

カンボジア王国  
国立農業研究所  
農業法制部

カンボジア国  
残留農薬分析能力強化プロジェクト  
(チーフアドバイザー業務)

業務完了報告書

2023 年 11 月

独立行政法人  
国際協力機構(JICA)

株式会社 建設技研インターナショナル

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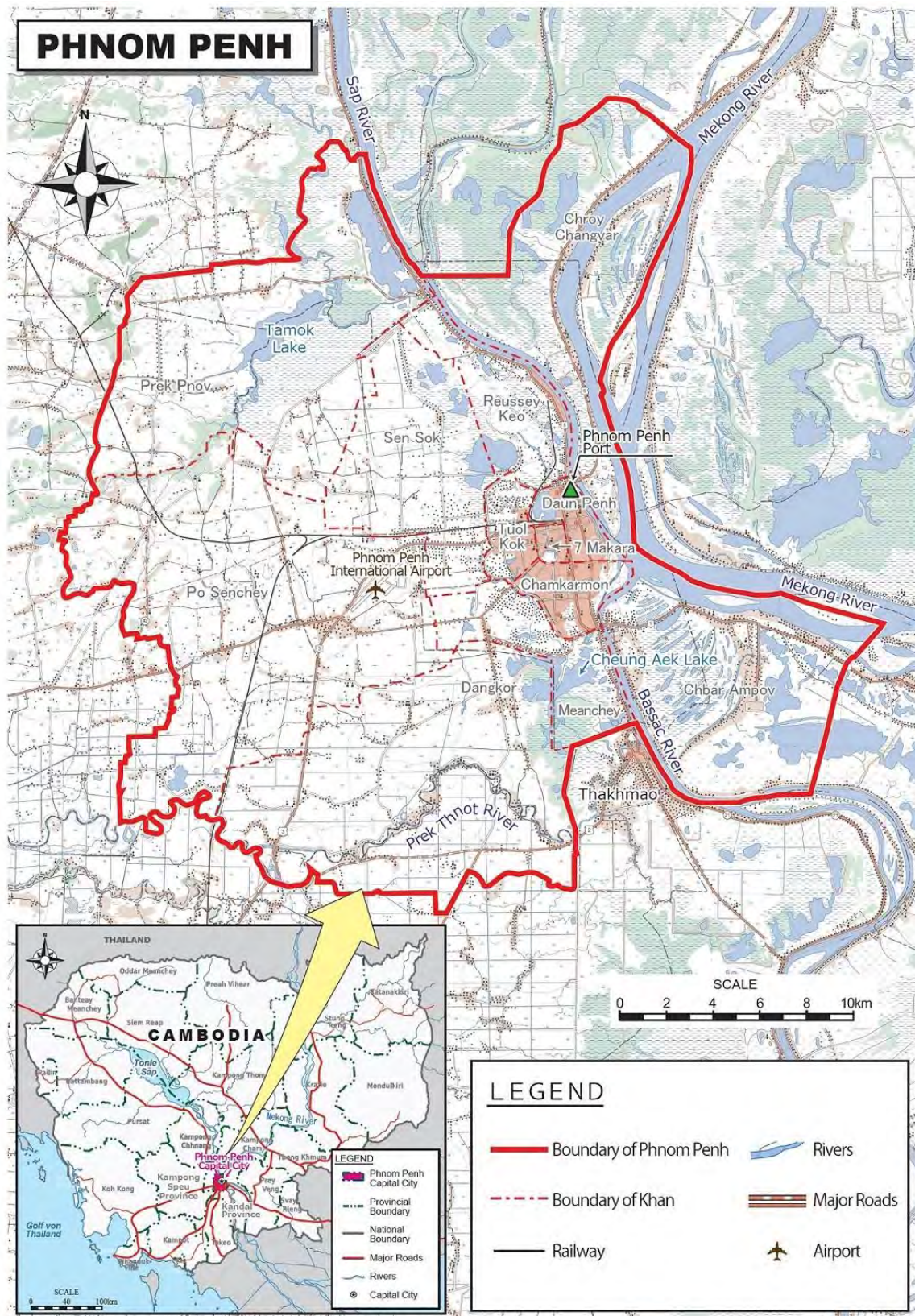
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プロジェクト位置図-プノンペン



## プロジェクト活動の様子



コロナ禍のオンラインセミナー  
分析基礎



ラボで残留農薬分析指導  
基礎講座を振り返りつつ実地指導



残留農薬分析の基礎講座  
フィリピン国より専門家を招聘



ラボで残留農薬分析指導  
新しい分析技術を指導



第3国研修でフィリピン国訪問  
民間ラボ訪問



分析機器の据付と指導  
ガスクロマトグラフを導入



立入検査に関わる機材提供  
農業法規部



技術ワークショップでプレゼンテーション  
活発な議論



カンボジア国  
残留農薬分析能力強化プロジェクト  
(チーフアドバイザー業務)

事業完了報告書

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- 添付資料 3 : 合同調整委員会議事録
- 添付資料 4 : モニタリングシート
- 添付資料 5 : プロジェクトメンバー及びカウンターパート
- 添付資料 6 : Sub-decree 改定の新旧対比表
- 添付資料 7 : 農林水産省ラボ統合に関わる新聞報道
- 添付資料 8 : 従事計画実績表

## 略語表

|         |                                                                         |                              |
|---------|-------------------------------------------------------------------------|------------------------------|
| ACSEP   | Agricultural Value Chain Competitiveness and Safety Enhancement Project | 農業バリューチェーン競争力強化及び安全性向上プロジェクト |
| ADB     | Asian Development Bank                                                  | アジア開発銀行                      |
| ASEAN   | Association of Southeast Asian Nations                                  | 東南アジア諸国連盟                    |
| C/P     | Counterpart                                                             | カウンターパート                     |
| CamLAPF | Cambodia Laboratory of Agricultural Products and Foods                  | カンボジア農産物・食品研究所               |
| CARDI   | Cambodian Agricultural Research and Development Institute               | カンボジア農業研究開発研究所               |
| CASDP   | Cambodia Agricultural Sector Diversification Project                    | カンボジア農業セクター多角化計画             |
| CAVAC   | Australia Agricultural Value Chain Program                              | オーストラリア農業バリューチェーンプログラム       |
| DAI     | Department of Agro-Industry                                             | 農産工業部                        |
| DAL     | Department of Agricultural Legislation                                  | 農業法制部                        |
| ECD     | Electron capture detector                                               | 電子捕獲型検出器                     |
| FPD     | Flame Photometric Detector                                              | 炎光光度検出器                      |
| FTD     | Flame Thermionic Detector                                               | 熱イオン化検出器                     |
| GAP     | Good Agricultural Practice                                              | 農業生産工程管理                     |
| GC      | Gas Chromatography                                                      | ガスクロマトグラフィー                  |
| GDA     | General Directorate of Agriculture                                      | 農業総局                         |
| GDAHP   | General Directorate of Animal Health and Production                     | 動物衛生生産総局                     |
| HPLC    | High Performance Liquid Chromatography                                  | 高速液体クロマトグラフィー                |
| ITC     | Institute of Technology of Cambodia                                     | カンボジア工科大学                    |
| JCC     | Joint Coordination Committee                                            | 合同調整委員会                      |
| LC-MS   | Liquid chromatography-mass spectrometry                                 | 液体クロマトグラフィー質量分析法             |
| LLE     | Liquid-liquid extraction                                                | 液-液抽出法                       |
| MAFF    | Ministry of Agriculture, Forestry and Fisheries                         | 農林水産省                        |
| MISTI   | Ministry of Industry, Science, Technology & Innovation                  | 産業科学技術イノベーション省               |
| NAHPRI  | National Animal Health and Production Research Institute                | 国立家畜衛生生産研究所                  |
| NAL     | National Agricultural Laboratory                                        | 国立農業研究所                      |
| NPD     | Nitrogen-phosphorus detector                                            | 窒素リン検出器                      |
| OJT     | On the job training                                                     | オンザジョブトレーニング                 |
| PDAFF   | Provincial Department of Agriculture, Forestry and Fisheries            | 省農林水産部                       |
| PDM     | Project Design Matrix                                                   | プロジェクトデザインマトリックス             |
| PPSPSD  | Plant Protection Sanitary and Phytosanitary Department                  | 植物保護・衛生植物検疫部                 |
| RUA     | Royal University of Agriculture                                         | 王立農業大学                       |
| RUPP    | Royal University of Phnom Penh                                          | 王立プノンペン大学                    |
| SDG     | Sustainable Development Goals                                           | 持続可能な開発目標                    |
| SLE     | Supported Liquid Extraction                                             | サポート型液体抽出法                   |
| SNS     | Social Networking Service                                               | ソーシャルネットワーキングサービス            |
| SOP     | Standard Operation Procedure                                            | 標準作業手順書                      |
| SPE     | Solid-phase extraction                                                  | 固相抽出法                        |
| UNIDO   | United Nations Development Programme                                    | 国連開発計画                       |
| WB      | World Bank                                                              | 世界銀行                         |



## 第1章 業務の背景

### 1.1 はじめに

カンボジア王国（以下「カンボジア」）では農業分野は GDP の 22%（世銀、2018）を占め、経済成長のためにも重要な役割を果たしている。2018 年に策定された国家戦略である第四次四辺形戦略においても、農業は四辺の一つである「包括的かつ持続的な開発」の重点分野に位置づけられている。また、2015 年に発表された産業開発計画では、2025 年までに農産物の輸出割合を 12%まで向上させること、また、付加価値の高い農業生産の促進等が目標とされている。

カンボジアの農業セクターは、このような背景の中、伝統的農業活動から農業資材を使用した集約的農業活動への移行が進んでいる最中であり、作物生産強化のための重要な資材として農薬が使用されている。しかし農産物の農薬残留が人々の健康、環境および国際貿易への懸念を生じさせている。農林水産省（Ministry of Agriculture, Forestry and Fisheries: ）では、同省に属する農業総局（General Directorate of Agriculture:以下「GDA」）の国立農業検査所（National Agriculture Laboratory: 以下「NAL」）を信頼できる水準での残留農薬分析を実施する機関として、その責務を果たすこととしているが、機材の整備は他ドナーからの支援で進む一方で、分析技術者の能力は不十分である。かかる背景からカンボジア政府により、ラボの能力強化を図るため本事業が我が国に要請された。

また 2009 年から 2012 年まで実施された技術協力プロジェクト「農業資材（化学肥料および農薬）品質管理能力向上計画」において、農業法規部（Department of Agricultural Legislation: 以下「DAL」）による農薬登録手続きの改善および強化が行われ、その終了時評価（2012 年）において、これらに対する日本側からの必要に応じたフォローアップ等が提言された。

そのような背景のため、本事業の詳細計画策定調査の中で、DAL から主にも主に農薬資材店における立入検査強化の要望が改めてあがったことを受け、本案件は DAL への協力も一つのコンポーネントとし、ラボの能力強化、及び流通現場での適切な農薬管理を整備することを図り、もって農作物に対する適切な農薬使用の推進に寄与することを目的とする。

なお、本業務は、2020 年第 4 四半期に活動を開始したが、新型コロナウイルス感染症の感染拡大と重なり、事業実施においては大きな影響を受けた。カンボジ

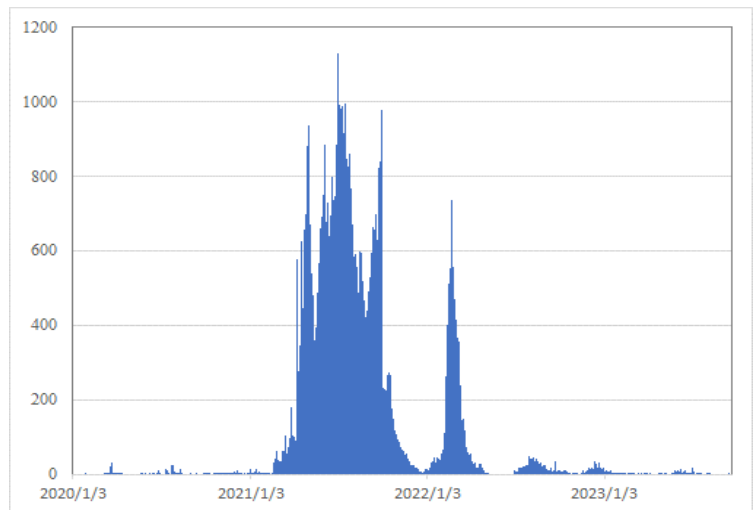


図 1-1 カンボジア国における新型コロナウイルスの新規感染者数推移（出典：WHO）

ア国では、2021 年 2 月 20 日のクラスター発生を起点にして、新規感染者数が急増（図 1-1）した結果、2021 年 3 月から 2022 年 2 月までの期間は、やむを得ず遠隔での活動に移行して業務を継続した。その後、この期間の業務活動の効率低下を補うために、2022 年 7 月 5 日の第 2 回合同調整委員会（JCC）にて業務期間を 1 年間延長することを合意し、2023 年第 4 四半期にプロジェクトを完了することとした。

## 1.2 業務の概要

本業務は、本案件の他専門家（表 1-1）と協力・連携した上で農作物の残留農薬分析能力をはじめとする NAL 職員の能力強化及び DAL に立入検査強化を通じて適切な農薬管理に関する支援・助言を行った。また、両部門 C/P の円滑な活動及び連携を促進した。カウンターパート（以下「C/P」）は、NAL 及び DAL であり、それぞれ指名されたカウンターパート職員のうち NAL については表 1-2 に、DAL については表 1-3 に示した。

表 1-1 本業務の専門家チームメンバー

|   | 氏名                       | 担当             |
|---|--------------------------|----------------|
| 1 | 村松康彦                     | チーフアドバイザー      |
| 2 | 北村恭朗                     | 上級農薬分析専門家      |
| 3 | 篠田隆祥                     | 農薬分析専門家 1      |
| 4 | Julio Salvador C. Valeza | 農薬分析専門家 2      |
| 5 | 大島雄                      | 農薬分析専門家 3      |
| 6 | 坂本知津                     | 業務調整員          |
| 7 | Rith Chanveasna          | プロジェクト支援スタッフ 1 |
| 8 | Hong Phoma               | プロジェクト支援スタッフ 2 |

表 1-2 NAL カウンターパート職員

|   | 指名             | 役職                                     |
|---|----------------|----------------------------------------|
| 1 | Phiv ChinTheng | Deputy Director of NAL                 |
| 2 | Lorn Socheata  | Chief of the Pesticide Laboratory      |
| 3 | Thao Seaklay   | Vice Chief of the Pesticide Laboratory |
| 4 | Neau Chanmonny | Vice Chief of the Pesticide Laboratory |
| 5 | Keo Sothary    | Vice Chief of the Pesticide Laboratory |
| 6 | Nguon Nirdey   | Technician of the Pesticide Laboratory |
| 7 | Khoun Kanha    | Technician of the Pesticide Laboratory |
| 8 | Yout Chakriya  | Technician of the Pesticide Laboratory |
| 9 | Leang Sina     | Technician of the Pesticide Laboratory |

表 1-3 DAL カウンターパート職員

|    | 氏名             | 役職                                                                         |
|----|----------------|----------------------------------------------------------------------------|
| 1  | Phum Ra        | Director at DAL/MAFF                                                       |
| 23 | Kan Kompheak   | Deputy Director at DAL/MAFF                                                |
| 3  | Lim Bolin      | Deputy Director at DAL/MAFF                                                |
| 4  | Em Pisey       | Chief of Planning and International Cooperation office at DAL/MAFF         |
| 5  | Sovuth Matra   | Vice-Chief of Agricultural Material Standards of office at DAL/MAFF        |
| 6  | Vinin Marineth | Vice-Chief of Planning and International Cooperation office at DAL/MAFF    |
| 7  | Thong Soklin   | Vice-Chief of Agricultural Litigation and Investigation office at DAL/MAFF |
| 8  | Srun Sopheak   | Vice-Chief of Planning and International Cooperation office at DAL/MAFF    |

なお、業務途中の 2023 年第 3 四半期に DAL の大幅な組織改編があり、農薬管理に関わる業務が GDA の植物保護・衛生植物検疫部（Plant Protection Sanitary and Phytosanitary Department: 以下「PPSPSD」）に移管された。そのため業務期間の最後 2 ヶ月間は、PPSPSD で指名されたカウンターパート（表 1-4）と業務を実施した。

表 1-4 PPSPSD カウンターパート職員

|   | 氏名                | 役職              |
|---|-------------------|-----------------|
| 1 | Dy Sam An         | Deputy Director |
| 2 | Chou Sovichea     | Deputy Director |
| 3 | Pen MonyVoth      | Vice Chief      |
| 4 | Moeng Bophayanika | Vice Chief      |
| 5 | No Sophearoth     | Vice Chief      |
| 6 | Choem Channa      | Officer         |

| 氏名 |               | 役職      |
|----|---------------|---------|
| 7  | Ly Kimleng    | Officer |
| 8  | Chy Tann      | Officer |
| 9  | Chhim Vannara | Officer |
| 10 | Mang Socheat  | Officer |

### 1.3 報告書の構成

本報告書は、第2章に農林水産省の組織・体制に関わる事項を整理し、第3章に活動内容の詳細を記載した。なお、契約書上の指示事項と本報告書における対応事項は、表1-5に整理した。

表 1-5 契約書上の指示事項と報告書の構成

| 指示事項 |                                   | 実際の活動内容                                                                                                  | 関連箇所                                          |
|------|-----------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| (1)  | 国内準備期間                            |                                                                                                          |                                               |
|      | 1 農薬関連の現状・課題分析                    | 出国に先立ち関連資料のレビューを実施し、JICA 本部及び専門家と協議、機材の供与につき方針を検討、FAMIC の訪問等を行った。                                        | 2.6 参照                                        |
|      | 2 ASEAN 残留農薬基準の適用可能性検討            |                                                                                                          |                                               |
|      | 3 現地業務内容整理                        |                                                                                                          |                                               |
|      | 4 業務内容につき意見交換                     |                                                                                                          |                                               |
|      | 5 カンボジア渡航に関して書類等準備                |                                                                                                          |                                               |
| (2)  | 現地業務期間                            | 現地渡航 9 回実施し、以下業務遂行                                                                                       |                                               |
|      | 6 PDM 及び PO に基づき円滑運営管理            | 第 2 回合同調整委員会（2022 年 7 月 5 日）にて、PDM の改定協議し合意                                                              | 2.7.1 参照                                      |
|      | 7 短期専門家の活動に関する計画立案                | 上級農薬分析専門家と協議し、農薬分析専門家の派遣時期、業務内容等につき計画立案                                                                  |                                               |
|      | 8 合同調整委員会（JCC）参加                  | 現地業務従事期間に 4 回の JCC 開催                                                                                    | 2.7.2 参照                                      |
|      | 9 モニタリングシートのドラフト案作成               | 2021 年 6 月以降に 4 回のモニタリングを実施                                                                              | 2.7.3 参照                                      |
|      | 10 重大事項につき、協議・調整                  | PDM 及び PO の修正等について協議、調整                                                                                  |                                               |
|      | 11 NAL のラボ構築に関する調整                | 2022 年 8 月より ADB の資金より「Agricultural Value Chain Infrastructure Improvement Project」を実施し、情報収集・分析・共有       | 2.5 参照                                        |
|      | 12 第三国専門家や第三国及び本邦研修についての計画策定・調整   | フィリピン国を第 3 国研修の渡航先として選定し、2023 年 8 月に実施                                                                   | 2.7.14 参照                                     |
|      | 13 農薬の使用状況及び農薬の流通に関する調査実施を支援      | カンボジアの野菜栽培における農薬使用慣行等について議論（Cambodia Development Resource Institute (CDRI) の SIM Sokcheng 氏）             | 左記以外は、「農業バリューチェーン構築支援に係る情報収集・確認調査」ファイナルレポート参照 |
|      | 14 既存機材の操作方法等について NAL 技術者の習熟度確認   | 既存機材の操作について各段の問題ないと判断                                                                                    |                                               |
|      | 15 農薬の分析基礎や検査器具の取り扱い等の研修計画立案      | 検査器具の取り扱いについて SOP 作成・計画協議                                                                                | 2.7.9 参照                                      |
|      | 16 中長期的な農薬行政についてフレームワーク策定         | Ministerial Strategic Plan for Laboratory Upgrading を策定支援。但し、大臣交代後、大幅に方向変更                               | 第 2 章参照                                       |
|      | 17 他専門家の実施する活動のフォローアップ及びモニタリング    | 事業実施期間を通じてフォローアップ及びモニタリングを実施                                                                             | 2.7 参照                                        |
|      | 17.1 残留農薬分析のためのラボの再構築             | Ministerial Strategic Plan for Laboratory Upgrading 策定。最終的にカンダール州にゴム総局、森林総局を除く農林水産省の全ラボを統合する方向           | 第 2 章参照                                       |
|      | 17.2 残留農薬を分析する NAL 技術者のために OJT 実施 | 以下組合せにつき残留農薬分析指導<br>- トマト-Imidacloprid<br>- 青唐辛子-Azoxystrobin<br>- マンゴー-Carbofurans<br>- 玄米-Tricyclazole | 以下を参照<br>2.7.5<br>2.7.6<br>2.7.7              |
|      | 17.3 対象作物と有効成分の組合せの残留農薬分析手順策定     |                                                                                                          |                                               |
|      | 17.4 残留農薬分析の情報交換ワークショップ           | 残留農薬分析の情報交換ワークショップを 2023 年 10 月 11 日に開催                                                                  | 2.7.8 参照                                      |
|      | 17.5 分析機材の運用及び維持管理強化              | NAL の農薬残留分析に利用する機材の標準作業手順書（SOP）作成                                                                        | 2.7.9 参照                                      |
|      | 17.6 農薬販売店への立入検査に関するマニュアル         | DAL 職員中心に、2023 年の第 2 四半                                                                                  | 2.7.11 参照                                     |

カンボジア国残留農薬分析能力強化プロジェクト  
(チーフアドバイザー業務)

| 指示事項 |         |                            | 実際の活動内容                                                                                                                                                                      | 関連箇所      |
|------|---------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|      |         | ル改訂                        | 期初めまでにドラフトを完成                                                                                                                                                                |           |
|      | 17.7    | DAL が実施する州農業局の検査員向けの研修を強化  | DAL の大幅な組織改編により、上記ドラフトは最終化できず、研修の開催は見送り                                                                                                                                      | 2.7.12 参照 |
|      | 17.8    | 農薬資材店への立入検査および違法農薬収集の仕組み改善 | 販売店の検査を実施する際の DAL と PDAFF の役割を再定義                                                                                                                                            | 2.7.10 参照 |
|      | 17.9    | 農薬の品質分析制度改善                | 二つの有効成分の農薬製剤分析の能力向上を支援                                                                                                                                                       | 2.7.13 参照 |
| (3)  | 国内作業期間  |                            | <ul style="list-style-type: none"> <li>- 現地業務の活動について整理し、適宜フォローアップのため、C/P 及び案件関係者へ情報共有</li> <li>- 案件に関する関係者からの問い合わせ等に対し、他専門家と連携し対応</li> <li>- 他専門家と連携し、次の現地業務に向け準備</li> </ul> | 2.7.4 参照  |
|      | 18      | 現地業務の活動の整理を行い、情報共有         |                                                                                                                                                                              |           |
|      | 19      | 国内業務中も対応                   |                                                                                                                                                                              |           |
|      | 20      | 次期現地業務に向け準備                |                                                                                                                                                                              |           |
| (4)  | 帰国後整理期間 |                            | 業務完了報告書を作成し、必要に応じて、内容に関わる質疑応答対応                                                                                                                                              |           |
|      | 21      | 活動結果報告書作成                  |                                                                                                                                                                              |           |
|      | 22      | 本部にて帰国報告会実施                |                                                                                                                                                                              |           |

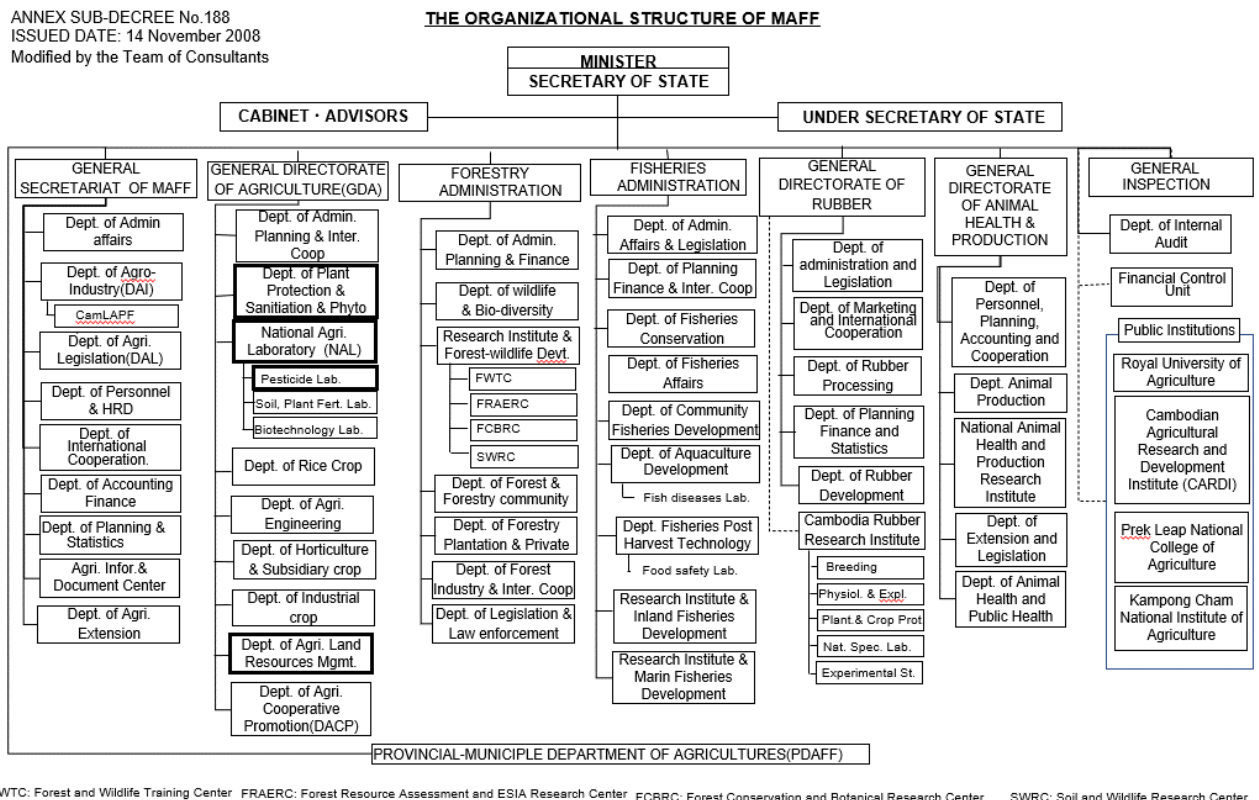
## 第2章 農林水産省の組織・体制に関わる事項

### 2.1 農林水産省の組織を把握することの意義

業務期間を通じて、適切な農業管理に関する支援・助言を行うことができるよう、業務実施に平行して、カンボジア国農林水産省の組織の把握に努めた。本業務実施中にも、組織改編が行われ、DALの業務がGDAに移管されたこと、また、カウンターパートであるNALは、将来農林水産省傘下の他のラボと統合される等の計画も持ち上がっており、農林水産省の組織を把握することは重要と考えた。今後も必要に応じて組織改革が行われると予測されるが、本節では、業務期間中に得られた情報を整理する。

### 2.2 農林水産省の組織

JICA カンボジア事務所より入手した農林水産省の組織図を基に、聞き取りを行った上で、情報を更新し、省全体の組織図（図2-1）を作成した。本業務の当初のカウンターパート機関であるDAL及びNALに加えて、下図では、DALから農業管理業務を移管される植物保護・衛生植物検疫部<sup>1</sup>(PPSPSD)及び同じく肥料管理業務を移管される農業土地資源管理部（Department of Agricultural Land Resources Management）も太線で示した。



出典：Agricultural Value Chain Infrastructure Improvement Project コンサルタントチーム

図2-1 農林水産省組織図

本組織図の改定で、JICA カンボジア事務所より入手した農林水産省の組織図に、新たに追加した情

<sup>1</sup> 本報告書では、General Directorate を総局、Department を部と訳した。また、Laboratory は、ラボと訳した。

報は、以下の通りである。

- ・ 外郭団体（Public Institute）として王立農業大学、カンボジア農業研究開発研究所（CARDI）、Prek Leap 農業大学及びカンポンチャム農業大学を追加して掲載した。
- ・ 農林水産省傘下のすべての研究室を特定した。これには、水産総局、畜産総局、ゴム総局に所属する研究室を含む。

但し、当初 DAL の傘下に、組織図上位置づけの不明確な肥料研究室が所属していたが、2023 年 8 月組織改編により、NAL の土壌植物栄養研究室に吸収されたため上の組織図には掲載していない。本事項は、以下の 2.3 節にも情報を示した。

## 2.3 農業法制部の組織

2023 年 8 月時点の DAL の組織図を図 2-2 に示した。当初、DAL 部長の下に、7 名の副部長が置かれ、①業務管理室、②計画・国際協力室、③法制・普及室、④法務調査室、⑤農業資材標準課室、⑥農業資材情報管理室の 6 つの室が配置されていた。

これまで肥料及び農薬の登録事務及び流通業者の立入検査は、⑤農業資材標準課室、⑥農業資材情報管理室が担っていたが、2023 年の組織改編により、農業資材標準課室及び農業資材情報管理室は GDA に移管された。図 2-2 では、赤線で示した。

その結果、新しい体制下では、4 名の副部長と 4 室（①業務管理室、②計画・国際協力室、③法制・普及室、④法務調査室）に規模を縮小し、以下業務<sup>2</sup>を担うこととなり、原則として、法制面の管理業務に集中することになる。但し、以下の 6. に示すように農林水産省の他部局が実施する立入検査に法執行の立場から参加し、助言する機能は継続維持の見込みである。

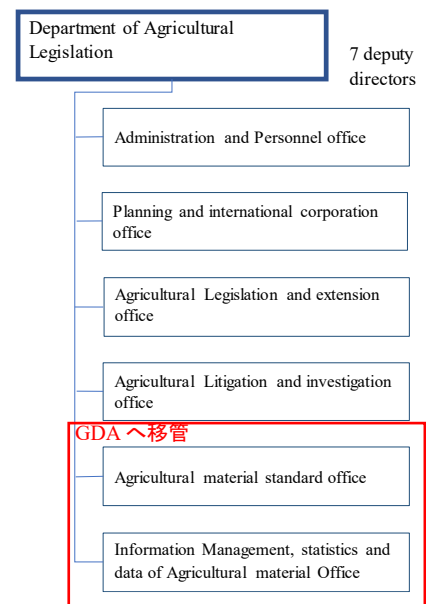


図 2-2 DAL 組織図

1. 公的文書の管理・保管
2. 同省の法律の施行を監視するための運用手順に関するガイドラインの策定・実施及びその他の技術的・法的支援
3. 法律及び規制の実施状況監視及び評価メカニズムの開発と実装
4. 農林水産業に関わる法律及び協定 - 法執行機関の活動に関する報告、当該部門の方針策定
5. 効果的な評価のため、農業関連法規執行活動に関連する報告書について助言、業務遂行のための各種ガイドラインを行政部門に要請
6. 法執行強化に資するあらゆる活動において、検査及びその実施への参加
7. 農業分野の法執行官の役割・責任履行の監視と違反の場合の懲戒手続き
8. 農業分野の民事、行政紛争に関する苦情の受理、分析及び助言。関連部局の要請に基づき紛争事案の調査及び解決
9. 法律及び規制の影響評価の方法開発、施行される法律・規制の調査、研究、再評価
10. その他部長の定める職務

<sup>2</sup> 以下を参考に記載

Prakas on 2002 and 2 new articles and 4 new articles of Prakas No. 514, PRK, dated 31 August 2017, on the revision of 2 and 4 articles of Prakas No. 356, PRK, dated 29 October 2002 on the Organization and Functioning of the Office of the Department of Agricultural Legislation Amendment to Article 1 of Prakas No. 356, dated October 29

本業務では、DAL の農薬管理に関わる分掌のうち、農薬流通業者の店舗及び倉庫等の立入検査のガイドライン作成を支援したが、これら業務は、PPSPSD に移管された。なお、上記の通り、今後、DAL は、PPSPSD を含めて農林水産省傘下で行われる立入検査には、法令専門家として参加すると想定される。

DAL では、農薬の他に肥料の登録・立入検査を担っていたが、当該業務は、今回の組織改編により GDA の農業土地資源管理部に移管された。

また、これまで組織上、明確に位置付けられていなかったが、肥料の微量元素を分析するラボが DAL に属しており、今回の組織改編で NAL の土壤植物栄養研究室に統合されたと報告されている。これまで、肥料の主要 3 元素（窒素、リン、カリ）の分析は NAL の土壤植物栄養研究室で行われ、微量元素が DAL で行われるという歪な分業が、今回の組織改編で改善されたと見なすことができる。

## 2.4 農業総局傘下の関連部門の組織

本業務では、農業総局傘下の国立農業研究所（NAL）をカウンターパートとしたが、農薬管理には、植物保護・衛生植物検疫部（PPSPSD）の役割も重要であり、本節に併せて組織図を整理した。なお、各部署の概ねの職員数を把握できる範囲で、図中の括弧内に示した。

NAL には、①農薬分析ラボ、②土壤植物栄養ラボ、③バイオテクノロジーラボの 3 つのラボがあり、本業務では、農薬分析ラボのみを成果 1 のカウンターパートとして業務を実施した。

農薬分析ラボは、これまで農薬登録に関わり製剤分析を実施していたが、今後は、農薬の残留分析も実施することになる。本業務の成果は、作物中の残留農薬分析に活用される。

土壤植物栄養ラボは、肥料の登録に関わる肥料の成分分析に加え、農業土地資源管理部が行う土地利用計画に際して、採取された土壌サンプルの分析を行い、土壌肥沃度の評価を行うことも重要な業務の一つである。上記の通り、DAL に所属していた分析ラボも、土壤植物栄養ラボと統合される。

バイオテクノロジーラボは、優良な品種の育成、種子配布を目指して、組織培養を生かして業務を行っている。

PPSPSD には、組織図上、上から①検疫対策室、②植物保護調査研究室、③植物保護室、④農産品品

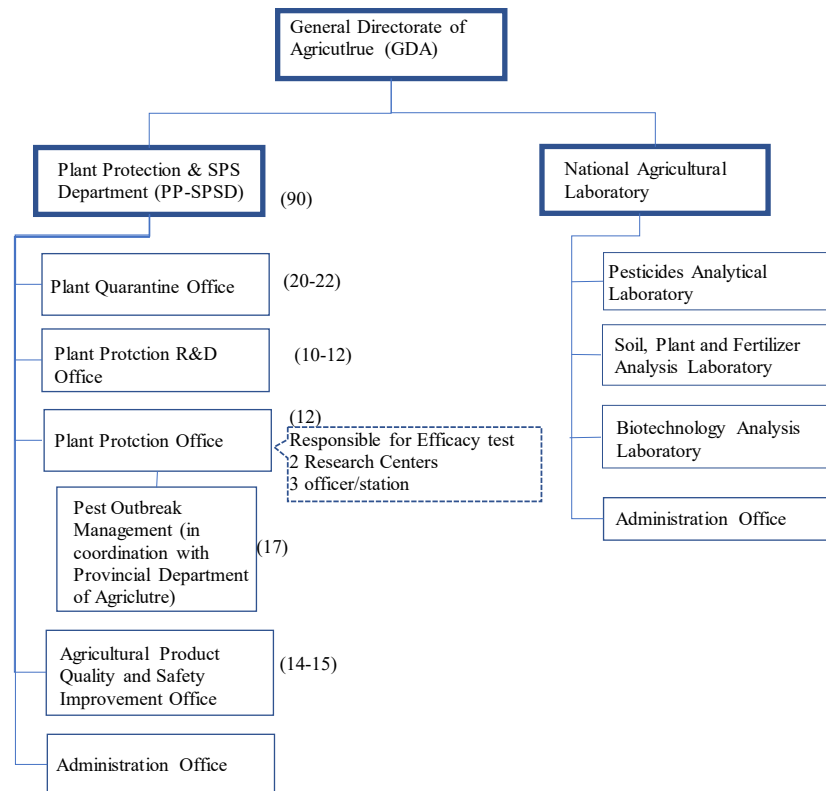


図 2-3 NAL 及び PPSPSD 組織図

質安全性改善室が属している。③植物保護室には、農薬の薬効試験実施のため2つの研究圃場を有しているようであるが、今回の業務では、それを現場で確認することはできなかった。また、④農産品品質安全性改善室は、ASEAN GAP の実施・普及を行う部署である。2023 年第3 四半期の組織改編で、PPSPSD の分掌も変更となり組織もそれに合わせる必要があると考えられるが、2023 年 10 月 5 日時点で、そのような動きは見られない。

