24444.16**				
Lot B: Lab. Apparatus/Glasswares												
1	05/Mar/2010	Weighing Boat	Wagtech/CE	Weighing Boat, standard, square, small weight	L	1	150.00	150.00	GDA cf	A	B	
2	05/Mar/2010	Vol Flask	Duran/Germany	Class A, MBL 25ml, 5/pack	L	5	51.00	255.00	GDA cf	A	A	
3	05/Mar/2010	Buret	Brand/Germany	Buret to ISO 385 PTFe, Stopcock, Sodal-lime glass with straight bore, 50ml	L	1	51.74	51.74	GDA cf	A	A	
4	05/Mar/2010	Mortar and Pestle	Wagtech/CE	Porcelain, diameter 160mm	L	1	25.92	25.92	GDA cf	B	B	
5	15/Mar/2010	Beaker, glass	Duran/Germany	Beaker, glass, 50ml	L	10	3.00	30.00	GDA cf	A	A	
6	15/Mar/2010	Stirring rod	BSP/Thailand	Stirring rod, glass 12 inches in length	L	10	5.00	50.00	GDA cf	A	A	
7	15/Mar/2010	Graduated Cylinder	Brand/Germany	Cylinder tall form, Class B, 500ml	L	2	50.00	100.00	GDA cf	A	A	
8	15/Mar/2010	Graduated Pipette	Brand/Germany	Class B, 1ml	L	10	14.00	140.00	GDA cf	A	A	
9	15/Mar/2010	Graduated Pipette	Brand/Germany	Class B, 10ml	L	10	14.00	140.00	GDA cf	A	A	
10	15/Mar/2010	Erlenmeyer flask	Duran/Germany	N/Neck 500ml	L	30	10.00	300.00	GDA cf	A	A	
11	04/Mar/2010	Tongs	Usbeck/Germany	Tongs, Strainless steel, 30cm length	L	2	60.00	120.00	GDA cf	A	A	
12	15/Mar/2010	Pipette bulb	Kartell/Italy	Pipette filler with adapter three glass ball valve	L	3	69.00	207.00	GDA cf	A	A	
13	12/Nov/2010	Cuvette 10mm, COMECTA	Selecta-CE	10mm	L	1	98.00	98.00	GDA cf	A	B	
14	12/Nov/2010	Graduated pipette	Wagtech/CE	10 ml, Class A, Soda glass	L	5	24.00	120.00	GDA cf	A	A	
15	12/Nov/2010	Pipette rack	Selecta-CE	For 112 pipettes	L	2	71.10	142.20	GDA cf	A	B	
16	12/Nov/2010	Porcelain Crucible	Wagtech/CE	Medium form. Capacity: 45ml.	L	2	76.00	152.00	GDA cf	A	B	
17	12/Nov/2010	Lid for Crucible	Wagtech/CE		L	2	67.20	134.40	GDA cf	A	A	
18	12/Nov/2010	Volumetric Flask, 25 mL	Wagtech/CE	Class A with stopper.	L	10	34.65	346.50	GDA cf	A	A	
19	12/Nov/2010	Volumetric Flask, 250 mL	Wagtech/CE	Class A with stopper.	L	25	32.50	812.50	GDA cf	A	A	
20	12/Nov/2010	Volumetric Flask, 50 mL	Wagtech/CE	Class A with stopper.	L	12	36.25	435.00	GDA cf	A	A	
21	12/Nov/2010	Volumetric pipette, 15 mL	Wagtech/CE	Soda lime glass, class A.	L	3	57.85	173.55	GDA cf	A	A	
22	12/Nov/2010	Volumetric pipette, 20 mL	Wagtech/CE	Soda lime glass, class A.	L	3	55.30	165.90	GDA cf	A	A	
23	12/Nov/2010	Wire basket with cross dividers	Selecta-CE	240 diam × 180mm.	L	2	85.00	170.00	GDA cf	A	B	
24	12/Nov/2010	Borosilicate glass fume tube	Selecta-CE	For macro kjeldahl digestion	L	1	414.00	414.00	GDA cf	B	B	Attachment for No.2
25	12/Nov/2010	Heating Mantle Banks for macro kjeldahl digestion	Selecta-CE	6 places of 300-500ml flasks. Come with 3 bars and bar clamps. Fume extractor tube clips.	L	1	2600.00	2600.00	GDA cf	B	B	Attachment for No.2
26	12/Nov/2010	Kjeldahl digestion tubes, 250ml	Wagtech/CE	KJELDATHEM Digestion Tube KTG	L	24	84.00	2016.00	GDA cf	A	B	

27	16/Dec/2010	Volumetric pipette, 3 mL	Fisher Scientific USA	Glass, class A.	L	1	180.00	180.00	GDA cf	B	B	
28	16/Dec/2010	Volumetric pipette, 4 mL	Fisher Scientific USA	Glass, class A.	L	1	180.00	180.00	GDA cf	B	B	
29	16/Dec/2010	Kjeldahl flask	Fisher Scientific USA	500 mL	L	4	280.00	1120.00	GDA cf	B	B	
30	17/Oct/2011	Beakers, 250 mL	Duran/Germany	Tall form, with spout Duran, Borosilicate glas	L	20	4.00	80.00	GDA cf	B	B	
31	31/Aug/2011	pH meter	Metrohm/Switzerland	827 pH lab	L	1	2023.00	2023.00	GDA cf	A	A	
32	31/Aug/2011	pH glass electrode	Metrohm/Switzerland	pH glass electrode with NTC temperature sensor	L	2	392.00	784.00	GDA cf	A	A	
33	30/Sep/2011	Crucibles	Assitent/Germany	Porcelain, medium form, supplied with lid 50n	L	19	38.00	722.00	GDA cf	B	B	
34	30/Sep/2011	Magnetic Retriever	Brand/Germany	Dimensions, mm 350x10	L	2	30.00	60.00	GDA cf			
35	30/Sep/2011	Volumetric flask , 100 mL	Duran/Germany	Class A, glass	L	50	17.00	850.00	GDA cf	A	B	
36	30/Sep/2011	Graduated pipette, 5 mL	Brand/Germany	Type 2, Class A	L	1	83.00	83.00	GDA cf	A	A	
37	30/Sep/2011	Watch glasses, Ground edges diameter 70 mm	Duran/Germany	Part No. 2332138	L	20	3.00	60.00	GDA cf	A	B	
38	30/Sep/2011	Spatula, stainless steel	Usbeck/Germany	Spoon end , other flat, length 150 mm	L	10	7.00	70.00	GDA cf	A	A	
39	30/Sep/2011	Funnel, polypropylene	Kartell/Italy	Top i.d. 100mm, stem o.d. 11mm, stem lengh 82mm	L	20	5.00	100.00	GDA cf	A	B	
40	30/Sep/2011	Accessory Stirrer Bars, Magnetic	Brand/Germany	Pivot ring, dimensions, 45x8mm	L	1	67.00	67.00	GDA cf	B	B	
41	17/Oct/2011	Watch glasses, Ground edges diameter 90 mm	Duran/Germany	Part No. 2332143	L	20	3.00	60.00	GDA cf	A	A	
Sub Total B								**15788.71**				