## 2.5 農林水産省ラボ統合の方向性

農林水産省では予てから、総局ごとに分散しているラボを1ヶ所に統合する方針が検討されており、本業務期間中に並行して集中的に協議が行われた。ここでは2023 年 9 月 27 日の新聞報道に基づき、農林水産省のラボ統合の方向性を以下に整理する。

農林水産省では、カンダール州に土地を取得し、新しくラボを建設する計画である。本ラボの建設の方針は、農林水産省大臣が強力なリーダーシップの下、方針を定め、食品安全性確保及び（家畜）感染症を抑制するために農産物の検査を行うラボとされる。図 2-1 に示した農林水産省の組織図を基に、2023 年 9 月末時点で対象となると考えられるラボを濃紺色（白抜き文字）で（図 2-4）示した。但し、これらのラボのみが対象になる場合、以下のラボが対象外となり、効率性改善の課題が残り、今後、確認が必要である。なお、下記の内容は今後のカンボジア農林水産省の政策検討により変更になる可能性がある。

1. NAL の農薬研究部がこれまで行ってきた農薬登録を目的とした製剤分析
2. NAL の土壌植物栄養研究室とバイオテクノロジー研究室（以下図では、薄い青色で示した。）

統合対象の可能性のあるラボについて、表 2-1 に整理した。

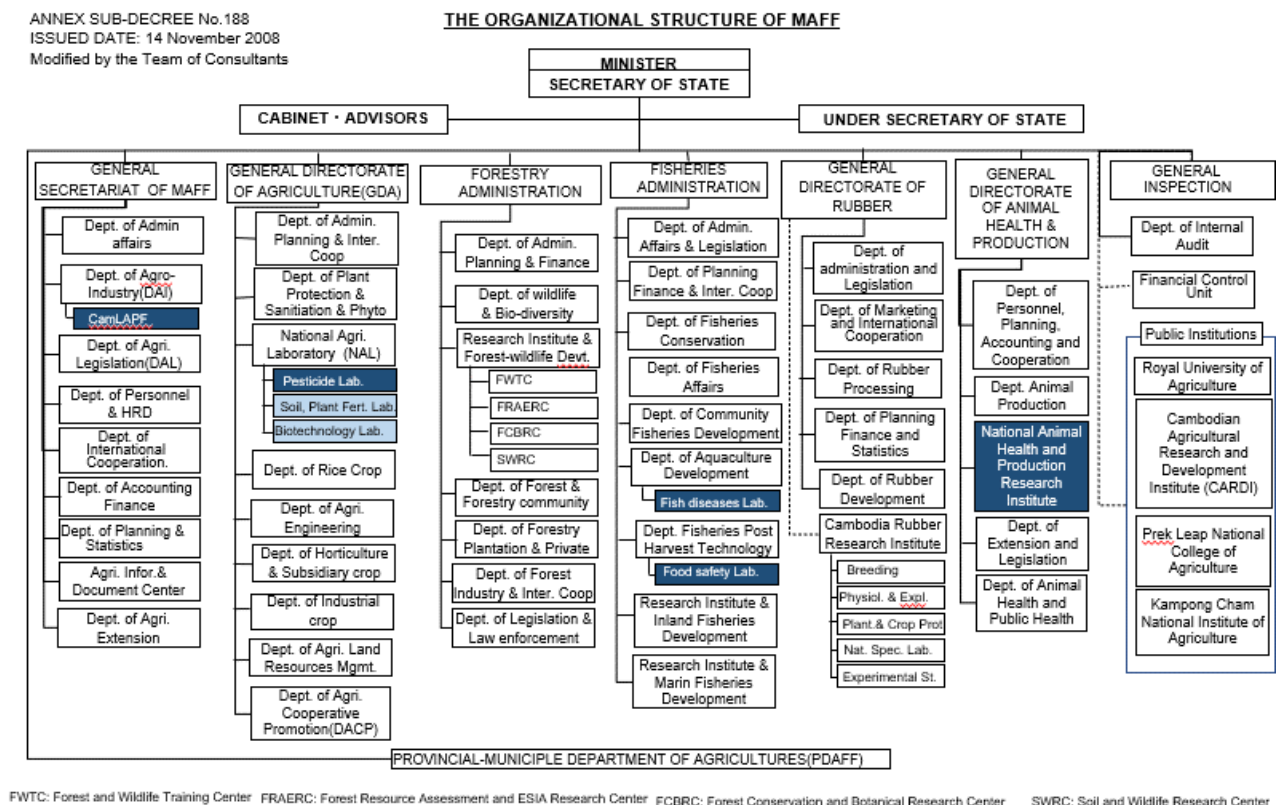


図 2-4 農林水産省ラボ統合の対象

また建設費は3,000万ドルと見積もられ、完成は2026年を予定している。

これらラボは、高額な分析機材への投資が必要となり、現在のように総局毎にラボが分散していると、機材投資の重複を避けることができないため、統合により分析機器の利用効率を向上させ、また、機器分析を担当する職員に協働の機会を提供し、技術力向上の相乗効果を期待できるためである。

表 2-1 統合対象の可能性のあるラボ

| 関連総局                                                             | 関連部署                                                                 | ラボ名称                                                                | 分析対象項目                                    | 統合の方針                    |
|------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------|--------------------------|
| 農水省事務総局<br>- General Secretariat of MAFF                         | 農産工業部<br>- Department of Agro-Industry                               | CamLAPF<br>- Cambodia Laboratory of Agricultural Products and Foods | 微生物<br>重金属<br>農薬<br>マイコトキシン               | 統合可能性高                   |
| 農業総局<br>- General Directorate of Agriculture                     | NAL<br>- National Agricultural Laboratory                            | Pesticide Laboratory                                                | 残留農薬<br>農薬製剤                              | 統合可能性高<br>但し、農薬製剤の分析は確認要 |
|                                                                  |                                                                      | Soil, Plant Fert. Lab                                               | 土壌肥沃度<br>肥料成分                             | 今後、確認要                   |
|                                                                  |                                                                      | Biotechnology Lab.                                                  | 種子品質検査、<br>植物組織培養、<br>生物農薬及び生物<br>肥料の品質検査 | 今後、確認要                   |
| 畜産衛生・生産総局<br>- General Directorate of Animal Health & Production | NAHPRI<br>- National Animal Health and Production Research Institute | -                                                                   | 動物医薬品                                     | 統合可能性高                   |
| 水産総局<br>- Fisheries Administration                               | 水産養殖部<br>- Dept. of Aquaculture Development                          | Fish diseases Lab.                                                  | ウィルス等の魚病                                  | 統合可能性高                   |
|                                                                  | 漁獲後処理部<br>- Dept. Fisheries Post Harvest Technology                  | Food safety Lab.                                                    | 微生物による汚染等                                 | 統合可能性高                   |

## 2.6 国内準備期間の活動

本業務に先立って実施された「カンボジア国農業バリューチェーン構築支援に係る情報収集・確認調査」の報告書に基づき以下を分析検討した。

### 1. 農薬関連の現状・課題分析

農薬関連の現状及び課題について分析した。その結果を表 2-2 に整理した。

表 2-2 農薬関連の現状・課題分析

| 参考資料                                              | 本業務への活用・適用                                                                                 |
|---------------------------------------------------|--------------------------------------------------------------------------------------------|
| 「四辺形戦略：カンボジアにおける成長、雇用形戦略：カンボジアにおける成長、雇用均衡、そして効率性」 | - 生産性と作物の多様化を高めるための農林水産省の優先行動として「植物の保護、品質、農産物の安全性の促進」を重視。1) 全作物の生産量拡大、2) 農産物輸出量増加等を目指す。    |
| 農業セクター戦略開発計画                                      |                                                                                            |
| 農薬肥料管理法                                           | - カウンターパートである DAL は農薬の登録、立入検査の実施に関わる責務を有すこと、また、NAL は、関係機関からの依頼に応じて分析を実施することが主な業務であることを再確認。 |

### 2. ASEAN 残留農薬基準の適用可能性検討

予め以下の ASEAN GAP について把握の上、カンボジアで推進されている GAP は、ASEAN GAP を

踏襲していること現地にて確認した。

- Good agricultural practices for production of fresh fruit and vegetables in the ASEAN region, Quality Assurance Systems for ASEAN Fruit and Vegetables, ASEAN Australia Development Cooperation Program Project

なお、当ガイドラインの適用は、世界銀行が推進する以下プロジェクトにて実施支援され、PPSPSD の農産品品質安全性改善室（Agricultural Product Quality and Safety Improvement Office）が普及を担っている。

- Cambodia Agricultural Sector Diversification Project

本プロジェクトは、農業生産の多角化推進を意図した業務内容で、業務のコンポーネントの一つに GAP 推進が含まれている。なお、その一環として、農薬の分析機材調達も予定されているが、農林水産省では、ラボの統合移転を優先課題として掲げており、現在、機材調達の活動は保留されている。

### 3. 業務内容につき意見交換

現地業務に先立ち、JICA 本部担当者及びメンバーと機材調達の方針、新型コロナウイルス感染症拡大期における現地業務実施方針等について以下の通り協議した。

- 分析機材は、ADB 支援のプロジェクト（Agricultural Value Chain Infrastructure Improvement Project）にて、GC-MS/MS 等の調達が予定されており、本業務では、調達後、それを利用して分析研修を実施
- 但し、ADB 支援のプロジェクトが遅延する可能性も踏まえ、本業務の活動とスケジュールが合わない場合は、その際、検討・協議
- 以上の前提のもとで、技術力向上のためには、ADB 案件とは重複のない GC-FPD 等の機材調達を先行して実施して、分析指導を行うことの意義はあると認識
- 新型コロナウイルス感染症の先行きは読めず、様子を見ながらの判断となるが、現地入り後、ホテル等での隔離を経て、業務を進める方針

### 4. 現地業務内容整理の上、業務内容につき意見交換

現地業務内容整理の上、研修実施方針等について JICA 本部職員と意見交換を行った。

### 5. カンボジア渡航に関して書類等準備

カンボジア渡航に際し、特に新型コロナウイルス感染症拡大期における入国に関わる書類等を作成した。

## 2.7 現地業務期間

### 2.7.1 PDM の変遷

プロジェクトの PDM は、本プロジェクトの詳細計画策定調査時に作成され、当該調査の討議議事録（2019 年 9 月 23 日署名）に添付されている。当初の PDM は、本報告書の添付資料 1 に添付した。

その後、現地業務開始後、カウンターパートと共に、当初の PDM には、論理構成、政策との整合性等の観点で改善の余地があることを確認の上、プロジェクトの活動及び基本構成に関しては、根本的な変更はせず、論理構成等に絞って見直しを行った。改定時に行った検討事項は、表 2-3 に整理した。

また、改定後の PDM は、添付資料 2 に示した。改定 PDM は、第 2 回合同調整委員会 (JCC) 会議 (2022 年 7 月 5 日) にて協議し、合意した。

表 2-3 プロジェクト設計マトリックスレビューの概要

| # | 分野                    | 修正前                                                   | 修正後                                                                                                                                                   | 背景／理由                                                                                                                                                                                                                    |
|---|-----------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 上位目標                  | 残留農薬研究所は新しい残留農薬分析法を自ら検証することができ、得られた能力は農薬規制システムに統合される。 | 農林水産省による適正農薬管理のために強化された能力が一貫して効果的に活用される。                                                                                                              | 農薬の適正使用の促進は、農薬管理における共通の目標と判断。本プロジェクトの 2 つの視点を考慮<br>- 登録農薬の流通改善促進<br>- 農薬使用改善のための政策立案に資する残留農薬に関する基礎情報を提供<br>プロジェクトの上記 2 点は、農薬の適正使用を促進するための重要な構成要素。能力開発は、農薬使用状況を改善するための農林水産省の政策に利用されると想定。また、当初の PDM の記述は、プロジェクトの目的を言い換えと判断 |
| 2 | 上位目標に関する指標            | オリジナルの PDM バージョン 0 では、指標は記載なし                         | 1. 農作物と農薬の有効成分の組み合わせについて残留農薬分析法を検証する。<br>農作物中の残留農薬のデータは、農薬散布基準やガイドラインなど、農薬の適正使用の改善に利用される。                                                             | プロジェクト全体の設計を考慮し、指標を追加・合意<br>データベース開発に関連する以下指標は、一度特定されたが、最新版では削除(上記#13、#14、#15、#16を参照)。<br>- 農薬データベースが、適切な農薬管理を改善するための活動に利用される。<br>農家は、農薬の適正使用・管理のための情報ルートをより多く持つようになる。                                                   |
| 3 | 上位目標達成のための外部条件        | オリジナルの PDM バージョン 0 では、前提条件は記載なし                       | 農薬規制制度における NAL/DAL の任務は大きく変わらない。<br>以下のドナー資金によるプロジェクトは、概ね現行の設計を変更することなく実施されている。<br>1. カンボジア農業セクター多様化プロジェクト (WB)<br>2. 農業バリューチェーン競争力・安全性強化プロジェクト (ADB) | JICA のプロジェクト運営に関連する 2 つのドナー支援プロジェクトが、上位目標達成に影響を与える可能性のある要因として特定                                                                                                                                                          |
| 4 | プロジェクト目標              | 残留農薬ラボの基礎的能力を向上させ、適切な農薬管理を強化する。                       | 農薬規制要件の遵守を強化する能力を強化。                                                                                                                                  | プロジェクト成果 (#7、#13 参照) について、上位目標 (#1 参照) の議論との関連で、プロジェクト目標の表現を工夫し、また、以下も考慮<br>1. 「残留農薬分析の能力開発」は目標を達成するための手段であり、目標そのものと捉えるべきではない。<br>2. プロジェクト目標は、2 つの独立したステートメントではなく、1 つのステートメントで表現されることが望ましい。                             |
| 5 | プロジェクト目的に関する指標        | オリジナルの PDM バージョン 0 では指標は未記載                           | 1. NAL は、特定の作物と有効成分の組合せについて残留農薬の情報を提供できる。<br>2. 地方担当官は農薬の立入検査に関するより良い情報を得る。                                                                           | 成果と目的を考慮し、指標を検討・特定し上記のとおり (#13 から #16 参照)、農薬登録データベースの開発に関する活動は最終的に削除。それに伴い、以下の指標を削除<br>- 農薬/肥料の登録管理の効率が改善される。                                                                                                            |
| 6 | プロジェクトの目標を達成するための外部条件 | 外部条件は未記載                                              | 農薬管理に関して、以下のドナー資金によるプロジェクトが協調して実施されている。<br>- カンボジア・オーストラリア農業バリューチェーン・プログラム (CAVAC)                                                                    | プロジェクトの準備段階では、CAVAC は特定されていなかった。<br>CAVAC は、農薬ラベルの改善に関わり DAL を支援<br>農薬使用に関する正しい情報にアクセスできるようにすることは、プロジェクト目標を達成するための重要なステップと判断                                                                                             |
| 7 | 成果 1                  | 農作物の残留農薬分析が可能である。                                     | 農作物の残留農薬分析が可能である。                                                                                                                                     | 変更せず。ただし、以下の点を再確認<br>- NAL は農薬の品質評価を行い、主に農薬登録プロセスや立入検査において                                                                                                                                                               |

| #  | 分野                    | 修正前                                                    | 修正後                                                         | 背景／理由                                                                                                                                                                                                                                                      |
|----|-----------------------|--------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                       |                                                        |                                                             | DAL を支援<br>農作物中の残留農薬のモニタリングも、農薬管理における農林水産省の枠組みの中で NAL の重要な任務                                                                                                                                                                                               |
| 8  | 成果 1 の活動              | 1-4. 特定の作物と有効成分の組み合わせにおける残留農薬分析手順の開発                   | 1-4. 農作物における有効成分の特定の組み合わせにおける残留農薬分析手順の開発                    | 残留農薬分析研修の範囲について議論し、共通の見解を構築するために文書を明確化した。この活動は、指標 1.2.1.(#12 参照)と合わせて解釈し、広く作物に利用される 4 種類以上の有効成分に焦点を当てる。                                                                                                                                                    |
| 9  | 成果 1 の活動              |                                                        | 1.7 残留農薬分析に関する海外研修／視察旅行                                     | PDM では日本側のインプットとして位置づけられていた。しかし、このコンポーネントを活動として統合し、成果 1 を生み出すことが提案された。活動として再掲する意図は、職員の受動的な海外研修への参加を避けるためであると理解された。                                                                                                                                         |
| 10 | 成果 1 の指標 <sup>3</sup> | 1-1-1 カウンターパートの XX%が残留農薬分析のための分析化学の基礎知識を習得             | 1-1-1 カウンターパートの 80%が残留農薬分析のための分析化学の基礎知識を習得                  | 80%という数値目標は NAL が提案したものである。NAL は、野心的ではあるが、80%という数値を維持する強い意志を持っていることが確認された。                                                                                                                                                                                 |
| 11 | 成果 1 の指標              | 1-1-2 カウンターパートの XX%が分析機器の基礎理論を習得                       | 1-1-2 カウンターパートの 80%が分析機器の基礎理論を習得                            | 80%という数値目標は NAL が提案したものである。NAL は、野心的ではあるが、80%という数値を維持する強い意志を持っていることが確認された。                                                                                                                                                                                 |
| 12 | 成果 1 の指標              | 1-2-1 作物と有効成分の 4 つの組み合わせに対する分析法が検証されている。               | 1-2-1 農作物における有効成分の組み合わせの分析法が検証される                           | 有効成分の数値目標を 4 種類に限定すべきではないとの考えから、この数値は削除された。ただし、有効成分の数値目標を 4 種類とすることは、プロジェクトで追求すべき最低限の目標であることに変わりはないと理解。また、活動に関する議論 (1.参照) と整合性を図るため、表現を変更した。                                                                                                               |
| 13 | 成果 2 の活動              | 2.1. 農薬立入検査の現行マニュアルとガイドラインの見直しと改訂                      | 2-1 マニュアルやガイドラインの情報管理と普及のための設計手法                            | 活動範囲の見直しに伴い、<br>1) 農薬・肥料法および農薬・肥料検査手順に関する Prakas に準拠した現場検査マニュアルを作成<br>2) PDAFF の農薬検査官を対象とした普及ワークショップを全国で開催                                                                                                                                                 |
| 14 | 成果 2 の活動              | 2-2 DAL、PD AFF 検査官を対象に研修を実施                            | 2-1. 農薬小売業者に対する関連規制・指導の適切な実施のため、合同立入検査を実施し、品質に疑問のある農薬を回収する。 | NAL による農薬サンプルの収集と品質評価活動は、成果を生み出すための重要な活動であることに変わりはない。ただし、農薬の物性評価については、指標 2-3 の議論と統合した (#18 参照)。一方、化学分析の数値目標は、この変更に伴う作業量の増加に対応するため、適宜調整された。                                                                                                                 |
| 15 | 成果 2 の活動              | 2-3 農薬小売業者の関連規制／ガイドダンスを適切に実施するため、立入検査を実施し、疑わしい農薬を回収する。 | 2-2. NAL による分析 (有効成分と物理性) を通じて、DAL がパイロットサイトで採取した農薬の品質を確認   | 以上の議論に基づき、活動内容を共同で見直し、改訂版の 2-1～2-4 で示された意図する成果を生み出すための一連のステップに分解した。                                                                                                                                                                                        |
| 16 | 成果 2 の活動              | 2-4 NAL による製剤分析を通じて、DAL がパイロットサイトで採取した農薬の品質を確認する。      | 2-3. NAL による農薬製剤の新規 2 つの有効成分のバリデーション法の実施                    | - 議論の過程で、農薬登録に関するデータベースの開発が議論され、提案された。しかし、現時点ではそのようなツールの開発に踏み切るのは時期尚早と判断された。その主な理由は以下の通り。<br>1. プロジェクトの枠組みを立入検査に重点を置くように設計<br>2. データベースに係る技術習得に長い時間枠が必要<br>3. 州レベルでは情報インフラが整備されていないため、こうした情報への頻繁なアクセスや迅速なアクセスができないこと。<br>データベースに関する活動の削除に合意したため、該当する指標は削除。 |
| 17 | 成果 2                  | 薬小売業者の立入検査と農薬品質モニタリングの能力向上                             | 農薬規制の遵守と執行の能力強化                                             | DAL は、肥料・農薬法やその他の関連法令、ガイドラインに対する遵守状況を評価することで、農薬取扱業者の業務を監督。農薬販売業者の立入検査は、最終的に規制遵守と執行を強化するための手段である。本プロジェクトは検査のためのガイドラインを作成し、PD AFF に普及させる。                                                                                                                    |

<sup>3</sup> プロジェクト・デザイン・マトリックスにおける客観的に検証可能な指標を、本稿では Indicator と呼ぶ。

| #  | 分野       | 修正前                                             | 修正後                                             | 背景／理由                                                                                                                                                                                                                 |
|----|----------|-------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18 | 成果 2 の指標 | 2-3. NAL が技術的な問題で分析できなかった 5 つの有効成分について、製剤分析法を検証 | 2-3. NAL が技術的な問題で分析できなかった 2 つの有効成分について、製剤分析法を検証 | 農薬管理において、農薬製剤の物性評価が見落とされていると判断。そこで、化学分析に加えて農薬製剤の物理的特性を評価する活動を統合することを提案・合意。一方、有効成分 5 種類という数値目標は、時間・人員の制約を考慮し、再検討。<br>以下の指標は、PDM の最新版では削除。(#13,#14,#15,#16 を参照)。<br>2-4. 農薬と肥料の登録に関する電子記録のアーカイブのプロトタイプが開発され、情報へのアクセスが向上 |
| 19 | 成果 2 の指標 | 2-2. パイロットサイトでは、作成したマニュアルに従って XX% の現場検査が実施された。  | 2-2. 州の検査官の 60% が、作成されたマニュアルを理解している。            | 60% という数値目標は、DAL と JICA チームの間で議論・合意。以下の順で効果発揮と想定<br>1. 普及ワークショップの開催<br>2. 参加者の理解<br>3. ガイドライン・マニュアルの日常的な検査活動への適用<br>通常、成果の達成状況評価は、普及ワークショップ直後に実施され、上記の 2 つ目から 3 つ目に至るまでの時間は長いと判断され、以前の指標を用いた評価は不可能であるため               |
| 20 | プロジェクト期間 | 2020 年 6 月～2022 年 6 月（予定）                       | 2020 年 11 月～2023 年 11 月                         | - COVID-19 の影響に対処するため、プロジェクト期間を 1 年間延長                                                                                                                                                                                |
| 21 | パイロットサイト | 検討対象                                            | ブノンペン、タイやベトナムとの国境の地方、トンレサップに近い地方。               | - パイロットサイトは、DAL の重点活動分野を考慮して提案                                                                                                                                                                                        |

## 2.7.2 合同調整委員会の開催

プロジェクトの合同調整委員会（JCC）は、2020 年第 4 四半期のプロジェクト開始以来、新型コロナウイルス感染症の影響を受けカンボジア国にて活動を行うことができず、第 1 回 JCC 会議は 2022 年 2 月 23 日に開催した。第 2 回 JCC 会議にて、プロジェクト期間の延長と機材の追加調達を協議し公式に認められた。その後、プロジェクトの進捗に影響を及ぼす重要事項が予見されなかったため、第 3 回 JCC 会議を機材調達が完了した 2023 年 4 月に開催した。最後の JCC は 2023 年 10 月 20 日に開催した。

表 2-4 合同調整委員会の概要

| JCC | 日時・場所           | 主要議題                                                                                                                                                                                                                                                                               |
|-----|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 2022 年 2 月 23 日 | 1. 当初、ADB のローン案件 Agricultural Value Chain Competitiveness and Safety Enhancement Project（以下 ACSEP）で供与予定の分析機器を利用して本業務にて能力開発を実施する計画であったが、当該 ADB 案件の機材調達は大幅に遅延の見込みであり、本業務における対応を協議<br>2. 新型コロナウイルス感染症の影響による業務の遅れに対し、農林水産省は、業務実施期間の延長の必要性を提言<br>3. JICA 側も期間延長の必要性を認め、次期 JCC にて協議を原則合意 |
| 2   | 2022 年 7 月 5 日  | 1. 上記第 1 回 JCC を受け、業務期間 1 年延長の原則合意を確認<br>2. ADB 案件の機材調達の遅延に対し、農林水産省より、分析機器（ガスクロマトグラフ）を新規に調達し、既存 LC-MS を修理して対応することの提案・要請あり。<br>3. DAL 側の支援（成果 2）に関し、農薬流通業者の立入検査マニュアル策定について明言<br>4. ACSEP の融資実行の条件の一つであるラボの戦略投資計画の早期策定を進言                                                            |
| 3   | 2023 年 4 月 11 日 | 1. 前回 JCC にて要請したガスクロマトグラフの据付完了を受け、農林水産省から追加で以下要請あり。<br>（ア） ISO 17025 取得支援<br>（イ） 試薬購入支援<br>（ウ） 多成分同時分析の指導<br>2. 上記に関連し、第 2 フェーズ実施の依頼あり。<br>3. フィリピンでの第 3 国研修の実施時期を、7 月の総選挙後と提案                                                                                                     |

| JCC | 日時・場所       | 主要議題                                                                                        |
|-----|-------------|---------------------------------------------------------------------------------------------|
| 4   | 2023年10月20日 | 1. NALを対象としたプロジェクト成果1は成功裏に実施<br>2. DALの組織改編により成果2は未達成<br>3. 今後、JICAカンボジア事務所が必要に応じてモニタリングを実施 |

各 JCC の議事録は、添付資料 3 に示した。

### 2.7.3 モニタリングの実施

業務従事期間に 4 回のモニタリングを実施した。以下に概要を示す。モニタリングシートは、添付資料 4 に添付した。

表 2-5 モニタリングの実施

| モニタリング | 時期         | 主な課題                                                                                                                                                                        |
|--------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 第 1 回  | 2021 年 6 月 | 1. 既存の LC-MS 修理の要請<br>2. 新型コロナウイルス感染症の影響で 3 ヶ月程度の遅れ見込み<br>3. 上記 2 の課題に対し、2021 年 7 月からオンラインでの研修計画策定                                                                          |
| 第 2 回  | 2022 年 1 月 | 1. 新型コロナウイルス感染症の影響による業務の遅れに対し、業務実施期間の延長を検討開始                                                                                                                                |
| 第 3 回  | 2022 年 6 月 | 1. 当初、ADB のローン案件 ACSEP で供与予定の分析機材を利用して能力開発を実施する計画であったが、ADB 案件の実施が遅れ、JICA 側で研修に必要な分析機材の調達を決定<br>2. 1 年の事業実施期間延長を決定                                                           |
| 第 4 回  | 2023 年 1 月 | 1. 上記の新規調達機は、検出器として 63Ni の密封線源を利用した検出器の輸入手続きのため調達に時間を要し、据え付け完了は 2023 年 4 月完了の見込み<br>2. UNIDO による CAPFISH-Capture: Post-Harvest Fisheries Development の支援で、NAL は広範な SOP 作成着手 |

### 2.7.4 オンラインでの研修計画立案実施

新型コロナウイルス感染症の影響を受け、現地渡航が困難であったため、業務開始当初は、オンラインで研修を開催した。2021 年 3 月からの 3 ヶ月の間は、北村専門家の他案件参画のタイミングと歩調を合わせて、オンライン研修形態等についての複数案の検討を行い、同年 6 月からオンラインで研修を開始した。セミナーの概要は、表 2-6 に示した。

表 2-6 オンラインセミナーの概要

| 対象        | ID  | 題名             | 担当者        | 目的                                                          | 内容/概要                                                                            |
|-----------|-----|----------------|------------|-------------------------------------------------------------|----------------------------------------------------------------------------------|
| NAL & DAL | 0   | 入門セミナー         | Veasna /坂本 | セミナー/トレーニング環境を整備                                            | インターネット環境とミーティングツール (Zoom) 立ち上げ。                                                 |
|           |     |                | 村松         | トレーニングへの参加準備を支援                                             | 1. トレーニング概要<br>2. オンライン・トレーニングのルール規程<br>3. 通訳、マイク、その他のロジスティクス                    |
| NAL       | N0  | 農薬入門 (現代農業と農薬) | 北村         | 歴史的視点からカンボジアの相対的な位置を考慮の上で、残留農薬分析における NAL の役割について説明できるようになる。 | NAL/DAL の合同セッション。NAL と DAL の関係役員が参加<br>1. 近代農業の歴史と農薬の役割<br>2. 農薬産業の歴史と農薬規制       |
|           | N1. | 農薬管理における政府の役割  | 北村         | 歴史的視点からカンボジアの相対的な位置を考慮して、残留農薬分析における NAL の役割について説明できるようになる。  | 1. ASEAN 地域における農薬の使用と管理の概要<br>2. 日本を中心とした諸外国における農薬管理の事例共有<br>3. カンボジアの現状と課題の洗い出し |
|           | N2. | 残留農薬分析 I-1.    | 北村         | ①製剤分析、②QuEChERS 法及び③ JICA プロジェクトが支                          | 1. 処方分析の基本操作・理論の再確認<br>2. 残留農薬分析の基本操作・理論の概説                                      |

| 対象  | ID  | 題名                | 担当者       | 目的                                                                                      | 内容/概要                                                                                                                                                  |
|-----|-----|-------------------|-----------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |     |                   |           | 援する残留農薬分析の違いを説明でき、特に、QuEChERS法に加えて溶媒抽出精製プロセスを用いた残留農薬分析を行う理由を説明できるようになる。                 | 3. QuEChERS法の操作と理論<br>4. 配合分析と残留分析の違いについて説明                                                                                                            |
|     | N3. | 統計の基礎             | 村松        | 検出基準と判定基準に関する基本的な概念を理解することができるようになる。                                                    | 1. 正規分布の復習<br>2. 検出基準と定量基準の復習<br>3. I型、II型過誤などの基本概念の確認                                                                                                 |
|     | N4  | レビューセッション         | 北村/<br>村松 | 第1シリーズの主要な問題を検討し議論する。                                                                   | 1. 講義1で議論された問題解決に、政府のラボがどのように関与できるかを議論する。<br>2. プロジェクトで達成すべき目標を説明し、議論する。<br>3. オンラインセッションを復習                                                           |
| NAL | N5  | 残留農薬分析 I-2. 1.    | 北村        | サンプリングから溶媒抽出までの手順を中心に、残留農薬分析の基本的な手順を理解し、溶媒の性質や極性に関する知識を用いて抽出方法の妥当性を評価できるようになる。          | 1. コーデックスガイドライン等で定められているサンプリング方法<br>2. 残留分析における基本的な手順（サンプリング、ホモジナイズ、サブサンプリング、抽出、濃縮、クリーンアップ）の具体的な説明<br>3. 抽出の各種操作手順<br>4. 溶媒の極性に関する基本事項を確認し、抽出における理論を理解 |
|     | N6  | ラボ管理 1.           | 村松        | 分析結果の妥当性を確保するためのラボ管理に関する基礎知識を習得する。                                                      | 1. 残留分析に使用する試薬のグレード<br>2. 試薬サンプルの適切な保管<br>3. 試薬サンプルの廃棄<br>4. ラボの安全管理                                                                                   |
|     | N7  | 違法農薬とその問題点        | 北村        | 他国の違法農薬の事例を知り、カンボジアにおける違法農薬使用規制の対策を立案し、議論することができるようになる。また、このような政府の取組におけるNALの役割について検討する。 | 1. アジア、アフリカ、ヨーロッパ、南米などにおける違法農薬の取引と使用の事例を紹介<br>2. 違法農薬の取引・使用の問題点と国際機関の取り組みを紹介<br>3. 日本での事例を紹介<br>4. カンボジアの現状と課題について議論                                   |
|     | N8  | 残留農薬分析 I-3.       | 北村        | 残留分析における①濃縮、②クリーンアップ/精製のプロセスに関する基礎知識を習得する。                                              | 宿題についてのディスカッションとプレゼンテーション<br>1. 残留分析の基本操作手順を確認<br>2. 濃縮とクリーンアップの操作手順を発表<br>3. 濃縮とクリーンアップの理論を発表                                                         |
|     | N9  | 残留農薬分析 I-4 & 配合分析 | 北村        | 参加者は、農薬の製剤分析および残留分析における機器/装置の使用に関する基本的な知識を習得する。                                         | 宿題についてのディスカッションとプレゼンテーション<br>1. 残留農薬分析に使用する分析機器<br>2. 製剤分析に使用する分析機器<br>3. 品質管理に重要な農薬製剤の物理化学的特性の測定方法を提示し議論                                              |
|     | N10 | ラボ管理 2.           | 村松        | 分析結果の妥当性を確保するための適切な分析操作に関する基礎知識を習得する。                                                   | 主に以下の問題について議論<br>1. 記録管理の必要性和手順<br>2. SOPの作成<br>3. 技能試験の内容                                                                                             |
|     | N11 | 基本統計              | 村松        | 参加者は、検出基準と定量基準の根拠を理解する。                                                                 | 1. 検出基準と定量基準の定義<br>2. 検出基準と定量基準の理論的説明<br>3. ケーススタディ                                                                                                    |
|     | N12 | 基本統計              | 村松        | 較正の問題点等紹介する。                                                                            | - 較正の基本                                                                                                                                                |
| DAL | D0. | 農薬入門（現代農業と農薬）     | 北村        | 残留農薬分析におけるNALの役割について、歴史的視点からカンボジアの相対的位置を考慮しながら説明できるようになる。                               | NAL/DALの合同セッション<br>NALとDALの関連職員が参加<br>1. 現代農業の簡単な歴史と農薬の役割<br>2. 農薬産業と農薬規制の歴史                                                                           |

| 対象 | ID  | 題名                | 担当者       | 目的                                                                                 | 内容/概要                                                                                                                                      |
|----|-----|-------------------|-----------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|    | D1. | 農薬管理における政府の役割     | 北村        | 参加者は、カンボジアの歴史的視点から相対的な位置を考慮した残留農薬分析におけるDALの役割について説明できるようにする。                       | 1. ASEAN 地域における農薬の使用と管理の概要<br>2. 日本を中心とした諸外国における農薬管理の事例共有<br>3. カンボジアの現状と主な課題の洗い出し<br>4. 特定された問題の解決に規制当局がどのように関与すべきかについて議論                 |
|    | D2. | 違法農薬とその問題点        | 北村        | 他国における違法農薬の事例を知り、カンボジアにおける違法農薬使用を規制するための対策を立案し、議論する。また、政府の取り組みにおけるDALの役割についても検討する。 | 1. アジア、アフリカ、ヨーロッパ、南米などにおける違法農薬の取引と使用の事例を紹介<br>2. 違法農薬の取引・使用の問題点と国際機関の取り組みを紹介<br>3. 日本での事例を紹介<br>4. カンボジアの現状と課題について議論<br>5. プロジェクトの活動について議論 |
|    | D3. | レビューセッション         | 北村/<br>村松 | 今までのセッションにおける主な問題を振り返り、議論する。                                                       | 1. カンボジアにおける農薬販売業者の現在のライセンス制度<br>2. 活動スケジュール<br>3. D1.と D2.のレビューディスカッション                                                                   |
|    | D4  | 小売業許可制度と立入検査の改善I  | 北村/<br>村松 | 参加者は、小売業許可制度や立入検査の問題点について情報を交換し、共通の見解を得る。                                          | - 小売ライセンス制度の改善について電子メールで議論                                                                                                                 |
|    | D5  | 小売業許可制度と立入検査の改善II | 北村/<br>村松 | 以上の問題点を解決するための対策を議論する。                                                             | - 電子メールによる農薬小売業者の立入検査の方法について議論                                                                                                             |

## 2.7.5 現地における活動の実施支援

カンボジア国において他専門家が実施する活動の実施支援を行った。なお、現地における業務では、技術面全体を統括する北村専門家に加え、3名の短期専門家が活動を主導した。