Lot C: Chemicals & Consumables												
1	23/Sep/2009	Methyl red indicator	Merck/Germany	Methyl red (C.I.13020) indicator ACS,	L	1	92.00	92.00	GDA cf	B	A	
2	23/Sep/2009	Magnesium Oxide (MgO)	Merck/Germany	Magnesium oxide (max.0.001% SO4) GR ACS, 100g/btl	L	1	303.00	303.00	GDA cf	B	A	
3	15/Mar/2010	Ammonium molybdate tetrahydrat	Merck/Germany	AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE GR FOR ANALYSIS 100g	L	1	350.00	350.00	GDA cf	B	A	
4	15/Mar/2010	Ammonium monovanadate	Merck/Germany	AMMONIUM MONOVANADATE GR FOR ANALYSIS REAG.PH EUR, 250g	L	1	323.00	323.00	GDA cf	B	A	
5	15/Mar/2010	Boric acid	Merck/Germany	BORIC ACID GR FOR ANALYSIS ACS, ISO, REAG. PH, 500g	L	1	186.00	186.00	GDA cf	B	A	
6	15/Mar/2010	Bromcresol green	Merck/Germany	BROMOCRESOL GREEN INDICATOR ACS , REAG. PH EUR, 25g	L	1	667.00	667.00	GDA cf	B	A	
7	15/Mar/2010	Buffer solution pH 4	Merck/Germany	BUFFER SOLUTION, TRACEABLE TO SRM FROM NIST AND PTB PH 4.00 (20 GRAD C)	L	1	102.00	102.00	GDA cf	B	A	
8	15/Mar/2010	Buffer solution pH 7	Merck/Germany	BUFFER SOLUTION, TRACEABLE TO SRM FROM NIST AND PTB PH 7.00 (20 GRAD C)	L	1	102.00	102.00	GDA cf	B	A	
9	15/Mar/2010	Copper sulfate tetrahydrate	Merck/Germany	COPPER(II) SULFATE PENTAHYDRATE GR FOR ANALYSIS ACS, ISO, REAG. PH EUR,	L	1	119.00	119.00	GDA cf	B	A	
10	15/Mar/2010	Ethanol 96%	Merck/Germany	ETHANOL 96% SUITABLE FOR USE AS EXCIPIENT EMRPOVE EXP PH.EUR, BP, 1L	L	1	80.00	80.00	GDA cf	B	A	
11	15/Mar/2010	Filter Paper	Albet/Spain	Filter paper, slow, dia. 150mm, box of 100	L	3	43.00	129.00	GDA cf	B	A	
12	04/Mar/2010	Hydrochloric Acid 37%	Merck/Germany	HYDROCHLORIC ACID FUMIN 37% GR FOR ANALYSIS ACS, ISO, REAG. PH EUR, 2.5lL	L	3	125.00	375.00	GDA cf	B	A	
13	15/Mar/2010	Lanthanum oxide	Merck/Germany	LANTHANUM(III) OXIDE LAB, 100g	L	0.5	242.00	121.00	GDA cf	B	A	
14	04/Mar/2010	Nitric Acid	Sigma-Aldrich/Germany	Nitric acid 65% GR ISO, 2.5L	L	1	207.00	207.00	GDA cf	B	A	
15	15/Mar/2010	Potassium dihydrogen phosphate	Merck/Germany	POTASSIUM DIHYDROGEN PHOSPHATE GR	L	2	110.00	220.00	GDA cf	B	A	
16	15/Mar/2010	Potassium sulfate	Merck/Germany	POTASSIUM SULFATE GR FOR ANALYSIS ACS, ISO, REAG. PH EUR, 1Kg	L	1	142.00	142.00	GDA cf	B	A	
17	15/Mar/2010	Salicylic Acid	Merck/Germany	SALICYLIC ACID EXTRA PURE PH EUR, BP	L	0.5	265.00	132.50	GDA cf	B	A	
18	15/Mar/2010	Selenium dioxide	Merck/Germany	SELENIUM DIOXIDE (SUBLIMED) FOR SYNTHESIS, 50g	L	1	120.00	120.00	GDA cf	B	A	
19	15/Mar/2010	Sodium hydroxide	Merck/Germany	SODIUM HYDROXIDE PELLETS GR FOR ANALYSIS ISO, 1Kg	L	5	59.00	295.00	GDA cf	B	A	
20	15/Mar/2010	Sodium Thiosulfate Pentahydrate	Merck/Germany	SODIUM THIOSULFATE PENTAHYDRATE GR FOR ANALYSIS ACS, ISO, REAG.PH EUR, 500g	L	1	88.00	88.00	GDA cf	B	A	
21	15/Mar/2010	Spillage Absorption granules	Merck/Germany	CHEMIZORB GRANULES ABSORBENT FOR	L	1	121.00	121.00	GDA cf	B	A	
22	15/Mar/2010	Standard solutions, 1000 ppm: K	Merck/Germany	POTASSIUM STANDARD SOLUTION TRACEABLE TO SRM FROM NIST KNO3 IN HNO3 0.5 MOL/L 1000 MG/L NA CERTIPUR, 100ML	L	5	62.00	310.00	GDA cf	B	A	
23	15/Mar/2010	Standard solutions, 1000 ppm: Na	Merck/Germany	SODIUM STANDARD SOLUTION TRACEABLE TO SRM FROM NIST KNO3 IN HNO3 0.5 MOL/L 1000 MG/L NA CERTIPUR, 100ML	L	5	62.00	310.00	GDA cf	B	A	
24	04/Mar/2010	Sulfuric Acid	Merck/Germany	SULFURIC ACIDE 95-97% GR FOR ANALYSIS ISO, 2.5L	L	5	110.50	552.50	GDA cf	B	A	
25	12/Nov/2010	Ethanol	Merck/Germany	2.5 L, Analytical Reagent (AR).	L	1	121.00	121.00	GDA cf	B	A	
26	26/Nov/2010	Potassium hydrogen phthalate	Merck/Germany	250 g, AR.	L	1	156.00	156.00	GDA cf	B	A	
27	26/Nov/2010	Phenolphthalein indicator	Merck/Germany	100g, AR.	L	1	169.00	169.00	GDA cf	B	A	
28	26/Nov/2010	Nitric Acid, 68%	Merck/Germany	2.5 L, Analytical Reagent (AR).	L	6	71.00	426.00	GDA cf	B	A	
29	26/Nov/2010	Silver Nitrate, AR	Merck/Germany	100g, AR.	L	1	296.00	296.00	GDA cf	B	A	
30	27/Dec/2010	Hydrochloric Acid, 37% AR	Merck/Germany	2.5 L, Analytical Reagent (AR).	L	20	48.00	960.00	GDA cf	B	A	5 bottles are remain

31	27/Dec/2010	Sulfuric Acid, 95-97% AR	Merck/Germany	2.5 L, AR.	L	10	50.00	500.00	GDA cf	B	A	
32	26/Nov/2011	Barium Chloride dihydrate, AR	Merck/Germany	1 kg, AR.	L	2	111.00	222.00	GDA cf	B	A	
33	05/Aug/2011	Ethanol, 96 %	Merck/Germany	2.5L	L	1	64.00	64.00	GDA cf	B	A	
34	31/Aug/2011	Sulfuric Acid, 98 %	Merck/Germany	Reagent grade, 2.5 L	L	10	36.00	360.00	GDA cf	B	A	
35	31/Aug/2011	Sodium Hydroxide	Merck/Germany	Reagent grade, 1Kg	L	10	26.00	260.00	GDA cf	B	A	
36	31/Aug/2011	Nitric acid	Merck/Germany	Reagent Grade, 2.5 L	L	10	54.00	540.00	GDA cf	B	A	
37	31/Aug/2011	Lanthanum oxide	Merck/Germany	Reagent grade, 500g	L	1	413.00	413.00	GDA cf	B	A	
38	23/Sep/2011	Filter Paper No.40	Whatman/UK	Ashless, slow, 150mm dia.	L	10	75.00	750.00	GDA cf	B	A	
39	30/Sep/2011	Parafilm	Whatman/UK	4"x125 ft roll	L	2	63.00	126.00	GDA cf	B	A	
40	30/Sep/2011	Test tube rack	Kartell/Italy	Plastic made, 40 holds	L	6	22.00	132.00	GDA cf	B	A	
Sub Total C								**10942.00**				
Total								**51174.87**				

Note: The Kjeldahl and its attachments (# 2, 9, 24 &25) work as expected. However, inceased number of samples to be analysed overwhelmed the capacity of a fumehood in place in the laboratory. A more powerful fumehood system is necessary in order for the equipment to work as designed.

ANNEX-V List of Machinerry and Equipment provided by JICA (Laboratory of Pesticides in the GDA)

Note: R/P:Route of Procurement: (J: from Japan, L: local purchase, E: for Expert
Frequency of Use: (A: Always - B: Often - C: Sometimes
Condition: (A: Good - B: Fair - C: Bad

Laboratory of Pesticides in the GDA

No	Date of Arrival	Description			R/P	QTY	Price US$		Place of Storage	Frequency of USE	Condition	Remarks
		Name of Equipment	Maker	Model			Unit	Total				
Lot A: Equipment												
1	15/Mar/2010	Ultrasonic Bath	Branson/USA	B3510E-MTH include Cover	L	1	1885.00	1885.00	GDA pest	A	A	
2	15/Mar/2010	Heating Mantle	Lab Heat/Germany	KH-ME for round-botton flask 250ml	L	1	692.00	692.00	GDA pest	A	A	
3	04/Mar/2010	Analytical Balance	Sartorius/Germany	Analytical Balance-Extend series Model: ED224S	L	1	2575.00	2575.00	GDA pest	A	A	
4	15/Mar/2010	Water still	Wagtech/CE	Water Still, Merit, W4000	L	1	2775.86	2775.86	GDA pest	A	A	
5	15/Mar/2010	Centrifuge Machine	Hettich/Germany	Bench top centrifuge, Model : EBA20	L	1	1324.00	1324.00	GDA pest	A	A	
6	15/Mar/2010	Draining Rack	Kartell/Italy	Draining Rack, PS, 72 Pegs	L	3	137.00	411.00	GDA pest	A	A	
7	04/Mar/2010	pH meter	Metrohm/Switzerland	pH Mmeter, Cosist with : 827 pH Lab Meter including Primatrode, Combined pH Glass electrode with NTC Temperature sensor	L	1	1099.00	1099.00	GDA pest	A	A	
8	15/Mar/2010	Laboratory oven	Memmert/Germany	Oven Electronic PID Temperture controller With Integral auto-diagnostic system	L	1	2414.00	2414.00	GDA pest	A	A	
9	12/Nov/2010	Spectrophotometer	PerkinElmer/Singapore	Lambda 25 UN/Vis Double Beam Spectrophotometer	L	1	18682.00	18682.00	GDA pest	A	A	
10	12/Nov/2010	High Performance Liquid Chromatography (new system)	PerkinElmer/USA	Q-UV-Degas Manual Injector	L	1	62346.00	62346.00	GDA pest	A	A	
Sub Total A								**94203.86**				
Lot B: Spareparts												
1	05/Mar/2010	GC Column	Thermo Fisher/CE	Trace TR-1GC Column ; 0.32mm ×0.25 μm × 30mm	L	2	1446.00	2892.00	GDA pest	A	A	
2	26/Mar/2010	SAX column for HPLC		SAX Column, 10μm, 240 × 4.6mm	L	1	1950.00	1950.00	GDA pest	A	A	
Spare parts and Consumables for GC (Ultra Trace Finnigan):										A	A	
3	12/Nov/2010	Collecting electrode FID	Thermo Fisher/CE	Part Number (PN) 2590115	L	1	663.00	663.00	GDA pest	A	A	
4	12/Nov/2010	Flame Ignition Coil	Thermo Fisher/CE	Part Number (PN) 20601603	L	1	2662.00	2662.00	GDA pest	A	A	
5	12/Nov/2010	Graphite ferrule	Thermo Fisher/CE	0.8 mm internal diameter (id). Part Number (PN) 29013486.	L	2	270.00	540.00	GDA pest	A	A	
6	12/Nov/2010	Graphite ferrule	Thermo Fisher/CE	0.45 mm id. Part Number (PN) 29013487	L	3	270.00	810.00	GDA pest	A	A	
7	12/Nov/2010	Graphite seal	Thermo Fisher/CE	Part Number (PN) 29003406	L	3	373.00	1119.00	GDA pest	A	A	
8	12/Nov/2010	Screw cap top with septa	Thermo Fisher/CE	Polypropylene cap , to fit 2 ml autosampler vials, red rubber/PTFE septa	L	30	178.00	5340.00	GDA pest	A	A	
9	12/Nov/2010	Septum for split-splitless	Thermo Fisher/CE	Part Number (PN) 31303211	L	4	473.00	1892.00	GDA pest	A	A	
10	12/Nov/2010	Split liner, 3 mm	Thermo Fisher/CE	Part Number (PN) 45320031	L	3	372.00	1116.00	GDA pest	A	A	
11	12/Nov/2010	Split liner, 5 mm	Thermo Fisher/CE	Part Number (PN) 45320030	L	3	331.00	993.00	GDA pest	A	A	
12	12/Nov/2010	Splitless liner, 5 mm	Thermo Fisher/CE	Thermo GC Liner 5x8x105 mm SSL	L	1	1035.00	1035.00	GDA pest	A	A	
13	12/Nov/2010	Splitless liner, 3 mm	Thermo Fisher/CE	Part Number (PN) 45320032	L	6	299.00	1794.00	GDA pest	A	A	
14	12/Nov/2010	Spanner for jet FID	Thermo Fisher/CE	Jet Removing Tool	L	1	433.00	433.00	GDA pest	A	A	
15	12/Nov/2010	Autosampler Vial	Thermo Fisher/CE	2 ml, clear, screw top.	L	30	178.00	5340.00	GDA pest	A	A	
Consumables for Air generators:									GDA pest	A	A	
16	12/Nov/2010	Back Ferrule, Swagelok, 1/8"	Clain/ Italy	For Claind ANG 2381.	L	5	8.00	40.00	GDA pest	A	A	
17	12/Nov/2010	Bronze Silencer	Clain/ Italy	For Claind ANG 2381.	L	2	38.00	76.00	GDA pest	A	A	
18	12/Nov/2010	Consumable kit for Air and Nitrogen generator	Clain/ Italy	For Claind ANG 2381.	L	2	413.00	826.00	GDA pest	A	A	
19	12/Nov/2010	Drain filter kit MW	Clain/ Italy	For Claind ANG 2381.	L	2	268.00	536.00	GDA pest	A	A	
20	12/Nov/2010	Drying Cartridge for hydrogen gen	Clain/ Italy	For HG 2200.	L	3	229.00	687.00	GDA pest	A	A	

21	12/Nov/2010	Front ferrule Swagelok, 1/8"	Clain/ Italy	For Claind ANG 2381.	L	5	8.00	40.00	GDA pest	A	A	
22	12/Nov/2010	Steel Plug 6 MB	Clain/ Italy	For Claind ANG 2381.	L	2	8.00	16.00	GDA pest	A	A	
Sub Total B								30800.00				
Lot C: Lab. Apparatus/Glasswares												
1	28/Sep/2009	Syringe Type Filter Holder	Wagtech/CE	Membrane Holder, syringe filter type stainless steel, 13mm, luer lock	L	6	282.53	1695.18	GDA pest	A	A	2 broken.
2	28/Sep/2009	Glass Syringe	Wagtech/CE	Glass syringe, glass tip, luer type 20ml	L	6	17.41	104.46	GDA pest	A	A	2 broken.
3	05/Mar/2010	Solvent Filtration Apparatus	Wagtech/CE	Solvent clarification kit : Funnel Vaccum Base	L	1	1442.57	1442.57	GDA pest	A	A	
4	15/Mar/2010	Gas Wash Bottle with Bottle heads	Lenz/Germany	Gas Wasbottles to d Drechsed without filter disc, with hose nozzle, 250ml	L	4	55.00	220.00	GDA pest	A	A	
5	15/Mar/2010	Round bottom flask 2 necks	BSP/Thailand	Round bottom flask 2 necks, 250ml	L	6	32.00	192.00	GDA pest	A	A	
6	15/Mar/2010	Round bottom flask	BSP/Thailand	Round bottom flask, 250ml	L	6	20.00	120.00	GDA pest	A	A	
7	15/Mar/2010	Condenser, Liebig	BSP/Thailand	Liebig condenser, eff length 200mm, 345mm, overall length, socket and cone 24/29	L	2	53.00	106.00	GDA pest	A	A	
8	15/Mar/2010	Density bottle	Brand/Germany	Density bottle 25ml., Cal, W/Thermo	L	2	190.00	380.00	GDA pest	A	A	
9	15/Mar/2010	Vol Flask	Duran/Germany	Flask Volumetric, PE, Stopper, 5ml	L	12	11.00	132.00	GDA pest	A	A	2 broken.
10	15/Mar/2010	Vol Flask	Duran/Germany	Flask Volumetric, PE, Stopper, 10ml	L	20	11.00	220.00	GDA pest	A	A	5 broken.
11	16/Mar/2010	Vol Flask	Duran/Germany	Flask Volumetric, PE, Stopper, 10ml	L	4	11.00	44.00	GDA pest	A	A	
12	05/Mar/2010	Vol Flask	Wagtech/CE	Class A, MBL 25ml, 5/pack	L	5	51.00	255.00	GDA pest	A	A	
13	15/Mar/2010	Spatula, micro	Usbeck/Germany	Micro Spatula Spoon Stainless 150mm. Width of spoon 5mm	L	6	7.00	42.00	GDA pest	A	A	
14	15/Mar/2010	Spatula, spoon end	Usbeck/Germany	Spatula Spoon Stainless Steel Flat Spoon 150mm. Width of spoon 29mm	L	10	13.00	130.00	GDA pest	A	A	
15	15/Mar/2010	Spatula, palette knife	Brand/Germany	Spatula Stainless Steel, Blade length 150mm.	L	3	27.00	81.00	GDA pest	A	A	
16	15/Mar/2010	Pipet, Volumetric	Brand/Germany	Class A, 0.5ml	L	6	7.00	42.00	GDA pest	A	A	
17	15/Mar/2010	Pipet, Volumetric	Brand/Germany	Class A, 1ml	L	6	7.00	42.00	GDA pest	A	A	
18	15/Mar/2010	Pipet, Volumetric	Brand/Germany	Class A, 2ml	L	12	18.00	216.00	GDA pest	A	A	
19	15/Mar/2010	Pipet , Volumetric	Brand/Germany	Class A, 3ml	L	12	20.00	240.00	GDA pest	A	A	
20	05/Mar/2010	Buret	Wagtech/CE	Buret to ISO 385 PTFe, Stopcock, Sodal-lime glass with straight bore, 25ml	L	2	54.90	109.80	GDA pest	A	A	
21	05/Mar/2010	Buret	Wagtech/CE	Buret to ISO 385 PTFe, Stopcock, Sodal-lime glass with straight bore, 50ml	L	2	51.74	103.48	GDA pest	A	A	
22	05/Mar/2010	Mortar and Pestle	Wagtech/CE	Porcelain, diameter 160mm	L	2	25.92	51.84	GDA pest	A	A	
23	15/Mar/2010	Stirring rod	BSP/Thailand	Stirring rod, glass 12 inches in length	L	10	5.00	50.00	GDA pest	A	A	
24	15/Mar/2010	Erlenmeyer flask with cover	Duran/Germany	W/Screw Cap 250ml	L	6	76.00	456.00	GDA pest	A	A	
25	15/Mar/2010	Erlenmeyer flask with cover	Duran/Germany	W/Screw Cap 500ml	L	6	84.00	504.00	GDA pest	A	A	
26	15/Nov/2010	Volumetric Flask with stopper	Wagtech/CE	25ml	L	25	56.61	1415.25	GDA pest	A	A	3 broken.
27	15/Nov/2010	Volumetric Flask with stopper	Wagtech/CE	10ml	L	50	53.47	2673.50	GDA pest	A	A	
28	15/Nov/2010	Volumetric Flask with stopper	Wagtech/CE	5ml	L	25	52.45	1311.25	GDA pest	A	A	
29	16/Dec/2010	Low temperature circulator	Fisher Scientific	Model name: CA-1112, EYELA/Japan	L	1	4313.33	4313.33	GDA pest	A	A	
30	5/Aug/2011	Glass Bottles	Schott Duran/Germany	500ml, Round, with polypropylene screw caps	L	10	7.50	75.00	GDA pest	A	A	
31	30/Sep/2011	Weighing bottles	Lenz/Germany	Lid, 24/12, borosilicate glass with ground glass	L	6	18.00	108.00	GDA pest	A	A	
32	30/Sep/2011	Beakers	Duran/Germany	100 ml, Low form with spout, Duran glass	L	6	3.00	18.00	GDA pest	A	A	
33	30/Sep/2011	Beakers	Duran/Germany	250 ml, Low form with spout, Duran glass	L	6	3.50	21.00	GDA pest	A	A	
34	30/Sep/2011	Reagent bottles	Duran/Germany	250 ml narrow mouth, amber soda lime glass with stoppers	L	10	25.00	250.00	GDA pest	A	A	
35	30/Sep/2011	Laboratory bottles	Duran/Germany	500 ml, amber, graduated with screw caps	L	6	26.00	156.00	GDA pest	A	A	
36	30/Sep/2011	Laboratory bottles	Duran/Germany	1000 ml, amber, graduated with screw caps	L	6	36.00	216.00	GDA pest	A	A	
37	30/Sep/2011	Measuring cylinders	Brand/Germany	100 ml, Class A glass with hexagonal base with plastic stoppers	L	5	90.00	450.00	GDA pest	A	A	
38	30/Sep/2011	Stirrer bars	Brand/Germany	Pivot ring, magnetic, 25 mm x 6 mm	L	1	45.00	45.00	GDA pest	A	A	