表 2-7 に各専門家の氏名と主な活動内容を示す。なお、表に示した活動内容のうち対象農薬と作物については、以下の 2.7.6 に整理した。

表 2-7 農薬分析専門家と担当業務

|   | 専門家                      | 主な活動内容                          |
|---|--------------------------|---------------------------------|
| 1 | 北村恭朗                     | 青唐辛子中の残留 Azoxystrobin 分析及び製剤分析等 |
| 2 | 篠田隆祥                     | トマト中の残留 Imidacloprid 分析         |
| 3 | Julio Salvador C. Valeza | マンゴー中の Carbofurans 分析           |
| 4 | 大島雄                      | 玄米中の Tricyclazole 分析            |

## 2.7.6 対象作物と有効成分の組合せの残留農薬分析手順策定

対象作物と有効成分の組合せは、カウンターパートと協議の上で、以下 4 つを選定（表 2-8）した。また、各組合せの分析手順を表 2-9 に整理した。

表 2-8 対象作物と有効成分の組合せ

| 組合 | 作物   | 有効成分               |
|----|------|--------------------|
| 1  | トマト  | Imidacloprid (殺虫剤) |
| 2  | 青唐辛子 | Azoxystrobin (殺菌剤) |
| 3  | マンゴー | Carbofurans (殺虫剤)  |
| 4  | 玄米   | Tricyclazole (殺菌剤) |

出典：第 1 回 JCC 会議資料

表 2-9 残留農薬分析手順策定

| 組合 | 組合せ                 | 分析手順                                                                                                                                                            |
|----|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Imidacloprid (トマト)  | <ul style="list-style-type: none"> <li>✓ アセトニトリルで抽出、珪藻土上に添加し、ヘキサン及びエチルアセテートで溶出させ夾雑物を除去の後、シリカゲルカラムとフロリジルカラムでクリーンアップ操作</li> <li>✓ 紫外線検出器付き HPLC で定量</li> </ul>    |
| 2  | Azoxystrobin (青唐辛子) | <ul style="list-style-type: none"> <li>✓ アセトンに溶解させアンモニウムクロライドとリン酸で凝集させ不純物を除去、ガラス繊維ろ過の後に C-18 カートリッジカラムとフロリジルカラムでクリーンアップ</li> <li>✓ 紫外線検出器付き HPLC で定量</li> </ul> |
| 3  | Carbofurans (マンゴー)  | <ul style="list-style-type: none"> <li>✓ アセトニトリルで抽出、C-18 カートリッジカラムとフロリジルカラムでクリーンアップ</li> <li>✓ アルカリ熱イオン化検出器 (FTD) 付ガスクロマトグラフで定量</li> </ul>                      |
| 4  | Tricyclazole (玄米)   | <ul style="list-style-type: none"> <li>✓ サポート型液体抽出法で抽出後、シリカゲルミニカラムでクリーンアップ</li> <li>✓ アルカリ熱イオン化検出器 (FTD) 付ガスクロマトグラフで定量</li> </ul>                               |
| 5  | QuEChERS method     | <ul style="list-style-type: none"> <li>✓ サンプルの均一化処理の後、QuEChERS キットを利用して抽出・精製</li> <li>✓ アルカリ熱イオン化検出器 (FTD) 付ガスクロマトグラフで定量</li> </ul>                             |

## 2.7.7 残留農薬を分析する NAL 技術者のために OJT 実施

各専門家が、残留農薬の分析の実施にあたり、円滑に作業が進むよう必要な支援をおこなった。

## 2.7.8 残留農薬分析の情報交換ワークショップ

残留農薬分析の情報交換ワークショップを 2023 年 10 月 11 日に開催した。当初は、農林水産省に属する他の食品分析ラボを対象と想定していたが、カウンターパートと協議の上、事業成果を早期に政策へ反映することができるようにすること、また、継続的な技術向上が実現できるよう本ワークショップの目的を以下の通りとした。

- 残留農薬分析に焦点を当てたプロジェクト情報を GDA 内の関連利害関係者に広め、残留農薬に関する NAL の分析サービスが他の部門で可能な限り早い時期に政策策定と介入に利用されるようにする。

本協議に基づき参集範囲を、主に農業総局の関連部署職員と大学関係者とした。

プロジェクトのカウンターパートから以下 4 題についてプレゼンテーションを行った。ワークショップ参加者は表 2-10 の通り。

1. トマト中の Imidacloprid の残留分析
2. グリーンチリペッパー中の Azoxystrobin の残留分析
3. マンゴー中の Carbofuran の残留分析
4. 玄米中の Tricyclazole の残留分析

表 2-10 技術ワークショップ参加者

| No | 氏名                 | 役職                      | 所属                                 |
|----|--------------------|-------------------------|------------------------------------|
| 1  | Sameang Keomnonine | Deputy Director General | General Directorate of Agriculture |
| 2  | Kang Sareth        | Chief Office            | General Directorate of Agriculture |

| No | 氏名                 | 役職                   | 所属                                                        |
|----|--------------------|----------------------|-----------------------------------------------------------|
| 3  | Chy Tann           | Officer              | General Directorate of Agriculture                        |
| 4  | Choem Channa       | Officer              | General Directorate of Agriculture                        |
| 5  | Chhim Vannara      | Officer              | General Directorate of Agriculture                        |
| 6  | Phiv Chintheng     | Deputy Director      | National Agricultural Laboratory                          |
| 7  | Lorn Socheata      | Chief of Office      | National Agricultural Laboratory                          |
| 8  | Neau Chanmonny     | Vice-Chief of Office | National Agricultural Laboratory                          |
| 9  | Thao Seakly        | Vice-Chief of Office | National Agricultural Laboratory                          |
| 10 | Keo Sotheary       | Vice-Chief of Office | National Agricultural Laboratory                          |
| 11 | Khoun Kanha        | Officer              | National Agricultural Laboratory                          |
| 12 | Nguon Nirdey       | Officer              | National Agricultural Laboratory                          |
| 13 | Yout Chakriya      | Officer              | National Agricultural Laboratory                          |
| 14 | Leang Sina         | Officer              | National Agricultural Laboratory                          |
| 15 | Pen Vuthy          | Director             | Department of Agricultural Legislation                    |
| 16 | Lim Bolin          | Deputy Director      | Department of Agricultural Legislation                    |
| 17 | Thong Soklim       | Vice-Chief of Office | Department of Agricultural Legislation                    |
| 18 | Vinin Marineth     | Vice-Chief of Office | Department of Agricultural Legislation                    |
| 19 | Srun Sopheak       | Officer              | Department of Agricultural Legislation                    |
| 20 | Horng Kimchhay     | Officer              | Department of Agricultural Legislation                    |
| 21 | Em Pisey           | Officer              | Department of Agricultural Legislation                    |
| 22 | Meng Socheat       | Officer              | Plant Protection, Sanitary and Phyto Sanitary Department  |
| 23 | Chou Sovichea      | Deputy Director      | Plant Protection, Sanitary and Phyto Sanitary Department  |
| 24 | Heng Chhunhy       | Deputy Director      | Plant Protection, Sanitary and Phyto Sanitary Department  |
| 25 | Pen Monyvoth       | Vice-Chief of Office | Plant Protection, Sanitary and Phyto Sanitary Department  |
| 26 | Hong Chanvibol     | Vice-Chief of Office | Plant Protection, Sanitary and Phyto Sanitary Department  |
| 27 | No Sophearoth      | Vice-Chief of Office | Plant Protection, Sanitary and Phyto Sanitary Department  |
| 28 | Chou Sophal        | Deputy Director      | Department of Horticulture and Subsidiary Crops           |
| 29 | Kong Kea           | Director             | Department of Rice Crop                                   |
| 30 | Lun Vanny          | Deputy Director      | Department of International Cooperation                   |
| 31 | Chem Mouylin       | Lecturer             | Faculty of Agro-industry, Royal University of Agriculture |
| 32 | Ek Pichmony        | Lecturer/Researcher  | Institute of Technology of Cambodia                       |
| 33 | Choub Vireak       | Researcher           | Royal University of Agriculture                           |
| 34 | Torng Socheat      | Deputy Director      | Royal University of Agriculture                           |
| 35 | Soum Veasna        | Lecturer             | Royal University of Phnom Penh                            |
| 36 | Sao Vibol          | Lecturer             | Royal University of Phnom Penh                            |
| 37 | Hong Phoma         | Assistant            | JICA/PPRAP                                                |
| 38 | Sakamoto Chizu     | Project Coordinator  | JICA/PPRAP                                                |
| 39 | Ohshima Yu         | Expert               | JICA/PPRAP                                                |
| 40 | Yasuhiko Muramatsu | Chief Advisor        | JICA/PPRAP                                                |
| 41 | Yasuo Kitamura     | Expert               | JICA/PPRAP                                                |
| 42 | Toyama Haruko      | Senior PO            | JICA Cambodia                                             |
| 43 | Chan Sokunthea     | Program Officer      | JICA Cambodia                                             |
| 44 | York Panha         | Interpreter          | First Class                                               |

## 2.7.9 分析機材の運用及び維持管理強化

NAL における農薬の残留分析に利用する機材の維持管理が適切に行われるよう標準作業手順書 (SOP) を作成した。それらを表 2-11 に整理した。

表 2-11 NAL の分析機器の標準作業手順書

| No | 機器名称                       | Description                                               |
|----|----------------------------|-----------------------------------------------------------|
| 1  | 遠心分離機                      | - 操作モード (使用説明書、検証手順) および装置の維持管理を含む遠心分離機の操作手順              |
| 2  | ロータリーエバポレーター               | - ロータリーエバポレーターの操作手順 (操作モード (使用説明書、検証手順) および機器の維持管理を含む)    |
| 3  | シェーカー                      | - 動作モード (使用説明書、検証手順) および装置のメンテナンスを含むシェーカーの操作手順            |
| 4  | 化学天秤(Sartorius)            | - 天びんザルトイウスの操作手順 (操作モード (使用説明書、検証手順) および機器のメンテナンスを含む)     |
| 5  | 化学天秤<br>(Balance XB42000C) | - 天びん XB42000C の操作手順 (操作モード (使用説明書、検証手順) および機器のメンテナンスを含む) |
| 6  | LC/MS                      | - LC/MS のシステム全体の電源管理                                      |

| No | 機器名称           | Description                                                                                                                                                                                                             |
|----|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                | <ul style="list-style-type: none"> <li>- 単回注入の方法</li> <li>- 連続注入の方法</li> <li>- 日常的維持管理</li> </ul>                                                                                                                       |
| 7  | GC/ECD/FTD/FPD | <ul style="list-style-type: none"> <li>- GC/ECD/FTD/FPD のシステム全体の電源管理</li> <li>- 単回注入の方法</li> <li>- 連続注入の方法</li> <li>- FPD 検出器のフィルターの交換方法</li> <li>- 検出器の切り替え手順</li> <li>- ガラスインサートの交換方法</li> <li>- 日常のメンテナンス</li> </ul> |

#### 2.7.10 農薬資材店への立入検査および違法農薬収集の仕組み改善

販売店の検査を実施する際の DAL と PDAFF の役割を定義し、PDAFF に対しては、州政府から活動実施のための予算を獲得することを求める方針とした。これにより DAL への業務集中を避け、効率的な立入検査実施を実現することが可能となる。本方針は、以下に述べる立入検査に関するマニュアルに反映した。

#### 2.7.11 農薬販売店への立入検査に関するマニュアル改訂

農薬販売店の現場検査マニュアルは、DAL の職員が中心になって、2023 年の第 2 四半期初めまでにドラフトを完成した。

マニュアルの内容について、JICA チームと協議し、一部修正を経て、2023 年 4 月末までに、地方事務所に配布できるほどに内容は十分と判断された。そのため DAL と JICA チームは以下を計画した。

1. 2023 年 6 月上旬までにマニュアルを正式承認
2. 2023 年 6 月中旬までに普及ワークショップに使用するマニュアル（200 部）を製本
3. 2023 年 8 月 8 日、15 日、22 日：全国 3 拠点で普及ワークショップを開催

但し、2023 年総選挙後の 8 月に DAL の組織改編が明らかになり、9 月には、農薬の登録及び立ち入り調査などの業務は、GDA の PPAPSD に移管されることとなった。

#### 2.7.12 DAL が実施する州農業局の検査員向けの研修を強化

上記の通り、立入検査マニュアルは、業務期間中に完成せず、研修の開催は見送ることを決定した。

#### 2.7.13 農薬の品質分析制度改善

DAL が収集した農薬及び生産者の要望により農業総局（以下「GDA」）が収集した農薬の品質分析制度を改善する。プロジェクト活動として二つの有効成分の農薬製剤分析の能力向上を支援した。

##### ①グリホサートを含む製剤分析

現状、NAL はグリホサートを HPLC で検出することはできるが、HPLC での分離条件が最適化されておらず測定精度に問題を抱えていた。そこで、グリホサートが水溶液中で両性イオン（pH により異なるイオン種として存在すること）となることから、分離カラムに陰イオン交換カラムを使用し、リン酸緩衝液の濃度、pH、有機溶媒量を変えて最適な分離条件を検討した。その結果、良好なピークが得

られる条件を確立することができた。

## ②エスフェンバレレートを含む製剤分析

エスフェンバレレートは、合成ピレスロイド殺虫剤であるフェンバレレートを構成している4つの異性体のうちSS体と言われる特定の鏡像異性体のことである。有効成分フェンバレレートは4つの異性体の混合物（ラセミ体）であるが、その中のSS体と言われる異性体が殺虫活性の主成分であることが判明した。製造技術が向上しSS体のみの製造ができるようになった。その結果、SS体の新規化合物として特許が認められ、フェンバレレートとは別の有効成分として農薬登録されている。この技術はキラルスイッチとして知られ、医薬品や農薬の開発で応用されている。鏡像異性体は通常の手法では分離が困難であり、NALでは今まで取り組んだことがなかった。そのため、本プロジェクト活動で取り組む対象有効成分としたところ、NALが保有しているHPLCで分析の実技研修を実施する予定であったが、NALが保有しているHPLCは1台のみで、そのHPLCも経年劣化で通常の使用中に移動相のリークが生じることがあった。エスフェンバレレートを他の3つのフェンバレレートの異性体と分離するためにはHPLCを順送モード（非極性溶媒を移動相とすること。エスフェンバレレートの分析ではヘキサン、1,2ジクロロエタン、エタノールの混合液を使用）として使う必要がある。NALのHPLCは逆相モード（移動相が水＋極性溶媒）で使用しているため、順相モードから逆相モードへの切り替えが必要となる。この順相から逆相への切り替えには、極性溶媒と非極性溶媒の両方に溶解するイソプロピルアルコール等を使用する必要があるが、イソプロピルアルコールは粘性が高くHPLC内部の圧力が非常に大きくなってしまう。NALのHPLCでモードの交換を実施すると内部圧力の高まりにより送液ポンプや配管のトラブルが発生することが懸念された。また、今まで逆相モードのみで使用してきているため、内部配管に非極性溶媒への耐性がない素材が使用されている可能性も指摘された。そのため、今回の研修ではエスフェンバレレートを有効成分とした分析方法については座学のみを実施することとした。

## 2.7.14 第3国研修の実施

第3国研修の渡航先はフィリピンを選定した。理由は以下の通り。

- 総括が、2022年にフィリピン国を訪問した際に、農林水産省のBureau of Plant Industryの分析研究所を訪問し、機材の維持管理状況等について聞き取りを行う機会があった。予算は必ずしも豊富に配分されているとは言えないが、機材の維持を確実に実施する等、カンボジア国に参考になる点が多々あると判断された。そのためカンボジアへの適用の可能性がより高いと考え、フィリピン国を選定した。

訪問先は、政府機関としては農林水産省の関連部門と民間ラボ等を組み合わせることとした。表2-12に訪問先と農薬管理における役割等を整理した。

表 2-12 第3国研修の訪問先

| 訪問先  |                                | 役割                                                                                                                            | 訪問した部室                                 |
|------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 政府機関 | Bureau of Plant Industry (BPI) | 「2013年食品安全法」により、BPIは農務省管轄の食品安全規制機関と位置づけ。BPI植物製品安全サービス部門（PPSSD）は、食品サプライチェーンの一次生産から収穫後処理に至るまで、生鮮および最小限に加工された植物性食品の食品安全に関する責務あり。 | Office of the Chief                    |
|      |                                |                                                                                                                               | Accreditation and Inspection Section   |
|      |                                |                                                                                                                               | Pesticide Analytical Laboratory (PALS) |
|      |                                |                                                                                                                               | Contaminants Laboratory Section        |
|      |                                |                                                                                                                               | Office of the Executive Director       |

| 訪問先  |                                                    | 役割                                                                    | 訪問した部室                          |
|------|----------------------------------------------------|-----------------------------------------------------------------------|---------------------------------|
|      | Fertilizer and Pesticide Authority (FPA)           | 農薬業者のライセンス付与、輸入管理、製品の品質と安全性の遵守、製品管理プログラムの制度化、肥料製品の登録、農薬製品の登録、広報と開発を担当 | Laboratory Service Division     |
|      |                                                    |                                                                       | Pesticides Regulations Division |
|      |                                                    |                                                                       | Fertilizer Regulation Division  |
|      | Bureau of Agriculture and Fishery Standards (BAFS) | フィリピンの農水産物の食品の安全性、品質、労働者の健康と福祉、環境管理、国際競争力を確保するための基準を開発し、推進            | Director                        |
|      |                                                    |                                                                       | Standard Development Division   |
|      |                                                    |                                                                       | Technical Service Division      |
|      |                                                    |                                                                       | Laboratory Service Division     |
|      |                                                    |                                                                       | Organic Agriculture Division    |
| 民間機関 | Crop life Philippines Inc.                         | 民間の農薬工業会                                                              | 適用なし                            |
|      | JEFCOR Laboratories Inc. – Cavite                  | 民間の ISO/IEC17025 認定ラボで農薬の残留分析等で経験豊富。フィリピンのパイオニア的存在                    | 適用なし                            |

研修実施時期は、新型コロナウイルス感染症が収束し、2023 年のカンボジア国民議会選挙が終了した 8 月とした。訪問先などを以下の表 2-13 に整理した。

表 2-13 第 3 国研修の日程

| 日付       | 訪問先                                                                                      |
|----------|------------------------------------------------------------------------------------------|
| 8 月 14 日 | JICA 表敬訪問の後、Crop life Philippines Inc.（農薬工業会）及び JEFCOR Laboratories Inc.（ISO 取得の民間ラボ）を訪問 |
| 8 月 15 日 | Fertilizer and Pesticide Authority (FPA) を訪問                                             |
| 8 月 16 日 | Bureau of Agriculture and Fishery Standards (BAFS) を訪問                                   |
| 8 月 17 日 | Bureau of Plant Industry (BPI) を訪問                                                       |
| 8 月 18 日 | 報告書作成                                                                                    |

研修参加者を表 2-14 に整理した。この表には、カウンターパートの氏名のみ掲載したが、引率として総括が参加し、他に通訳 1 名、プロジェクトコーディネーターが参加した。

なお、研修実施に先立ちフィリピン国農業省とは、2023 年 4 月から調整を開始し、上級次官である DOMINGO F. PANGANIBAN 氏に連絡を入れた後に各研究所（BPI, FPA, BAFS）と調整をするよう指示を得た。その結果、各機関とも非常に協力的に研修準備から研修当日まで対応頂くことができたことを付記する。

表 2-14 第 3 国研修の参加者

| 参加者 | 参加者氏名            | 所属     |
|-----|------------------|--------|
| 1   | SAMENG Keomonine | GDA    |
| 2   | LORN Socheata    | NAL    |
| 3   | KHOUN Kanha      | NAL    |
| 4   | THAO Seaklay     | NAL    |
| 5   | NEAU Chanmonny   | NAL    |
| 6   | LEANG Sina       | NAL    |
| 7   | CHOU Sovichea    | PPSPSD |
| 8   | PEN Mony Voth    | PPSPSD |
| 9   | NO Sophearoth    | PPSPSD |
| 10  | CHOEM Channa     | PPSPSD |
| 11  | HUOT Ponleu      | PPSPSD |

## 2.7.15 習熟度評価

2023 年 9 月から 10 月にかけて NAL の職員に対して、SNS を利用したアンケート調査を実施した。その結果を以下に整理する。総じて、成果 1 の NAL に対する残留農薬分析に関わる能力開発活動は、他ドナーのプロジェクトによる支援もあり、NAL の技術レベルは、当初の想定を超える状況となったと評価できる。しかし、成果 2 の立入検査に関わる能力は、プロジェクトの最終段階で、大きな組織改

編があったため当初目標を達成することはできなかった。

## (1) 成果 1 の NAL の残留農薬分析に関わる事項

習熟度評価では、残留農薬の分析に必要な代表的な基礎知識 3 つを選定し、NAL の農薬分析を担当する職員に、それらについて説明できる程度にまで理解しているかを問いた。その結果、職員の 80%以上（表 2-15）がこれら基礎知識を習得していると判断された。

表 2-15 習熟度評価（基礎知識）

|   | 残留農薬分析に必要な基礎知識     | 回答者のうち理解し説明できる者の割合 |
|---|--------------------|--------------------|
| 1 | オクタノール-水分配係数       | 88%                |
| 2 | pKa                | 88%                |
| 3 | SPE、SLE、LLE について説明 | 100%               |

- オクタノール-水分配係数とは、薬剤の親水性（水に溶けやすさ）あるいは疎水性（油に溶けやすさ）の指標・比率で、作物から農薬を抽出する際に使う有機溶媒の選択において必要な知識となる。職員の 8 割以上が説明することができるほどに理解を示し、この知識を利用して、今回、実際に分析実務研修を行った 4 つの組合せ以外の農薬についても分析方法を検討することが可能になると期待される。
- pKa は、酸の強さを定量的に表す酸解離定数を指し、HPLC の移動相の調整、溶液中の化学成分の挙動を理解するために必要な基礎知識である。職員の 8 割以上が pKa について理解し、説明することが可能となった。今回、実際に分析実務研修を行った 4 つの組合せ以外の農薬についても分析方法を検討することが可能になると期待される。
- 試料から農薬を抽出する際に利用される代表的な 3 つの技術（SPE：固相抽出法、SLE：サポート型液体抽出法、LLE：液-液抽出法）について、全員が理解して説明できるようになった。これら農薬の抽出方法は、他の薬剤・作物にも適用が可能と期待される。

本業務では、4 つの農薬と作物の組合せについて、分析操作に関わる研修を行い 8 割以上の回答者が十分な理解を得ることができた。

表 2-16 習熟度評価（分析方法）

| ID | 組合せ                               | 回答者のうち理解し説明できる者の割合 |
|----|-----------------------------------|--------------------|
| 1  | Imidacloprid (Tomato)             | 100 %              |
| 2  | Azoxystrobin (Green Chili Pepper) | 100 %              |
| 3  | Carbofurans (Mango)               | 87.5 %             |
| 4  | Tricyclazole (Brown Rice)         | 100%               |

ガスクロマトグラフ(GC)、高速液体クロマトグラフ(HPLC)について、検出の基礎現地及び維持管理について評価を行った。なお、機器分析の利用にあたっては、NAL 職員は、それぞれ担当者を配置していることから、各機器の担当者を対象に聞き取りを行った。その結果は以下のように整理できる。

主な検出器の原理について、各機材の担当者は以下を説明できるほどに理解が深まった。

- GC の炎イオン化検出器 (FID) の原理
- GC の炎光光度検出器 (FPD) の原理
- GC の窒素・リン検出器(NPD)の原理
- HPLC の紫外線検出器 (UV) の原理
- HPLC の蛍光検出器の原理

また、GC の担当者は運用・保守に関わり、以下の問題が生じた際の対策を知っている。

- ガス流量が低いときの対策
- 汚染が疑われるときの対策
- クロマトグラムのピークが分割している時の対策

## (2) 成果 2 の DAL の立入検査に関わる事項

2023 年 4 月までに、立入検査マニュアルはドラフトが仕上がった。しかし、2023 年の総選挙後の組織改編で、前述の通り、DAL の農薬登録と立入検査に関わる機能は、PPSPSD に移管され、普及のためのワークショップ等を開催できなかった。また、組織改編に伴い関連 Prakas を改定する必要があり、それら完了後に立入検査マニュアルの見直しも必要となる。

## 2.8 国内作業期間

各現地業務終了後、現地業務で収集分析した情報を整理し、次期現地業務の準備を行った。

添付資料



## 添付資料 1

プロジェクトデザインマトリックス  
(初版)



## Project Design Matrix

Version 0

Date: 23rd September, 2019

**Project Title:** Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce

**Implementing Agency:** National Agriculture Laboratory (NAL), Department of Agricultural Legislation (DAL)

**Period of Project:** June 2020 to June of 2022 (Tentative)

**Project Site: Phnom Penh**

**Pilot Site:** To be considered

**Direct Beneficiary:**

Output 1: Staff of NAL

Output 2: Staff of NAL, DAL and Provincial Department of Agriculture, Forestry and Fisheries (PDAFF)

| Narrative Summary                                                                                                                                                    | Objectively Verifiable Indicators                                                                                                                                                                                                                                                                                                                                                                                            | Means of Verification                                                                                                          | Important Assumption                                                              |                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Overall Goal                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                |                                                                                   |                                                                    |
| Pesticide residue laboratory can validate new pesticide residue analysis method by themselves and capability obtained is integrated into pesticide regulation system | To be determined                                                                                                                                                                                                                                                                                                                                                                                                             | - GDA official reports<br>- DAL official reports<br>- Other relevant reports by public and private sector                      | - Mandate of NAL/ DAL in pesticide regulation system does not change drastically. |                                                                    |
| Project Purpose                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                |                                                                                   |                                                                    |
| Basic capacity of pesticide residue laboratory is improved and appropriate pesticide management is strengthened                                                      | To be determined                                                                                                                                                                                                                                                                                                                                                                                                             | - GDA official reports<br>- DAL official reports<br>- Other relevant reports by public and private sector<br>- Project reports | - Mandate of NAL/ DAL in pesticide regulation system does not change drastically. |                                                                    |
| Outputs                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                |                                                                                   |                                                                    |
| 1. Capability of residue analysis for selected combinations of pesticide and crop is obtained                                                                        | 1-1-1. XX% of counterpart personnel acquire basic knowledge on analytical chemistry for pesticide residue analysis<br>1-1-2. XX% of counterpart personnel acquire basic theory of analytical equipment<br>1-2-1. Analytical methods for 4 combinations of crop and active ingredient are validated<br>1-2-2. Standard Operating Procedures (SOPs) required for validation of pesticide residue analysis method are developed | - Monitoring sheets/Project reports<br>- Evaluation method developed by the Project                                            |                                                                                   |                                                                    |
| 2. Capability of on-site inspection for pesticide retailer and pesticide quality monitoring is improved                                                              | 2-1. Manual for on-site inspection of pesticide retailer is developed<br>2-2. XX% of on-site inspection follow developed manual in pilot site<br>2-3. Formulation analysis methods are validated for 5 active ingredients which NAL could not analyze due to technical difficulties                                                                                                                                          | - Monitoring sheets/Project reports<br>- Observation done by Japanese experts<br>- Questionnaire<br>- Monitoring sheet         |                                                                                   |                                                                    |
| Activities                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                              | Inputs                                                                                                                         |                                                                                   |                                                                    |
| 0. Conduct survey on pesticide usage by farmer at field by GDA and sales in pilot site by DAL                                                                        | [Japanese side]<br><br>(1) Dispatch of Experts Long term<br>- Chief advisor/                                                                                                                                                                                                                                                                                                                                                 | [The Cambodia side]<br><br>(1) Assignment of C/P<br>•Project Director                                                          |                                                                                   | - Priorities and budget allocation for pesticide management is not |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                 |                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-1. Confirm capacity of NAL analyst for operation of existing equipment<br>1-2. Facilitate laboratory upgrading for pesticide residue analysis (*1)<br>1-3. Carry out On-the-Job Training for NAL analyst to analyze pesticide residue<br>1-4. Develop procedures for pesticide residue analysis in selected combinations of crop and active ingredient<br>1-5. Conduct technical workshop to exchange knowledge on pesticide residue analysis among analytical laboratories<br>1-6. Strengthen operation and maintenance skill of equipment            | Coordinator<br>Short term<br>- Pesticide Residue Analysis<br>- Pesticide Regulation<br>- Pesticide Formulation Analysis (as required)<br><br>(2) Provision of equipment/consumable<br>- Basic experimental apparatus for pesticide residue and formulation analysis<br>- Other relevant equipment and chemicals (as necessary for project activities)<br><br>(3) Training in Japan / Third Country<br>- Training for pesticide residue analysis/ pesticide regulation<br>- Other training program(s) (as necessary) | •Project Manager<br>•Counterpart personnel<br><br>(2) Facilities<br>•Office space and furniture<br>•Electricity, water, telephone/communication | changed negatively.<br>- Majority of counterparts are not transferred.<br>- Number of counterparts is not decreased.<br><br><u><b>Pre-Condition</b></u><br><br>The laboratory for pesticide residue analysis is prepared. |
| 2-4. Review and revise current manuals and guidelines of pesticide on-site inspection<br>2-5. DAL conducts training for PDAFF inspectors<br>2-6. Conduct on-site inspection and collect suspicious pesticide for the proper implementation of relevant regulation/ guidance for pesticide retailer<br>2-7. Confirm quality of pesticide collected in pilot site by DAL through formulation analysis by NAL<br>2-8. Conduct pesticide formulation analysis by NAL for suspicious pesticide collected by GDA upon request/information from farmer at field |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                 |                                                                                                                                                                                                                           |

\*1 Actual implementation of laboratory upgrading will be conducted through collaboration with Agriculture Value Chain Infrastructure Improvement Project (AVIP) by ADB project No.50264.

## 添付資料 2

プロジェクトデザインマトリックス  
(改訂版)



## Project Design Matrix

Version 2.0  
Date: 5<sup>th</sup> July 2022

**Project Title:** Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce (PPRAP)

**Implementing Agency:** National Agriculture Laboratory (NAL), Department of Agricultural Legislation (DAL)

**Period of Project:** November 2020 to November 2023

**Project Site: Phnom Penh**

**Pilot Site:** Phnom Penh, Provinces in the border with Thailand and Vietnam, Provinces close to Tonle Sap.

**Direct Beneficiary:** NAL for Output 1, NAL and DAL for Output 2 and relevant departments under General Secretariat of MAFF and General Directorate of Agriculture

| Narrative Summary                                                                                               | Objectively Verifiable Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Means of Verification                                                                                                                                                                              | Important Assumption                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overall Goal</b>                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Enhanced capacity is utilized for consistent and effective intervention by MAFF for proper pesticide management | <ol style="list-style-type: none"> <li>1. Pesticide residue analytical methods for combination of active ingredient on crops are validated.</li> <li>2. The data on pesticides residue in crops are used for improving appropriate pesticide use including such as pesticide application standard and guideline.</li> </ol>                                                                                                                                                                      | <ul style="list-style-type: none"> <li>- GDA official reports</li> <li>- DAL official reports</li> <li>- Other relevant reports by public and private sector</li> </ul>                            | - Mandate of NAL/ DAL in pesticide regulation system does not change drastically.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Project Purpose</b>                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Capacity to enhance compliance with pesticide regulatory requirements strengthened.                             | <ol style="list-style-type: none"> <li>1. NAL is capable of providing pesticides residue information for selected crops and active ingredients.</li> <li>2. Provincial officers acquire better information on the pesticide on-site inspection.</li> </ol>                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>- GDA official reports</li> <li>- DAL official reports</li> <li>- Other relevant reports by public and private sector</li> <li>- Project reports</li> </ul> | <ul style="list-style-type: none"> <li>- Mandate of NAL/ DAL in pesticide regulation system does not change drastically.</li> <li>- The following donor funded projects are implemented generally in line with the present designs unchanged.                             <ol style="list-style-type: none"> <li>1. Cambodia Agricultural Sector Diversification Project (WB)</li> <li>2. The Agricultural Value Chain Competitiveness and Safety Enhancement Project (ADB)</li> </ol> </li> </ul> |
| <b>Outputs</b>                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. Capability of pesticide residue analysis for selected combinations of pesticide on crops are obtained        | <ol style="list-style-type: none"> <li>1-1-1. 80 % of counterpart personnel acquire basic knowledge on analytical chemistry for pesticide residue analysis</li> <li>1-1-2. 80 % of counterpart personnel acquire basic theory of analytical equipment</li> <li>1-2-1. Analytical methods for combinations of active ingredient on crops are validated</li> <li>1-2-2. Standard Operating Procedures (SOPs) required for validation of pesticide residue analysis method are developed</li> </ol> | <ul style="list-style-type: none"> <li>- Monitoring sheets/Project reports</li> <li>- Evaluation method developed by the Project</li> </ul>                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. Capacity in pesticide regulatory compliance and enforcement enhanced                                         | <ol style="list-style-type: none"> <li>2-1. Manual for on-site inspection of pesticide retailer is developed</li> <li>2-2. 60 % of provincial inspector understand the developed manual.</li> <li>2-3. Formulation analysis methods are validated for 2 active ingredients which NAL could not analyze due to technical difficulties</li> </ol>                                                                                                                                                  | <ul style="list-style-type: none"> <li>- Monitoring sheets/Project reports</li> <li>- Observation done by Japanese</li> <li>- Questionnaire</li> <li>- Monitoring sheet</li> </ul>                 | The following donor funded project is implemented in a concerted manner on the matters related to the pesticides management. Cambodia-Australia Agricultural Value Chain Program (CAVAC)                                                                                                                                                                                                                                                                                                           |
| <b>Activities</b>                                                                                               | <b>Inputs</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                      |                                                                                                                                                                                                                       |                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0. Conduct survey on pesticide usage by farmer at field by GDA and sales in pilot site by DAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | [Japanese side]<br>(1) Dispatch of Experts<br>Long term<br>- Chief advisor/<br>Coordinator<br>Short term<br>- Pesticide Residue Analysis<br>- Pesticide Regulation<br>- Pesticide Formulation Analysis (as required) | [The Cambodia side]<br>(3) Assignment of C/P<br>- Project Director<br>- Project Manager<br>- Counterpart personnel<br>(4) Facilities<br>- Office space and furniture<br>- Electricity, water, telephone/communication | - Priorities and budget allocation for pesticide management is not changed negatively.<br>- Majority of counterparts are not transferred.<br>- Number of counterparts is not decreased. |
| 1-7. Confirm capacity of NAL analyst for operation of existing equipment<br>1-8. Facilitate laboratory upgrading for pesticide residue analysis <sup>1</sup><br>1-9. Carry out On-the-Job Training for NAL analyst to analyze pesticide residue<br><del>1-10.</del> Develop procedures for pesticide residue analysis in selected combinations of active ingredient on crops<br>1-11. Conduct technical workshop to exchange knowledge on pesticide residue analysis among analytical laboratories<br>1-12. Strengthen operation and maintenance skill of equipment<br>1-13. Oversea training/study tour on pesticide residue analysis | (2) Provision of equipment/consumable<br>- Basic experimental apparatus for pesticide residue and formulation analysis<br>- Other relevant equipment and chemicals (as necessary for project activities)             |                                                                                                                                                                                                                       | <b><u>Pre-Condition</u></b><br><br>The laboratory for pesticide residue analysis is prepared.                                                                                           |
| 2-9. Design approach for information management and dissemination of manuals and guidelines <sup>3</sup><br>2-10. Conduct joint on-site inspection and collect suspicious pesticide for the proper implementation of relevant regulation/guidance for pesticide retailers<br>2-11. Confirm quality of pesticide collected in pilot site by DAL through analysis (A.I. & Physical) by NAL<br>2-12. Conduct new 2 A.I. validated methods of pesticide formulation by NAL<br>2-6. Conduct pesticide formulation analysis by NAL for suspicious pesticide collected by GDA upon request/information from farmer at field                   | (3) Training in Japan / Third Country<br>- Training for pesticide residue analysis/ pesticide regulation<br>- Other training program(s) (as necessary)                                                               |                                                                                                                                                                                                                       |                                                                                                                                                                                         |

1 Actual implementation of laboratory upgrading will be conducted through collaboration with Agriculture Value Chain Infrastructure Improvement Project (AVIP) by ADB project No.50264.

2: FAMIC stands for Food and Agricultural Materials Inspection Centre. It is a government au

添付資料 3

合同調整委員会議事録





MINUTES OF THE FIRST JOINT COORDINATION COMMITTEE MEETING  
ON  
PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN  
AGRICULTURAL PRODUCE

The Joint Coordination Committee (JCC) of the Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce (PPRAP) was convened on February 23<sup>rd</sup>, 2022 from 8:00 A.M. to 12:15 P.M. (Cambodia Standard Time). The meeting was held in a hybrid manner at Hotel Cambodiana linked with the video conference platform to minimize the risk of the COVID-19 infection. The agenda of the meeting is attached to this minutes as Annex 1. The list of attendance is also attached as Annex 2.

The meeting was commenced by the online welcome remarks of H.E. Lor Reaksmey, the Under Secretary of States in charge of Department of Agricultural Legislation (DAL), Ministry of Agriculture Forestry and Fisheries(MAFF); and Ms. Kamei Haruko, the Chief Representative of JICA Cambodia Office. H.E. Chan Phalloeun, Under Secretary of State of MAFF and the chair of this meeting, then formally opened the meeting with her opening remark. The participants agreed to make these Minutes of Meeting in order to confirm the mutual understanding reached through the discussions during the meeting.

H.E. Lor Reaksmey warmly welcomed all participants of the JCC meeting. He initially shared the challenges during the pandemic by mentioning how the government put a lot of efforts into combatting the virus. He then emphasized that public-private partnership would be an indispensable mechanism to alleviate financial difficulties during and post-pandemic era. He further suggested that the organization of this event should, in response to the approach of the public, private, development partners and the community, contribute to increasing the potential for agricultural trade diversification in Cambodia, as set out in the Rectangular Strategy, Phase 4 of the Royal Government, the 6<sup>th</sup> Legislature of the National Assembly. His remark traced back to 1996 when JICA supported the Ministry in building the human resources in agriculture in Cambodia; and mentioned the development efforts in forestry and aquaculture sectors; and the construction of the Marine Aquaculture Research Institute in Sihanoukville in 2012.

Ms. Kamei Haruko expressed her appreciation for everyone's active engagement and contributions to the project; and for organizing this first JCC meeting. She recalled how JICA has been supporting the Royal Government of Cambodia in its efforts for the proper usage and quality control of fertilizers and pesticides, through the previous technical cooperation called QCAM project, "Project for Capacity Building for Quality Standard Control of Agricultural Materials (Chemical Fertilizers and Pesticides)" from 2009 to 2012. In this project, JICA and MAFF worked on the development of the regulatory system and the improvement of the laboratory capacity. In order to further build on the outcomes of the QCAM project, PPRAP commenced its activities in November 2020, based on the agreement between JICA and MAFF. She pointed out that some activities of this project were forced to be suspended due to the unprecedented outbreak of the COVID-19 pandemic. However, she appreciates the strong efforts and cooperation of the Cambodian government represented by the National Agriculture Laboratory (NAL) and the Department of Agricultural Legislation (DAL) with the assistance of the Japanese experts; and underlined that the project activities have made progress in alternative ways. Thus a series of training and discussions by both offline and online between Cambodia and Japan have been happening. She is pleased to confirm that some progress has been made in strengthening the capacity for pesticide residue analysis and enhancing compliance with pesticide regulatory requirements.



H.E. Chan Phalloeun emphasized, in her opening remark, that the agricultural sector plays an essential role in national economic growth, ensuring food security, promoting rural economic development, and improving people's living standards by increasing productivity and diversifying crop production along with development of agribusiness. As NAL and DAL are not yet functioning in its full-fledged states to meet the international standards, the Cambodian government, through MAFF, requested cooperation by the Government of Japan through the Japan International Cooperation Agency (JICA) to assist MAFF in strengthening the capacity to analyze pesticide residues in agricultural produce. Through several discussions and finally, on February 11th, 2020, a Record of Discussion was signed between MAFF and JICA to implement the project from 2021 to 2022 to strengthen the capacity in managing pesticides in order to increase the technical capacity to comply with the legal requirements of pesticide management. She addressed that, in 2021, the Covid-19 outbreak that occurred worldwide has caused the following impacts on PPRAP:

1. The project implementation was forced to be postponed, which has thus required the project operated online;
2. The experts could not travel from Japan to Cambodia, which affected the planned action plan;
3. The Liquid Chromatography/Mass Spectrometry (LC/MS) of NAL for analyzing pesticide residues has not been repaired due to Covid-19 problems because the maintenance engineer could not travel from abroad.
4. The Agricultural Value Chain Competitiveness and Safety Enhancement Project (ACSEP) funded by ADB was designed to provide key instruments such as GC-MS/MS and LC-MS/MS. The pandemic has also affected the implementation of the ADB project as well.

At last, she invited the participants to do their best to discuss in depth the Plan Design Matrix, the challenges, and the direction to continue to achieve the desired and expected results.

At this point of time, the chairperson proposed to take a break after photo session.

#### Presentation by Mr. Yasuhiko Muramatsu

Mr. Yasuhiko Muramatsu, the Chief Adviser of the JICA Technical Assistant Team, gave an introductory presentation on the Project. He initially provided a brief review of the project history and the status quo in using pesticides. He then shared two observations: 1) a significant progress made in improving the pesticide management in the past decade since the enactment of the pertinent law; and 2) enormous challenges ahead in the pesticide management especially in promoting proper use of pesticides despite the significant improvement. He further shed a light to the project outputs: 1) Pesticides regulatory compliance and enforcement and 2) capacity development in pesticides Residue Analysis. In his subsequent discussion, it was informed that 1) the delay of project implementation caused by the pandemic has an implication on the overall project schedule; and 2) the impact on the schedule would be further assessed to quantify the duration for the extension when more information on the pandemic and its impact becomes available. He then projected some pictures taken during the online and offline training to the participants.

#### Presentation by Lorn Socheata

Mr. Lorn Socheata, the Chief of Office of Administration, Planning, Accounting and International Cooperation of the National Agriculture Laboratory (NAL), gave a presentation on the project activities focusing on the training conducted online in the period from July 2021 until January 2022, then, offline training in February 2022 by identifying the major thematic issues of the training. He then informed that PPRAP procured a set of laboratory equipment,



apparatus, and standards and chemicals for on-the-job training (OJT). He further proceeded to the discussion on the challenges and opportunities to emphasize the impacts caused by the Covid-19 pandemic, which has forced the training convened in its online manner; prevented the international travel of the experts from Japan; discouraged the maintenance engineer from traveling for repairing LC-MS from Thailand; and caused a significant delay of the ADB project implementation with resultant impacts on the JICA's project for pesticides residue analysis because they are closely linked each other. Emphasizing that the physical presence of the experts is highly important to provide OJT in Laboratory; and recognizing that the repair of the LC-MS for Pesticide Residues Analysis is of great importance; he concluded that the following components should also be implemented as part of the project to ensure project sustainability: 1) a training component for Operation and Maintenance of laboratory instruments; and 2) a study tour(s) or training in Japan or third countries for Pesticide Residue Analysis /Formulation Analysis

#### Presentation by Mr. Lim Bolin

Mr. Lim Bolin, the Deputy Director of DAL/MAFF, initially shared the project outline by reviewing the project counterparts, the support by JICA; and reminded that DAL is also a key player along with NAL in the project. He then discussed that the project would design an approach for information management and dissemination of manuals and guidelines. He then underlined that the development and modification of the database for improved data accessibility is one of the key areas. He shared some pictures during the on-site inspection of the pesticide retailers along the border with Thailand, in Battambang Province and Banteay Meanchey Province (21-23 January-2021). The trainings he informed, were conducted in an online manner in the period from 6th July until 23rd December 2021. Other follow-up sessions were conducted in a face-to-face manner. He then informed the participants that the themes in the online training included the following: an overview of modern agriculture, the status of Illicit pesticides, the status and experience of pesticide management in the world and in other countries, especially in Japan, the International rules and organizations on pesticide management with a focus on Codex Alimentarius and the Supervised Residue trials to determine MRLs. In the final section of his presentation, he informed that 1) JICA supports the preparation of manuals for pesticide inspectors, printing and disseminating to inspectors nationwide, divided into four training regions; and 2) JICA provides financial support for the publication of the Prakas on the List of Pesticides in the Kingdom of Cambodia and the Prakas on Guidelines for Labeling and the model of Pesticide information.

Immediately after the presentation by Mr. Lim Bolin, the floor proceeded to the presentation by the Chief Adviser on "Review of PDM Modification and Plan of Operation".

#### Presentation by Mr. Yasuhiko Muramatsu

In the presentation, he affirmed that 1) the PDM was modified and agreed in the meeting on March 2, 2021 by integrating the expectations of NAL and DAL; and 2) the revised PMM, however, still need to be formalized by the relevant authorities with signature. At this point, he reminded the participants, on the basis of the agreements between the governments, that the project funded by ADB is to provide the equipment, while the project supported by JICA is to deliver service for developing technical skills in pesticides residue analysis, 2) harmonization and streamlining of the activities between DAL and NAL is of prime importance for improving the pesticides management in the country; and 3) MAFF is supposed to allocate adequate budget for the operation of the laboratory in coordination with MEF. He then underscored that project would be implemented through progressive elaboration to materialize the long-term vision for proper pesticide use.



In the subsequent section of his presentation, he identified 1) Imidacloprid, 2) Chlorpyrifos, 3) Flubendiamide and 4) Carbofuran as the main targets of the active ingredients in this project for residue analysis. But he also recalled that the target may be modified in line with the said approach of progressive elaboration. Recognizing the fact that “Teaching someone else is the best way to learn”, he discussed the approach of the project for capacity development wherein the project experts will provide OJT directly to five officers nominated by NAL, then, the officers will provide teaching to other staff of the laboratory. He further argued that the project would focus on some physical parameters of pesticides formulation as they have been overlooked in the past assistance. The major physical parameters focused in the project would include: degree of dispersion, suspensibility and wet sieve test.

On the activities for DAL, he underlined two major outcomes: Improved Inspection Procedures for the pesticide retailers and Improved accessibility to Pesticides Registry. However, he admittedly discussed that the components on the information accessibility on pesticide registry are under further review in consultation with DAL with due consideration on the limited absorptive capacity of the provincial government officers on IT technology and the limited identification of the needs on information accessibility. He informed the participants that the matter related to information accessibility would be further discussed and may be deleted if judged proper to maximize project benefit.

He subsequently expounded the background and the discussion in reviewing and modifying the PDM where he emphasized the original spirits of the project design remain unchanged; some minor modifications were made for clarification and simplification. The modified PDM is also attached to this minutes of the meeting as Annex 3.

#### Open Forum

By referring to the statement by the Chief Advisor in his presentation, H.E. Chan Phalloeun reaffirmed that there was the agreement between JICA, MAFF, and ADB that JICA would assist MAFF in developing the capacity on the pesticide residue analysis and the ADB would make the physical investment of the laboratory through procurement of the major equipment. However, she shed light on the fact that the ADB's project has not provided any equipment yet. She then reiterated that the NAL analysts cannot apply the theory and may end up losing the knowledge provided by the JICA's project. She suggested JICA to consider consulting with ADB to find the immediate approaches to get the equipment as fast as possible.

Mr. Neou Ratana, the Director of NAL, mentioned that the laboratory has played an essential role in assessing and analyzing the MRL to meet the standard requirement of national, international, or regional markets. He expressed the concern that the counterparts would gain theory and knowledge on residue analysis but would not gain practical experience. He stated that NAL would not accept such consequences. He emphasized that the NAL's significant workload arising from the crop residue analysis needs prompt repair of LC-MS. The procurement process of the project financed by ADB is delayed, which has caused compound complexity in delivering the NAL's service by using LC-MS. He thus requested JICA to repair the existing laboratory instruments of NAL.

Mr. Heng Chhunhy, the Deputy Director, the Department of Plant Protection, Sanitary and Phytosanitary (PPSPD), reiterated the challenges of the project timeline caused by the delayed delivery of ADB's project outputs. He then shared his experience in another project where the expert's contract was ended and left the project; and the equipment arrived with significant delay. In this occasion, the counterparts could not develop adequate skills in using the instruments as the theory in lectures could not be put into practices. Thus, he again suggested that JICA help facilitate the procurement process in consultation with ADB. MAFF wishes to



promote exports and strives for Cambodian products to be recognized internationally. GDA anticipated project execution because it has been the aspiration of MAFF to make improvements in the capacity on pesticide residue analysis more accurately and reliably. If the farm products from Cambodia have inadequate quality, nobody would buy from Cambodia. In addition, Cambodia needs to produce agricultural products to promote and maintain the health of the local Cambodian people. He further suggested that the officers of the PPSPD should also participate in the project because it is the organizer of the MRL table in accordance with the ASEAN standards and manager of the organic and GAP products.

Mr. Neou Ratana reiterated that the JICA's project should be implemented in tandem with the ADB's project to exert the intended projects' outputs.

Mr. Yasuhiko Muramatsu acknowledged the prime importance of the close collaboration between the two projects to achieve the key objective as designed and agreed. He then informed to the participants that a JICA officer proposed an online meeting to the officer in charge of the ADB's project to acquire more information on the status and outlook of the project implementation.

H.E. Chan Phalloeun strongly requested an extension of the project duration for a year period with consideration of the status and challenges; suggested JICA to include a minor training component for maintenance and repair of laboratory instruments to ensure project sustainability. She then emphasized the importance of preparing the up-to-date technical protocol standard. She further reacted to the proposal by PPSPD and suggested to include PPSPD as an important stakeholder of the project with consideration of the fact that it is the focal point with the ASEAN counterparts.

Regarding the extension of the project duration, Mr. Makoto Norimatsu, the officer in charge of the project at JICA Head Quarter, understood the need for the project period extension. But he also reminded that it requires consultation and dialogue to make it happen. He then suggested to discuss the matter in the upcoming JCC meeting scheduled most likely in July 2022.

Mr. Heng Chhunhy, PPSPD, reassured that the Cambodian side requested the extension of at least 1 year period; and requested a record in the minutes. He also requested an earlier arrangement to ensure adequate and smooth coordination among the relevant ministries for approval of the extension.

Reaffirming that the significant issues have been discussed, H.E. Chan Phalloeun asks JICA for the need for project duration extension, LC/MS equipment maintenance and training, and coordination with ADB (Agricultural Value Chain Competitiveness and Food Safety Enhancement) to speed up the instrument availability in her closing remark of the meeting.

Then the first JCC meeting was formally closed at 12:15 noontime. ✕

**Signature**

**Sameng Keomonine**

**Project Director**

## THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE

Venue: Hotel Cambodiana  
Date: 23<sup>th</sup> February 2022  
Time: 9:00-12:00

### Agenda of the Joint Coordination Committee Meeting

MC: Ms. Meas Sophea, Vice Chief of Admin, General Directorate of Agriculture (GDA), MAFF

| Time        | Activity                                                    | Persons                                                                                                                 |
|-------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 8:30 -9:00  | Registration (as necessary)                                 | Mr. Rith Chanveasna                                                                                                     |
| 9:00-9:15   | Welcome Remark by the Ministry                              | H.E Lor Reaksmeay<br>Under Secretary of States in<br>charge of Department of<br>Agricultural Legislation<br>(DAL), MAFF |
| 9:15-9:30   | Welcome Remarks by JICA                                     | Ms. Kamei Haruko,<br>Chief Representative, JICA<br>Cambodia Office                                                      |
| 9:30-9:45   | Opening Remarks by the Ministry                             | H.E Chan Phalloeun<br>Under Secretary of State of<br>the Ministry of Agriculture,<br>Forestry and Fisheries<br>(MAFF)   |
| 9:45-10:00  | Introduction of Participants                                |                                                                                                                         |
|             | Break                                                       |                                                                                                                         |
| 10:00-10:30 | Presentation of the Project Progress                        |                                                                                                                         |
|             | 10 min. · Overview                                          | Yasuhiko Muramatsu                                                                                                      |
|             | 10 min. · Online Training and<br>Expectation on the Project | NAL nominee                                                                                                             |
|             | 10 min. · Online Training and<br>Expectation on the Project | DAL nominee                                                                                                             |
| 10:30-10:40 | Open Forum                                                  |                                                                                                                         |
| 10:40-11:00 | 20 min. · Review of PDM Modification<br>· Plan of Operation | Yasuhiko Muramatsu                                                                                                      |
| 11:00-11:20 | Open Forum                                                  |                                                                                                                         |
| 11:20-11:30 | Closing Remark                                              | H.E Chan Phalloeun<br>Under Secretary of State of<br>the Ministry of Agriculture,<br>Forestry and Fisheries<br>(MAFF)   |
| 12:00-      | Lunch meeting                                               |                                                                                                                         |

## THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE

### Attendance List

|    | Name                   | Organization | Position                                                                            | Note   |
|----|------------------------|--------------|-------------------------------------------------------------------------------------|--------|
| 1  | H.E Lor Reaksmeay      | MAFF         | Under Secretary of States in charge of Department of Agricultural Legislation (DAL) | Online |
| 2  | H.E Chan Phalloeun     | MAFF         | Under Secretary of States in charge of General Directorate of Agriculture (GDA)     |        |
| 3  | Mr. Sameng Keomonine   | MAFF/GDA     | Deputy Director General and the Project Director                                    |        |
| 4  | Mr. Neou Ratana        | MAFF         | Director of the National Agriculture Laboratory (NAL) and the Project Manager       |        |
| 5  | Mr. Phum Ra            | MAFF         | Director of Department of Agricultural Legislation (DAL) and the Project Manager    |        |
| 6  | Ms. Kamei Haruko       | JICA         | Chief Representative                                                                | Online |
| 7  | Ms. Haruko Toyama      | JICA         | Senior Program Officer                                                              |        |
| 8  | Ms. Chan Sokunthea     | JICA         | Program Officer                                                                     | Online |
| 9  | Mr. Makoto Norimatsu   | JICA         | Agriculture and Rural Development Group 1, Rural Development Department             |        |
| 10 | Mr. Yasuhiko Muramatsu | JICA/PPRAP   | Chief Adviser                                                                       |        |
| 11 | Dr. Yasuo Kitamura     | JICA/PPRAP   | Expert                                                                              |        |
| 12 | Ms. Chizu Sakamoto     | JICA/PPRAP   | Project Coordinator                                                                 |        |
| 13 | Mr. Rith Chanveasna    | JICA/PPRAP   | Project Assistant                                                                   |        |
| 14 | Mr. Lim Bolin          | DAL          | Deputy Director                                                                     |        |
| 15 | Mr. Kan Kompheak       | DAL          | Deputy Director                                                                     |        |
| 16 | Mr. Em Pisey           | DAL          | Chief of the Office                                                                 | Online |
| 17 | Mrs. Sovuth Matra      | DAL          | Vice- Chief of the Office                                                           |        |
| 18 | Mrs. Vinin Marineth    | DAL          | Vice- Chief of the Office                                                           |        |
| 19 | Mr. Thong Soklin       | DAL          | Vice- Chief of the Office                                                           |        |
| 20 | Mr. Sen Socheat        | DAL          | Vice- Chief of the Office                                                           |        |
| 21 | Mr. Mean Khieng        | DAL          | Vice- Chief of the Office                                                           | Online |
| 22 | Mr. Horng Kimchay      | DAL          | Officer                                                                             | Online |
| 23 | Mr. Lun Makara         | DAL          | Officer                                                                             | Online |
| 24 | Mr. Phiv ChinTheng     | NAL          | Deputy Director                                                                     |        |
| 25 | Mr. Lorn Socheata      | NAL          | Chief Office                                                                        |        |
| 26 | Ms. Thao Seaklay       | NAL          | Vice Chief                                                                          |        |
| 27 | Ms. Neau Chanmonny     | NAL          | Vice Chief                                                                          | Online |
| 28 | Ms. Nguon Nirdey       | NAL          | Technician                                                                          |        |
| 29 | Ms. Khoun Kanha        | NAL          | Technician                                                                          |        |
| 30 | Ms. Yout Chakriya      | NAL          | Technician                                                                          |        |
| 31 | Ms. Leang Sina         | NAL          | Technician                                                                          |        |
| 32 | Ms. Meas Sophea        | NAL          | Vice Chief                                                                          |        |
| 33 | Mr. Heng Chhun HY      | MAFF         | Deputy Director, Department of Plant Protection, Sanitary, and Phytosanitary        |        |

## Proposed Project Design Matrix

**Project Title:** Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce (PPRAP)  
**Implementing Agency:** National Agriculture Laboratory (NAL), Department of Agricultural Legislation (DAL)  
**Period of Project:** November 2020 to September of 2022  
**Project Site:** Phnom Penh  
**Pilot Site:** Phnom Penh, Provinces in the border with Thailand and Vietnam, Provinces close to Tonle Sap.  
**Direct Beneficiary:** NAL for Output 1, NAL and DAL for Output 2 and relevant departments under General Secretariat of MAFF and General Directorate of Agriculture

| Narrative Summary                                                                                               | Objectively Verifiable Indicators                                                                                                                                                                                                                                                                                                                                                                                                                    | Means of Verification                                                                                                          | Important Assumption                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overall Goal</b>                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |
| Enhanced capacity is utilized for consistent and effective intervention by MAFF for proper pesticide management | 1. Pesticide residue analytical methods for combination of active ingredient on crops are validated.<br>2. The data on pesticides residue in crops are used for improving appropriate pesticide use including such as pesticide application standard and guideline.<br>3. The pesticides database is used for actions to improve proper pesticide management<br>4. Farmers have more channel of information for proper pesticides use and management | - GDA official reports<br>- DAL official reports<br>- Other relevant reports by public and private sector                      | - Mandate of NAL/ DAL in pesticide regulation system does not change drastically.                                                                                                                                                                                                                                                                        |
| <b>Project Purpose</b>                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |
| Capacity to enhance compliance with pesticide regulatory requirements strengthened.                             | 1. NAL is capable of providing pesticides residue information for selected crops and active ingredients.<br>2. Provincial officers acquire better information on the pesticide management.<br>3. Efficiency of pesticides/fertilizer registry management improved.                                                                                                                                                                                   | - GDA official reports<br>- DAL official reports<br>- Other relevant reports by public and private sector<br>- Project reports | - Mandate of NAL/ DAL in pesticide regulation system does not change drastically.<br>- The following donor funded projects are implemented generally in line with the present designs unchanged.<br>1. Cambodia Agricultural Sector Diversification Project (WB)<br>2. The Agricultural Value Chain Competitiveness and Safety Enhancement Project (ADB) |
| <b>Outputs</b>                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                          |
| 1. Capability of pesticide residue analysis for selected combinations of pesticide on crops are obtained        | 1-1-1. 80 % of counterpart personnel acquire basic knowledge on analytical chemistry for pesticide residue analysis<br>1-1-2. 80 % of counterpart personnel acquire basic theory of analytical equipment<br>1-2-1. Analytical methods for combinations of active ingredient on crops are validated<br>1-2-2. Standard Operating Procedures (SOPs) required for validation of pesticide residue analysis method are developed                         | - Monitoring sheets/Project reports<br>- Evaluation method developed by the Project                                            |                                                                                                                                                                                                                                                                                                                                                          |
| 2. Capacity in pesticide regulatory compliance and enforcement enhanced                                         | 2-1. Manual for on-site inspection of pesticide retailer is developed<br>2-2. 60 % of provincial inspector understand the developed manual.<br>2-3. Formulation analysis methods are validated for 5 active ingredients which NAL could not analyze due to technical difficulties                                                                                                                                                                    | - Monitoring sheets/Project reports<br>- Observation done by Japanese experts<br>- Questionnaire<br>- Monitoring sheet         | The following donor funded project is implemented in a concerted manner on the matters related to the pesticides management.                                                                                                                                                                                                                             |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2-4 A prototype of archiving of electronic records of registry of pesticides and fertilizer developed with improved accessibility.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                      | Cambodia-Australia Agricultural Value Chain Program (CAVAC)                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Inputs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                            |
| <p>0. Conduct survey on pesticide usage by farmer at field by GDA and sales in pilot site by DAL</p> <p>1-1. Confirm capacity of NAL analyst for operation of existing equipment</p> <p>1-2. Facilitate laboratory upgrading for pesticide residue analysis<sup>1</sup></p> <p>1-3. Carry out On-the-Job Training for NAL analyst to analyze pesticide residue</p> <p>1-4. Develop procedures for pesticide residue analysis in selected combinations of active ingredient on crops</p> <p>1-5. Conduct technical workshop to exchange knowledge on pesticide residue analysis among analytical laboratories</p> <p>1-6. Strengthen operation and maintenance skill of equipment</p> <p>1-7. Oversea training/study tour on pesticide residue analysis</p> | <p>[Japanese side]</p> <p>(1) Dispatch of Experts</p> <p>Long term</p> <ul style="list-style-type: none"> <li>- Chief advisor/Coordinator</li> </ul> <p>Short term</p> <ul style="list-style-type: none"> <li>- Pesticide Residue Analysis</li> <li>- Pesticide Regulation</li> <li>- Pesticide Formulation Analysis (as required)</li> </ul> <p>(2) Provision of equipment/consumable</p> <ul style="list-style-type: none"> <li>- Basic experimental apparatus for pesticide residue and formulation analysis</li> <li>- Other relevant equipment and chemicals (as necessary for project activities)</li> </ul> <p>(3) Training in Japan / Third Country</p> <ul style="list-style-type: none"> <li>- Training for pesticide residue analysis/pesticide regulation</li> <li>- Other training program(s) (as necessary)</li> </ul> | <p>[The Cambodia side]</p> <p>(1) Assignment of C/P</p> <ul style="list-style-type: none"> <li>- Project Director</li> <li>- Project Manager</li> <li>- Counterpart personnel</li> </ul> <p>(2) Facilities</p> <ul style="list-style-type: none"> <li>- Office space and furniture</li> <li>- Electricity, water, telephone/communication</li> </ul> | <ul style="list-style-type: none"> <li>- Priorities and budget allocation for pesticide management is not changed negatively.</li> <li>- Majority of counterparts are not transferred.</li> <li>- Number of counterparts is not decreased.</li> </ul> <p><b><u>Pre-Condition</u></b></p> <p>The laboratory for pesticide residue analysis is prepared.</p> |
| <p>2-1. Design approach for information management and dissemination of manuals and guidelines<sup>3</sup></p> <p>2-2. Conduct joint on-site inspection and collect suspicious pesticide for the proper implementation of relevant regulation/ guidance for pesticide retailers</p> <p>2-3. Develop/Modify the database for improved data accessibility</p> <p>2-4. Confirm quality of pesticide collected in pilot site by DAL through formulation analysis by NAL</p> <p>2-5. Conduct new 5 validated methods of pesticide formulation by NAL</p> <p>2-6. Conduct pesticide formulation analysis by NAL for suspicious pesticide collected by GDA upon request/information from farmer at field</p>                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                            |

1 Actual implementation of laboratory upgrading will be conducted through collaboration with Agriculture Value Chain Infrastructure Improvement Project (AVIP) by ADB project No.50264.

2: FAMIC stands for Food and Agricultural Materials Inspection Centre. It is a government authority on pesticides management in Japan.



MINUTES OF THE SECOND JOINT COORDINATION COMMITTEE MEETING  
ON  
PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN  
AGRICULTURAL PRODUCE

The Second Joint Coordination Committee (JCC) of the Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce (PPRAP) was convened on July 5<sup>th</sup>, 2022, from 8:00 A.M. to 12:30 P.M. (Cambodia Standard Time). The meeting was held in a hybrid manner at Himawari Hotel linked with the video conference platform with the online participants of ADB HQ and JICA HQ. The agenda of the meeting is attached to this minutes as Annex 1. The list of attendance is also found as Annex 2.

The meeting was commenced by welcome remarks of H.E. Lord Reasmey, the Under Secretary of States in charge of the Department of Agricultural Legislation (DAL), the Ministry of Agriculture Forestry and Fisheries (MAFF); and Mr. Shimodaira Takayuki, the Representative of JICA Cambodia Office. Then the meeting was formally opened by H.E Touch Bunhour, the Secretary of State of MAFF. H.E. Chan Phalloeun, Under Secretary of State of MAFF acted as the chair of this meeting. The participants agreed to make these Minutes of Meeting in order to confirm the mutual understanding reached through the discussions during the meeting.

H.E. Lord Reasmey warmly welcomed all participants in the second JCC meeting. He briefly reviewed the timeline of the support by JICA on building the human resources in agricultural sector in Cambodia since 1996, in which he highlighted those in the forestry and aquaculture sectors and mentioned a project on the Marin Aquaculture Research Institute in Sihanoukville in 2012. He then looked back on the history, dating back to 7<sup>th</sup> January 1979, on the import of pesticides and fertilizers under aid schemes by Japan and other donors; enactment of the laws on Agricultural Material Management in 1998; and the establishment of DAL in 2000. He then shed light on the enactment of the Law on the Management of Pesticides and Fertilizer on 4<sup>th</sup> January 2012, which was followed by development and approval of four (4) Ministerial-Prakas, two (2) Joint-Prakas with the Ministry of Economy and Finance, and other 10 Prakas by MAFF to support the implementation of the law. He further emphasized that Cambodia became a signatory and party to the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemical and Pesticides in International Trade in 2013; and NAL is mandated to conduct assessment and DAL inspect all kind of pesticides to ensure safety before being used.

Mr. Shimodaira Takayuki, the JICA representative, expressed his sincere appreciation for everyone's active engagement in the project, especially for the Cambodian Counterparts in the efforts to progress the project despite the unprecedented COVID-19 situation. He further reminded that JICA and MAFF worked closely to implement the project since November 2020 to produce numerous significant outcomes in the midst of COVID-19 pandemic. He shared his observations on a series of both online and offline training where a successful implementation of the training has promoted the capacity of NAL's and DAL's officials. He also extended his sincere thanks for the regular coordination among the project team and other development partners in the agriculture sector for harmonizing the cooperation and upgrading the agricultural laboratory in Cambodia. Finally, he encouraged the participants in active discussions to accelerate the project implementation based on the progress and challenges.

H.E Touch Bunhour emphasized in his opening remark that the agricultural sector plays an important role in the national economy by ensuring food security, promoting rural economic development, and improving people's livelihood through increasing productivity and diversifying crop production along with agribusiness development. Recognizing the



importance of pesticides, in the context of rapid transformation from the traditional to the modern agriculture, he recalled that use of pesticides also poses a concern on human health and environment which also has implications on accessibility of Cambodian farm products to foreign markets on the ground of Maximum Residue Level (MRL) incompliance. He further added that MAFF has established the Law on the Management of Pesticides and Fertilizers, Prakas on the List of Banned and Restricted Pesticides, and Prakas on Maximum Residue Level and various Technical Guidelines such as Good Agricultural Practices (GAP), Organic Agriculture and Agricultural Geography in order to use pesticide in proper manner with quality and safety. He reaffirmed that the project has faced challenges which made some activities unworkable in line with the Proposed Project Design Matrix (PDM) due to COVID-19 pandemic. Recognizing the challenges, he requested JICA, on behalf of MAFF, to extend the project to achieve the expected results; he then raised the followings:

1. Request one GC-FPD/ECD device for analysis
2. Request to repair LC/MS (Perkin Elmer) that is not working
3. Propose to improve the laboratory to comply with ISO 17025
4. Request to move activities that have not been implemented in the 1<sup>st</sup> PDM to continue in the extension project

At last, he invited the participants to do their best to discuss in depth the Project Design Matrix, the challenges, and the direction to continue to achieve the desired and expected results.

At this point of time, the chairperson proposed to take a break after photo session.

#### Presentation by Mr. Muramatsu Yasuhiko

Mr. Muramatsu Yasuhiko, the Chief Adviser of the JICA team, provided three presentations: 1) An overview, 2) Extension of project duration and 3) PDM Review and update.

In his first presentation, considering that there are officers who did not participate in the past JCC meetings, he reviewed the project history in chronological order with an emphasis on the demarcation between ADB and JICA on the provision of analytical instruments. He then shared the discussion in the previous JCC meeting on 23<sup>rd</sup> February 2022 in which MAFF made a request for an extension of the project duration; JICA HQ thereafter made decisions, in response to the request, on the extension of the project duration for one (1) year until November 2023, procurement of a Gas Chromatograph (GC) equipped with Flame Photometric Detector (FPD) and Electron Capture Detector (ECD); and repair of the existing Liquid Chromatograph-Mass Spectrometer (LC-MS). He further underlined the significant implication of maintenance and its fiscal impacts; and the renovation needs of NAL's building with recognition of the recurrent flood occurrence and a leaking roof of the building.

In the second presentation, he initially shared the project status by reviewing the achievement in which the JICA team has assisted NAL in developing the skills in undertaking residue analysis of Imidacloprid in tomato. He then discussed that other three (3) active ingredients, most likely Flubendiamide, Chlorpyrifos and Carbofuran would be focused in the project until November 2023. By looking at the timeline of the project, he identified three major issues: 1) the lead time for procurement of GC-FPD/ECD estimated at 6 months or longer would have implication on the overall time management of the project; 2) mobilization of short-term experts requires coordination with private sectors and third countries as well; and 3) sustainability of maintenance of analytical instruments requires cautious approach.

In the final presentation, he discussed the review and modification of PDM. The major issues he initially emphasized included: 1) the review was rendered once in the midst of the pandemic, in which the concerned parties were not fully reached on the changes because in-person meetings were postponed or cancelled; 2) a further review was performed in the first quarter



of the year 2022, in which the proposed activities of DAL on database development was left pending for further consultation.

He then shared the discussion in June 2022 between DAL and the JICA Team on the activities in PDM with a focus on output 2. The followings are the salient points of the discussion. Based on the discussion, the PDM was modified. The proposed PDM is attached to this minutes as Annex 3.

- ✓ Development of database on pesticides registration was once discussed and proposed. However, it was judged premature at this time to step in developing such tools. The main reasons are followings: 1) Project Framework, 2) Absorptive capacity of provincial officers, and 3) Availability of information infrastructure in the region.
- ✓ It was also reaffirmed that the focus of the output 2 should remain “on-site inspection” rather than broadening the scope to produce intended project outputs.
- ✓ Meanwhile, it was recognized that assessment of physical properties of pesticides formulation have been overlooked. Therefore, it was proposed and agreed to integrate an activity for assessment of physical properties of pesticides formulation.

#### Presentation by NAL representative

Ms. Chanmonny Neau, the Vice Chief of the Pesticides Laboratory, provided a brief on collaboration between JICA and GDA. She provided a precise description of the demarcation between the JICA funded project and the ADB funded Project on Agriculture Value Chain Competitiveness and Safety Enhancement; then, informed that the training on Imidacloprid analysis was complete which has included Extraction of Sample by using Liquid Liquid Extraction, Solid Phase Extraction and Support Liquid Extraction, use of rotary evaporator, among others. She then added that NAL also received some columns for extraction and clean up samples such as sodium sulfate, activate carbon (type 1&2), graphite carbon, Al-N, strong anion exchange (SAX), NH<sub>2</sub>, PLS-2 (Styrene diving/benzene), bond elute (solid phase extraction) and oasis (sample extraction products). As discussed by the Chief Adviser, she underlined the importance of 1) the extension of the project duration, 2) procurement of a GC-FPD/ECD, 3) repair of the existing LC-MS; and expressed her expectation for completion of all the activities in PDM within the extended period. In addition, she pointed out the strategic importance of 1) laboratory renovation to comply with ISO requirement, 2) procurement of a pick up track for sample collection.

#### Presentation by DAL representative

Mr. Lim Bolin, the Deputy Director of DAL, discussed the core activities of DAL in the project: 1) Conduct on-site inspection and take samples for analysis, and 2) Prepare a plan to disseminate the manual to inspectors. He also mentioned that DAL and the JICA team discussed two main activities 1) Preparation of inspection manual for pesticide inspectors, Organizing a dissemination workshop for pesticide inspection officers, and procurement of pesticide sampling equipment. He added that inspection manual would be drafted in accordance with 1) the Law on the Management of Pesticides and Fertilizer; and 2) Prakas on the Procedure of Inspecting Pesticides and Fertilizers in September 2022; and a series of dissemination workshops for inspectors would be designed and implemented in November or December in 2022 with four major provinces selected for the workshop.