39	30/Sep/2011	Magnetic retriever	Brand/Germany	350 x 8 mm	L	2	30.00	60.00	GDA pest	A	A	
40	30/Sep/2011	Volumetric flask	Duran/Germany	200 ml, Class A glass with plastic cover	L	6	19.00	114.00	GDA pest	A	A	
41	30/Sep/2011	Immersion Circulator	Thermo Scientific/USA	Digital, heats water to 100 C With an accuracy of approximately +0.02 C, pump capacity for closed system 17 liters/min. Minimum immersion depth of 3 inch	L	1	2553.00	2553.00	GDA pest	A	A	
Sub Total C								20758.66				
Lot D: Chemicals & Consumables												
1	23/Sep/2009	Membrane Filter	Whatman/UK	Membrane filter, 0.45 um, 13mm, Nylon, 100/pk	L	10	130.00	1300.00	GDA pest	A	A	
2	23/Sep/2009	Membrane Filter	Whatman/UK	Membrane filter, 0.45 um, 47mm, Nylon, 100/pk	L	10	178.00	1780.00	GDA pest	A	A	
3	15/Mar/2010	Acetic Acid, glacial	Merck/Germany	ACETIC ACID (GLACIAL) 100% ANHYDROUS GR FOR ANALYSIS ACS, ISO, REAG.PH, 1L	L	2	109.00	218.00	GDA pest	A	A	
4	15/Mar/2010	Acetonitrile, HPLC	Merck/Germany	ACETONITRILE ISOCRATIC GRADE FOR LIQUID CHROMATOGRAPHY LICHROSOLV, 1L	L	36	83.00	2988.00	GDA pest	A	A	
5	04/Mar/2010	Alpha-cypermethrin (Pesticide Standard	Sigma-Aldrich/Germany	Alpha-cypermethrin 0.1g	L	1	167.00	167.00	GDA pest	A	A	
6	15/Mar/2010	Ammonia Solution 25%	Merck/Germany	AMMONIA SOLUTION 25% GR FOR ANALYSIS, 1L	L	2	99.00	198.00	GDA pest	A	A	
7	04/Mar/2010	Arsenic Trioxide	Sigma-Aldrich/Germany	Arsenic (III) Oxide puriss ACS 99.95-100%, 100g	L	5	356.00	1780.00	GDA pest	A	A	
8	04/Mar/2010	Azoxystrobin (Pesticide Standard)	Sigma-Aldrich/Germany	Azoxystrobin 0.1g	L	1	243.00	243.00	GDA pest	A	A	
9	15/Mar/2010	Buffer solution pH 2	Merck/Germany	BUFFER SOLUTION, TRACEABLE TO SRM FROM NIST AND PTB PH 2.00 (20 GRAD C) CERTIPUR, 1L	L	1	210.00	210.00	GDA pest	A	A	
10	15/Mar/2010	Buffer solution pH 4	Merck/Germany	BUFFER SOLUTION, TRACEABLE TO SRM FROM NIST AND PTB PH 4.00 (20 GRAD C) CERTIPUR, 1L	L	1	102.00	102.00	GDA pest	A	A	
11	15/Mar/2010	Buffer solution pH 7	Merck/Germany	BUFFER SOLUTION, TRACEABLE TO SRM FROM NIST AND PTB PH 7.00 (20 GRAD C) CERTIPUR, 1L	L	1	102.00	102.00	GDA pest	A	A	
12	04/Mar/2010	Carbaryl (Pesticide Standard)	Sigma-Aldrich/Germany	Carbaryl, 0.25g	L	1	135.00	135.00	GDA pest	A	A	
13	04/Mar/2010	Carbendazim (Pesticide Standard)	Sigma-Aldrich/Germany	Carbendazim, 0.25g	L	1	113.00	113.00	GDA pest	A	A	
14	04/Mar/2010	Cypermethrin (Pesticide Standard)	Sigma-Aldrich/Germany	Cypermethrin, 0.1g	L	1	126.00	126.00	GDA pest	A	A	
15	15/Mar/2010	Ethanol 96%	Merck/Germany	ETHANOL 96% SUITABLE FOR USE AS EXCIPIENT EMRPOVE EXP PH.EUR, BP, 1L	L	2	80.00	160.00	GDA pest	A	A	
16	04/Mar/2010	Fenobucarb (Pesticide Standard)	Sigma-Aldrich/Germany	Fenobucarb, 0.25g	L	1	113.00	113.00	GDA pest	A	A	
17	04/Mar/2010	Fenvalerate (Pesticide Standard)	Sigma-Aldrich/Germany	Fenvalerate, 0.25g	L	1	147.00	147.00	GDA pest	A	A	
18	15/Mar/2010	Formaldehyde, 37-38%	Merck/Germany	FORMALDEHYDE SOLUTION MIN. 37% GR FOR ANALYSIS STABILIZED WITH ABOUT 10% METHANOL ACS, REAG. PH EUR, 1L	L	2	125.00	250.00	GDA pest	A	A	
19	04/Mar/2010	Hydrochloric Acid 37%	Merck/Germany	HYDROCHLORIC ACID FUMIN 37% GR FOR ANALYSIS ACS, ISO, REAG. PH EUR, 2.5L	L	1	125.00	125.00	GDA pest	A	A	
20	04/Mar/2010	Imidacloprid (Pesticide Standard)	Sigma-Aldrich/Germany	Imidacloprid, 0.1g	L	1	135.00	135.00	GDA pest	A	A	
21	15/Mar/2010	Iodine, Resublimed	Merck/Germany	IODINE SUBLIMATES GR FOR ANALYSIS ACS ISO, REAG. PH EUR, 500g	L	1	515.00	515.00	GDA pest	A	A	
22	04/Mar/2010	Lead Acetate Trihydrate	Sigma-Aldrich/Germany	Lead(II) Acetate Trihydrate ACS ISO Ph. EUR, 99.5-102.0%, 250g	L	3	108.00	324.00	GDA pest	A	A	
23	04/Mar/2010	Mancozeb (Pesticide Standard)	Sigma-Aldrich/Germany	Mancozeb, 0.25g	L	1	72.00	72.00	GDA pest	A	A	
24	04/Mar/2010	Matalaxyl (Pesticide Standard)	Sigma-Aldrich/Germany	Matalaxyl, 0.1g	L	1	101.00	101.00	GDA pest	A	A	
25	15/Mar/2010	Methanol, HPLC	Merck/Germany	METHANOL FOR LIQUID CHROMATOGRAPHY LICHROSOLV, 1L	L	24	30.00	720.00	GDA pest	A	A	
26	15/Mar/2010	Ortho-Phosphoric Acid	Merck/Germany	ORTHO-PHOSPHORIC ACID 85% GR FOR ANALYSIS ACS, ISO, REAG. PH EUR, 1L	L	2	165.00	330.00	GDA pest	A	A	

27	15/Mar/2010	Potassium Hydroxide pellets	Merck/Germany	POTASSIUM HYDROXIDE PELLETS GR FOR ANALYSIS, 500g	L	2	112.00	224.00	GDA pest	A	A	
28	15/Mar/2010	Potassium Iodide	Merck/Germany	POTASSIUM IODIDE GR FOR ANALYSIS ISO, REAG. PH EUR, 250g	L	2	212.00	424.00	GDA pest	A	A	
29	15/Mar/2010	Potassium Iodate	Merck/Germany	POTASSIUM IODIDE GR FOR ANALYSIS ACS, ISO, REAG. PH EUR, 500g	L	1	382.00	382.00	GDA pest	A	A	
30	15/Mar/2010	Potassium Thiocyanate	Merck/Germany	POTASSIUM THIOCYANATE GR FOR ANALYSIS ACS, ISO, REAG. PH EUR, 1Kg	L	1	300.00	300.00	GDA pest	A	A	
31	04/Mar/2010	Pretilachlor (Pesticide Standard)	Sigma-Aldrich/Germany	Pretilachlor, 0.25g	L	1	218.00	218.00	GDA pest	A	A	
32	04/Mar/2010	Propiconazole (Pesticide Standard)	Sigma-Aldrich/Germany	Propiconazol, 0.25g	L	1	189.00	189.00	GDA pest	A	A	
33	15/Mar/2010	Sodium Carbonate	Merck/Germany	SODIUM CARBONATE ANHYDROUS GR FOR ANALYSIS ISO, 500g	L	1	185.00	185.00	GDA pest	A	A	
34	15/Mar/2010	Sodium Sulfite	Merck/Germany	SODIUM SULFITE ANHYDROUS GR FOR ANALYSIS REAG.PH EUR, 500g	L	1	192.00	192.00	GDA pest	A	A	
35	15/Mar/2010	Sodium Thiosulfate Pentahydrate	Merck/Germany	SODIUM THIOSULFATE PENTAHYDRATE GR FOR ANALYSIS ACS, ISO, REAG.PH EUR, 500g	L	1	88.00	88.00	GDA pest	A	A	
36	04/Mar/2010	Difenoconazole (Pest Standard)	Sigma-Aldrich/Germany	Difenoconazole, 0.25g	L	1	197.00	197.00	GDA pest	A	A	
37	04/Mar/2010	Acetone	Merck/Germany	ACETONE GR FOR ANALYSIS ACS, ISO, REAG.PH EUR, 2.5L	L	5	84.00	420.00	GDA pest	A	A	
38	15/Mar/2010	Starch(soluble)	Merck/Germany	STARCH SOLUBLE GR FOR ANALYSIS ISO, 250g	L	2	163.00	326.00	GDA pest	A	A	
39	04/Mar/2010	Sulfuric Acid	Merck/Germany	SULFURIC ACIDE 95-97% GR FOR ANALYSIS ISO, 2.5L	L	1	110.50	110.50	GDA pest	A	A	
40	04/Mar/2010	Thiametoxam (Pesticide Standard)	Sigma-Aldrich/Germany	Thiametoxam, 0.1g	L	1	218.00	218.00	GDA pest	A	A	
41	04/Mar/2010	Tricyclazole (Pesticide Standard)	Sigma-Aldrich/Germany	Tricyclazole, 0.1g	L	1	264.00	264.00	GDA pest	A	A	
42	15/Mar/2010	Tri-Sodium Citrate	Merck/Germany	TRI-SODIUM CITRATE DIHYDRATE GR FOR ANALYSIS ACS, ISO, REAG.PH EUR, 500g	L	2	139.00	278.00	GDA pest	A	A	
43	04/Mar/2010	Glyphosate	Fluka/Germany	Glyphosate, 0.25g	L	1	89.00	89.00	GDA pest	A	A	
44	16/Mar/2010	Abamectin	Fluka/Germany	Abamectin, 0.1g	L	1	260.00	260.00	GDA pest	A	A	
45	12/Nov/2010	2,4 D	Fluka/Germany	250 mg	L	1	128.00	128.00	GDA pest	A	A	
46	12/Nov/2010	Acephate	Dr.Ehernstorfer/Germany	250 mg	L	1	262.00	262.00	GDA pest	A	A	
47	12/Nov/2010	Buprofesin	Dr.Ehernstorfer/Germany	100 mg	L	1	194.00	194.00	GDA pest	A	A	
48	12/Nov/2010	Butachlor	Fluka/Germany	100 mg	L	1	365.00	365.00	GDA pest	A	A	
49	12/Nov/2010	Carbofuran	Fluka/Germany	250 mg	L	1	101.00	101.00	GDA pest	A	A	
50	12/Nov/2010	Chlorfenapyr	Dr.Ehernstorfer/Germany	100 mg	L	1	273.00	273.00	GDA pest	A	A	
51	12/Nov/2010	Chlorothalonil	Dr.Ehernstorfer/Germany	250 mg	L	1	183.00	183.00	GDA pest	A	A	
52	12/Nov/2010	Chlorpyrifos	Dr.Ehernstorfer/Germany	250 mg	L	1	157.00	157.00	GDA pest	A	A	
53	12/Nov/2010	Deltamethrin	Dr.Ehernstorfer/Germany	250 mg	L	1	219.00	219.00	GDA pest	A	A	
54	12/Nov/2010	Dichlorvos	Dr.Ehernstorfer/Germany	250 mg	L	1	141.00	141.00	GDA pest	A	A	
55	12/Nov/2010	Esfenvalerate	Dr.Ehernstorfer/Germany	100 mg	L	1	236.00	236.00	GDA pest	A	A	
56	12/Nov/2010	Fenitrothion	Dr.Ehernstorfer/Germany	250 mg	L	1	141.00	141.00	GDA pest	A	A	
57	12/Nov/2010	Fipronil	Fluka/Germany	100 mg	L	1	783.00	783.00	GDA pest	A	A	
58	12/Nov/2010	Glyphosate	Fluka/Germany	250 mg	L	1	117.00	117.00	GDA pest	A	A	
59	12/Nov/2010	Iprodione	Dr.Ehernstorfer/Germany	100 mg	L	1	126.00	126.00	GDA pest	A	A	
60	12/Nov/2010	Lambdacyhalothrin	Fluka/Germany	100 mg	L	1	761.00	761.00	GDA pest	A	A	
61	12/Nov/2010	Mancozeb	Dr.Ehernstorfer/Germany	250 mg	L	1	90.00	90.00	GDA pest	A	A	
62	12/Nov/2010	Oxadiazon	Dr.Ehernstorfer/Germany	100 mg	L	1	126.00	126.00	GDA pest	A	A	
63	12/Nov/2010	Pretilachlor	Dr.Ehernstorfer/Germany	250 mg	L	1	273.00	273.00	GDA pest	A	A	
64	12/Nov/2010	Profenofos	Dr.Ehernstorfer/Germany	250 mg	L	1	141.00	141.00	GDA pest	A	A	
65	12/Nov/2010	Propanil	Dr.Ehernstorfer/Germany	250 mg	L	1	183.00	183.00	GDA pest	A	A	
66	12/Nov/2010	Propineb	Dr.Ehernstorfer/Germany	250 mg	L	1	90.00	90.00	GDA pest	A	A	
67	12/Nov/2010	Quinchlorac	Fluka/Germany	250 mg	L	1	274.00	274.00	GDA pest	A	A	
68	12/Nov/2010	Tebuconazole	Dr.Ehernstorfer/Germany	250 mg	L	1	194.00	194.00	GDA pest	A	A	
69	26/Nov/2010	Acetone	Merck/Germany	AR, 2.5 L	L	20	56.00	1120.00	GDA pest	A	A	
70	26/Nov/2010	Methanol	Merck/Germany	HPLC grade, 2.5 L	L	20	74.00	1480.00	GDA pest	A	A	
71	31/Aug/2011	Acetone	Merck/Germany	AR, 2.5 L	L	12	37.00	444.00	GDA pest	A	A	
72	31/Aug/2011	Acetonitrile	Merck/Germany	HPLC Grade, 2.5 liters	L	12	110.00	1320.00	GDA pest	A	A	
73	31/Aug/2011	Methanol	Merck/Germany	HPLC Grade, 1 x 2.5 liters	L	25	54.00	1350.00	GDA pest	A	A	
74	31/Aug/2011	Methanol	Merck/Germany	AR, 1 x 2.5 liters	L	10	34.00	340.00	GDA pest	A	A	
75	31/Aug/2011	Tetrahydrofuran	Merck/Germany	HPLC Grade, 1 x 2.5 liters	L	2	570.00	1140.00	GDA pest	A	A	
76	31/Aug/2011	n-Hexane	Merck/Germany	HPLC Grade, 1 x 2.5 liters	L	2	220.00	440.00	GDA pest	A	A	
77	31/Aug/2011	2- Propanol	Merck/Germany	HPLC Grade, 1 x 2.5 liters	L	2	154.00	308.00	GDA pest	A	A	
78	31/Aug/2011	n - Propanol	Merck/Germany	HPLC Grade, 1 x 2.5 liters	L	5	142.00	710.00	GDA pest	A	A	
79	31/Aug/2011	Calcium Carbonate	Merck/Germany	1kg, AR	L	1	129.00	129.00	GDA pest	A	A	