#### Presentation by ADB Funded Project Representative

Mr. Chheng Vibolrith, the Deputy Director of the Department for International Cooperation of MAFF, gave a brief presentation on the Agricultural Value Chain Competitiveness and Safety



Enhancement Project (ACSEP) co-financed by ADB, AFD<sup>1</sup>, AIIB<sup>2</sup> and grant from Japan Fund for Prosperous and Resilient Asia and the Pacific. He expounded that the project is designed to strengthen value chain of competitive five (5) agricultural products: cassava, mangoes, cashew nuts, vegetables, and native chicken in the Kampong Cham, Kampong Thom, Oddar Meanchey, Preah Vihear, Siem Reap and Tboung Khmum Provinces; it has three outputs: 1) Agricultural Value Chain Financing Enhanced; 2) Agricultural Value Chain Linkage and Safety Strengthened; and 3) Agricultural Value Chain Connectivity Enhanced. He further emphasized that the project will benefit 230 agricultural cooperatives and about 50 agribusiness in the project area. He then discussed that ADB's TA under the Project has been recruiting one (1) international consultant and three (3) national consultants to develop the Ministerial Strategy and Associated Investment Plan for laboratories: 1) NAL under GDA, 2) NAHPRI under the General Directorate of Animal Health and Production (GDAHP) and 3) CamLAPF under the Department of Agro-industry (DAI).

### **Open Forum**

H.E Chan Phalloeun emphasized that NAL and DAL have requested to buy more instruments such as GC-FPD/ECD, chemical reagents, repairing LC-MS, renovation of laboratory...etc. She then asked if JICA would purchase and support NAL and DAL in the project.

Mr. Muramatsu Yasuhiko replied with appreciation on the consideration and the proposal. Setting aside the agreement for the extension of the project duration, and reallocation of budget for procurement of a GC-FPD/ECD and the repair of the existing LC-MS; he reminded the participants on the demarcation between JICA and ADB in the project; and the budget constraints of the project for 1) laboratory renovation to comply with ISO requirement and 2) procurement of a pickup truck for sample collection. He then added that the project timeframe, even with the extension of the duration, would not allow integration of such activities for renovation. He then suggested to explore other potential sources of funds such as China, Korea or other donors.

Mr. Neou Ratana, the Director of NAL, appreciated JICA for the support extended to NAL both on purchasing chemical reagents and conducting the hands-on training on pesticide residue analysis. He reaffirmed and reminded the participants that JICA would allocate budget for procurement of a GC-FPD/ECD and repair LC-MS; and has agreed the extension of the project until November 2023. Meanwhile, he emphasized that NAL has waited since 2019 for the ADB's project to provide the equipment and materials support. He also acknowledged the needs of strategic plan on laboratory and investment before commencement of the investment and procurement, which he admitted a long process for procurement of international and national consultants to conduct the survey and write the strategic plan. These circumstances, he reiterated, would not allow optimistic prospect for investment in the near future.

Mr. Phum Ra, the Director of DAL, reminded the needs of support for DAL on capacity building for pesticide management especially in the context of inspection of the pesticides dealers in the field. He also suggested JICA help develop the guideline on pesticide inspection. He shared his observation on the projects in Thailand and the Philippines with the fund of JICA where many laboratories in Asia have been supported. He reminded JICA to assist MAFF in developing capacity on Laboratory facility, supporting equipment and materials like other countries in order to comply with the ISO standard.

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<sup>1</sup> AFD: Agence Francaise de Develomen

<sup>2</sup> AIID: Asian Infrastructure Investment Bank



Mr. Muramatsu Yasuhiko suggested H.E Chan Phalloeun to request Mr. Chheng Vibolrith to react to the requests raised by NAL and DAL for facilitation of procurement process of the project financed by ADB. Mr. Chheng Vibolrith then shared brief information on the current situation of the project.

H.E Chan Phalloeun suggested the JICA team to discuss with Asian Development Bank (ADB) in order to accelerate the procurement process to avoid potential impacts on JICA's project. She suggested that ADB should consider an urgent procurement process to accelerate the project progress.

Mr. Chheng Vibolrith reminded that MAFF did not complete the criteria of ADB procedure to develop the strategic plan of laboratory and investment. Therefore, ADB will not supply the equipment, materials and chemical reagents. He added that there are other donors such as the World Bank and UNIDO working on the relevant projects in Cambodia and suggested NAL to request for support.

H.E Chan Phalloeun addressed that ADB and MAFF should accelerate the strategic plan on laboratory and investment. JICA confirmed to extend the project until November 2023. Therefore, we need to accelerate of work progress. He added that we should do the priority work such as DAL to develop the inspection manual and disseminate to sellers and farmers. If work cannot be finished with the proposed timeline, we should request JICA to extend more for fruitful achievement of the project. He hoped that laboratory under GDA will comply with the ISO Standard in the future. He finally suggested GDA officials to write an official report and submit to the Minister of MAFF to know about the current situation of the project.

Mr. Shimodaira Takayuki emphasized that the request will be considered and discussed one by one. As Mr. Ratana and Mr. Chheng mentioned, ADB is recruiting the international and national consultants to formulate the strategic plan of laboratory. He believed that after preparation of this strategic plan, ADB will be able to design and proceed to procurement of necessary equipment.

Recognizing that the budget will become available for procurement of a GC and repair of LC-MS, H.E Chan Phalloeun reiterated that NAL made a request to procure a pickup car for traveling to collect sample and laboratory renovation. She further summarized that DAL will work in collaboration with JICA to develop the guideline on pesticide inspection. Admitting that it is difficult to control the informal pesticide import from other countries, she suggested that DAL should have a set of equipment for sampling to be used during inspection. She expressed high expectations regarding the training abroad components to familiarize the officers with the good practices in other countries to apply the findings to the daily business of MAFF. She finally suggested JICA to continue the support extended to DAL and NAL to comply with ISO requirement in the future.

It was also noted that there were no contentious issues in the PDM.

The JCC meeting was formally closed at 12:30 noontime. The participants moved on to lunch meetings to follow up the discussion.

**Signature**

**Sameng Keomonine**

**Project Director**

## THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE

Venue: Himawari Hotel

Date: July 5<sup>th</sup> 2022

Time: 9:00-12:00

Agenda of the Joint Coordinating Committee Meeting

MC: Ms. Meas Sophea, Vice Chief of Admin, General Directorate of Agriculture (GDA)

| <b>Time</b> | <b>Activity</b>                            | <b>Persons</b>                                                                                                         |
|-------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 8:30 -9:00  | Registration                               | Mr. Meng Kro                                                                                                           |
| 9:00-9:15   | Welcome Remark by the Ministry             | H.E Lord Reasmey<br>Under Secretary of States in<br>charge of Department of<br>Agricultural Legislation<br>(DAL), MAFF |
| 9:15-9:30   | Welcome Remarks by JICA                    | Mr. Shimodaira Takayuki<br>Representative,<br>JICA Cambodia Office                                                     |
| 9:30-9:45   | Opening Remarks by the Ministry            | H.E Toch Bunhour,<br>Secretary of State of the<br>Ministry of Agriculture,<br>Forestry and Fisheries (MAFF)            |
| 9:45-10:00  | Introduction of Participants               |                                                                                                                        |
| 10:00-10:10 | Group picture and Break                    |                                                                                                                        |
| 10:10-10:25 | Presentation and Discussion                |                                                                                                                        |
|             | 10 min. · Overview                         | Mr. Muramatsu Yasuhiko                                                                                                 |
|             | 5 min. · Donor Coordination<br>(ADB-WB)    | Mr. Chheng Vibolrith                                                                                                   |
| 10:25-10:40 | Open Forum                                 |                                                                                                                        |
| 10:40-11:20 | 10 min. · Extension of Project<br>Duration | Mr. Muramatsu Yasuhiko                                                                                                 |
|             | 10 min. · Progress and Status              | NAL                                                                                                                    |
|             | 10 min. · Progress and Status              | DAL                                                                                                                    |
|             | 10 min. · PDM Review and<br>Update         | Mr. Muramatsu Yasuhiko                                                                                                 |
| 11:20-11:50 | Open Forum                                 |                                                                                                                        |
|             |                                            | H.E Chan Phaloeun<br>Under Secretary of State of<br>the Ministry of Agriculture,<br>Forestry and Fisheries             |
| 11:50-12:00 | Closing Remark                             |                                                                                                                        |
| 12:00-      | Lunch meeting                              |                                                                                                                        |

## THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE

### Attendance List

| No. | Name                          | Organization     | Position                                                                                                                                   | Note   |
|-----|-------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1   | H.E Touch Bunhour             | MAFF             | Secretary of State of the Ministry of Agriculture, Forestry and Fisheries                                                                  |        |
| 2   | H.E Lord Reasmey              | MAFF             | Under Secretary of States in charge of Department of Agricultural Legislation (DAL)                                                        |        |
| 3   | H.E Chan Phalloeun            | MAFF             | Under Secretary of States in charge of General Directorate of Agriculture (GDA)                                                            |        |
| 4   | Mr. Sameng Keomouine          | MAFF             | Deputy Director General of the General Directorate of Agriculture (GDA)                                                                    |        |
| 5   | Mr. Neou Ratana               | MAFF             | Director of the National Agriculture Laboratory (NAL)                                                                                      |        |
| 6   | Mr. Phum Ra                   | MAFF             | Director of Department of Agricultural Legislation (DAL)                                                                                   |        |
| 7   | Mr. Chheng Vibolrith          | MAFF             | Deputy Director, Department of International Cooperation                                                                                   |        |
| 8   | Mr. Hy Heng Chhun             | MAFF             | Deputy Director, Department of Plant Protection, Sanitary, and Phytosanitary.                                                              |        |
| 9   | Mr. Chel Vy                   | MAFF             | Officer                                                                                                                                    |        |
| 10  | Mr. Lun Tina                  | MAFF             | GDA, DAPAIC                                                                                                                                |        |
| 11  | Mr. Nakada Shunichi           | JICA HQ          | Senior Advisor                                                                                                                             | Online |
| 12  | Mr. Nakamura Kota             | JICA HQ          | Agriculture and Rural Development Group 1, Rural Development Department                                                                    | Online |
| 13  | Mr. Shimodaira Takayuki       | JICA             | Representative                                                                                                                             |        |
| 14  | Ms. Toyama Haruko             | JICA             | Senior Program Officer                                                                                                                     |        |
| 15  | Ms. Chan Sokunthea            | JICA             | Program Officer                                                                                                                            |        |
| 16  | Mr. Okada Naoya               | Embassy of Japan | Second Secretary                                                                                                                           |        |
| 17  | Mr. Muramatsu Yasuhiko        | JICA/PPRAP       | Chief Adviser                                                                                                                              |        |
| 18  | Dr. Kitamura Yasuo            | JICA/PPRAP       | Expert                                                                                                                                     |        |
| 19  | Ms. Sakamoto Chizu            | JICA/PPRAP       | Project Coordinator                                                                                                                        |        |
| 20  | Mr. Meng Kro                  | JICA/PPRAP       | Project Assistant                                                                                                                          |        |
| 21  | Mr. Ueda Takeshi <sup>3</sup> | ADB              | Principal Natural Resources and Agricultural Economist, Environment, Natural Resources and Agriculture Division, Southeast Asia Department | Online |
| 22  | Mr. Lim Bolin                 | DAL              | Deputy Director                                                                                                                            |        |
| 23  | Mr. Bun Chanlida              | DAL              | Chief of the Office                                                                                                                        | Online |
| 24  | Mr. Phoem Pheak               | DAL              | Chief of the Office                                                                                                                        | Online |
| 25  | Mr. Em Pisey                  | DAL              | Chief of the Office                                                                                                                        | Online |
| 26  | Mrs. Sovuth Matra             | DAL              | Vice- Chief of the Office                                                                                                                  |        |
| 27  | Mrs. Vinin Marineth           | DAL              | Vice- Chief of the Office                                                                                                                  |        |
| 28  | Mr. Thong Soklin              | DAL              | Vice- Chief of the Office                                                                                                                  |        |
| 29  | Mr. Sen Socheat               | DAL              | Vice- Chief of the Office                                                                                                                  |        |
| 30  | Mr. Mean Khieng               | DAL              | Vice- Chief of the Office                                                                                                                  |        |
| 31  | Mr. Srun Sopheak              | DAL              | Vice- Chief of the Office                                                                                                                  |        |
| 32  | Mr. Hou Sara                  | DAL              | Officer                                                                                                                                    |        |
| 33  | Mr. Horng Kimchay             | DAL              | Officer                                                                                                                                    | Online |

<sup>3</sup> He left the meeting after the opening remark for an unavoidable reason.

*Annex 2*  
*Attendance List*

|    |                    |     |                                                               |        |
|----|--------------------|-----|---------------------------------------------------------------|--------|
| 34 | Mr. Lun Makara     | DAL | Officer                                                       | Online |
| 35 | Mr. Trang Sidorn   | DAL | Officer                                                       | Online |
| 36 | Mr. Ly Dalux       | DAL | Officer                                                       | Online |
| 37 | Mr. Phiv ChinTheng | NAL | Deputy Director                                               |        |
| 38 | Mr. Lorn Socheata  | NAL | Chief of the Office                                           |        |
| 39 | Ms. Thao Seaklay   | NAL | Vice Chief                                                    |        |
| 40 | Ms. Neau Chanmonny | NAL | Vice Chief                                                    |        |
| 41 | Ms. Nguon Nirdey   | NAL | Technician                                                    |        |
| 42 | Ms. Khoun Kanha    | NAL | Technician                                                    |        |
| 43 | Ms. Yout Chakriya  | NAL | Technician                                                    |        |
| 44 | Ms. Keo Sothary    | NAL | Technician                                                    |        |
| 45 | Ms. Leang Sina     | NAL | Technician                                                    |        |
| 46 | Ms. Meas Sophea    | NAL | Vice Chief of Admin, General Directorate of Agriculture (GDA) |        |

## Proposed Project Design Matrix

Version 2.0  
Date: 05<sup>th</sup> July 2022

**Project Title:** Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce (PPRAP)

**Implementing Agency:** National Agriculture Laboratory (NAL), Department of Agricultural Legislation (DAL)

**Period of Project:** November 2020 to November 2023

**Project Site: Phnom Penh**

**Pilot Site:** Phnom Penh, Provinces in the border with Thailand and Vietnam, Provinces close to Tonle Sap.

**Direct Beneficiary:** NAL for Output 1, NAL and DAL for Output 2 and relevant departments under General Secretariat of MAFF and General Directorate of Agriculture

| Narrative Summary                                                                                               | Objectively Verifiable Indicators                                                                                                                                                                                                                                                                                                                                                                                                        |                                                         | Means of Verification                                                                                                          | Important Assumption                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overall Goal                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                         |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                        |
| Enhanced capacity is utilized for consistent and effective intervention by MAFF for proper pesticide management | 1. Pesticide residue analytical methods for combination of active ingredient on crops are validated.<br><br>2. The data on pesticides residue in crops are used for improving appropriate pesticide use including such as pesticide application standard and guideline.                                                                                                                                                                  |                                                         | - GDA official reports<br>- DAL official reports<br>- Other relevant reports by public and private sector                      | - Mandate of NAL/ DAL in pesticide regulation system does not change drastically.                                                                                                                                                                                                                                                                      |
| Project Purpose                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                         |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                        |
| Capacity to enhance compliance with pesticide regulatory requirements strengthened.                             | 1. NAL is capable of providing pesticides residue information for selected crops and active ingredients.<br><br>2. Provincial officers acquire better information on the pesticide on-site inspection.                                                                                                                                                                                                                                   |                                                         | - GDA official reports<br>- DAL official reports<br>- Other relevant reports by public and private sector<br>- Project reports | - Mandate of NAL/ DAL in pesticide regulation system does not change drastically.<br>- The following donor funded projects are implemented generally in line with the present designs unchanged.<br>1.Cambodia Agricultural Sector Diversification Project (WB)<br>2.The Agricultural Value Chain Competitiveness and Safety Enhancement Project (ADB) |
| Outputs                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                         |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                        |
| 1. Capability of pesticide residue analysis for selected combinations of pesticide on crops are obtained        | 1-1-1. 80 % of counterpart personnel acquire basic knowledge on analytical chemistry for pesticide residue analysis<br><br>1-1-2. 80 % of counterpart personnel acquire basic theory of analytical equipment<br><br>1-2-1. Analytical methods for combinations of active ingredient on crops are validated<br><br>1-2-2. Standard Operating Procedures (SOPs) required for validation of pesticide residue analysis method are developed |                                                         | - Monitoring sheets/Project reports<br>- Evaluation method developed by the Project                                            |                                                                                                                                                                                                                                                                                                                                                        |
| 2. Capacity in pesticide regulatory compliance and enforcement enhanced                                         | 2-1. Manual for on-site inspection of pesticide retailer is developed<br><br>2-2. 60 % of provincial inspector understand the developed manual.<br><br>2-3. Formulation analysis methods are validated for 2 active ingredients which NAL could not analyze due to technical difficulties                                                                                                                                                |                                                         | - Monitoring sheets/Project reports<br>- Observation done by Japanese<br>- Questionnaire<br>- Monitoring sheet                 | The following donor funded project is implemented in a concerted manner on the matters related to the pesticides management. Cambodia-Australia Agricultural Value Chain Program (CAVAC)                                                                                                                                                               |
| Activities                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                          | Inputs                                                  |                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                        |
| 0. Conduct survey on pesticide usage by farmer at field by GDA and sales in pilot site by DAL                   |                                                                                                                                                                                                                                                                                                                                                                                                                                          | [Japanese side]<br>(1) Dispatch of Experts<br>Long term | [The Cambodia side]<br>(1) Assignment of C/P<br>- Project Director<br>- Project Manager                                        | - Priorities and budget allocation for pesticide management is not changed negatively.                                                                                                                                                                                                                                                                 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                               |                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1-1. Confirm capacity of NAL analyst for operation of existing equipment</p> <p>1-2. Facilitate laboratory upgrading for pesticide residue analysis<sup>1</sup></p> <p>1-3. Carry out On-the-Job Training for NAL analyst to analyze pesticide residue</p> <p>1-4. Develop procedures for pesticide residue analysis in selected combinations of active ingredient on crops</p> <p>1-5. Conduct technical workshop to exchange knowledge on pesticide residue analysis among analytical laboratories</p> <p>1-6. Strengthen operation and maintenance skill of equipment</p> <p>1-7. Oversea training/study tour on pesticide residue analysis</p> | <p>- Chief advisor/ Coordinator</p> <p>Short term</p> <p>- Pesticide Residue Analysis</p> <p>- Pesticide Regulation</p> <p>- Pesticide Formulation Analysis (as required)</p> <p>(2) Provision of equipment/consumable</p> <p>- Basic experimental apparatus for pesticide residue and formulation analysis</p> <p>- Other relevant equipment and chemicals (as necessary for project activities)</p> <p>(3) Training in Japan / Third Country</p> <p>- Training for pesticide residue analysis/ pesticide regulation</p> <p>- Other training program(s) (as necessary)</p> | <p>- Counterpart personnel</p> <p>(2) Facilities</p> <p>- Office space and furniture</p> <p>- Electricity, telephone/communication water,</p> | <p>- Majority of counterparts are not transferred.</p> <p>- Number of counterparts is not decreased.</p> <p><b>Pre-Condition</b></p> <p>The laboratory for pesticide residue analysis is prepared.</p> |
| <p>2-1. Design approach for information management and dissemination of manuals and guidelines<sup>3</sup></p> <p>2-2. Conduct joint on-site inspection and collect suspicious pesticide for the proper implementation of relevant regulation/ guidance for pesticide retailers</p> <p>2-3. Confirm quality of pesticide collected in pilot site by DAL through analysis (A.I. &amp; Physical) by NAL</p> <p>2-4. Conduct new 2 A.I. validated methods of pesticide formulation by NAL</p> <p>2-6. Conduct pesticide formulation analysis by NAL for suspicious pesticide collected by GDA upon request/information from farmer at field</p>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                               |                                                                                                                                                                                                        |

1 Actual implementation of laboratory upgrading will be conducted through collaboration with Agriculture Value Chain Infrastructure Improvement Project (AVIP) by ADB project No.50264.

2: FAMIC stands for Food and Agricultural Materials Inspection Centre. It is a government authority on pesticides management in Japan.



MINUTES OF THE THIRD JOINT COORDINATION COMMITTEE MEETING  
ON  
PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN  
AGRICULTURAL PRODUCE

The Third Joint Coordination Committee (JCC) Meeting of the Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce (PPRAP) was conducted on 11 April 2023, from 8:30 am. to 12:00 pm. at Sunway Hotel. The meeting was presided over by H.E. Ing Hok Lim, the Under Secretary of State of the Ministry of Agriculture, Forestry and Fisheries (MAFF). The participants of the meeting included: H.E. Lord Reasmey, the Under Secretary of State in charge of DAL of MAFF and H.E. Chan Phalloeun, the Under Secretary of State in charge of GDA of MAFF, Miyahara Ai, the Senior Representative of the Japan International Cooperation Agency (JICA) in Cambodia, Director of the Department of International Cooperation, leaders of the General Department of Agriculture (GDA) and officials of the line departments, counterparts of the National Agriculture Laboratory (NAL) and the Department of Agricultural Legislation (DAL), consisting of 46 participants. The agenda of the meeting is attached to this minutes as Annex 1. The list of attendance is also found in Annex 2.

The meeting was started by welcome remarks of H.E. Lord Reasmey and Ms. Miyahara Ai. Then the meeting was formally opened by H.E. Ing Hoc Lim. H.E. Chan Phalloeun acted as the chair of this meeting. The participants agreed to make these Minutes of the Meeting in order to confirm the mutual understanding reached through the discussions during the meeting.

On behalf of H.E. Dith Tina, the Minister of MAFF, H.E. Lord Reasmey warmly welcomed all the participants. In his remark he reviewed the historical context of the pesticides management in Cambodia by referring that 1) Cambodia has used fertilizers since 1950; 2) it has become a signatory and party to the Rotterdam Convention on 3 June 2013; 3) MAFF accordingly reviewed the laws to apply them in Cambodia. On “the 6<sup>th</sup> national day for the promotion of using Khmer products” organized in April 2023, he informed that the government is calling on all concerned Ministries, including the Ministry of Commerce (MoC), MAFF, the Ministry of Industry, Science, Technology and Innovation (MISTI), and all levels of the local administrations to promote the production and processing by all potential resources in Cambodia according to the concept of one village one product. He added that the price of fertilizers and pesticides now is on the rise because of COVID-19 and the crisis between Russian and Ukraine, which has affected farmers' livelihood and induced the illegal import of fertilizers and pesticides in the border provinces.

Ms. Miyahara Ai expressed her sincere appreciation for everyone's active engagement in the project. She highlighted that food safety is one of the most important attributes to the growth of Cambodia's agricultural products. The quality pesticide and its proper usage are essential for maximizing agricultural productivity, as well as for ensuring both human and environmental safety in Cambodia. She emphasized that, for this reason, JICA and MAFF have cooperated over the years to develop national pesticide regulatory system by improving the laboratory capacity on pesticide residue analysis. She then referred that the project is extended and thus complete in November 2023. She added, JICA's expectation is to attain project sustainability. Since the remaining period of the project is less than a half year, she looks forward to seeing the further outcomes and the challenges addressed until the end of the Project. Finally, she expressed her expectation for the fruitful discussion.



H.E. Ing Hoc Lim emphasized in his opening remark that the agricultural sector plays an important role in the national economy. Now, the sector has transformed to modern production by using multi-materials, agricultural machinery and agricultural inputs. Pesticide is an important input to protect crops, but the usage also causes a concern over human health and environment, which is also related to the accessibility of Cambodian farm products to foreign markets. For international trade, it requires to check Maximum Residue Level (MRL) in agricultural products to ensure the safety of products to consumers. Therefore, to manage pesticides effectively, concerned institutions should manage the pesticides and conduct the inspection. He added that MAFF established strategies to control pesticides in line with international laws and standards. In fact, MAFF has enacted the Law on the Management of Pesticides and Fertilizers, Prakas on the List of Banned and Restricted Pesticides, and Prakas on Maximum Residue Level and various Technical Guidelines such as Good Agricultural Practices (GAP), Organic Agriculture and Agricultural Geography to promote proper pesticide use.

At this point, the chairperson proposed to take a break after the photo session. After taking a break, H.E. Chan Phalloeun led a meeting.

#### Presentation by Mr. Muramatsu Yasuhiko

Mr. Muramatsu Yasuhiko, the Chief Adviser of the project, provided a presentation. His presentation consisted of 8 contents, including 1) Purpose of JCC meeting, 2) Review of previous JCC, 3) Procurement of GC-ECD/FTD/FPD, 4) Repair of LC-MS, 5) Key Challenges in maintenance of equipment, 6) Review of the scope, 7) Study tour in the Philippines and 8) Project timeline. Salient point of his presentation are as follows: 1) this JCC meeting is the last JCC meeting before the final meeting scheduled in October 2023; 2) the purpose of this meeting is to share information on the project attainments so far and to develop a common view on the direction toward the completion; 3) a GC was procured and installed in March 2023; 4) the LC-MS was repaired; 5) an adequate amount of budget should be set aside for future maintenance of the analytical instruments; 6) the target pesticides and crops for pesticide residue analysis are Imidacloprid in Tomato, Azoxystrobin in Green Chili Pepper, Carbofurans in Mango and Tricyclazole in Brown Rice.

After presentation by Mr. Muramatsu Yasuhiko, H.E Chan Phalloeun opened the floor for question and discussion. As no question was raised, she made a comment regarding the study tour in the Philippines scheduled in June 2023. In consideration on the recent announcement on the travel ban of the government officers in June and July, she suggested to make it happen in either May or August 2023.

H.E. Lord Reasmey appreciated the direction of the project and has fully agreed with the project activities by reaffirming the historical context of issue and problems behind the tricyclazole regulation. In his statement, he touched on the debate on the health hazard of Tricyclazole commenced in 2006; actions of the EU committee to set up a level of Tricyclazole in rice in 2008; reactions of the rice producers in Cambodia and the Council for Development of Cambodia.

Mr. Muramatsu Yasuhiko expressed his appreciation for their comments. In the response to the suggestion on the study tour to the Philippines, he said that the proposal to put it ahead to take place in June is not feasible because of the time shortage for preparation and coordination. He then suggested to make it either in August or September. For Tricyclazole, he appreciated the information to help clarify the link of the government policies and the project activities.



H.E. Dr. Prum Somany, the Director of the International Cooperation Department of MAFF, participating in the JCC meeting of this project first time, decided to join as the Minister inquired about the project status. Recognizing the importance of the technical assistance to NAL on pesticides residue analysis and the relevance with the export facilitation of agricultural commodities, he concerned over the challenges in equipment maintenance especially the needs of engineers authorized by the manufacturers for maintenance service. He then requested JICA for an extension of a year of the project duration in consideration of the needs of supplemental capacity development of NAL to ensure project sustainability. He further expressed desire to develop an additional project phase to help ready for accreditation of ISO 17025.

Mr. Neou Ratana, the Director of NAL, appreciated JICA for the support extended to NAL and referred to the request made by H.E. Dr. Prum Somany. Concurring the H.E. Dr. Prum Somany's expectation for the extension and expansion of the project scope, he pointed out the needs of broader pesticides coverage to deliver full service; and strongly requested JICA for additional support to help NAL acquire ISO accreditation in 2026 as recommended by the Minister.

In response, Mr. Muramatsu Yasuhiko first reminded the participants the purpose of the JCC meeting which is to share the information on the project attainments so far and to develop a common view on the direction toward the completion. He then reaffirmed that the project is so designed to equip the NAL's laboratory officers with basic skills and knowledge on pesticide residue analysis as agreed in the Minutes of Meeting between the two governments.

Dr. Kitamura Yasuo gave his supplementary comments by highlighting the importance of pesticide residue level in agricultural produce. He added it depends on how pesticides are used. To know the actual pesticides residue level in farm crops, the capacity of pesticide residue analysis should be enhanced. He reminded that the pesticide residue analysis is not a simple step which often starts from sample preparation, extraction, clean up and instrumental analysis. He mentioned that we first could learn individual analysis, which can then be leveraged to broaden the scope. He emphasized that training of Tricyclazole residue analysis will be conducted in the coming September and October using the GC. He suggested that MAFF conduct residue trials after the project to assess the pesticide residue level to identify the quantitative relation between the residue level and pesticide application method.

Ms. Miyahara Ai reminded that the purpose of the JCC meeting is to discuss the current project. As it still has five or six months more, she emphasized that the project will produce the intended outputs through implementing the remaining activities. She requested the chairman to continue the presentations and informed that she will reply to the request raised by the participants after the presentation.

#### Presentation by NAL representative

Ms. Chanmonny Neau, the Vice Chief of the Pesticides Laboratory, provided a brief presentation. She summarized that NAL 1) received the training on Azoxystrobin residue analysis; 2) learned theories on pesticide residue analysis; 3) received analytical instruments, some spare parts, necessary chemical reagents and apparatus; 4) received a new GC. She also reported that NAL participated in a series of training sessions on quality control of pesticide products, "OECD Checklist for regulation decision marking", Importance of pesticide products quality monitoring, and conducted a study tour at Nagoya University's laboratory in RUA, among others. She then pointed out that the NAL's challenges include: 1) Lack of knowledge



on multi-pesticide residue analysis, 2) Lack of knowledge on maintenance of instruments, 3) Limited capacity of technical staff, 4) Unavailability of pesticide standards, 5) Limited capacity for operation of analytical instruments and 6) non-attainment of accreditation. She requested: 1) 1 year extension of the project, 2) skill development support on multi-residues analysis, 3) preparing ISO/IEC: 17025 documents, 4) renovation of laboratory facility to comply with ISO, 5) more pesticide standards for developing methods analysis, and 6) more chemicals to extend the scope of operation.

#### Presentation by DAL representative

Mr. Lim Bolin, the Deputy Director of DAL, gave a presentation on DAL's activities. He reported that the project procured safety equipment for on-site inspections and sampling of pesticides and fertilizers and gave training. In addition, he mentioned that DAL completed the draft guideline for inspection and now it is under review and update in collaboration with JICA's experts and it is expected to finish in April. He added that the guideline contains chapters on: 1) Pesticide and Fertilizer Management Mechanism, 2) Inspection Planning and 3) Inspection Operations. After finalization and approval, DAL will conduct 4 regional workshops to disseminate the guideline to the stakeholders and PDAFF. He then reminded that the inspection guideline is an important tool to perform their duties in accordance with the laws. At the last, he requested NAL to acquire information on MRL based analysis in accordance with requirements of the countries where we will export our products.

Again, H.E Chan Phalloeun opened the floor for discussion.

Mr. Ho Puthea, Deputy Director General of GDA, expressed his sincere appreciation to JICA for supporting NAL and DAL. In addition, he also requested JICA to continue this project for one more phase. Even if it is not the case, he requested JICA to consider supplemental support for the following three areas: 1) Needs of ISO 17025 accreditation: He emphasized that ISO accreditation is very necessary because even application for Good Agricultural Practice (GAP) and Organic products requires analysis by accredited laboratories. Although NAL attempted to acquire ISO 17025 accreditation, MAFF recognized some critical bottlenecks which prevent accreditation in terms of facilities and human resources; 2) Support for purchasing chemical reagents: Considering the budgetary constraints for purchasing the chemical reagents used in pesticides residue analysis, he requested JICA to support procurement of such chemical reagents; and 3) Support for Simultaneous multi-parameter analysis: He requested JICA to support for developing skill in using simultaneous multi-parameter analysis of pesticides. He recommended that the analysis of target crops should be linked with the market's needs and policy orientations. For instance, recently the government set up a policy to promote five (5) types of agricultural commodities: Mango, cashew nut, Maize, Casava and Pailin's Longans and which would be expanded to 10 commodities in the future.

In reply to the requests by the participants, Ms. Miyahara Ai admitted that the numbers of requests were more than her expectation, then she requested the counterparts to concentrate on the remaining project activities since there are only 5 to 6 months. Regarding the requests for extension and the next phase, she expressed that JICA understood the importance of ISO accreditation and facilitation of export of agricultural commodities. She then mentioned that JICA will evaluate the requests by performing monitoring of the remaining activities of the project and consult with JICA headquarter. She emphasized importance of self-reliance of the project recipient after the project completion to ensure project sustainability and reminded the fact that JICA has provided necessary equipment and technical inputs during the implementation period.



For extension of the project, she underlined the importance and needs to demonstrate the achievements of the current project. She then re-emphasized that MAFF should focus on the remaining project activities. Further she requested the participants: 1) to demonstrate the rationale and priority of ISO accreditation; 2) to provide cost information for ISO accreditation. She finally informed that clear indication of counterpart fund by the Cambodian government would be appreciated for further consideration.

Mr. Shimodaira Takayuki of JICA Cambodia Office reminded that the laboratory would not be supported by JICA alone and emphasized importance of coordination with ADB.

H.E. Dr. Prum Somany said that the study tour in the Philippine should be organized in August. Besides, he stated that he did not have any comments on the ongoing project because it has clear timeline. He, however, strongly requested JICA for the 2<sup>nd</sup> phase of this project specially to support the accreditation.

Mr. Muramatsu Yasuhiko mentioned that MAFF is now in a critical stage for the discussion and conclusion on the strategy for upgrading the laboratory. Recalling that the fund of ACSEP would be used only for procurement of equipment for strengthening the laboratories, he suggested that MAFF would need to identify fund source for the activities on accreditation. Dr. Kitamura Yasuo then emphasized that this is ongoing project focusing on improvement of capability of pesticide residue analysis. He added that a focus should be given to utilizing the capacity on key issues in pesticides management. He gave a recommendation to conduct a pesticide residue trials.

H.E. Chan Phalloeun said that the meeting achieved good results with energy and had lively discussions between Cambodia and JICA. She admitted that the project went ahead as planned despite the disruption by Covid-19. She then expressed high expectations that JICA should increase the funding to authorize laboratory as an official laboratory by referring the strong needs of ISO / IEC: 17025 for implementation of policies on GAP and Organics standard.

Finally, on behalf of the Chairperson of the Meeting, H. E. Chan Phalloeun thanked JICA as well as the Government of Japan for its continued assistance for Cambodia in all areas, especially assistance for the MAFF for the development of the agricultural sector to improve the national economy and people's livelihood.

She concluded the meeting by expressing her sincere appreciation to JICA and all participants. She found out this meeting produced a lot of fruitful discussion and results.