80	31/Aug/2011	Magnesium Oxide	Merck/Germany	1 x 500 grams.	L	1	499.00	499.00	GDA pest	A	A	
81	30/Sep/2011	Filter paper No.1	Whatman/UK	No. 1, 150 mm diameter	L	3	28.00	84.00	GDA pest	A	A	
82	23/Sep/2011	Potassium Hydroxide	Merck/Germany	Pellets 1 x 1 kg	L	1	36.00	36.00	GDA pest	A	A	
83	30/Sep/2011	Acetamiprid	Dr.Ehernstorfer/Germany	250mg	L	1	314.00	314.00	GDA pest	A	A	
84	30/Sep/2011	2,4-D IBE	Dr.Ehernstorfer/Germany	250mg	L	1	121.00	121.00	GDA pest	A	A	
85	30/Sep/2011	Dimethoate	Dr.Ehernstorfer/Germany	250mg	L	1	185.00	185.00	GDA pest	A	A	
86	30/Sep/2011	Diazinon	Dr.Ehernstorfer/Germany	250mg	L	1	150.00	150.00	GDA pest	A	A	
87	30/Sep/2011	Hexaconazole	Dr.Ehernstorfer/Germany	250mg	L	1	250.00	250.00	GDA pest	A	A	
88	30/Sep/2011	Phenthoate	Dr.Ehernstorfer/Germany	250mg	L	1	250.00	250.00	GDA pest	A	A	
89	30/Sep/2011	Etofenprox	Dr.Ehernstorfer/Germany	250mg	L	1	522.00	522.00	GDA pest	A	A	
90	30/Sep/2011	Glyphosate	Dr.Ehernstorfer/Germany	250mg	L	1	199.00	199.00	GDA pest	A	A	
91	30/Sep/2011	Buprofezin	Dr.Ehernstorfer/Germany	250mg	L	1	210.00	210.00	GDA pest	A	A	
Sub Total D								**33977.50**				
Total								**179740.02**				

ANNEX-VI List of Counterpart Personnel

(1) Director and Co-managers of the Project :

No	Name	Position in the MAFF	Position in the Project	Original project member assigned by the Minister in Dec. 2008	Notes
1	H.E. San Vanty	Under secretary of state	Project director	○	
2	H.E. So Khan Rithykun	Direct-general, GDA	Co-project	○	
3	Mr. Ouk Syphan	Director, DAL	Co-project manager	○	Member for Development of
4	Dr. Hean Vanhan	Deputy direct-general, GDA	Assistant of co-project manager	○	
5	Mrs. Oung Vannary	Chief , NAL	Assistant of co-project manager	○	No successor since she was retired in July 2010.
6	Mr. Phum Ra	Deputy Director, DAL	Assistant of co-project manager	○	Member for Awareness Raising Activities
7	Mr. Chea Chanveasna	Deputy Director, DAL	Assistant of co-project manager		

(2) Project Operation Group of the DAL :

No	Name	Position in the MAFF	Position in the Project		Notes
1	Mr. Sok Sarou	Vice Chief, Bureau of Agricultural Materials Standard (BAMS)	Chief of the group of legislative procedure and	○	
2	Mr. Be Seakmeng	Vice Chief, BAMS	Chief of the laboratory group	○	
3	Mr. Seang Sin	Vice Chief, Legislation and Law Extension Office	Member of the group of legislative procedure and	○	
4	Mr. Heng Bora	Vice Chief, Administration Office	Member of the group of legislative procedure and	○	
5	Mr. Yang Sokheng	Vice Chief, Legislation and Law Extension Office	Member of the group of legislative procedure and		
6	Mr. Kong Sarin	Vice Chief, Litigation and Investigation Office	Member of the laboratory group	○	
7	Mr. Ros Pan	Staff, BAMS	Member of the laboratory group	○	
8	Mr. Pen Chea	Staff, BAMS	Member of the laboratory group	○	

(2) Project Operation Group of the GDA :

No	Name	Position in the MAFF	Position in the Project		
1	Mr. Pheav Chintheng	Vice Chief, NAL	Chief of the group of the National Laboratory of		
2	Mr. Hong Puthea	Vice Chief, NAL	Member		
3	Mr. Hok Sieng	Vice Chief, NAL	Member	○	
4	Mr. Phon Sothea	Vice Chief, NAL	Member	○	
5	Mr. Koe Vy	Staff, NAL	Member	○	
6	Mrs. Koe Sothary	Staff, NAL	Member		
7	Mr. Chea Vutha	Staff, NAL	Member		

8	Mrs. Em Meta	Staff, NAL	Member	○	
9	Mr. Lorn Socheata	Staff, NAL	Member		Member for Laboratory and Awareness Raising Activities
10	Mr. Meas Poev	Staff, NAL	Member	○	
11	Mrs. Lim Piyana	Staff, NAL	Member		
12	Mrs. Ty Sotheary	Staff, NAL	Member		
13	Mrs. Hour Kimsreing	Staff, NAL	Member	○	
14	Mrs. Chun La	Staff, NAL	Member	○	
15	Mr. Tean Sithan	Staff, NAL	Member	○	
16	Mr. Vorn Sign	Staff, NAL	Member	○	
17	Miss. Sreiy Souphea	Staff, NAL	Member	○	
18	Miss. Pheng Ravy	Staff, NAL	Member		

(3) Operation Group of Target Provinces:

Kandal Province:

No	Name	Position in the MAFF	Position in the Project		
1	Mr. Buntuon Simona	Director, PDA Kandal	Chief		
2	Mr. San Voeurn	Vice Chief, Legislation	Member		

Battambang Province:

No	Name	Position in the MAFF	Position in the Project		
1	Mr. Cheam Chansorphon	Director, PDA Battambang	Chief		Removed as a result of the Mid-term Review in
2	Mr. Seng Rottanak	Vice Chief, Legislation Office	Member		Removed as a result of the Mid-term Review in April 2010

ANNEX VII: List of Achievement of the Project

Summary of the project	Objectively Verifiable Indicators	Achievements in the period
Overall Goal		
Proper usage and quality control of chemical fertilizers and pesticides is enhanced in Kandal and neighboring provinces.	1. Distribution of registered chemical fertilizers and pesticides with Khmer label are increased.	
	2. No retailers sell banned pesticides.	
Project Purpose		
Proper usage and quality control of chemical fertilizers and pesticides is enhanced in pilot area.	1. Two thirds of licensed retailers in pilot area utilize the following materials provided by the project on their sales in order to secure proper selection and usage of chemical fertilizers and pesticides; (1) Khmer labels on pesticides (2) Reference materials on proper selection and usage of chemical fertilizers and pesticides.	As for the OVI of 1(1), the Guidebook for Pest Management was already distributed to every licensed retailers and has been utilized for their businesses, while the Guidebook for Pest Management (Part 2) will be soon distributed to them before the end of the project. These would complete the OVI of 1(1). Regarding the OVI of 1(2), it was found out in the field survey of October, 2011 that the licensed retailers of 84.6% on average were using each reference material for their businesses.
	2. Number of licensed retailers who do not sell banned pesticides is doubled in pilot area.	The number of licensed retailers in the OVI of 1 (2), increased from 14 in August 2010 to 43 in October 2011 according to the results of the field surveys.
Outputs		
1. Baseline data for the Project is developed.	1-1. Baseline data on registered chemical fertilizers in the pilot area(s) is in hand.	The baseline survey was implemented in July, 2009, and the report was made.
	1-2. Baseline data on registered pesticides in the pilot area(s) is in hand.	The baseline survey was implemented in July, 2009, and the report was made.
	1-3. Baseline data on labeling in Khmer in the pilot area(s) is in hand.	The baseline survey was implemented in July, 2009, and the report was made.

Summary of the project	Objectively Verifiable Indicators	Achievements in the period
2. Capability of laboratories is improved in terms of analyses of chemical fertilizers and pesticides.	2-1. Laboratory equipment/ facilities are properly set up and functioning.	(Laboratories on analysis of chemical fertilizers): Since all the necessary equipment has been properly set up, the laboratories in the DAL and the GDA have been operational. As for the laboratory in the DAL, the laboratory equipment which was provided, but not installed by the ADB in 2003, was also set up by the QCAM Project. (Laboratory on analysis of pesticides): All the necessary equipment has been properly set up, and the laboratory has been operational.
	2-2. Fertilizer laboratory in the DAL and the GDA can analyze N, P, K and other elements (Fe, Mn, Zn, Cu, Ca, Mg).	The targeted elements can be analyzed by the two laboratories in the DAL and the GDA.
	2-3. Pesticide laboratory can analyze at least 60% of 24 prioritized active ingredients.	The Pesticide Laboratory can 32 active ingredients including the 24 prioritized ones (Note: As for application for registration of pesticides, analytical standards are supposed to be submitted to the MAFF by applicants.).
	2-4. Manuals for analyses of N, P, K and other elements (Fe, Mn, Zn, Cu, Ca, Mg) for chemical fertilizers and at least 60% of 24 prioritized active ingredients for pesticides are developed.	(Analysis of chemical fertilizers): All the necessary manuals were developed. (Analysis of pesticides) : Manuals on analysis of the 32 active ingredients above were developed.
	2-5. Manuals for operation and maintenance for laboratory equipment are developed.	(Analysis of chemical fertilizers): Manuals on major equipment were developed. (Analysis of pesticides) : Manuals on major equipment were developed.
	2-6. Analytical reports of samples collected by inspectors from licensed retailers are developed (to be shared among stakeholders).	Although samples were not collected by inspectors, they were periodically purchased and analyzed by the laboratory staff, and the analytical resulsts were shared by all members of the QCAM Project.

Summary of the project	Objectively Verifiable Indicators	Achievements in the period
3. Development of Regulation related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is facilitated with the expectation of having the 1st draft.	3-1. Policy option(s) related to Standard Requirement for registration and post-registration of chemical fertilizers and pesticides is provided.	Technical Information Exchange Programs were implemented in the FPA three times, and the draft law on management of fertilizers and pesticides, and the first draft regulations on procedures and standard requirements for registration of pesticides as well as for registration of fertilizers, were developed in both Khmer and English. Comments on the draft law were given to the DAL by the QCAM Project, while the FPA staff also gave their comments on the two draft regulations to the staff of the DAL during the TIEPs. In December 2011, the draft law was approved at the national assembly.
4. Awareness is raised on proper usage and quality of chemical fertilizers and pesticides.	4-1. At least each type of materials; pamphlet, posters, and audio visual media is developed and disseminated for public awareness activities.	The Pesticide List which was developed by the MAFF in 2003, was translated in Khmer and distributed to all the licensed pesticide shops in the pilot areas. Two posters were developed on banned pesticides and on effective prevention of brown planthoppers. They were distributed to the licensed shops, commune and district agricultural offices, and other public places including the schools in the pilot areas. During the nation-wide campaign on eradicating the banned pesticides in April, 2011, the posters on banned pesticides were distributed to all the PDAs and licensed shops in Cambodia. The video program on proper management of pesticides by the FPA was translated in Khmer and given to all the PDAs for their use. Furthermore, one TV spot and one TV talk show videos were developed for the campaign and broadcast through the TVK and Bayon channels. In December, 2011, one new TV spot was developed and broadcast through the TVK and the CTN to inform the public on the new law on fertilizers and pesticides as well as to promote their purchase of agricultural materials at the licensed shops.

Summary of the project	Objectively Verifiable Indicators	Achievements in the period
	4-2. Khmer labels and reference materials on selection and usage of pesticides are distributed to all of the licensed retailers in pilot area.	By using information collected through the baseline survey and the monitoring activities, the pocket guide on banned and restricted pesticides was developed and distributed to all the PDAs and licensed shops over this country during the campaign. Furthermore, the Guide Book for Pest Management was developed in Khmer and English for the licensed retailers in order that they can properly sell the effective pesticides to their customers, and they were distributed to all the licensed pesticide shops in the pilot areas. Besides that, the QCAM Project has been currently supporting five licensed distributors of pesticides to develop one Khmer technical document (Guide Book for Pest Management (Part II)) which is a supplemantary document to the Guide Book for Pest Management and explains how to properly use their registered pesticides. It will be distributed to the licensed retailers in the pilot areas soon after when it is finalized.
	4-3. Reference materials on selection and usage of chemical fertilizers are distributed to all of the licensed retailers in pilot area.	Poster on proper purchase and use of chemical fertilizers was developed and distributed to the licensed shops, commune and district agricultural offices, and other public places including the schools in the pilot areas.

ANNEX VIII: Summary of Training on Analysis of Chemical Fertilizers and Pesticides

Training	Period	Expert (Organization)	Main Contents of the Training	Major Outcomes
1st OJT				
Analysis of Chemical Fertilizers	Aug. 2, 2009 ~Dec. 24, 2009	Ms. Edna Lynn C. Floresca (BSWM)	(1) Check-up of laboratory equipment, apparatus and consumables in the laboratories of the DAL and the GDA, (2) List-up of the necessary laboratory equipment, apparatus and consumables in the laboratories of the DAL and the GDA (Preparation for the procurement), (3) Assessment on analytical skills of trainees in the OJT, (4) Technical guidance on using the laboratory equipment, (5) Technical guidance on analysis of NPK, (6) Development of manuals related to (4) and (5).	(1) List of laboratory equipment, apparatus and chemicals in the laboratories of the DAL and the GDA, (2) List-up and purchase of the necessary laboratory equipment, apparatus and chemicals in the laboratories of the DAL and the GDA, (3) Assessment sheet for each trainee, (4) Analytical reports (35 reports by the GDA and 13 reports by the DAL), etc.
Analysis of Pesticides	Aug. 2, 2009 ~Dec. 24, 2009	Ms.Maria Esperanza De Guzman Uy (BPI)	(1) Check-up of laboratory equipment, apparatus and consumables in the pesticide lab of the GDA, (2) List-up of the necessary laboratory equipment, apparatus and consumables in the pesticide laboratory of the GDA (Preparation for the procurement), (3) Assessment on analytical skills of trainees in the OJT, (4) Technical guidance on formulation analysis of pesticides (7 active ingredients: DDVP, Chlopyrifos, Fenobucarb, Butachlor, Lambdacyhalothrin, Phenthoate, Deltamethrin), (5) Technical guidance on using the GC and the HPLC, (6) Development of manuals related to (4) and (5).	(1) Validation reports for 7 active ingredients (DDVP, Chlopyrifos, Fenobucarb, Butacholor, Lambdacyhalothrin, Phenthoate, Deltamethrin)、(2) Manauals on procedures containing the 7 validated active ingredients, (3) Laboratory reports (10 reports), (4) Work instructions for operation of Gas Generator, the GC and the HPLC, (5) Work instructions for the computation of results, (6) List of laboratory equipment, apparatus and chemicals in the pesticide lab, (7) List-up and purchase of the necessary laboratory equipment, apparatus and chemicals in the
2nd OJT				
Analysis of Chemical Fertilizers	Feb. 14, 2010 ~July 14, 2010	Ms. Edna Lynn C. Floresca (BSWM)	(1) Inspection and set-up of laboratory equipment, apparatus and consumables which were newly procured in the laboratories of the DAL and the GDA, (2) Technical guidance on analysis of P, K, Zn, Cu, Mn, Fe, Ca and Mg (including samples which were collected in the pilot areas), (3) Technical guidance on using the AAS, (4) Development of manuals related to (2) and (3).	(1) Manuals on analysis of chemical fertilizers and on use of the laboratory equipment, (2) List-up and purchase of the necessary laboratory equipment, apparatus and chemicals in the laboratories of the DAL and the GDA, (3) Log-book for the laboratories of the DAL and the GDA, (4) List on recurrent cost for the laboratories of the DAL and the GDA, (5) Training Plan for the future
Analysis of Pesticides	Feb. 14, 2010 ~July 14, 2010	Ms.Maria Esperanza De Guzman Uy (BPI)	(1) Inspection and set-up of laboratory equipment, apparatus and consumables which were newly procured in the pesticide laboratory, (2) Technical guidance on method development, validation and verification, (3) Technical guidance on formulation analysis of pesticides (11 samples including pesticide samples collected in the pilot areas.), (4) Lecture/ Determination of physico-chemical properties of formulations, (5) Technical guidance on using the analytical equipment and maintenance, (6) Development of manuals related to the topics (2) to (5).	(1) Analytical reports on nine active ingredients (Fenvalerate, Diazinon, Dimethoate, Cypermethrin, Difenoconazole, Propiconazole, Alpha cypermethrin, Profenofos, Pretilachlor) (10 reports), (2) Validation reports on the nine active ingredients above (10 reports), (3) Reports on analytical procedures on the nine active ingredients above (10 reports), (4) Draft reports on analytical procedures of three active ingredients (Carbaryl, Abamectin, Chlorpyrifos), (5) Analytical reports on pesticide samples (1
3rd OJT				