The JCC meeting was formally closed at 11:40 morning time. The participants moved on to lunch meetings to follow up the discussion. †

Signature

**Sameng Keomouine**

**Project Director**

## **THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE**

Venue: Sunway Hotel Phnom Penh

Date: 11<sup>th</sup> April 2023

Time: 9:00-12:00

### **Agenda of the Joint Coordinating Committee Meeting**

| <b>Time</b> | <b>Activity</b>                                                           | <b>Persons</b>                                                                                               |
|-------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 8:30 -9:00  | Registration (as necessary)                                               | Hong Phoma                                                                                                   |
| 9:00-9:15   | Welcome Remark by the Ministry                                            | H.E. Lord Reasmey, Under Secretary of States in charge of Department of Agricultural Legislation (DAL), MAFF |
| 9:15-9:30   | Welcome Remarks by JICA                                                   | Ms. Miyahara Ai, Senior Representative, JICA Cambodia Office                                                 |
| 9:30-9:45   | Opening Remarks by the Ministry                                           | H.E. Ing Hoc Lim, Under Secretary of State of the Ministry of Agriculture, Forestry and Fisheries (MAFF)     |
| 9:45-10:00  | Introduction of Participants                                              |                                                                                                              |
| 10:00-10:30 | Group Photo and Break                                                     |                                                                                                              |
| 10:30-11:00 | Presentation and Discussion<br>-Status and Plan toward Project Completion | Mr. Muramatsu Yasuhiko                                                                                       |
| 11:00-11:15 | Presentation and Discussion<br>- Next step for sustainability             | NAL                                                                                                          |
| 11:15-11:30 | Presentation and Discussion<br>- Inspection Manual and its dissemination  | DAL                                                                                                          |
| 11:30-11:50 | Open Forum                                                                |                                                                                                              |
| 11:50-12:00 | Closing Remark                                                            | H.E. Chan Phalloeun, Under Secretary of State of the Ministry of Agriculture, Forestry and Fisheries (MAFF)  |
| 12:00-      | Lunch meeting                                                             |                                                                                                              |

| Attendance ListNo. | Name                         | Organization              | Position                                                                            |
|--------------------|------------------------------|---------------------------|-------------------------------------------------------------------------------------|
| 1                  | H.E Ing Hoc Lim <sup>a</sup> | MAFF                      | Under Secretary of State of the Ministry of Agriculture, Forestry and Fisheries     |
| 2                  | H.E Lord Reasmey             | MAFF                      | Under Secretary of States in charge of Department of Agricultural Legislation (DAL) |
| 3                  | H.E Chan Phalloeun           | MAFF                      | Under Secretary of States in charge of General Directorate of Agriculture (GDA)     |
| 4                  | Mr. Ho Puthea                | GDA                       | Deputy Director General of GDA                                                      |
| 5                  | Mr. Neou Ratana              | MAFF                      | Director of the National Agriculture Laboratory (NAL)                               |
| 6                  | Mr. Kean Sophea              | MAFF                      | Director of Department of Horticulture and Subsidiary Crops                         |
| 7                  | Mr. Sok Vanna                | MAFF                      | Deputy Director, Department of PPSPSD/GDA                                           |
| 8                  | Mr. Prum Somany              | MAFF                      | Director, Department of International Cooperation                                   |
| 9                  | Mr. Ros Phan                 | DAL                       | Officer                                                                             |
| 10                 | Mr. Hong Pros                | NAL                       | Deputy Director of NAL                                                              |
| 11                 | Mr. Okada Naoya              | Embassy of Japan          | Second Secretary                                                                    |
| 12                 | Ms. Miyahara Ai              | JICA Cambodia Office      | Senior Representative                                                               |
| 13                 | Mr. Shimodaira Takayuki      | JICA                      | Representative                                                                      |
| 14                 | Ms. Toyama Haruko            | JICA                      | Senior Program Officer                                                              |
| 15                 | Ms. Chan Sokunthea           | JICA                      | Program Officer                                                                     |
| 16                 | Mr. Muramatsu Yasuhiko       | JICA/PPRAP                | Chief Adviser                                                                       |
| 17                 | Dr. Kitamura Yasuo           | JICA/PPRAP                | Expert                                                                              |
| 18                 | Ms. Sakamoto Chizu           | JICA/PPRAP                | Project Coordinator                                                                 |
| 19                 | Mr. Hong Phoma               | JICA/PPRAP                | Project Assistant                                                                   |
| 20                 | Mr. York Panha               | First-Class Solutions Ltd | Interpreter                                                                         |
| 21                 | Mr. Thiv Vanthy              | MAFF                      | Director of Department/GDA                                                          |
| 22                 | Mr. Chan Siphon              | MAFF                      | Deputy Director of Dept./GDA                                                        |
| 23                 | Mr. Lim Bolin                | DAL                       | Deputy Director                                                                     |
| 24                 | Mr. Bun Chanlida             | DAL                       | Chief of the Office                                                                 |
| 25                 | Mr. Phoem Pheak              | DAL                       | Chief of the Office                                                                 |
| 26                 | Mr. Em Pisey                 | DAL                       | Chief of the Office                                                                 |
| 27                 | Mr. Kong Kee                 | GDA                       | Director of DRC/GDA                                                                 |
| 28                 | Mrs. Vinin Marineth          | DAL                       | Vice- Chief of the Office                                                           |
| 29                 | Mr. Thong Soklin             | DAL                       | Vice- Chief of the Office                                                           |
| 30                 | Mr. Sen Socheat              | DAL                       | Vice- Chief of the Office                                                           |
| 31                 | Mr. Mean Khieng              | DAL                       | Vice- Chief of the Office                                                           |
| 32                 | Mr. Srun Sopheak             | DAL                       | Vice- Chief of the Office                                                           |
| 33                 | Mr. Kan Kompheak             | DAL                       | Deputy Director                                                                     |
| 34                 | Mr. Horng Kimchay            | DAL                       | Officer                                                                             |
| 35                 | Mr. Lun Makara               | DAL                       | Officer                                                                             |
| 36                 | Mr. Trang Sidorn             | DAL                       | Officer                                                                             |
| 37                 | Mr. Ly Dalux                 | DAL                       | Officer                                                                             |
| 38                 | Mr. Phiv ChinTheng           | NAL                       | Deputy Director                                                                     |
| 39                 | Mr. Lorn Socheata            | NAL                       | Chief of the Office                                                                 |
| 40                 | Ms. Thao Seaklay             | NAL                       | Vice Chief                                                                          |
| 41                 | Ms. Neau Chanmonny           | NAL                       | Vice Chief                                                                          |
| 42                 | Ms. Nguon Nirdey             | NAL                       | Technician                                                                          |
| 43                 | Ms. Khoun Kanha              | NAL                       | Technician                                                                          |
| 44                 | Ms. Keo Sothary              | NAL                       | Technician                                                                          |
| 45                 | Ms. Leang Sina               | NAL                       | Technician                                                                          |
| 46                 | Ms. Meas Sophea              | NAL                       | Vice Chief of Admin, General Directorate of Agriculture (GDA)                       |

<sup>a</sup> After opening remark, he left the meeting.



**MINUTES OF THE FORTH JOINT COORDINATION COMMITTEE MEETING  
ON  
PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN  
AGRICULTURAL PRODUCE**

The Forth Joint Coordination Committee (JCC) Meeting of the Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce (PPRAP) was conducted on 20 October 2023 from 9:00 A.M. to 12:00 PM at Phnom Penh Hotel under the chairmanship of H.E. Kong Chanveasna, the Secretary of State, Ministry of Agriculture, Forestry and Fisheries (MAFF). The participants of the meeting included: the officers of the line departments, counterparts of the National Agriculture Laboratory (NAL) and Department of Agricultural Legislation (DAL), Plants Protection, Sanitary and Phyto-sanitary Department (PPSPSD) of MAFF, consisting of 46 participants. The agenda of the meeting is attached to this minute as Annex1. The list of attendance is also found in Annex 2.

The meeting was started with a welcome speech by Ms. Miyahara Ai, the Senior Representative of the JICA Cambodia Office. She expressed her sincere appreciation for everyone's active engagement in the project. She highlighted that agriculture is the backbone of Cambodia's society, and it plays an indispensable role in ensuring food security and promoting the economic growth of the country. Recognizing such aspects, she reminded that JICA and MAFF have implemented the project since the November 2020 for three years with the main objective to strengthen the capacity on pesticide residue analysis and enhance pesticide regulatory compliance and enforcement. Reaffirming the closure of the project in upcoming November 2023, she encouraged that MAFF should continue to play its leading role in enhancing pesticides residue analysis and other related activities for proper pesticides use and management to strengthen agricultural production, diversification and export to ensure the project sustainability. She encouraged the participants to discuss the achievements and key challenges; and to explore possible solutions for the sustainability of the Project. In the conclusion, she mentioned that JICA would seek to continue working closely with MAFF, GDA, PDAFFs and related parties for the implementation of the remaining Project's activities.

On behalf of the MAFF, H.E. Kong Chanveasna, the Secretary of State of MAFF, in his opening speech, thanked JICA for supporting the implementation of the Project, and appreciated the excellent efforts and cooperation between NAL, DAL and JICA expert team to achieve remarkable results of the project in the past three years in the midst of COVID 19. He acknowledged that the activities on pesticide residue analysis were successfully implemented, which included, among others, the repair of the pesticide residue analytical machine, the installation of new analytical equipment, and the study tours to the Philippines and a series of the training on analysis of pesticide residues.

For Output 2, he admitted that the project has not been fully complete yet due to time constraints and the transfer of duties on management of pesticides and fertilizers from DAL to GDA in the last July. However, he emphasized that, although the inspection manual of agricultural pesticides has been drafted, some further adjustments should be made because MAFF need to update the relevant legal documents in the near future. He then referred to the dissemination workshop to be convened when the inspection guideline is complete. At this point, he expressed expectations regarding the follow-up funding by JICA for dissemination of the guidelines to inspectors to achieve the full success of output 2.

He assured that the team of the GDA would remain to pursue the implementation of this work until the end and to report the results to JICA. In his remark, he promised, in case JICA faces difficulty in providing the budget for the implementation of the remaining activities, he is



committed to finding other source of fund to complete this activity. Regarding the new national laboratory, he informed that MAFF acquired 2 hectares of land in Kandal province to build the laboratory suited to ISO/IEC 17025 accreditation.

Finally, regarding equipment provided to DAL for sampling pesticides, he encouraged GDA and DAL to coordinate the transfer in consideration of the transfer of duties.

After the opening speech, H.E. Kong Chanveasna assigned H.E. Lord Reasmey, the Under Secretary of State of MAFF, to preside over the meeting due to his urgent matter. As the chair of the meeting, H.E. Lord Reasmey proceeded to the next agenda by inviting Dr. Muramatsu Yasuhiko, the Chief Advisor to make a presentation.

In the presentation, Dr. Muramatsu Yasuhiko shed light on the evaluation of the project after an introductory part. The evaluation was performed in terms of (1) Relevant, (2) Coherence, (3) Effectiveness, (4) Efficiency, (5) Impact and (6) Sustainability. He expounded the analysis for each of the criteria and concluded as follows: 1) Highly Satisfactory in terms of consistency of the project design to the national plans, 2) Highly Satisfactory in terms of coherency of the project design to the policies of Japan's ODA and other donors, 3) Partially satisfactory in terms of Effectiveness of the project to achieve the project purpose, 4) Satisfactory in terms of Efficiency to generate the outputs by the given project resources, 5) Conditionally Satisfactory in terms of Impact in achieving the intended overall goal and 6) Partially Satisfactory in terms of Sustainability measured by the prospect of delivering the project's benefits beyond the timeframe of the project. He then itemized two conditions pertaining to the Impact: 1) Smooth integration and transfer of NAL to the new laboratory of MAFF; and 2) Smooth transfer of duties related to pesticide registration and inspection from DAL to PPSPSD.

Mr. Nakada Shunichi, the Senior Advisor, the Economic Development Department of JICA Headquarters, discussed and presented the recommendations drawn from the observation and interviews. He emphasized that there were good achievements produced by the project, but one big issue the project faced was the policy change on the responsibility of pesticide regulation as well as integration of the laboratory. From the point of view of the project management, the project purpose unfortunately was not achieved, but the direction of policy itself is going in the right direction. Therefore, it may take time to complete the processes but it will enhance further capacity building of the Cambodian government for pesticide management. For this regard, he proposed three recommendations (1) Recommendation to NAL: As overall goal, NAL is required to expand the scope of analytical methods for combination of active ingredient on crops and to develop SOPs for each of them. NAL (and GDA) is required to accelerate designing process of integrated laboratory. Accumulation of these effort will lead ultimately to ensuring competence of laboratory management through ISO accreditation. (2) Recommendation to DAL/PPSPSD: DAL and PPSPSD are required to smoothly transfer the work on pesticide regulations and the inspection manual, and then PPSPSD is required to conduct regular inspections to ensure appropriate pesticide distribution and use of the developed inspection manual in collaboration with PAFF. (3) Recommendation to MAFF: MAFF is required to improve productivity and strengthen quality control of Cambodian agriculture commodity through further improvement of pesticide quality management and appropriate usage promotion by utilizing the acquired capabilities of pesticide residue analysis and inspection.

After the two presentations, H.E. Lord Reasmey thanked for the presentations, then, opened the floor for discussion.

First, Mr. Lorn Socheata, the Chief of Office of NAL, mentioned that his colleagues learned the methods to analyze the four combinations of crops/pesticides; and have gained an adequate



knowledge on the analysis. He then informed that NAL is considering to expand the scope to develop the analytical methods for 8 prioritized crops for export on the basis of the project experience; and NAL wishes to proceed to ISO/IEC 17025 accreditation which is also supported by UNIDO. In ISO accreditation, he emphasized that it may take a lengthy period of time for the calibration of all analytical instruments and the documentation. He said that it may take three years at least for the accreditation process of ISO and reminded participants that it requires additional cost for accreditation and operation.

Mr. Chou Sovichea, the Deputy Director of PPSPSD, reported that the draft guideline was handed over to GDA from DAL. He then informed that the inspection manual would be finalized after all legal documents and Prakas related to pesticide managements were revised.

Mr. Lim Bolin, the Deputy Director of DAL, reviewed the points of discussion in the presentations by highlighting the satisfactory achievement of NAL on pesticide residue analysis and development of the draft inspection manual by DAL, though dissemination workshop is incomplete due to the MAFF's reform.

Secondly, he referred to the new laboratory and reminded the participants that it is one of the MAFF's reform programs on laboratories under MAFF to integrate them into one laboratory to provide all analysis services to the private sector in agricultural business both for import and export. So, he added that JICA doesn't need to worry about this matter because MAFF would manage to utilize the ability of NAL's officers who have gained knowledge from this project. Regarding the transfer of duties from DAL to PPSPSD, he emphasized that the revisions of legal documents may a long time to complete. He then expressed willingness to assist PPSPSD in finalizing legal documents.

Thirdly, he advised that the samples would be taken by using sampling tools properly and that samples should be taken from legal pesticides only.

Having confirmed that participants discussed fully on the project status and challenges, H.E. Lord Raksmeay concluded that the project was successful especially for Output 1 to be highly satisfactory; and Output 2 to be partially satisfactory. MAFF/GDA will continue to amend relevant Prakas and conduct the workshop to PDFAFF inspectors for dissemination of the inspection guidelines. MAFF will inform JICA when the activities are fully implemented.

Finally, referring the fruitful discussion based on the evaluation results and recommendations, H.E. Lord Reasmey congratulated the success of the project and appreciated JICA for supporting this project. He then acknowledged that the project has contributed to achieving priority actions of MAFF to "promote plant protection, quality, and agricultural product safety".

The meeting is closed at 12:00 noon time. 

Signature

**Sameng Keomonline**

**Project Director**



## THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE

Venue: Phnom Penh Hotel

Date: 20 October 2023

Time: 9:00-12:00

### Agenda of the Joint Coordinating Committee Meeting

| Time        | Activity                                               | Persons                                                                                                          |
|-------------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 8:30 -9:00  | Registration                                           | Hong Phoma                                                                                                       |
| 9:00-9:15   | Welcome Remark by the JICA                             | Ms. Miyahara Ai,<br>Senior Representative of Japan<br>International Cooperation Agency<br>(JICA) Cambodia Office |
| 9:15-9:30   | Opening Remarks by the Ministry                        | H.E. Kong Chanveasna,<br>Sectary of State of the Ministry<br>of Agriculture, Forestry and<br>Fisheries (MAFF)    |
| 9:30-10:15  | Introduction of Participants<br>Photo session<br>Break |                                                                                                                  |
| 10:15-10:55 | Results of Project Evaluation                          | Dr. Muramatsu Yasuhiko                                                                                           |
| 10:55-11:15 | Recommendations and Way Ahead                          | JICA HQ                                                                                                          |
| 11:15-11:45 | Open Forum                                             |                                                                                                                  |
| 11:45-12:00 | Closing Remark                                         | H.E. Lord Reasmey,<br>Under Sectary of State of the<br>Ministry of Agriculture, Forestry<br>and Fisheries (MAFF) |
| 12:00-      | Lunch meeting                                          |                                                                                                                  |



### Proposed JCC members for the Meeting

| Roles in JCC                                                  | Position                                                                                  | Names                                                            |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Chairperson:                                                  | Secretary of State of the Ministry of Agriculture, Forestry and Fisheries (MAFF)          | H.E. Kong Chanveasna                                             |
|                                                               | Under Secretary of States in charge of Department of Agricultural Legislation (DAL), MAFF | H.E. Lord Reasmey                                                |
|                                                               | Under Secretary of States in charge of General Directorate of Agriculture (GDA), MAFF     | H.E. Chan Saruth                                                 |
| Department of International Cooperation, MAFF                 | Director                                                                                  | Representative                                                   |
| Project Director:                                             | Deputy Director General of the General Directorate of Agriculture (GDA), MAFF             | Mr. Sameng Keomonine, Representative of GDA and Project Director |
| Project Manager:                                              | Director of the National Agriculture Laboratory (NAL), MAFF                               | Mr. Neou Ratana                                                  |
|                                                               | Director of Department of Agricultural Legislation (DAL), MAFF                            | Mr. Pen Vuthy                                                    |
| Representative of GDA/MAFF                                    | Deputy Director General of GDA                                                            | Mr. Ho Puthea                                                    |
| Department of GDA                                             | Director of Department                                                                    | 4 persons                                                        |
| Counterpart Personnel Assigned to the Project                 |                                                                                           | NAL, PPSPSD & DAL staff                                          |
| Representatives of GDA/MAFF                                   |                                                                                           |                                                                  |
| Embassy of Japan in Cambodia                                  | Second Secretary                                                                          | Mr. Okada Naoya                                                  |
| Japan International Cooperation Agency (JICA) Cambodia Office | Senior Representative                                                                     | Ms. Miyahara Ai                                                  |
|                                                               | Senior Program Officer                                                                    | Ms. Toyama Haruko                                                |
|                                                               | Program Officer                                                                           | Ms. Chan Sokunthea                                               |
| JICA Headquarter                                              | Senior advisor                                                                            | Mr. Nakada Shunichi                                              |
|                                                               | Agricultural and Rural Development Group 1, Economic Development Department               | Mr. Nakamura Kota                                                |
| JICA Project Team                                             | Chief Adviser                                                                             | Dr. Muramatsu Yasuhiko                                           |
|                                                               | Expert                                                                                    | Dr. Kitamura Yasuo                                               |
|                                                               | Expert                                                                                    | Dr. Ohima Yu                                                     |
|                                                               | Project Coordinator                                                                       | Ms. Sakamoto Chizu                                               |
|                                                               | Project Assistant (temporary)                                                             | Mr. Hong Phoma                                                   |

添付資料 4

モニタリングシート



TO CR of JICA Cambodia OFFICE

## Project Monitoring Sheet

**Project Title: THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE**

**Version of the Sheet: Ver.1 (Term: 20<sup>th</sup> November 2020 until 31<sup>st</sup> May 2021)**

Name : Sameng Keomonine

Title : Project Director

Name : Yasuhiko Muramatsu

Title : Chief Advisor

Submission Date: 1<sup>st</sup> June 2021




## I. Summary

## 1 Progress

## 1-1 Progress of Inputs

This project monitoring sheet covers the progress achieved in the period from the commencement of the project dated on 20<sup>th</sup> November 2020 until 31<sup>st</sup> May 2021.

Inputs by the Japanese Side

A total of 2.33 person-months (P-M) of the Chief Advisor have been mobilized during the evaluation period, which is equivalent to 29 % of the planned total input for the activities in Cambodia by JICA. In addition to the service in Cambodia, a total of 2.0 P-M was also mobilized for home-based activities in Japan. Thus a total of 4.3 P-M was mobilized during the evaluation period.

The senior specialist has rendered the home based service to support the Chief Advisor during his assignment in Cambodia. He then provided crucial inputs in the planning process and equipment procurement in the period from March until the end of May.

A Japanese coordinator was also mobilized for a period of approximately six (6) months since 20<sup>th</sup> November 2020 for organizing, filing and retrieving records of meetings, communicating with various departments and other agencies, scheduling appointments, and coordinating travel and accommodations. Further a Cambodian Project Assistant was recruited and contracted on 1<sup>st</sup> February 2021 to assist the team in managing and implementing the project activities.

A set of laboratory glassware such as volumetric flask, beaker, separating funnels and its stands was procured in the first quarter of the year 2021 to ensure smooth delivery of project service.



**Inputs by the Cambodian Side**

For NAL, eight (8) laboratory officers were nominated as the project counterpart. All of them are the officers of the pesticides laboratory of NAL with adequate basic knowledge and experience on chemical analysis of pesticides. They joined all the activities pertaining to the capacity development of NAL including assessment and planning. They participated in two sessions as well on Statistics in Analytical Chemistry where they reviewed the fundamentals and essentials such as accuracy, precision, normal distribution and then exercised computation of instrumental/method detection limits.

For DAL, eight (8) officers were nominated to represent the offices of Planning and International Cooperation, Agricultural Material Standards, Agricultural Litigation and Investigation. The department organized a two (2) days field visit in the western border area, in which the chief advisor and the coordinator participated. There were other occasions of discussion and exchange views on the major issues in pesticides management.

**1-2 Progress of Activities****Activity 0. Conduct survey on pesticide usage by farmer at field by GDA and sales in pilot site by DAL**

The activity is to collect, assemble and analyse broad information on pesticides in Cambodia to ensure proper use of pesticides, which would include institutional framework along with real status of pesticides use by farmers. During the first quarter of the year 2021, the Chief Adviser identified and consulted key stakeholders who may affect future orientation of NAL; and acquired pertinent information. The activity will be performed in an intermittent manner throughout the project period to fine-tune the approach and direction especially to achieve the long-term target.

**Activity 1-1. Confirm capacity of NAL analyst for operation of existing equipment**

An assessment of capacity was undertaken for the purpose of planning the project's training programme. A planning process performed under the project is accordingly provided following a brief description, hereunder, of capacity assessment.

A desk review of the relevant documents was initially performed. During this stage, the followings, among others, were reviewed to analyse the status quo: 1) Inspection Equipment Selection Research report prepared by SPEC Bio Laboratory Co., Ltd, 2) Capacity assessment and recommendations for the accreditation of 3 laboratories in Cambodia prepared by Mr. Benoit Glaud, 3) Draft Final Report by Agrifood Consulting International prepared for ADB on Agricultural Value Chain Infrastructure Improvement

**Project.**

The basic knowledge and skills of the NAL's officers were subsequently assessed on the past experience on the pesticide residue analysis, use of analytical instruments and past exposure to fundamentals on statistical processing of analytical results. This activity was rendered by a series of questionnaire survey, which was further verified by an interview and a laboratory visit.

In the subsequent stage of the project from the middle of March to June 2021, various training plans have been prepared. A standard plan of the training was designed to split the entire project period into four (4) intermittent terms to enable flexible but effective intervention to achieve the project purpose. In this plan, the senior specialist of the team was scheduled to engage in each of the terms at least for a period of two weeks; and other experts including Japanese and those from other countries were planned to be mobilized thereafter initially from Term 2.

Term 1 from June to July 2021

Term 2 from Nov. to Dec. 2021

Term 3 from Apr. to May 2022

Term 4 in Sept. 2022

The major components of the training were then identified based on the assessment of the staff skill and the laboratory physical capacity. The training programme is composed of 21 sessions including classroom lectures, laboratory OJT and workshops. The subjects of the training included, among others: 1) Government's role in pesticide management, 2) Theory and Practices in Pesticide Residue analysis, 3) Basics in Application of Statistics to Chemical Analysis, 4) Laboratory management and 5) Illegal pesticides.

Meanwhile, a series of online meetings were convened with the participation of 1) JICA HQ, 2) JICA Cambodia and 3) Food and Agricultural Material Inspection Centre (FAMIC) to share project information and thus help FAMIC ready for their participation in the project.

**Activity 1-2. Facilitate laboratory upgrading for pesticide residue analysis**

As reported in the section on Progress of Inputs, a set of laboratory glassware such as volumetric flask, beaker, separating funnels and its stands was procured in the first quarter of the year 2021. Regarding maintenance of existing LC/MS, NAL has requested Perkinelmer company in Singapore to repair it, however, Covid 19 disrupted the company's travel to Cambodia. Further, another set of laboratory equipment necessary for implementation of the training program was identified in April 2021 on the basis of the standard plan of project activity. It included, among others: 1) Gum rubber laboratory tubing (vacuum tubing), 2) Kiriya rohto and Bell jar, 3) Filter Papers, 4) Disposable

Syringe Membrane Filter Unit. The team then proceeded to a call for pre-quotation to estimate the budget. It was subsequently found that the overall cost of the procurement requires an approval and settlement process by JICA Cambodia because the total cost went beyond the budget ceiling specified in the relevant guidelines; and it does not allow the team to control the procurement process. This was caused partly by the escalation of international transport cost as well. Resultantly it was recognized that the procurement requires at least 3 to 4 months to complete all the procurement process needed to commence the activity in Cambodia.

**Other activities will be carried out in the coming months generally in line with the updated Plan of Operation (Project Monitoring Sheet II).**

### **1-3 Achievement of Output**

At the time of this monitoring, the project is on the track of producing the intended outputs.

### **1-4 Achievement of the Project Purpose**

At the time of this monitoring, the project is on the track of achieving the purpose.

### **1-5 Changes of Risks and Actions for Mitigation**

The first phase of the training program (Term 1) was previously scheduled to be rendered in June 2021. However the emergence and the rapid resurgence of COVID-19 both in Cambodia and Japan in the second quarter of the year 2021 have prevented its implementation. It has especially affected the process of : 1) Procurement of Laboratory Equipment necessary for the training; and 2) the series of training in Cambodia. As for the procurement of laboratory equipment especially those imported, it is affected by the ongoing disruption of international transport and logistics which was caused by the below-average operation capacity of port facility. Consequently this will cause: 1) a significant delay of delivery of equipment and 2) an increased international transportation cost leading to a higher overall cost.

### **1-6 Progress of Actions undertaken by JICA**

As a mitigation arrangement against the interference by the Pandemic, the JICA Team has decided to convene a series of online training program starting in July 2021 for a period of three (3) months. An introductory session of the online program is scheduled to take place on 16<sup>th</sup> June 2021.

### **1-7 Progress of Actions undertaken by Gov. of Cambodia**

All the arrangement mentioned above are being coordinated with the counterpart officers of MAFF.

**1-8 Progress of Environmental and Social Considerations (if applicable)**

No specific environmental and social issues have been identified.

**1-8 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

No specific gender issues have been identified.

**1-9 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

No specific remarks.

**2 Delay of Work Schedule and/or Problems (if any)**

**2-1 Detail**

The risks caused by the Pandmic will have implication on the overall schedule of the project. The delay in the project's delivery date due to the Pandemic is estimated at 3 months at the minimum. The current status of the delay may be possibly absorbable by flexibly pursuing project activity to catch up with the original plan with the consideration of the followings: 1) there still remain one and a half years for completion of the project at the time of writing this brief paper; 2) the project requires four (4) months period in total in Cambodia in any of the plans; and 3) the next project activities in Cambodia is tentatively scheduled to take place in October 2021. However, a further delay of the project activity may require an extension of the project.

**2-2 Cause**

The potential delay of the project timeline is caused by 1) an outbreak of COVID-19, 2) the emergence of COVID-19 variants, and 3) the disruption of international transport and logistics affecting the import of laboratory equipment.

**2-3 Action to be taken**

As reported above, the current delay is absorbable but require an extension of the project period when a further delay is anticipated. The status needs to be closely monitored.

**2-4 Roles of Responsible Persons/Organization (JICA, Gov. of●●,etc.)**

Not applicable.

### **3 Modification of the Project Implementation Plan**

#### **3-1 PO**

#### **3-2 Other modifications on detailed implementation plan**

*(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)*

### **4 Current Activities of Gov. of Cambodia to Secure Project Sustainability after its Completion**

GDA is coordinating with other donors including ADB and World Bank for physical investment of the laboratory. And NAL/GDA participated with CAPFish-Post-harvest Fisheries Development (UNIDO) training on ISO 17025 (2017). Further the government shares small cost of reagent used in laboratory and NAL has been collecting some analysis fees as the government revenue.

## **II. Project Monitoring Sheet I & II      as Attached**



## TO CR of JICA Cambodia OFFICE

## Project Monitoring Sheet

**Project Title: THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE**

**Version of the Sheet: Ver.1 (Term: 1<sup>st</sup> June 2021 until 31<sup>st</sup> December 2021)**

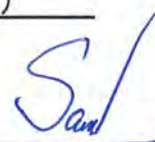
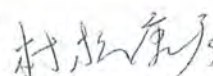
Name: Sameng Keomonline

Title: Project Director

Name: Yasuhiko Muramatsu

Title: Chief Advisor

Submission Date: 1<sup>st</sup> January 2022

## I. Summary

### 1 Progress

#### 1-1 Progress of Inputs

This project monitoring sheet covers the progress achieved in the period from the 1<sup>st</sup> day of June 2021 until 31<sup>st</sup> day of December 2021.

#### Inputs by the Japanese Side

A total of 2.28 person-months (P-M) of the Chief Advisor has been mobilized for home-based activities in Japan during the evaluation period. A total of 6.61 P-M has been thus mobilized since the beginning of the Project for the service in Cambodia at 2.33 P-M and in Japan 4.28 P-M.

The expert on pesticides has been mobilized in a consecutive manner for the period to render home based service in designing and delivering online lectures on pesticide residue analysis and management.

A Japanese coordinator, contracted on November 20<sup>th</sup> 2020, has engaged in the activities for the entire period for organizing, filing and retrieving records of meetings, communicating with various departments and other agencies and scheduling appointments. Further a Cambodian Project Assistant, contracted on February 1<sup>st</sup> 2021, provided coordination and logistic support for smooth implementation of the Project activities.

A set of laboratory equipment necessary for pesticides residue analysis was procured. They included, among others, homogenizers, Separation funnels and rotary evaporators in addition to the first batch of procurement took place in the first quarter of the year 2021 to ensure smooth delivery of project service.

#### Inputs by the Cambodian Side

During the evaluation period, the counterpart officers participated in the series of online training on pesticides residue analysis and management.

For NAL, eight (8) laboratory officers participated in seven (7) joint online sessions and 10 sessions specifically on pesticides residue analysis. Meanwhile, DAL's eight (8) officers participated in the seven (7) joint sessions and one (1) session specifically on the situation of pesticides use and the regional and domestic pesticide management.

Each of the online sessions was mostly designed as a 3-hours lecture combined with discussion and questions/answers. Therefore it is estimated that the NAL and DAL officers spent approximately 408 and 192 hours respectively to participate in the online session. Please note that it is a conservative estimate because there were homeworks to review the sessions. The total hours were thus estimated to be 600 hours.

## **1-2 Progress of Activities**

In the following section of the report, the activities performed in the previous evaluation period are recorded in grey color. Meanwhile, the activities performed in this evaluation period is presented in black color.

### **Activity 0. Conduct survey on pesticide usage by farmer at field by GDA and sales in pilot site by DAL**

- It was reported in the previous monitoring sheet on June 1<sup>st</sup>, 2021.

### **Activity 1-1. Confirm capacity of NAL analyst for operation of existing equipment**

- It was reported in the previous monitoring sheet on June 1<sup>st</sup>, 2021.

### **Activity 1-2. Facilitate laboratory upgrading for pesticide residue analysis**

During the evaluation period, a set of equipment was additionally identified and procured to supplement the procurement activity in the precedent period. The followings are the major, but not limited, equipment procured in the period.

- Solid Phase Extraction Vacuum Manifolds
- SPE Vacuum Pump Trap Kit
- Vacuum pump
- Separation funnel shaker
- Separation funnel holder
- SUMICHIRAL OA-2000I Column
- Homogenizer

Chemicals and other consumables such as Hexane, 1,2-Dichloroethane, L-Ascorbic acid, Isopropyl alcohol and Dichloromethane were also procured.

**Activity 1-3. Carry out On-the-Job Training for NAL analyst to analyze pesticide residue**

During the evaluation period, two terms of online training were designed and implemented. The first term began on July 6<sup>th</sup>, 2021, then completed on September 20<sup>th</sup>, 2021. The second term was commenced in December 2021 to bridge the gap between the first term online session and the activity in Cambodia scheduled to take place in the first quarter of the year 2022.

The first term contained sixteen (16) sessions in total with approximately three (3) hours for each, among which three (3) sessions were designed as the joint sessions for DAL and NAL; meanwhile, ten (10) sessions were conducted with a focus on the theories on pesticides residue analysis specifically for NAL; and one (1) session was provided specifically for DAL. Two sessions were convened in the second term. Both of them were implemented as joint program for DAL and NAL.

It is also noted that simultaneous interpretation service was provided for all the joint sessions and for those targeted at DAL officers. Meanwhile, the consecutive interpretation service (from English to Khmer and vice versa.) was provided for the training targeted at the NAL officers. The intention of mobilizing a consecutive interpreter was to promote an understanding because the officers are familiar with English technical jargons as well.

In the following part of the report, a summary of the sessions is also provided to help the readers of this report to capture an overview after a brief evaluation and observation on the training.

**Evaluation and Observation**

To assess the perception of the participants on the training program, a questionnaire survey was conducted. The summary of the questionnaire survey is found at the end of this Monitoring Sheet. Some of the major observations in the survey are as follows:

- 1) The online training provided an adequate level of introductory and broad information on pesticides residue analysis and management.
- 2) However, it was observed that a limited number of participants declared full understanding on the lectures, while the rest expressed partial understanding. It was construed that the online mode of the lectures might have discouraged active interactive process to deepen the understanding of the participants, which had impaired efficiency of the training program.
- 3) The hands-on trainings in Cambodia scheduled in the first quarter of the year 2022 should be thus accompanied by a review of the theories lectured online to help gain more self-confidence on their knowledge on pesticide residue analysis and management.
- 4) It was admitted that most of the training sessions were designed and implemented for

NAL officers with focuses on the technical aspects of pesticides residue analysis. It requires a rapid catching-up process when the service in Cambodia is commenced.

- 5) It was also observed that some of the lectures were not fully within the current scope of the counterpart's mandates. For instance, 1) the session on December 23<sup>rd</sup> discussed Supervised Residue Trials to determine Maximum Residue levels (MRLs); 2) the Supervised Residue Trials are seen as an important process to verify the information of pesticides container labels in Cambodia; 3) however such trials are not designed and implemented solely by NAL and DAL. Although the Project is not designed to directly address such challenges, it is also important for the young officers to be aware about the needs of such trials.

### Summary of Sessions

The following section provides a summary of the online trainings.