Training	Period	Expert (Organization)	Main Contents of the Training	Major Outcomes
Analysis of Chemical Fertilizers	Nov. 7, 2010 ~Mar. 7, 2011	Ms. Elvira M. Bautista (BSWM)	(1) Inspection and set-up of laboratory equipment, apparatus and consumables which were newly procured in the laboratories of the DAL and the GDA, (2) Technical guidance on analysis of N, S, P, K, Zn, Cu, Mn, Fe, Ca and Mg (including samples which were collected in the pilot areas), (3) Technical guidance on using the laboratory equipment (e.g. Scrubber Unit and Water Recirculation Vaccum Unit), (4) Development of manuals related to (2) and (3).	(1) Method validation reports for Sulfur (DAL: 9 reports), (2) Analytical reports on samples using validated procedures for Sulfur (DAL: 10 reports, GDA: 58 reports, (3) Method validation reports for Nitrogen (DAL: 9 reports, GDA: 2 reports), (4) Analytical reports on samples using validated procedure for Nitrogen (DAL: 4 reports, GDA: 14 reports), (5) Analytical reports on Total Nitrogen in Urea samples (DAL: 2 reports, GDA: 14 reports), (6) Analytical reports on Total Nitrogen in Nitrate-containing samples (DAL: 2 reports, GDA: 14 reports), (7) Analytical reports on Determination of Total Ammoniacal Nitrogen (GDA: 2 reports), (8) Laboratory management plan, etc.
Analysis of Pesticides	Nov. 7, 2010 ~Mar. 7, 2011	Ms. Laylo Erlinda (BPI)	(1) Check and review on analytical assignments by trainees, (2) Inspection and set-up of laboratory equipment, apparatus and consumables which were newly procured in the pesticide laboratory of the GDA, (3) Technical guidance on using the laboratory equipment (e.g. HPLC and Spectrophotometer), (4) Technical guidance on formulation analysis of pesticides (including pesticide samples collected in the pilot areas.), (5) Development of manuals related to (3) and (4).	(1) Analytical reports on 23 pesticide samples which consist of 25 active ingredients, (2) Anlysis on five active ingredients by HPLC and on two active ingredients by GC, (3) Anlysis on 3 active ingredients by conventional analytical methods, (4) Determination of physico-chemical properties of two pesticide samples, (5) Laboratory management plan, etc.
4th OJT				
Analysis of Chemical Fertilizers	July 4, 2011 ~Oct. 28, 2011	Ms. Edna Lynn C. Floresca (BSWM)	(1) Inspection and set-up of laboratory equipment, apparatus and consumables which were newly procured in the laboratories of the DAL and the GDA, (2) Check and review on analytical assignments by trainees, (3) Review and wrap-up of technical guidance on analysis of chemical fertilizers, (4) Review and wrap-up of technical guidance on using the laboratory equipment, (5) Development of manuals related to (3) and (4), (6) Evaluation on analytical activities by trainees.	(1) Manual on Fertilizer Analysis (Khmer and English), (2) Manual on Method Validation (English), (3) Manual on Equipment Operation and Maintenance (Khmer and English), (4) Manual on Quality Management (English), (5) Training lessons (English), etc.
Analysis of Pesticides	July 4, 2011 ~Sep. 23, 2011	Ms.Maria Esperanza De Guzman Uy (BPI)	(1) Inspection and set-up of laboratory equipment, apparatus and consumables which were newly procured in the pesticide laboratory of the GDA , (2) Check and review on analytical assignments by trainees, (3) Review and wrap-up of technical guidance on formulation analysis of pesticides, (4) Review and wrap-up of technical guidance on using the laboratory equipment, (5) Development of manuals related to (3) and (4), (6) Evaluation on analytical activities by trainees.	(1) Manual on Pesticide Formulation Analysis (Khmer and English), (2) Work Instructions (Khmer-English), (3)Equipment Maintenance Guide (English), (4) Quality manual (Final Laboratory Management Plan) (English), (5) Evaluation report on analytical activities by trainees, etc.
Other Activities				
Laboratory tour	Sep. 6, 2011	Laboratory tour was organized for 40 third and fourth year students of the Faculty of Agronomy at the Royal University of Agriculture (RUA). The purpose was to provide an opportunity to learn about laboratory activities in two laboratories of chemical fertilizers and pesticides of the GDA. After the laboratory tour, there was a session on Q&A of laboratory activities among all the participants, laboratory staff and experts.		
Final Report on the OJTs	Sep. 16, 2011	A final reporting was organized on analytical activities of chemical fertilizers and pesticides. The aim of the report was to discuss outcomes, challenges and solutions of these activities to date at the GDA. The participants included staff from the DAL and the GDA, representatives from Cambodian Agricultural Research and Development Institute (CARDI), the Ministries of Commerce and Health and finally a JICA Senior Volunteer, to share valuable information about the QCAM Project. Experts also presented their concrete recommendations on the laboratory activities by the MAFF.		

ANNEX-IX:List of Summary on achievements of the awareness raising activities in the QCAM Project:

Date	Place	Theme	Information Material (IM) (#)	Contents of the activity
2010				
Aug.18 ~Aug.25	Kien Svay (KS) & Koh Thom (KT) in Kandal	Prohibition of selling and buying the banned pesticides.	1. Poster on the banned pesticides (300) 2. List of the banned pesticides in Khmer (61)	The IMs were explained and distributed to 43 licensed pesticide shops (15 in KS & 28 in KT), 18 unlicensed shops (15 in KS & 3 in KT), commune offices and other public places. A field survey on the banned and restricted pesticides was also implemented.
Sep.29 ~Oct.6	KS&KT	Effective prevention of brown planthoppers (BPHs)	Poster on effective prevention of BPHs (300)	The IM was explained and distributed to 42 licensed pesticide shops (13 in KS & 29 in KT), 15 unlicensed shops (11 in KS & 4 in KT), commune offices and other
2011				
Jan.18 ~Jan.31	KS&KT	Prohibition of selling and buying the banned	Pocket Guide on Banned and Restricted Pesticides (100)	The IM was explained and distributed to all the licensed pesticide shops in the pilot areas.
Feb.23 ~Feb.24	MAFF	Agricultural extension	1. Poster on the banned pesticides (A4) (1200) 2. Poster on effective prevention of BPHs (A4) (1200) 3. Pocket Guide on Banned and Restricted Pesticides (1000) 4. Project Leaflet (1200) 5. Video Program on proper management of	The IMs were exhibited at the booth of the QCAM Project with the other IMs on the JICA's activities in the exposition on agricultural IMs of the MAFF. The Video Program on proper management of pesticides by the FPA was dubbed in Khmer and shown to the participants.
Apr.25 ~May 1	Nationwide	Eradication of the banned pesticides.	1. Poster on the banned pesticides (3265) 2. Pocket Guide on Banned and Restricted Pesticides (2481) 3. Campaign banners (110) 4. Video Program on proper management of pesticides by the FPA. (24) 5. TV spot and talk show for the campaign.	Cooperation for the campaign was requested to all 24 PDAs in the annual meeting of the MAFF on 5th April, while the IMs were distributed to them, accoding to the number of pesticide shops in their areas. During the campaign period, the IMs were distributed to the pesticide shops, while the TV spot and talk show were broadcast through TVK and Bayon channels.
				(Campaign activities by the PDAs) : 1. The Department of Agriculture in Phnom Penh visited the Orussey Market in Phnom Penh where many banned pesticides are sold, with the staff of the QCAM Project, and requested each pesticide shop to stop selling the banned pesticides.
				2. The PDA in Prey Veng requested 160 retailers of agricultural materials and 37 farmers to cooperate for the campaign by distributing the IMs.
				3. The PDA in Takeo explained and distributed the Ims to 128 retailers.

				4. The PDA in Svay Rieng invited the Provincial Governor, 77 farmers and 98 retailers to distribute the IMs and watch the video program of the FPA.
				5. The PDA in Pursat distributed the IMs to 69 retailers in five districts, and implemented a training on procedures and techniques of selling agricultural
May 3 ~May 9	MAFF	Eradication of the banned pesticides.	Campaign banners(6)	The campaign banners were hoisted in front of the MAFF and the GDA.
Jun.10 ~Jun.30	KS&KT	Proper purchase and use of chemical fertilizers.	Poster on proper selection and use of chemical fertilizers(200)	The IM was explained and distributed to all the licensed fertilizer shops, commune offices and other public places in the pilot areas.
Aug.30 ~Sep.9	KS&KT	Identification of major pests & recommendable pesticides (active ingredients) in rice & Chinese cabbage.	Guide Book for Pest Management (100)	The IM was explained and distributed to 58 licensed pesticide shops (23 in KS & 35 in KT) and 3 unlicensed shops in KS.
Sep.2 &Sep.19	MAFF	Proper selection & use of registered pesticides.	Guide Book for Pest Management (Part 2) (Under production)	Two meetings were held to propose the Guide Book for Pest Management (Part 2) which explains how to properly use each registered pesticide, to the licensed pesticide distributors. Five distributors agreed to produce and distribute the Guide Book for Pest Management (Part 2) to the licensed pesticide shops in the pilot areas.
Oct.5 ~Oct.11	KS&KT& Siem Reap	Survey on simple impact assessment of the awareness raising activities.		For this survey, 64 retailers of chemical fertilizers and pesticides and 40 end-users were interviewed, while their sales on c.f. and pesticides were physically checked. Staff of the VVOB and the REDP under the GIZ were also visited and interviewed to see how they are using the IMs of the QCAM Project.
Nov.22	MAFF	Identification of major pests & recommendable pesticides (active ingredients) in rice & Chinese cabbage.	Guide Book for Pest Management (5500)	5500 copies of the IM were printed and will be distributed to the 24 PDAs and the licensed pesticide shops over the country.
Dec.3 ~Dec.18	Nationwide	Eradication of the banned pesticides.	New TV spot on the banned pesticides & compliance of the new law.	New TV sport was broadcast through the CTN and TVK from 3rd to 18th December to inform the public of prohibition of selling and using the banned pesticides and purchase of the agricultural materials at the licensed

ANNEX-X: List of JCC Meeting, Quarterly and Monthly Meetings

1. JCC meeting		
A	December 11, 2009	# of Cambodian participants: 14
B	April 30, 2010	# of Cambodian participants: 15
C	December 21, 2010	# of Cambodian participants: 11
D	February 22, 2012 (scheduled)	# of Cambodian participants: xx
2. Quarterly meeting		
A	August 31, 2009	# of Cambodian participants: 13
B	July 27, 2010	# of Cambodian participants: 15
C	March 28, 2011	# of Cambodian participants: 11
D	September 20, 2011	# of Cambodian participants: 9
3-1. Monthly progress meeting for laboratory activities:		
A	May 28, 2010.	# of Cambodian participants: 14
B	June 30, 2010.	# of Cambodian participants: 13
C	August 27, 2010.	# of Cambodian participants: 10
D	September 27, 2010.	# of Cambodian participants: 14
E	October 25, 2010.	# of Cambodian participants: 14
F	December 2, 2010.	# of Cambodian participants: 13
G	January 31, 2011.	# of Cambodian participants: 13
H	February 28, 2011.	# of Cambodian participants: 9
I	May 26, 2011.	# of Cambodian participants: 10
J	July 27, 2011.	# of Cambodian participants: 11
K	September 1, 2011.	# of Cambodian participants: 12
L	October 24, 2011.	# of Cambodian participants: 10
M	November 28, 2011.	# of Cambodian participants: 7
3-2. Monthly progress meeting for awareness raising activities:		
A	June 17, 2010.	# of Cambodian participants: 6
B	July 9, 2010.	# of Cambodian participants: 6
C	August 6, 2010.	# of Cambodian participants: 4
D	September 8, 2010.	# of Cambodian participants: 4
E	October 28, 2010.	# of Cambodian participants: 2
F	November 26, 2010.	# of Cambodian participants: 4

G	February 7, 2011.	# of Cambodian participants: 3
H	March 7, 2011.	# of Cambodian participants: 3
I	May 18, 2011.	# of Cambodian participants: 3
J	July 25, 2011.	# of Cambodian participants: 3
K	August 29, 2011.	# of Cambodian participants: 2
L	October 28, 2011.	# of Cambodian participants: 2

ANNEX-XI: List of Materials and Manuals Developed by the Project

(1) List of Manuals

No	Description	Language
1	Manual on Fertilizer Analysis	Khmer & English
2	Manual on Method Validation	English
3	Manual on Equipment Operation and Maintenance	Khmer & English
4	Manual on Quality Management	English
5	Tranining Lesson	English
6	Manual on Pesticide Formulation Analysis	Khmer & English
7	Work Instruction	Khmer & English
8	Equipment Maintenance Guide	English
9	Quality Manual (Final Laboratory Management Plan)	English

(2) List of Materials

No	Description	Language
1	Poster in the banned pesticides	Khmer & English
2	Poster on effective prevention of brown planthoppers	Khmer & English
3	Pocket guide on banned and restricted pesticides	Khmer & English
4	Video CD on proper use and management of pesticides	Khmer & English
5	TV Spot for the nation-wide campaign on eradicating the banned pesticides in Cambodia	Khmer & English Caption
6	TV Talk Show Program for the nation-wide campaign on eradicating the banned pesticides in Cambodia	Khmer & English Subtitle
7	Poster on proper selection and use of chemical fertilizers	Khmer & English
8	Guide book for pest management	Khmer & English
9	Guide book for pest management (Part 2)	Khmer
10	TV Spot on eradication of the banned pesticides, purchase of agriculture materials at the licensed shops, and compliance of the new law on management of pesticides and fertilizers	Khmer with English Caption

(3) List of Legal Documentary

No	Description	Language
1	Draft Law on Management of Pesticide and Fertilizer Note: English Version is Under Production	Khmer
2	First Draft Regulation on Procedures and Standard Requirements for Registration of Pesticide	Khmer & English
3	First Draft Regulation on Procedures and Standard Requirements for Registration of Fertilizer	Khmer & English
4	First Draft List of Pesticides	English

ANNEX-XII: List of Findings on DAL Fertilizer Laboratory

Factor that impact sustainability	Status in DAL laboratory	Remarks
1. Clear operational plan	There is an idea that DAL laboratory will focus on analysis of trace elements while N, P, K will be sent for analysis to GDA. Yet, this is still an idea.	The clear operational plan is necessary for sustainability.
2.Number of staff	There are only two technical staff and one non-technical staff. Among them, only one has chemistry background.	Although DAL has been waiting for new staff, they feel it is difficult to justify the recruitment of laboratory staff since it is regulatory body.
3.Facilities, equipment, manuals	Having equipment for analysis of N, P, K, Zn, Cu, Fe, Ca, S, Mn, Mg. A series of manual for analysis, method validation, operation and maintenance of equipment has been developed.	All equipment are in place and operational. A number of necessary manual are available. However, the Logbook for consumable is not in place.
4.Budget for operation and maintenance of laboratory	Fees generated by DAL in registration activities are submitted to national treasury. No specific and regular budget allocation to laboratory is found.	Budget is a basic necessity for sustainability.
5.Commitment of individual staff and the management to pursue personal corporate growth toward laboratory development	Originally the staff were recruited and trained as regulatory officers. In addition, there is less mechanism and equipment to avoid unnecessary hazards while in the laboratory.	Individual staff's interest in their work and incentive is significant for sustainability.

ANNEX-XIII: List of Findings on GDA Fertilizer Laboratory

Factor that impact sustainability	Status in GDA laboratory	Remarks
1. Clear operational plan	There is no clear operation plan (short, medium and long-term) in place although a national program for the purpose of capacity building of laboratory staff exists. Under this program 5 provinces have been selected as pilot. Samples are collected from those provinces for laboratory analysis for both pesticides and fertilizers. This program has been in place since 2009.	The clear operational plan is necessary for sustainability.
2.Number of staff	There are seven technical staff who completed the trainings for N, P, K, and S; method validation; and quality control in analysis. But there is no complete participation in training on other elements due to absence of AAS in GDA.	Enough number of staff to manage the current load of samples for soil and fertilizer but not for other trace elements.
3.Facilities, equipment, manuals	Having sufficient space and functioning equipment for analysis of N, P, K and S determination. But there is no equipment for analysis of Zn, Cu, Fe, Ca, Mn, Mg. in addition, a number of manuals for analysis, method validation, etc were developed	An AAS would allow analysis of more elements, thus, expanding the services to clients and income. Necessary manuals are available.
4.Budget for operation and maintenance of laboratory	No specific and regular budget allocation to laboratory. However, service fee from some sample analysis are collected and used as revolving fund. Yet, the fee can only cover reagent cost.	Budget is a basic necessity for sustainability.
5.Commitment of individual staff and the management to pursue personal corporate growth toward laboratory development	Commitment of individual staff to learning needs to be enhanced. Most staff lacks motivation to solve problems. In addition, there is no incentive for them while they have to expose more to the risk of chemical impact on their health.	Individual staff's commitment is important and incentive is significant for sustainability.

ANNEX-XIV: List of Findings on Pesticide Laboratory

Factor that impact sustainability	Status in Pesticide laboratory	Remarks
1. Clear operational plan	There is no clear operation plan (short medium and long-term) in place although a national program for the purpose of capacity building of laboratory staff. Under this program 5 provinces were selected as pilot. Samples are collected from those provinces for laboratory analysis for both pesticide and fertilizers. This program has been running since 2009 based on annual request and approval.	The clear operational plan is necessary for sustainability.
2.Number of staff	Three (3) staff completed the training course.	As the laboratory manager takes a role of management and technical analysis, it is recommended to hire and strengthen additional analyst.
3.Facilities, equipment ,manuals	Fully equipped and operational. In addition, a number of manuals for analysis, method validation, etc were developed	All equipment are in place and operational. Necessary manuals are also available. However, the Logbook for consumable is not in place.
4.Budget for operation and maintenance of laboratory	Sufficient budget for its operation had not been provided.	Budget is a basic necessity for sustainability.
5.Commitment of individual staff and the management to pursue personal corporate growth toward laboratory development	While staff has commitment in their work, there is no incentive given while they have to expose more to the risk of chemical impact on their health.	Individual staff's commitment is important and incentive is significant for sustainability.

ANNEX-XV: List of Findings on Regulatory component

Factor that impact sustainability	Status in Regulatory component	Remarks
1. Clear operational plan	- Law on Management of Pesticides and fertilizers is in place. - 3-year work plan for enforcing the Law for developing 25 regulations. - Prakas for procedure and standard requirement for management of pesticide and fertilizer have been drafted and expected to be approved within 2012. -DAL working group for regulations development in place	Database for the pesticides and fertilizers registration are necessary to implement the operational plan.
2.Number of staff	-Having 9 staff at central for registration and inspection and 9 staff at PALO Kandal mainly for inspection.	
3.Registration and inspection procedure , structure	Chemical formulation analysis is a prerequisite for registration and inspection. In practice, only efficacy test is conducted due to the limited capacity of laboratories and insufficient arrangement.	Formulation analysis is a prerequisite for registration and inspection. Collaboration between GDA and DAL is necessary based on each mandate to connect laboratory to registration and inspection.
4.Budget for operation and maintenance of laboratory	No additional national budget allocation is secured for law enforcement. However, the new Law allows DAL to collect penalty. 50% of penalty fee will be submitted into national treasury and another 50% to be kept by DAL for implementing its activities.	Budget is a basic necessity for sustainability.
5.CAMTA	DAL initiated the establishment of CAMTA and 57 private companies would like to be the members with a temporary President and Vice President. The "members" recognized the importance of CAMTA and they need strong support from DAL in process of official establishment.	CAMTA is good channel for Public Private Partnership in pesticide and fertilizer management. So this movement is encouraged.

ANNEX-XVI: List of Findings on Awareness Raising Activities

Both DAL and GDA are doing awareness raising activities.
Factors that could impact the sustainability of law enforcement were identified and listed as below.

Factor that impact sustainability	Status in awareness raising	Remarks
1. Clear operational plan	A system of training of retailer with retailers' own cost is in place. There is a plan to dissemination of Pesticide and Fertilizer Law to distributors and retailers in 15 provinces.	The clear operational plan is necessary for sustainability.
2.Number of staff	-Having 2 staff at central level of DAL and GDA respectively and 2 staff in Kandal.	The number of staff seems to be appropriate for awareness raising activities. However, the capacity to develop material need to be strengthened.
4.Budget for operation	National budget is not sufficient but support from FAO is expected.	Budget is a basic necessity for sustainability.
5.Private sector	Private sector is playing a role in provide training to retailers. This practice is practical and benefit for all.	It is necessary to ensure collaboration between government and private sector.


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