#### *Term 1 from July to September 2021*

- Jul. 6<sup>th</sup>, 2021: This was a Joint introductory session to share an overview of modern agriculture
- Jul. 7<sup>th</sup>, 2021: This was a follow-up session for NAL on use of pesticides in modern agriculture. The presentation shed a light on the advantage and disadvantages of the conventional pesticide residue analysis and QuEChERS method. The participants then discussed major types of organic insecticides such as Organophosphates, Carbamates among others.
- Jul. 8<sup>th</sup>, 2021: This was a follow-up session for DAL on use of pesticides in modern agriculture. The presentation focused on the roles of DAL in management of pesticide by reviewing the mandates of the Ministry of Agriculture and the Health Authority; then proceeded to the discussion on labels, licensing of retailer, On-site inspection of importers and retailers.
- Jul. 13<sup>th</sup>, 2021: This was the first session on pesticide residue analysis to understand the purpose of residue analysis, the importance of samples, the portion of agricultural produce to be analyzed, and a definition of pesticides residue in the analysis; and to confirm the differences between pesticide formulation and residue analyses.
- Jul. 15<sup>th</sup>, 2021: The session handled the basics on statistical processing of analytical results and calibration. It began with a discussion on traceability and calibration in other countries, which was accompanied by the case in

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | Cambodia. The participants then discussed calibration of volumetric apparatus, general rules in recalibration of volumetric glassware.                                                                                                                                                                                                                                                                                                                                                                             |
| Jul. 20 <sup>th</sup> , 2021:  | This was a joint session on the status of Illicit pesticide and the role of a government laboratory. The lecture reviewed the status in India and Myanmar with focuses on non-genuine / illegal pesticides and pesticides use at banana plantations.                                                                                                                                                                                                                                                               |
| Jul. 27 <sup>th</sup> , 2021   | The session began with a presentation by NAL counterpart officers to review the major types of organic insecticides based on the lecture on July 7. Then the session proceeded to the main issues on definition of pesticides residue compliance with MRLs and recommended methods of sampling for the determination of pesticides.                                                                                                                                                                                |
| Jul. 28 <sup>th</sup> , 2021   | This was the third session on the pesticides residue analysis for the officers of NAL. It began with the theory of extraction, then discussed the differences between pesticide formulation analysis and residue analysis; further emphasized importance of sampling procedure.                                                                                                                                                                                                                                    |
| Aug. 5 <sup>th</sup> , 2021    | The joint session discussed the status and experience of pesticide management in the world and the role of government laboratories. It began with a presentation on the status and experience on pesticide regulatory management in other countries especially Japan; and the role of government laboratories.                                                                                                                                                                                                     |
| August 10 <sup>th</sup> , 2021 | The session discussed laboratory management for the officers of NAL. The major issues discussed included: 1) Grade of reagents used for residual analysis, 2) Proper storage of reagents and samples, 3) Disposal of reagents and samples and 4) Laboratory safety management.                                                                                                                                                                                                                                     |
| Aug. 17 <sup>th</sup> , 2021   | This was the fourth session on the pesticides residue analysis for the officers of NAL. It began with a presentation by the officers of NAL on active ingredients of pesticides and their structural formula, water solubility, and Octanol Water partition coefficient as a reaction to a request by the JICA Team on July 28 <sup>th</sup> , 2021. The lecture gave a focus on theories of Liquid-Liquid Extraction of pesticides. An exercise was provided on the calculation process of partition coefficient. |
| Aug. 31 <sup>st</sup> , 2021   | This was the fifth session on the pesticides residue analysis for the officers of NAL. It began with a presentation by the officers of NAL on physical and chemical properties of the active ingredients of pesticides as a reaction to a request on August 17 <sup>th</sup> , 2021. The lecture continued to focus on Liquid-Liquid Extraction and solvent miscibility.                                                                                                                                           |

|                              |                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sep. 3 <sup>rd</sup> , 2021  | This was a joint session with DAL and NAL to present pesticide management in Japan. In the discussion on Pesticide Registration Scheme in Japan, an emphasis was given to the significance of the inter-agency coordination among the Ministry of Health, Labor and welfare, the Ministry of the Environment in addition to the Ministry of Agriculture, Forestry and Fisheries.             |
| Sep. 7 <sup>th</sup> , 2021  | This was the second session on laboratory management for NAL to follow-up the session on August 10 <sup>th</sup> , 2021. It provided the information on record-keeping needs and procedures, development of SOPs and Proficiency Test.                                                                                                                                                       |
| Sep. 14 <sup>th</sup> , 2021 | This was the sixth session on the pesticides residue analysis for the officers of NAL. It began with a presentation on normal phase and reverse phase in chromatography as a reaction to a request on July 17 <sup>th</sup> 2021. The session focused on the process of salting out, a process to increase efficiency of extraction of pesticides from solvents.                             |
| Sep. 20 <sup>th</sup> , 2021 | This was a joint session with DAL and NAL on Good Agricultural Practice (GAP) to discuss its origin and implementation. It traced back to Agenda 21 in 1992 which evolved into ASEAN GAP in 2006 and then Global GAP in 2007 to discuss the Cambodian GAP. The speaker encouraged to examine and study how the pesticide administrators and analytical chemists are getting involved in GAP. |

*Term 2 from December 2021*

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dec. 16 <sup>th</sup> , 2021 | This is a joint session on the International rules and organizations on pesticide management. It began with a introductory discussion on WTO which was followed by Animal health: World Organization for Animal Health (OIE), the International Plant Protection Convention (IPPC), Codex Alimentarius Commission (Codex Alimentarius). A focus was also given to The Codex Committee on Pesticide Residues. The topics in the session would help the officers in capturing the roles and importance of the Government in managing pesticides and their residue. |
| Dec. 23 <sup>rd</sup> , 2021 | This is a joint session to follow-up the lecture on December 16 <sup>th</sup> , 2021 on the International rules and organizations on pesticide management. A focus was given to Supervised Residue trials to determine MRLs, It was discussed that undertaking Supervised Residue trials to determine MRLs would be the vital role NAL is expected to exert a role as a                                                                                                                                                                                          |

pesticides authority of Cambodia in the future.

Other two sessions are scheduled in January 2022.

**Other activities will be carried out in the coming months generally in line with the updated Plan of Operation (Project Monitoring Sheet II).**

### **1-3 Achievement of Output**

At the time of this monitoring, the project is on the track of producing the intended outputs.

### **1-4 Achievement of the Project Purpose**

At the time of this monitoring, the project is on the track of achieving the purpose.

### **1-5 Changes of Risks and Actions for Mitigation**

- The actions in the previous monitoring period was reported in the monitoring sheet on June 1st, 2021.

In the early part of the fourth quarter of 2021, it appeared that COVID-19 is more under control in Cambodia and Japan. Thus the JICA team discussed that the resumption of the activity in Cambodia should be planned in the first quarter of 2022. However, the emergence of Omicron variant reported in the latter part of the fourth quarter of 2021 has posed a concern on the proposed rescheduling of the project activities.

It is also noted that procurement of laboratory equipment needs a longer lead time than previously expected. The delivery of some of the equipment such as rotary evaporator would delay. The said challenge will be managed and controlled by prioritization of training components to maximize the project benefit.

### **1-6 Progress of Actions undertaken by JICA**

- The actions in the previous monitoring period was reported in the monitoring sheet on June 1st, 2021.

As a follow-up mitigation arrangement, the JICA Team designed and implemented an additional online training to bridge the Term 1 online training and the field activity scheduled in the first quarter of 2022.

### **1-7 Progress of Actions undertaken by Gov. of Cambodia**

All the arrangement mentioned above are being coordinated with the counterpart officers of MAFF.

### **1-8 Progress of Environmental and Social Considerations (if applicable)**

No specific environmental and social issues have been identified.

### **1-8 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

No specific gender issues have been identified.

### **1-9 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

No specific remarks.

## **2 Delay of Work Schedule and/or Problems (if any)**

### **2-1 Detail**

■ The risks were also discussed in the previous monitoring sheet on June 1st, 2021.

The delay of project implementation caused by the Pandemic has an implication on the overall project schedule. The impact on the schedule will be assessed to determine the needs of extension of the project duration and quantify the duration for extension when more information on the Pandemic and its impact become available.

### **2-2 Cause**

The potential delay of the project timeline is caused by 1) an outbreak of COVID-19, 2) the emergence of COVID-19 variants, and 3) the disruption of international transport and logistics affecting the import of laboratory equipment.

### **2-3 Action to be taken**

■ The actions were also discussed in the previous monitoring sheet on June 1st, 2021. An extension of project duration may be necessary. But quantitative assessment of the period would be performed when more information become available.

### **2-4 Roles of Responsible Persons/Organization (JICA, Gov. of●●,etc.)**

Not applicable.

## **3 Modification of the Project Implementation Plan**

### **3-1 PO**

### **3-2 Other modifications on detailed implementation plan**

*(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities,*

*and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)*

#### **4 Current Activities of Gov. of Cambodia to Secure Project Sustainability after its Completion**

GDA is coordinating with other donors including ADB and World Bank for physical investment of the laboratory. And NAL/GDA participated with CAPFish-Post-harvest Fisheries Development (UNIDO) training on ISO 17025 (2017). Further the government shares small cost of reagent used in laboratory and NAL has been collecting some analysis fees as the government revenue.

**II. Project Monitoring Sheet I & II**      *as Attached*

## **Summary Report on the 1st Online Training**

### **Training Outline**

Period: July – September, 2021

Lecturer: Dr. Yasuo KITAMURA and Dr. Yasuhiko MURAMATSU

Participants and Contents:

[NAL & DAL]

1. Introduction: The birth of modern society and modern agriculture
2. Actual status of Illicit pesticide, the role of a government lab, etc
3. Status and experience of pesticide Management in the World and the Role of Government Labs, etc.
4. Pesticide management in Japan
5. Origin and history of Good Agricultural Practice (GAP) and how we should assist in implementing GAP

[DAL]

1. Pesticide in modern agriculture

[NAL]

1. Pesticide in modern agriculture
2. Pesticide residue analysis I-1
3. Pesticide residue analysis I-2
4. Pesticide residue analysis I-3
5. Laboratory Management 1
6. Pesticide residue analysis I-4
7. Pesticide residue analysis I-5
8. Laboratory Management 2
9. Pesticide residue analysis I-6

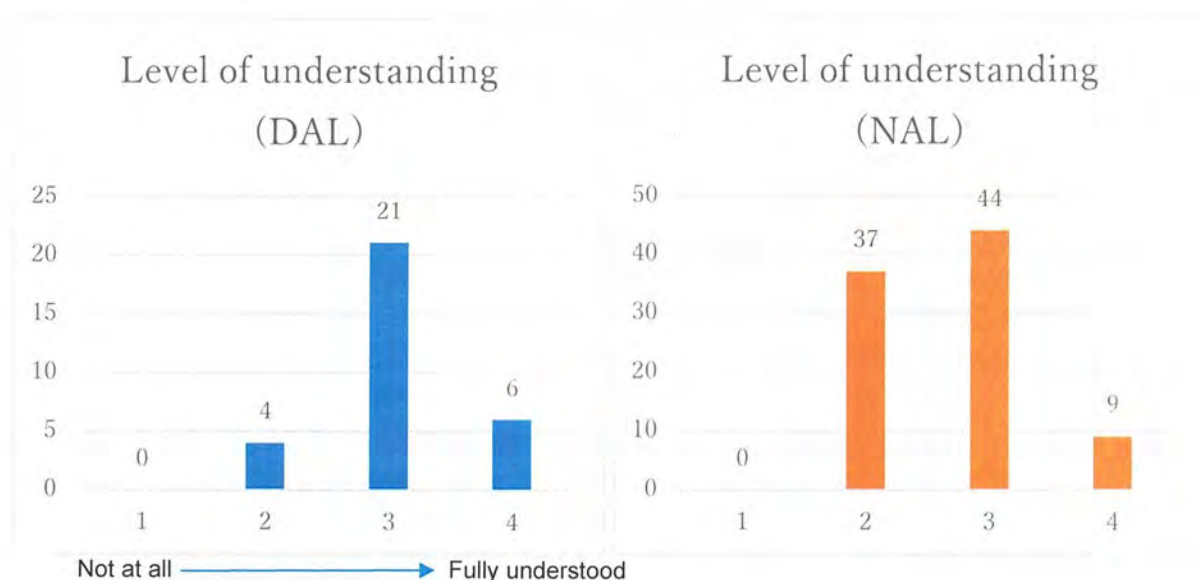
## Survey Result

Number of Surveys: DAL 5 / NAL 14

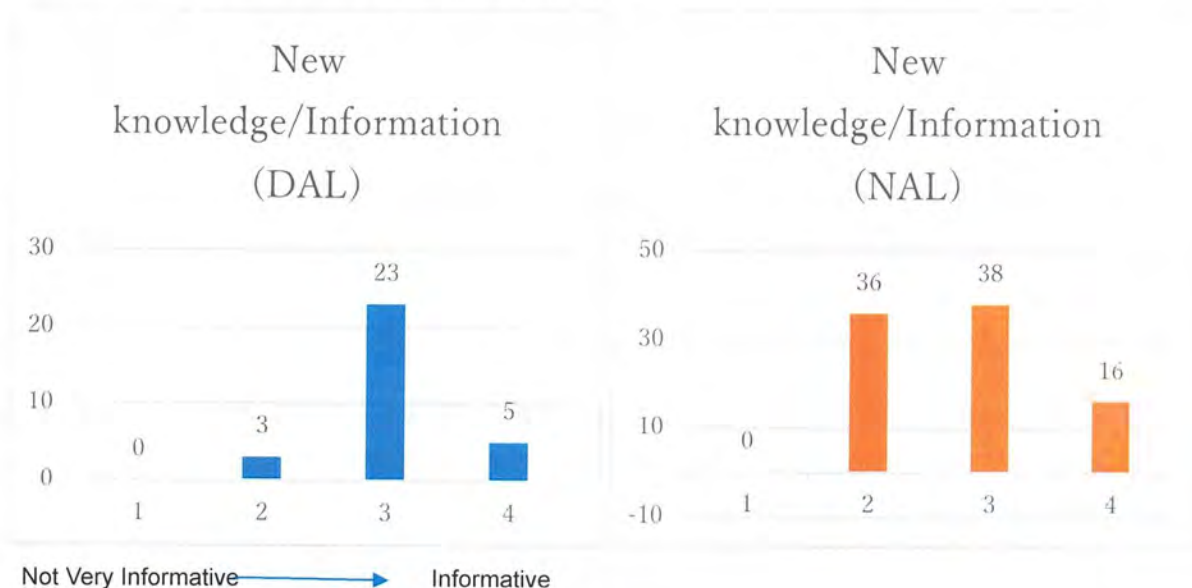
Cumulative number of responses: DAL 31 / NAL 90

Survey method: Google Forms (English and Khmer)

### 1. Level of understanding



### 2. Gain in new knowledge / information



### 3. Questions and comments from the participants

[DAL]

- Want to know about pesticide control
- Evaluation of pesticide, fertilizer, and variety to be used and registered

### The results of the Questionnaire Survey on the First Term of the Online Training

- I would like you to reduce some words in the slide to the 666 rule in the presentation. Thanks
- In the last three years, FAO has launched an online method for pesticide registration. It is called the "Pesticide Registration Toolkit". This toolkit is very helpful for developing countries to access data online based on the international guideline/regulations and the other 'country's experience. Based on the registration experiences, the classification of toxic pesticide classes is a bit different, and also the banned on active ingredients is also different. As we know that HHP pesticides are classified as very harmful to human animals and the environment. However, I also got some information on the toolkit source stated that some pesticides that we are allowed to register and use are classified in the Carcinogenic group in which those products could cause cancer, for example, the case of Glyphosate use by a groundkeeper in the US in 2018, after using Roundup for more than 5 years that man got skin cancer. As your country experiences, does Japanese law classify the group of Carcinogenic products? If so, did they do their experiment based on other 'country's experiences?
- Please support raising fund and strategies of inspection for Department of Agriculture Legislation.
- I would like to express my sincere thanks to JICA and the government of Japan for always supporting us both financially and technically. I really appreciate Dr. Kitamura and Dr. Muramatsu for their informative lectures and I hope to learn more soon.
- Should show some video as the examples that are related to pesticide management in Japan
- May JICA continue to support the field of pesticides and fertilizers
- GAP must be developed as a national guideline and integrated with every stakeholder.
- I want to know precisely the procedure of pesticide risk management.
- Pesticide Risk assessment should be discussed more.
- What are the principles of JICA to participate in reducing the crime in the fertilizer and pesticide trade?

#### [NAL]

- How to improve pesticide management in Cambodia in future
- What are the penalties for finding or arresting perpetrators of illegal pesticides in developed countries?
- I would like to know about the experience and the procedure to establish Marks.
- Related to the types of pesticides, I would like to know how many pesticides are in Carbamate, Organophosphate, Organochlorine, and Pyrethroid. If you have documents, I would like to get them.
- Explain clearly on single and multi-residue analysis. And other methods of analysis.
- Under what biological form is pyrethroid identified to identify it as a pyrethroid?

- How to stop illegal pesticides in the world and Cambodia
- I would like to know the temperature condition of the storage sample, after homogenizing, fresh sample, and the sample after extraction and purification to minimize pesticide loss.
- I want to ask how much of the sample we are analyzing will be stored in the refrigerator and at what temperature?
- An analytical sample of all commodities and definition of MRL
- Why do we need to analyze fruit or vegetable peel although we 'don't eat the peel? Will the result we get accurate or not?
- I have a question related to the tomato sample collection. In the slide, you have mentioned the tomato weight 1Kg. Does the 1kg of tomato from the field collecting or sample preparation testing?
- How to calculate of solute after extraction.
- How many degrees Celsius should we keep the sample after making the mixture?
- Put more quizzes and answers in detail
- For pesticide analysis used solvents brand Merk for analysis EMSURE® but local company never give the certificate analysis so next should ask him to give the certificate or not?
- Is the coefficient used only for Octanol and Water or can it be used on any other substance?
- I would like to know about the Kow. Does Kow have a limitation range? Could we say that the log Kow value is high, it is non-polar?
- I would like you to clarify how to do SOPs of performing the analysis and quality control?
- Can we apply salting-out techniques to analyze residue in soil or vegetables or fruits?

#### **4. What the participants want to learn more**

[DAL]

- Inspection and how to register pesticides globally
- Pesticide Control Techniques and Procedures
- Pesticides of international standard medicine
- I would like to know about the sampling method and sampling error.
- Pesticide use from the early 20th century until now and many concerns related to food safety. MRLs of pesticide in international trade, pesticide residue analysis
- We are willing to learn more about the pesticide management system in Japan.
- How to proceed a good inspection and entering of the database on pesticide
- Want to learn how to manage pesticides and fertilizers properly and safely to end-users.
- I want to learn practical work about the procedure of disseminating information on pesticides and fertilizers to traders, farmers and relevant institutions to contribute to professional development?

Annex  
The results of the Questionnaire Survey  
on the First Term of the Online Training

- Pesticide Control and Inspection
- Effective management methods for all types of pesticides
- The role of inspection
- I want to study the toxicity of pesticides and the method for protecting pesticides
- Want JICA to open more courses
- Specific to pesticide residue analysis of OC, OP, Carbamate and Pyrethroid in fruit, vegetable, cereal, cassava, pepper
- I want to learn about various operation procedures of extraction
- What advance between C18 and C8 column.
- And want to explain more about solid-phase extraction (SPE).
- I want to learn practical pesticide inspection.
- I want to learn more about the 'Japanese's experience in pesticide management. Thanks.
- Pesticide Control
- the rule of inspection
- I hope to learn more about the on-site inspection.
- I would like to study about interpret the analyses chromatogram.
- Aside from pesticide residue analysis in lab, I would like to understand how to generate MRL in each country
- Pesticide management from others countries and Cambodia.
- We would like you to make a more detailed presentation about the on-site inspection process and the preparation of registration dossiers for pesticide companies.
- About the management of pesticides and fertilizers
- The method of inspection
- I would like to know more about the procedures for inspecting the pesticide trade in Japan.
- Multi analysis pesticide residue method.
- I would like to learn more about guidelines for pesticide labelling in Japan!
- I want to learn the concept and implementation of pesticides.
- Want more new courses related to pesticide knowledge

[NAL]

- Specific solvent and reagents used for residue analysis. 'What's solvent to be extracted and cleaned up for a certain group of pesticides. How is reacted?
- I want to learn about sampling methods different from QuEChERS Method
- I would like to learn how to do the validation method.
- I want to learn about different sample preparation methods.
- I want to learn something related to agriculture
- Methods analysis pesticide residue.
- More detail on sampling, preparation sample, extraction, clean up techniques, and operation and practice of GC and LC. How to develop SOP, preparation of a document for applying ISO 17025 (2017)
- I would like to know how to evaluate the risk assessment on pesticides.
- I would like to learn how to calculate the long-term dietary intake of pesticides.

Annex  
The results of the Questionnaire Survey  
on the First Term of the Online Training

- I want to learn how to calculate data
- Method for cleaning up for different commodities (example some commodities have more chlorophyll....)
- Want to learn about pesticides that affect the food
- Guideline of sample extraction for pesticide residue analysis
- Want to learn how to calculate other data methods related to pesticide residue
- Learn about error standards
- I want to learn about laboratory safety management.
- Extraction and clean up methodologies
- Representative sampling method to get the results obtained in proportion to the total agricultural product accurately
- Want to analyze pesticide residues in water and soil
- I would like to learn how to prepare different commodities samples for testing such as fruits, vegetables, cereal (rice, corn ...) so on.
- Techniques for analyzing fruits and vegetables
- Clean up solute method before analyzing with GC or HPLC.
- Chromatographic background knowledge
- Pesticide risk management
- Want to learn about pesticide analysis
- Chromatography
- I would like to learn how to do quality control during the process of test.

Tentative Plan of Operation  
Version 3 (Dated December 31st, 2021)  
Project Title: Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce

| Inputs                                                        | Plan<br>Actual | 2020 |    |     |    | 2021 |    |     |    | 2022 |    |     |    |
|---------------------------------------------------------------|----------------|------|----|-----|----|------|----|-----|----|------|----|-----|----|
|                                                               |                | I    | II | III | IV | I    | II | III | IV | I    | II | III | IV |
| Expert                                                        |                |      |    |     |    |      |    |     |    |      |    |     |    |
| Chief advisor                                                 | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |
| Senior Specialist                                             | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |
| Pesticide Residue Analyst                                     | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |
| Pesticide Formulation Analysis (as required)                  | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |
| Coordinator                                                   | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |
| Project Assistant                                             | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |
| Equipment                                                     |                |      |    |     |    |      |    |     |    |      |    |     |    |
| Basic experimental apparatus for pesticide residue analysis   | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |
| Basic experimental apparatus for pesticide residue analysis   | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |
| Training in Japan/ Third country                              |                |      |    |     |    |      |    |     |    |      |    |     |    |
| Training for pesticide residue analysis/ pesticide regulation | Plan<br>Actual |      |    |     |    |      |    |     |    |      |    |     |    |

7

| Activities                                                                                                      |                | 2020   |  |  |  | 2021 |   |    |     | 2022 |   |    |     |    |  |
|-----------------------------------------------------------------------------------------------------------------|----------------|--------|--|--|--|------|---|----|-----|------|---|----|-----|----|--|
|                                                                                                                 | Sub-Activities | Plan   |  |  |  |      | I | II | III | IV   | I | II | III | IV |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
| Output 1: Capability of residue analysis for selected combinations of pesticide and crop is obtained.           |                |        |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
| Output 2: Capability of on-site inspection for pesticide retailer and pesticide quality monitoring is improved. |                |        |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Plan   |  |  |  |      |   |    |     |      |   |    |     |    |  |
|                                                                                                                 |                | Actual |  |  |  |      |   |    |     |      |   |    |     |    |  |

Legend in the expert assigner

Activity in Cambodia

Online Activity in Japan

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# TO CR of JICA Cambodia OFFICE

## Project Monitoring Sheet

**Project Title: THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE  
RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE**

**Version of the Sheet: Ver.1 (Term: 1<sup>st</sup> January 2022 until 30<sup>th</sup> June 2022)**

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Title: Project Director  
Name: Yasuhiko Muramatsu  
Title: Chief Advisor  
Submission Date: 30<sup>th</sup> June 2022


### I. Summary

#### 1 Progress

##### 1-1 Progress of Inputs

This project monitoring sheet covers the progress achieved in the period from the 1<sup>st</sup> day of January 2022 until 30<sup>th</sup> day of June 2022.

##### Inputs by the Japanese Side

A total of 1.78 and 1.73 person-months (P-M) of the Chief Advisor has been mobilized for home-based activities in Japan and those in Cambodia during the evaluation period. A total of 10.14 P-M has been thus mobilized since the beginning of the Project. The senior expert on pesticides was mobilized to provide hands-on training on pesticide residue analysis in laboratory, which was grounded on the series of online lectures provided prior to the field service in February 2022. Then he organized and supervised the training by the junior pesticide expert.

The Junior pesticides expert, under the direct supervision of the senior expert, provided hands-on training on the analysis of imidacloprid in tomato for a period of 29 days from the middle of May 2022.

A Japanese coordinator, contracted on November 20<sup>th</sup>, 2020, has engaged in the activities for the entire period for organizing, filing and retrieving records of meetings, communicating with various departments and other agencies and scheduling appointments. Further a Cambodian Project Assistant, contracted on February 1<sup>st</sup> 2021, provided coordination and logistic support for smooth implementation of the Project activities.

A set of laboratory equipment and consumables necessary for pesticides residue analysis was procured. They included, among others, 30 sets of eggplant shaped flasks, Hydrochloric acid, sulfuric acid, tricyclazole and Sep-Pak Florisil Cartridges. The followings are also on order: 1) a set of low temperature circulator used for concentration of pesticides solvent extract and 2) a set of fume hood to reduce exposure of the laboratory staff to hazardous vapors.

##### Inputs by the Cambodian Side

During the evaluation period, the counterpart officers participated in the series of the hands-on training in laboratory in addition to the online training.

For the hands-on training, it was mostly designed to provide a half day coaching on operating procedure for residue analysis in laboratory which was then followed by review and discussion on the following day. Six laboratory officers, three vice-chiefs and three laboratory technicians, regularly and consistently attended the course

throughout the periods. The managerial level officers also participated in the training wherever possible. The inputs by the NAL is thus estimated approximately 168 person-days<sup>1</sup> in total during the two consecutive periods, Q1 and Q2 of 2022, in a conservative estimate.

## **1-2 Progress of Activities**

### **Activity 0. Conduct survey on pesticide usage by farmer at field by GDA and sales in pilot site by DAL**

- It was reported in the previous monitoring sheet on June 1<sup>st</sup>, 2021.

### **Activity 1-1. Confirm capacity of NAL analyst for operation of existing equipment**

- It was reported in the previous monitoring sheet on June 1<sup>st</sup>, 2021.

### **Activity 1-2. Facilitate laboratory upgrading for pesticide residue analysis**

During the evaluation period, a set of equipment was additionally procured to supplement the procurement activity in the precedent period. The followings are the major, but not limited, equipment and consumables procured in the period.

- 30 sets of eggplant shaped flasks,
- Hydrochloric acid,
- Sulfuric acid,
- Tricyclazole
- Sep-Pak Florisil Cartridges

### **Activity 1-3. Carry out On-the-Job Training for NAL analyst to analyze pesticide residue**

During the evaluation period, two rounds of hands-on laboratory training on pesticides residue analysis were provided for a period of approximately one month each in the first and second quarter of the year 2022.

In the first quarter, the officers of NAL were furnished with fundamental and essential knowledge and skills pertaining to pesticides residue analysis. They included the followings, among others: 1) use of separation funnels, 2) types and properties of organic solvents used in extraction process, 3) salting out effect used in improving separation efficiency, 4) sample treatment process such as homogenization and filtration, 5) purification by using graphite carbon column, 6) purge of solvents by dry nitrogen for concentration of extracts, 7) conditioning of HPLC-UV<sup>2</sup> for quantification of imidacloprid and 8) recovery test of imidacloprid from water sample by one of the following three technical options: Liquid-Liquid extraction, Supported Liquid Extraction and Solid Phase Extraction.

This fundamental training in the first quarter led to the laboratory hands-on training on the analysis of Imidacloprid in Tomato. All the officers of NAL except the management level officers exposed to and experienced the whole process of pesticides residue analysis.

### **Activity 1-4. Develop procedures for pesticide residue analysis in selected combinations of active ingredient on crops**

Under the guidance of the short-term expert, the NAL officers participated in the

<sup>1</sup> 5 days/week, 4 weeks in a quarter, for 2 quarters, participated by 6 officers with a multiplier of 0.7

<sup>2</sup> HPLC-UV stands for High Performance Liquid Chromatograph equipped with Ultraviolet detector

training developed the procedure for the analysis of Imidacloprid in Tomato in the second quarter of the year 2022.

In the project, it was designed to address the capacity bottleneck for pesticides residue analysis for the following combinations of Pesticide/Crop types.

- 1: Pesticides with lower water solubility in crops containing more sugars
- 2: Pesticides with higher water solubility in crops containing more chlorophyll
- 3: Pesticides with variable solubility by pH in crops with lesser impurities
- 4: Pesticides requiring measurement of their metabolites in crops with higher lipids.

**Other activities will be carried out in the coming months generally in line with the updated Plan of Operation (Project Monitoring Sheet II).**

### **1-3 Achievement of Output**

At the time of this monitoring, the project is on the track of producing the intended outputs.

### **1-4 Achievement of the Project Purpose**

At the time of this monitoring, the project is on the track of achieving the purpose.

### **1-5 Changes of Risks and Actions for Mitigation**

In the first Joint Coordination Committee meeting on February 23rd, 2022, it was argued that an extension of project duration was unavoidable because the COVID-19 pandemic caused crucial delays in delivering the project outputs. In response, a scenario analysis of project extension was performed in April 2022 to determine a reasonable period of extension. Two scenarios were subject to review and analysis: 1) six (6) months and 2) one (1) year extension scenarios. The analysis indicated that the following four training components could not be completed if the first option (6 months scenario) was adopted: 1) Quantification of residue pesticides in the final extract by using an analytical instrument; 2) a technical workshop to share and discuss the project outputs; 3) development of procedures for pesticides requiring measurement of their metabolites in crops with higher lipids; and 4) the training in Japan or elsewhere for capacity development on pesticides management. Reaffirming that completion of these four components of the project activity are crucial for achieving the project purpose, it was thus concluded that the extension of the project duration for a period of one (1) year is imperative to achieve the intended purpose of the project.

A series of meetings was then convened to discuss the major assumptions made in formulating the project, which has eventually led to two major decisions in the project budgeting as follows: 1) additional procurement of one (1) GC-FPD/ECD and 2) repair of the existing LC-MS.

The assumptions focused at this stage included:

- 1) The analytical instruments provided under the Agricultural Value Chain Infrastructure Improvement Project funded by ADB would become operational and accessible for the training purpose organized by this Project; and
- 2) The existing LC-MS would be used for the same purpose when the implementation of the said project funded by ADB significantly delays.

The crisis unleashed by COVID-19 has caused significant delay in the delivery of analytical instruments under the ADB funded project. Meanwhile, the existing LC-MS has become non-operational since June 2020 due to an instrumental error in mass spectrometry.



It is deemed that the failures of the assumptions, both of which were unavoidable and uncontrollable though, would prevent attainment of the first training component mentioned in the foregoing paragraph for quantification of residue pesticides. In addition, a due consideration was also given to the fact that NAL's officers raised a concern in a meeting in 2021 over potential failure of other analytical instruments as a result of the training, which would cause fatal impacts on the approval process of pesticides in the country.

#### **1-6 Progress of Actions undertaken by JICA**

- Decisions were made for 1) extension of the project duration for 1 year and 2) procurement of a GC-FPD/ECD and repairment of the LC-MS.

In consultation between the JICA Headquarter and the JICA TA team, the JICA HQ made the decisions: 1) the project duration should be extended for a period of one (1) year, 2) a GC-FPD/ECD should be procured and 3) the LC-MS should be repaired.

#### **Progress of Actions undertaken by Gov. of Cambodia**

The decisions of the JICA HQ was informed to the counterpart of MAFF. They commenced preparation of a request letter addressed to the JICA Cambodia office for extension of the project duration.

#### **1-8 Progress of Environmental and Social Considerations (if applicable)**

No specific environmental and social issues have been identified.

#### **1-7 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

No specific gender issues have been identified.

#### **1-8 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

No specific remarks.

## **2 Delay of Work Schedule and/or Problems (if any)**

### **2-1 Detail**

The issues related to the delay caused by the Pandemic is already discussed in the section 1-5 on Changes of Risks and Actions for Mitigation.

### **2-2 Cause**

The issues related to the delay caused by the Pandemic is already discussed in the section 1-5 on Changes of Risks and Actions for Mitigation.

### **2-3 Action to be taken**

The issues related to the delay caused by the Pandemic is already discussed in the section 1-5 on Changes of Risks and Actions for Mitigation.

### **2-4 Roles of Responsible Persons/Organization (JICA, Gov. of●●,etc.)**

Not applicable.

## **3 Modification of the Project Implementation Plan**

### **3-1 PO**

### **3-2 Other modifications on detailed implementation plan**

*(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs,*



*activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)*

#### **4 Current Activities of Gov. of Cambodia to Secure Project Sustainability after its Completion**

GDA is coordinating with other donors including ADB and World Bank for physical investment of the laboratory. And NAL/GDA participated with CAPFish-Post-harvest Fisheries Development (UNIDO) training for accreditation of ISO 17025 (2017). Further the government shares small cost of reagent used in laboratory and NAL has been collecting some analysis fees as the government revenue.

## **II. Project Monitoring Sheet I & II**      *as Attached*

# TO CR of JICA Cambodia OFFICE

## Project Monitoring Sheet

**Project Title: THE PROJECT FOR CAPACITY BUILDING FOR PESTICIDE RESIDUE ANALYSIS IN AGRICULTURAL PRODUCE**

**Version of the Sheet: Ver.1 (Term: 1<sup>st</sup> July 2022 until 31<sup>st</sup> December 2022)**

Name: Sameng Keomonline  
Title: Project Director  
Name: Yasuhiko Muramatsu  
Title: Chief Advisor  
Submission Date: 31<sup>th</sup> January 2023

### I. Summary

#### 1 Progress

##### 1-1 Progress of Inputs

This project monitoring sheet covers the progress achieved in the period from the 1 July 2022 until 31 December 2022.

- At the occasion of the Second Joint Coordination Committee (JCC) meeting on 5 July 2022, the concerned parties agreed the followings: 1) to modify the Project Design Matrix (PDM) and 2) to extend the project duration for one year until the end of the year 2023.

This monitoring report is, therefore, prepared on the basis of the amended PDM.

Note that the Project for Capacity Building for Pesticide Residue Analysis in Agricultural Produce may be referred to as the Project or PRAP as the context requires.

##### Inputs by the Japanese Side

A total of 0.7 and 1.37 person-months (P-M) of the Chief Advisor has been mobilized for home-based activities in Japan and those in Cambodia during the evaluation period. A total of 12.18 P-M has been thus mobilized since the beginning of the Project. The senior expert on pesticides was mobilized to provide hands-on training on pesticide residue analysis in laboratory, which was combined with a series of lectures. A Japanese coordinator, contracted on 20 November 2020, has engaged in the activities for the entire period for organizing, filing and retrieving records of meetings, communicating with various departments and other agencies and scheduling appointments. For the Cambodian Project Assistant, contracted on 1 February 2021, he had provided coordination and logistic support for smooth implementation of the Project activities until the end of September 2022 and left the team to pursue a new opportunity.

During the evaluation period, the team has commenced a procurement process of a "Gas Chromatograph equipped with Flame Photometric Detector and Electron Capture Detector" (GC-FPD/ECD). At the time of writing this monitoring report, a safe outdoor storage of gas cylinders for the Gas Chromatograph is installed. Tubing, filters, and fittings for gas supply will be provided once the main unit is installed.

The Liquid Chromatograph-Mass Chromatography (LC-MS) of NAL has been repaired by cleaning the ion source. Some of the technical challenges in operation of LC-MS is discussed in the Section on Activity 1-2. Other important inputs during this period include, among others:

- 1 GC Columns

- 2 HPLC Columns
- 3 Conditioned graphite ferrules
- 4 Septa used by the GC

The information on the equipment procured for NAL is found in Attachment 1 and 2.  
Inputs by the Cambodian Side

During the evaluation period, the counterpart officers participated in the series of the hands-on training in laboratory. It was mostly designed to provide a half day coaching on operating procedure for residue analysis in laboratory which was then followed by review and discussion on the following day. Six laboratory officers, three vice-chiefs and three laboratory technicians, regularly and consistently attended the course throughout the periods. The managerial level officers also participated in the training wherever possible.

In November 2022, the laboratory officers of NAL has translated the SOP on the residue analysis of Imidacloprid in Tomato to prepare the Khmer version. Then, they organized a brush up training on the analysis of Imidacloprid to all the officers of the laboratory.

## **1-2 Progress of Activities**

### **Activity 0. Conduct survey on pesticide usage by farmer at field by GDA and sales in pilot site by DAL**

- It was reported in the previous monitoring sheet on June 1<sup>st</sup>, 2021.

### **Activity 1-1. Confirm capacity of NAL analyst for operation of existing equipment**

- It was reported in the previous monitoring sheet on June 1<sup>st</sup>, 2021.

### **Activity 1-2. Facilitate laboratory upgrading for pesticide residue analysis**

As reported above, the team has commenced the procurement process of a GC-FPD/ECD. It is scheduled to be delivered and installed before the end of January 2023. However, a delay of delivery is anticipated mainly due to 1) the major disruptions in transport and logistics services as a result of COVID-19 and 2) the import formalities of the Electron Capture Detector (ECD) because it contains a sealed radioactive source and requires additional documentation and approval process for the import to Cambodia. Construction of a safe outdoor storage of gas cylinders, on the other hand, is complete. Tubing, filters, and fittings for gas supply will be provided once the main unit is installed. In an updated estimate, the main unit and the detector of the GC-FPD/ECD will be delivered and installed at the end of February 2023.

For the repair of LC-MS, it was complete in December 2022 under a service contract between JICA Cambodia and Perkin Elmer Thailand and Singapore. The following provides the status and issues of LC-MS.

- The maintenance service has enabled detection and improved resolution of substance below 400 Da<sup>1</sup> after cleaning the ion source and repeated tuning. Therefore, the LC-MS is now able to detect and quantify substances below 400 in terms of molecular weight.

For a longer-term operation of LC-MS, it was requested to:

- avoid injection of samples which is not subject to adequate clean-up process;
- flush the system after running the system to make it free from severe contamination; and

<sup>1</sup> The dalton or unified atomic mass unit

- prevent abrupt changes in voltage of the power instantaneously.

### **Activity 1-3. Carry out On-the-Job Training for NAL analyst to analyze pesticide residue**

During the evaluation period, residue analysis techniques such as coagulation process, solid phase extraction and liquid-liquid extraction were introduced, and the relevant hands-on training was provided on the analysis of Azoxystrobin in Green Chili Pepper.

For the hands-on training, the followings components were guided and instructed:

- 1) Sample Preparation
- 2) Extraction process from samples by using acetone
- 3) Purification process by using coagulation process
- 4) Extraction process by using C18 solid phase extraction (SPE) cartridge
- 5) Extraction process by using Acetone/ Dichloromethane
- 6) Dehydration process with combined use of Anhydrous sodium sulfate and cotton on glass funnel
- 7) Identification and quantification of Azoxystrobin by HPLC-UV

It was previously planned to use leafy vegetables for the analysis of Azoxystrobin. Green Chili Pepper, instead, was used as its matrix in response to the needs of the officers of NAL.

To support the above-mentioned training, a series of lectures was provided as follows:

- 1) Coagulation in residue analysis
- 2) Principles of C18 SPE cartridge extraction
- 3) Use of Acetone/ Dichloromethane for extraction
- 4) Optimization of purification and extraction conditions
- 5) Recovery test and its application

### **Activity 1-4. Develop procedures for pesticide residue analysis in selected combinations of active ingredient on crops**

In December 2022, NAL officers participated in a series of lectures and hands-on training on the analysis of Azoxystrobin in Green Chili Pepper as presented in Activity 1-3.

### **Activity 1-5. Conduct technical workshop to exchange knowledge on pesticide residue analysis among analytical laboratories**

It is tentatively scheduled to take place on 18 October 2023. The invitees would include those at Institute of Technology of Cambodia and Royal University of Agriculture. The design of the workshop will be further discussed in the coming months.

### **Activity 1-6. Strengthen operation and maintenance skill of equipment**

Maintenance of analytical instruments is the major challenges in Cambodia. For instance, the LC-MS (Liquid Chromatography–Mass Spectrometry) procured for NAL under an ADB funded project had been left unused since June 2020 due to contaminated ionization source which leads to lower sensitivity of detection. It was confirmed, as the fundamental cause behind it, that the local supplier of the LC-MS has terminated the service contract with the original manufacturer based in Thailand and is no longer able to provide technical support for maintenance of the LC-MS.

During the evaluation period, it was found that other laboratories<sup>2</sup> under the Ministry of Agriculture, Forestry and Fisheries (MAFF) also have analytical instruments which have been unused due to limited maintenance service.

In this context, it was recognized that procurement from local supplier with sound backup structure for maintenance service of analytical instruments is an important condition to ensure sustainable operation of laboratory.

Therefore, in the bidding process of GC-FPD/NPD(FTD)/ECD system under this project, the following conditions were embedded into the bidding documents. Further the bidders were requested that the engineer(s) and the chemist(s) shall hold a certificate dully issued by the manufacturer of the proposed instrument.

1. Bidders shall have at least five (5) years of sales experience of Gas Chromatograph in Cambodia.
2. Bidders shall meet the following two conditions to demonstrate its capacity of providing maintenance service of the proposed instrument: (i) Availability of one (1) or more engineer on standby for preventive maintenance service; and (ii) Availability of one (1) or more application chemist on standby for the service.

At the installation of GC-FPD/NPD(FTD)/ECD, the local supplier will provide initial operation instruction on use of the analytical instrument.

It is noted that QuEChERS Method applied for Pesticide Residue Analysis at NAL may involves more risks of contamination of the ion source because it does not have adequate level of purification process in extraction of pesticides. Use of liquid-liquid extraction for pesticides residue analysis, as instructed under the project, is expected to minimize the risks of such incidence requiring cleaning service by the manufacturers.

#### **Activity 1-7. Oversea training/study tour on pesticide residue analysis**

It is planned to send selected officers to the Philippines in June 2023.

During the evaluation period, the team leader of the project, taking opportunity of visiting the Philippines for another project, has consulted the Plant Product Safety and Services Division (PPSSD), Bureau of Plant Industry (BPI), Department of Agriculture (DA) of the Government of the Philippines; and identified the following potential destinations of the training/study tour.

- 1 Plant Product Safety and Services Division (PPSSD), Bureau of Plant Industry (BPI), Manila
- 2 Pesticide Analytical Laboratory, PPSSD, BPI, Quezon
- 3 Laboratory Services Division, The Fertilizer and Pesticide Authority (FPA), Quezon
- 4 Pesticide Regulations Division (/Fertilizer Regulations Division), FPA, Quezon
- 5 Croplife Philippines Inc.
- 6 JEFECOR LABORATORIES, INC. Cavite

#### **Activity 2-1. Design approach for information management and dissemination of manuals and guidelines**

<sup>2</sup> They are Cambodia Laboratory of Agricultural Products and Foods (CamLAPF) under the Department of Agro-Industry and the National Animal Health and Production Research Institute (NAHPRI) under the General Directorate of Animal Health and Production. An officer of NAHPRI admitted that the local supplier of the HPLC (High Performance Liquid Chromatograph) was not totally capable of providing maintenance service. For the CamLAPF, the majority of the instruments were those manufactured by Chinese companies with limited availability of maintenance service by local suppliers.

It was understood that a series of workshops at four locations in the country should be conducted for dissemination of the guidelines on inspection. It will take place in the latter part of the year 2023.

**Activity 2-2. Conduct joint on-site inspection and collect suspicious pesticide for the proper implementation of relevant regulation/ guidance for pesticide retailers**

Needs of a set of sampling equipment was identified in consultation with DAL. The team has proceeded to procurement of the following sets of equipment necessary for on-site inspection.

- Digital Scale for Laboratories
- Glass Sample Bottle
- Disposable Protective clothing + Shoe Covers,
- Disposable Chemical Resistant Gloves,
- Safety Goggles
- Pipettor/Pipette Bulb (Volume 50ml)
- Disposable Pipette 50ml
- 36L Laboratory Cooler to keep samples
- Half Facepiece Reusable Respirator,
- Organic Vapor/Acid Gas Cartridge,
- Laptop Computer,
- Tablet

**Activity 2-3. Confirm quality of pesticide collected in pilot site by DAL through analysis (A.I. & Physical) by NAL**

For the purpose of collecting samples, a set of equipment was procured as mentioned in Activity 2-2.

**Activity 2-4. Conduct new 2 A.I. validated methods of pesticide formulation by NAL**

To enable analysis of new two (2) active ingredients (A.I), a new column used in analysis by HPLC was procured. Other columns for separation of chemicals will be additionally procured for GC and HPLC. The list of equipment procured and to be procured are attached to this paper as Attachment 2.

- "SUMICHIRAL OA-2000I column, :(R)-Phenylglycine, Support: High-purity silica gel Particle size: 5µm 4.6 mm X 250 mm, 1/pk"

**Activity 2-6. Conduct pesticide formulation analysis by NAL for suspicious pesticide collected by GDA upon request/information from farmer at field**

As the introduction to the activity, the following hands-on training was conducted in the evaluation period:

- 1) Evaluation and test methods on physical properties of pesticides formulation.
- 2) Stability evaluation of diluted emulsion
- 3) Suspensibility of wettable powder
- 4) apparent specific gravity
- 5) Color

In addition, the following lectures were provided:

- 1) Physico-chemical properties affecting efficacy of pesticides products
- 2) Methods of validation of the above
- 3) Needs of monitoring physical properties of pesticides properties

### **1-3 Achievement of Output**

At the time of this monitoring, the project is on the track of producing the intended outputs.

### **1-4 Achievement of the Project Purpose**

At the time of this monitoring, the project is on the track of achieving the purpose.

### **1-5 Changes of Risks and Actions for Mitigation**

In the first Joint Coordination Committee meeting on 23 February 2022, the participants discussed the delay of PRAP caused by COVID-2019. Then it was discussed that the delay of the ADB funded Agricultural Value Chain Competitiveness and Safety Enhancement Project (ACSEP) would make PRAP unable to use the analytical instruments of ACSEP for the training purpose.

The participants proposed to have an extension of the project duration; and procure analytical instruments to facilitate the capacity development process.

#### **Progress of Actions undertaken by JICA**

In response to the proposal in the first Joint Coordination Committee meeting, it was formally agreed to extend the project duration for one year until the end of 2023 in the second JCC meeting on 5 July 2022. In addition, JICA agreed to procure one (1) GC-FPD/ECD and 2) repair of the existing LC-MS<sup>3</sup>, which had been previously expected to be delivered under ACSEP.

#### **Progress of Actions undertaken by Gov. of Cambodia**

The counterparts of the project, in response to the changes, decided to mobilize the officers to participate in the project activities until the end of 2023.

### **1-8 Progress of Environmental and Social Considerations (if applicable)**

No specific environmental and social issues have been identified.

### **1-6 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

No specific gender issues have been identified.

### **1-7 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

No specific remarks.

## **2 Delay of Work Schedule and/or Problems (if any)**

### **2-1 Detail**

As mentioned above, a delay of delivery is anticipated mainly due to the import formalities of the ECD. The project activities would not be affected by the delay if installation is complete before April 2023.

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<sup>3</sup> LC-MS stands for Liquid Chromatograph-Mass Spectrometer

## 2-2 Cause

It is because the ECD contains a sealed radioactive source and requires additional documentation and approval process for the import to Cambodia. Secondly, it has been also affected by unavailability of direct flight from Japan to Cambodia.

## 2-3 Action to be taken

As mentioned above, the delay would not affect any project activity if all the installation is complete before the end of March 2023. The team will carefully monitor the status of delivery and installation during the first quarter of the year 2023.

## 2-4 Roles of Responsible Persons/Organization (JICA, Gov. of●●,etc.)

Not applicable.

## 3 Modification of the Project Implementation Plan

### 3-1 PO

### 3-2 Other modifications on detailed implementation plan

*(Remarks: The amendment of R/D and PDM (title of the project, duration, project site(s), target group(s), implementation structure, overall goal, project purpose, outputs, activities, and input) should be authorized by JICA HDQs. If the project team deems it necessary to modify any part of R/D and PDM, the team may propose the draft.)*

Upon the agreement on the extension of the project duration, the PDM was reviewed and modified to accommodate the field activities which has been fine-tuned in the course of the project. The Summary of Project Design Matrix Review is attached to this report as Attachment 3.

## 4 Current Activities of Gov. of Cambodia to Secure Project Sustainability after its Completion

It becomes readily apparent that MAFF is coordinating to mobilize fund to ensure project sustainability as evidenced by the following facts. Close monitoring and further coordination with relevant officers of MAFF are needed to ensure that the project benefit is maximized and the project resource is used in a efficient manner.

### Overview on the on-going effort of MAFF for sustainability enhancement

MAFF is implementing the following projects, all of which have relevance to strengthening process of NAL and DAL.

1. Agricultural Value Chain Competitiveness and Safety Enhancement Project (ACSEP) funded by ADB
2. Cambodia Agricultural Sector Diversification Project (CASDP) funded by the World Bank

Further, for the purpose of facilitating ACSEP implementation, MAFF is now implementing the following project and would complete before April 2023.

- Agricultural Value Chain Infrastructure Improvement Project (AVCIIP) funded by ADB

In AVCIIP, MAFF will (i) clarify and streamline the roles and functions of the laboratory system, (ii) develop a Strategic Plan for Laboratory Upgrading (SPLU), and (iii) design investments and other activities to be financed by ACSEP towards the ISO 17025 accreditation and develop financially sustainable operational plans.

#### CASDP, ACSEP and AVCIIP in relation to PRAP

The Pesticides Laboratory of NAL is a direct beneficiary of CASDP and ACSEP; and is being assessed on its investment needs and planning under AVCIIP. These projects were designed to install a GC-MS, and other major analytical instruments needed for pesticides residue analysis. Combined with the investment by JICA, NAL will become fully operational for pesticides residue analysis if all the planned activities are put in place. The investment of ACSEP will improve the laboratory environment as well by installing laboratory tables and other major laboratory furniture. It is also noted that the SOPs developed under the JICA's PRAP would serve as the basis for ISO accreditation under ACSEP.

## **II. Project Monitoring Sheet I & II**      *as Attached*

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## 添付資料 5

プロジェクトメンバー及びカウンターパート



### **List of Dispatched Experts**

- |    |                                                                                                                                                                                                           |                                          |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| 1. | Muramatsu Yasuhiko                                                                                                                                                                                        | Team Leader                              |
| 2. | Kitamura Yasuo                                                                                                                                                                                            | Senior Specialist                        |
| 3. | Shinoda Takayoshi                                                                                                                                                                                         | Pesticides Residue Analysis Specialist 1 |
| 4. | Julio Salvador C. Valeza                                                                                                                                                                                  | Pesticides Residue Analysis Specialist 2 |
| 5. | Oshima Yu                                                                                                                                                                                                 | Pesticides Residue Analysis Specialist 3 |
| 6. | Sakamoto Chizu                                                                                                                                                                                            | Project Coordinator                      |
| 7. | Rith Chanveasna                                                                                                                                                                                           | Cambodian Project Assistant 1            |
| 8. | Hong Phoma                                                                                                                                                                                                | Cambodian Project Assistant 2            |
| -  | The Cambodian Project Assistant 1 was contracted on 1 February 2021 and supported the project until the end of September 2022. The position was replaced since then by the Cambodian Project Assistant 2. |                                          |

### **List of Counterparts**

#### **NAL**

- |    |                                                                                                                      |                                        |
|----|----------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 1. | Phiv ChinTheng                                                                                                       | Deputy Director of NAL                 |
| 2. | Lorn Socheata                                                                                                        | Chief of the Pesticide Laboratory      |
| 3. | Thao Seaklay                                                                                                         | Vice Chief of the Pesticide Laboratory |
| 4. | Neau Chanmonny                                                                                                       | Vice Chief of the Pesticide Laboratory |
| 5. | Keo Sothary                                                                                                          | Vice Chief of the Pesticide Laboratory |
| 6. | Nguon Nirdey                                                                                                         | Technician of the Pesticide Laboratory |
| 7. | Khoun Kanha                                                                                                          | Technician of the Pesticide Laboratory |
| 8. | Yout Chakriya                                                                                                        | Technician of the Pesticide Laboratory |
| 9. | Leang Sina                                                                                                           | Technician of the Pesticide Laboratory |
| -  | Mr. Hun Rithy participated in the project in the early half of the duration, then transferred to another department. |                                        |

#### **DAL**

- |    |                |                                                                             |
|----|----------------|-----------------------------------------------------------------------------|
| 1. | Mr. Phum Ra    | Director at DAL/MAFF                                                        |
| 2. | Kan Kompheak   | Deputy Director at DAL/MAFF                                                 |
| 3. | Lim Bolin      | Deputy Director at DAL/MAFF                                                 |
| 4. | Em Pisey       | Chief of Planning and International Cooperation office at DAL/MAFF          |
| 5. | Sovuth Matra   | Vice-Chief of Agricultural Material Standards of office at DAL/MAFF         |
| 6. | Vinin Marineth | Vice-Chief of Planning and International Cooperation office at DAL/MAFF     |
| 7. | Thong Soklin   | Vice-Chief of Agricultural Litigation and Investigation office at DAL/MAFF) |
| 8. | Srun Sopheak   | Vice-Chief of Planning and International Cooperation office at DAL/MAFF     |

#### **PPSPSD**

- |     |                    |                 |
|-----|--------------------|-----------------|
| 1.  | Dy Sam An          | Deputy Director |
| 2.  | Chou Sovichea      | Deputy Director |
| 3.  | Pen Monyvuth       | Vice Chief      |
| 4.  | Moeung Bophayanika | Vice Chief      |
| 5.  | No Sophearoth      | Vice Chief      |
| 6.  | Choem Channa       | Officer         |
| 7.  | Ly Kimleng         | Officer         |
| 8.  | Chy Tann           | Officer         |
| 9.  | Chhim Vannara      | Officer         |
| 10. | Mang Socheat       | Officer         |



添付資料 6

Sub-decree 改定の新旧対比表



Sub-decree改定の新旧対比表

|      | 旧条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 新条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | The revision of Article 12 of the Sub-Decree No. 17 ANKr.BK, Dated on 17 <sup>th</sup> , April, 2000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 第12条 | <p>農業法制部は、次に掲げる事務をつかさどる。</p> <ol style="list-style-type: none"> <li>① 市場経済において、貧困農家を含む農家世帯の社会経済的地位改善に向けた政策立案に関すること。</li> <li>② 法的諸条件を整備し、対策を提案し、事業体や農業組織の発展促進に関すること。</li> <li>③ 現行法に基づく部門または下位組織の要請に応じて、法律、規制およびその他法令の草案作成および改定に関すること。</li> <li>④ 部門および関連機関に対する農業分野の法令、条項、および規制文書の実施普及および継続的改善に関すること。</li> <li>⑤ 農業資材の品質基準の登録、設計および農業資材の検査措置の改善に関すること。</li> <li>⑥ 大臣指導部および同省の監督下にある団体の農業問題に関する法務補佐としての活動に関すること。</li> <li>⑦ 農林水産大臣によって指示されたその他事務をつかさどる。</li> </ol> <p>2. 2008 年 11 月 14 日付けの政令 No. 188 ANKr.BK、総局と同等の立場にある森林漁業行政を推進するため、省の総局を事務総局に昇格させる改正に関するもの。 農業・農地整備局を農業総局とするとともに、ゴム農園総局を改正して農林水産省管轄のゴム総局とすることを推進する。</p> | <p>農業法制部は次に掲げる事務をつかさどる。</p> <ol style="list-style-type: none"> <li>① 農林水産省関連法令の起草に関わる計画・企画に関すること。</li> <li>② 法律草案、修正案、法定書簡およびその他の規則の調査、研究、策定および改正に関すること。</li> <li>③ 同省および関連省庁の部門により起草された法律および法的文書についての確認および助言に関すること。</li> <li>④ 法律およびその他の法的文書に対する調査、研究、監視および影響評価の実施に関すること。</li> <li>⑤ 法執行機関の検査のための運用標準手順に関するガイドラインを作成し、同省の関連部門に対する法令作成支援に関すること。</li> <li>⑥ 法律および有効な関連法令の施行の有効性の調査、監視、評価に関すること。</li> <li>⑦ 同省の農業法務担当官および法執行官の資格を向上させるための研修やワークショップの開催を通じて人材の能力開発に関すること。</li> <li>⑧ 同省の法執行官による職務および懲戒手続きの実施の調査および監視に関すること。</li> <li>⑨ 他の専門部門と協力し、法令の配布に関すること。</li> <li>⑩ 国内および国際機関、民間部門、開発パートナーとの協力の下で、同省の法律および関連法規の作成および施行に関すること。</li> <li>⑪ 部門の年間活動計画と予算計画に関すること。</li> <li>⑫ 部門の職員、事務作業および資料管理に関すること。</li> <li>⑬ 月次レポート、四半期レポート、期間レポート、9 ヶ月レポート、年次レポートの作成に関すること。</li> <li>⑭ 書記長によって指示されたその他の事務をつかさどる。</li> </ol> <p>農業法制部は、現行の規定に従い、局長 1 名とその補佐として副局長数名を置く。<br/>農業法制部は、農林水産省事務総局の管轄下に置く。</p> |
| 第32条 | Article 32 and Article 33 of the Sub-Decree No. 188 ANKr.BK, dated on 14th, November, 2008;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|  | 旧条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 新条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>植物保護衛生局は、次に掲げる事務をつかさどる。</p> <ol style="list-style-type: none"> <li>① 持続的かつ生物多様性を活かした生産性の向上を図るため、農薬、生物農薬、化学肥料の管理を図る政策、計画、プロジェクト、開発プログラムの策定に関すること。</li> <li>② 消費者および市場が求める農作物の品質と安全性を確保し、その輸出促進を図るために、農作物の品質基準策定、安全性と品質を確保するためのシステム構築および政策策定に関すること。</li> <li>③ 政府政策および WTO の衛生植物検疫に関する協定に沿い、植物保護、食品安全および植物検疫検査に関わる法整備およびそれらの運営サービスの構築に関すること。</li> <li>④ 農産物の品質と安全性を高め、農家収入および収益向上を図り、農作物の輸出を促進するため、管理目標を定め、傘下機関による試験研究活動を推進し、農業普及局や地方団体との協力の下、農家、農業団体、投資家、民間部門に対し、植物保護対策、植物検疫対策、生産性および開発の普及に関すること。</li> <li>⑤ 国境を越える作物の輸送に関わるあらゆる活動の検査機関としての作物品種検査の実施に関すること。</li> <li>⑥ 民間部門との連携を強化し、植物保護および植物検疫作業に関するサービスや、農産物の品質向上に向けた民間投資の奨励・促進に関すること。</li> <li>⑦ 病害虫の駆除、植物保護、抑制、成長促進等を利用される化学物質の分析、土壌養分の改善、農産物の品質分析等の技術支援の提供に関すること。</li> <li>⑧ 国内、地域、国際条約や協定を履行するための連携と協調に関すること。</li> <li>⑨ 総局長によって指示されたその他の業務実行に関すること。</li> </ol> <p>植物防疫・植物検疫局は、局長 1 名とその補佐として副局長数名を置く。</p> | <p>植物保護衛生局は、次に掲げる事務をつかさどる。</p> <ol style="list-style-type: none"> <li>① 植物保護および植物検疫に関する政策、法令、基準、戦略計画、プログラムおよび開発プロジェクトの策定・実施に関すること。</li> <li>② 食の安全性を確保するために、適正な農業慣行や有機農業を含む農業生産システムの開発および決定に関すること。社会実装を支援し、食の安全性を確保するための生産システムに関わる証明書の発行に関すること。</li> <li>③ 植物保護および植物検疫の枠組み内で、法律の規定、植物保護に関する国際条約、世界貿易機関の衛生植物検疫に関する協定および植物検疫に関わる方法について、国内外の基準に従い、作業システム管理およびその他の関連規制の実施に関すること。</li> <li>④ 気候に優しい農業生産に関わり、その品質と安全性を向上させるための植物保護措置と植物検疫措置の調査研究に関すること。</li> <li>⑤ 植物の保護および植物検疫に携わる職員の技術力強化と資質向上を図るための教育活動および研修に関すること。</li> <li>⑥ カンボジア王国を横断する農産物の輸出入または輸送に関わり、植物、植物製品および製品に対する植物保護および植物検疫措置を実施することによる有害成分の管理および制御に関すること。</li> <li>⑦ 植物保護措置および植物検疫措置の実施に関するあらゆる種類の技術サービスを、あらゆる種類の植物保護製品の品質、有効性および危険リスクの観点からの科学的な管理、監視および評価の実施に関すること。</li> <li>⑧ 植物保護製品の品質と有効性の調査、研究、評価に関すること。</li> <li>⑨ 有害動植物を殺虫（殺菌）し、作物中の農薬および化学物質の最大残留基準値の分析・評価に関わるサービス提供に関すること。</li> <li>⑩ 農産物の安全性のリスク分析、検査を実施し、あらゆる種類の植物検疫証明書の発行に関すること。</li> <li>⑪ 植物保護措置および植物検疫措置の実施枠組み策定において、植物検疫に関する情報を管理し、国民への教育普及活動の実施に関すること。</li> <li>⑫ 輸出国の植物検疫要件を調査し、農産物の市場開放について交渉し、植物、植物製品およびその他の植物検疫検査対象農産物の取引促進に関すること。</li> </ol> |

|      | 旧条項                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 新条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>⑬ 農産物の品質と安全性向上に向けて、関係省庁、地方行政機関、民間部門、市民社会、開発パートナーと協力し、植物保護措置と植物検疫措置に関わる能力の強化に関すること。</p> <p>⑭ 国際植物防疫条約、国際貿易の対象となる特定の有害な化学物質及び駆除剤についての事前のかつ情報に基づく同意の手続に関するロッテルダム条約の履行において、カンボジア王国の代表として公的役割を果たし、国際的なコミュニケーションと協力に関すること。 国際的または地域的な文書の実施、および植物保護と植物検疫に関連する国際フォーラムへの参加に関すること。</p> <p>⑮ カンボジア王国で取引および使用される農薬に関する検査の管理および実施に関すること。</p> <p>⑯ 月次、四半期、期間、9ヶ月、年次レポートを作成に関すること。</p> <p>⑰ 農業総局局長によって指示されたその他業務の遂行に関すること。</p> <p>植物保護衛生局は、現行の規制に従って、局長 1 名とその補佐として副局長数名を置く。</p>                                                             |
| 第33条 | <p>農地資源管理部は、次に掲げる事務をつかさどる。</p> <p>① 持続的な天然資源と生物多様性を確保し、土地資源の潜在能力に基づいて、作物生産と土壌利用の生産性を向上させることを目的とした作物生産に関わる政策、計画、開発プログラム、土壌利用および土壌品質改善対策の策定に関すること。</p> <p>② 政策および国、地域、国際レベルの条約および協定に従って農地を改善するため土地資源の管理と利用に関わる関連法規等の策定に関すること。</p> <p>③ 作物品種、土壌タイプおよび地形ごとに適した生育地域選定、土地台帳作成、土地利用および土壌栄養の改善の指導等の農耕地利用ガイドラインの策定に関すること。</p> <p>④ 土地資源の潜在力に応じた作物・土地生産性の向上に向けて、農業普及局および地元団体との協力の下、土地資源利用対策、作物生産および開発における土壌養分改善に関わり関連研究機関による試験研究活動の管理目標の設定および普及活動実施に関すること。</p> | <p>農地資源管理局は、次に掲げる事務をつかさどる。</p> <p>① 政府の政策に基づいて農地資源を効果的かつ持続的に管理するための戦略と計画の策定に関すること。</p> <p>② 持続可能な農地資源の管理と利用に関する政策、国、地域の方針および国際協定に従って、法律を策定し、効果的な実施促進に関すること。</p> <p>③ 研究および実験活動を推進するための戦略目標の策定、また、政府、民間、開発パートナー、農業組織と協調し、農地管理、農地の質低下防止、保全と農業生態、農地と水保全、農地利用、気候変動に配慮した農業に関わる技術移転に関すること。</p> <p>④ 栽培地の選定、農地台帳、土地利用の技術指導、土壌品質の改善など、農地資源の効果的かつ持続的な管理に関わる技術ガイドラインの策定に関すること。</p> <p>⑤ 農業近代化の流れの中で、農地保全と持続的な高度利用の促進を通じて、農地保全を進めるための研究と技術開発に関すること。</p> <p>⑥ 衛星・デジタル技術を活用して、農地資源、農地利用、作物生産を管理し、気候変動が作物生産に及ぼす影響の監視・評価および農業気象の情報公開に関すること。</p> |

|      | 旧条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 新条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <p>⑤ 民間セクターとの連携を図り、土地の質改善に関わる支援サービスへの投資促進に関すること。</p> <p>⑥ 土地の質、作物生育状況、土壌養分の過多により生じる生育不良、化学肥料、有機肥料、および土壌品質を改善するために使用される物質の評価に関するサービス提供に関すること。</p> <p>⑦ 国内、地域、国際レベルでの条約や協定を履行するための調整・連絡に関すること。</p> <p>⑧ 農地資源管理部長によって指示されたその他の業務実施に関すること。</p> <p>農地資源管理部は部長 1 名とその補佐として次長数名を置く。</p>                                                                                                                                                                                                                                                                                                                                                            | <p>⑦ 農地管理、土壌肥沃度評価、農地利用、生態系と社会経済の評価および作物栄養素に関するサービスの実施、評価、提供に関すること。</p> <p>⑧ カンボジア王国で取引および使用される農業用肥料に関し、その検査活動の管理・実施に関すること。</p> <p>⑨ 国際協力を強化し、国、地域、国際レベルでの研究プロジェクトやその他の関連条約や協定の実施協力に関すること。</p> <p>⑩ 月次、四半期、期間、9 ヶ月、年次レポートを作成に関すること。</p> <p>⑪ 長官によって指示されたその他の事務をつかさどる。</p> <p>農地管理局は、現行の規定に従い、局長 1 名とその補佐として副局長数名を置く。</p>                                                                                                                                                                                                                             |
| 第26条 | <p>New Article 26 of the Sub-Decree No. 81 ANKr.BK, Dated on 21st, June, 2019.</p> <p>3. 2008 年 11 月 14 日付けの政令 188 ANKr.BK の第 2 条、第 25 条、第 26 条および第 35 条の改正に関する政令第 81 号 ANKr.BK の新しい条項 26 および新しい条項 2017 年 7 月 26 日付けの政令 No. 118 ANKr.BK の 27</p> <p>第 26 条 -</p> <p>農業総局は、農林水産省の補佐として、次に掲げる事務をつかさどる。</p> <p>① 生態学的条件、土地資源の潜在能力、気候変動の影響、市場ニーズ、天然資源と環境の持続性に応じ政策、計画、プログラム、プロジェクトおよび作物生産開発対策の提案に関すること。</p> <p>② 食の安全性確保、国民生活水準向上、農作物輸出促進を目的とした作物生産および農村経済の発展に資する試験研究の実施に関すること。</p> <p>③ 農業生産性を向上させるために、広く農家と民間に対し、作物生産技術の指導と支援サービスの効果的な普及の実施に関すること。</p> <p>④ 農民組織と農業生産組織を設立し、公的・民間機関、農家および生産者団体間の連携を促すことによって、作物生産ガイドラインおよび技術普及に関し、効果的な教育普及を</p> | <p>農業総局は農林水産省の補佐機関であり、次に掲げる事務をつかさどる。</p> <p>① 作物生産に関する政策、戦略、計画、プロジェクト、プログラムおよび持続可能で生産的かつ競争力のある方策の提案に関すること。</p> <p>② 食の安全性を確保し、農作物の輸出を促進し、もって国民生活を向上させるために、作物生産の生産性向上と農業の商業化を図り、経営の多角化に関連する試験、研究、技術開発および社会経済的研究の実施に関すること。</p> <p>③ 教育活動や技術移転を通じて、農業者や関係者に対して農業技術に関する啓発活動を幅広く実施し、効果的な情報提供に関すること。</p> <p>④ 農家とその関係者に農業コミュニティと農業生産者組織の形成を促し、それらの機能、運営、発展の支援に関すること。公共経営者、民間および農業生産者が地方の農業経済企業となり、マーケティング交渉力を強化できるように、組織力および農業技術の開発促進に関すること。</p> <p>⑤ 農家とその関係者の収入向上を目指し、生態系および社会経済的地理的条件に配慮した適切な作物品種の選定、肥料、灌漑システム、農業技術、衛生植物検疫、植物保護措置、農業機械使用の奨励に関すること。</p> |

|  | 旧条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 新条項                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>実現し、市場開拓をし、農家の利益の向上に資する活動に<br/>関すること。</p> <p>⑤ 農業生産性と農家収入の増加に向けて、社会経済的地理的<br/>条件に応じた適切な栽培品種、土地資源、灌漑の使用、ま<br/>あ、生態学的栽培を適用し、植物保護を進め、農業機械の<br/>利用の促進に関すること。</p> <p>⑥ 分析、研究、農地の品質の評価、作物の健康状態の評価、<br/>あらゆる種類の作物の品種評価、病害虫診断、農薬および<br/>生物資材の分析に関するサービス提供に関すること。</p> <p>⑦ 効果的かつ持続的に作物生産量の増加を目的に、作物生産<br/>の品質を維持するために農薬、生物資材、品種等の利用に<br/>関わる関連法規の制定に関すること。</p> <p>⑧ 協力を促進し、国家、地域および国際レベルでの基準、ガ<br/>イドライン、議定書、覚書、協定およびその他の法的文書<br/>の実施に関すること。</p> <p>⑨ 作物の生育状況を監視し、病気を排除してリスクを軽減す<br/>るための解決策を検討することによる病害虫の発生予察に<br/>関すること。</p> <p>⑩ 農林水産大臣によって指示されたその他の業務実施に関す<br/>ること。</p> <p>農業総局は局長1名と、必要に応じて補佐として副局長数名を<br/>置く。</p> | <p>⑥ 生産と農業商業化を図るため土壌、肥料、水、植物、農薬、作物生育状況、あ<br/>らゆる種類の作物の品種、病害虫診断、生物資材、化学廃棄物、化学廃棄物な<br/>どの品質と安全性を分析、研究、評価に関すること。</p> <p>⑦ 作物サブセクターの発展のための関連法に基づく法律草案および法的文書の作<br/>成に関すること。</p> <p>⑧ 農産加工品の生産性、品質、食の安全性を向上を目指し、インフラ投資を進<br/>め、気候に優しい植物保護、衛生および植物検疫の効果的な実施促進に関す<br/>ること。</p> <p>⑨ 国家、地域、国際レベルでの基準、ガイドライン、議定書、覚書、協定および<br/>その他の法的文書の協力と実施に関すること。</p> <p>⑩ 有効な栽培地域を選定するための土壌肥沃度、土地利用、生態系および社会経<br/>済に関わる調査・評価の実施に関すること。</p> <p>⑪ 農業の生産性向上、公衆衛生改善および持続性確保に向けて、農薬および肥料<br/>の有効かつ安全な使用を促進するための管理および検査実施に関すること。</p> <p>⑫ 月次、四半期、期間、9ヶ月、年次レポートの作成に関すること。</p> <p>⑬ 大臣によって割り当てられたその他の任務の遂行に関すること。</p> <p>農業総局は、現行の規定に従い、局長1名と補佐として副局長数名を置く。</p> |



## 添付資料 7

農林水産省ラボ統合に関わる新聞報道



## AGRICULTURE MINISTER TINA PLANS NATIONAL LABORATORY

Van Socheata | Publication date 27 September 2023 | 21:49 ICT

Agriculture minister Dith Tina (right) met with Asian Development Bank (ADB) country director Jyotsana Varma on September 26. MAFF

Minister of Agriculture, Forestry and Fisheries Dith Tina has mooted the idea of building a large, modern national agricultural laboratory in Kandal province. Construction is expected to cost \$30 million and scheduled for completion in 2026.

While meeting with Asian Development Bank (ADB) country director Jyotsana Varma on September 26, Tina said he welcomes all investment and development projects that would improve the livelihoods of farmers and drive Cambodia towards becoming an upper-middle-income country by 2030.

“The national laboratory will be an essential part of inspecting agricultural products, in order to guarantee food safety and control infectious diseases,” he explained. “We welcome any development partners who want to join us in this project.”

Ministry spokesperson Im Rachna said on September 27 that the lab construction project was initiated by the minister himself. Having inspected key general departments, Tina intends to establish a national lab that will combine the work of the labs of each municipal-provincial agriculture department.

“The national lab will help us a lot, in terms of cutting costs regarding equipment that is generally expensive. That’s our first goal.

“Second, if we bring all of the scientists and lab technicians together, they can share their experience, to strengthen one another’s’ capacities,” she said.

Thong Ra, a food safety specialist at the UN Industrial Development Organisation (UNIDO), voiced strong support for the establishment of the facility, adding that the UN agency stands ready to provide the ministry with technical assistance.

He explained that the ministry met with his organisation recently to discuss the idea, believing that the lab will be very important to improve food safety, both domestically and for export products.

“We strongly support the establishment of this lab. UNIDO has previously noted that the existing labs lack human resources for analysing data and issuing findings.

“To date, we have worked with many labs in Cambodia and provided over 10 state and private labs with training to make technical comments and improve food safety standards,” he said.

Rachna said the facility will be built on 2ha of land in Sitbo commune of Kandal province’s Takhmao town, just outside the capital.

On the same day, Tina also met with Russian ambassador Anatoly Borovik at the ministry headquarters.

During the meeting, he welcomed Cambodia-Russia agricultural cooperation, which focuses mainly on boosting trade, including the import of fertilisers from Russia and the export of Cambodian produce.

Both sides also discussed holding a memorial service for eight Russian agricultural specialists who were killed by the Khmer Rouge in Kampong Cham province on August 23, 1983.

They agreed to hold a service in the province and install a memorial. The names of the eight experts will be engraved on the monument, in both the Khmer and Russian languages.

添付資料 8

従事計画実績表



從事計画実績表

[illegible]

CTII:建設技研インターナショナル

2022年11月現地業務期間中、11月2, 4, 10, 18, 22日及び30日を除く23日間稼働

2022年12月の現地業務は12月1～3日の3日間稼働

2023年1月の現地業務は1月22日～29日及び1月31日の9日間稼働  
2023年2月は左記の現地業務に継続して2月1日から2月3日までの3日間。また現地業務で2月25日から2月27日までの3日間。2月10日、13日及び15日の3日間は国内業務。

2023年3月の現地業務は3月24日～31日の8日間稼働、国内稼働は、3/10、3/13-3/15の4日間

2023年4月の現地業務は4月1日～4月25日。4月26日はADB予算。国内稼働は、4/27及び4/28の2日間