

ミャンマー連邦共和国
中央乾燥地における
節水農業技術開発プロジェクト
中間レビュー調査報告書

平成28年6月
(2016年)

独立行政法人国際協力機構
農村開発部

農村
JR
16-054

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序 文

独立行政法人国際協力機構は、ミャンマー連邦共和国政府との討議議事録に基づき、技術協力プロジェクト「ミャンマー連邦共和国中央乾燥地における節水農業技術開発プロジェクト」を2013年11月から5年間の計画で実施しています。

プロジェクトの中間地点である2016年6月6日から6月24日までの間、日本及びミャンマー側での合同評価を通じて、協力期間前半における活動の実績の確認と評価及び後半に向けての課題の抽出と提言を行うことを目的として、JICA 農村開発部第一グループ次長鈴木和哉を団長とする中間レビュー調査団を現地に派遣しました。

本報告書は、これらの中間レビュー調査団による現地調査や協議の内容・結果をまとめたものであり、今後のプロジェクト運営に広く活用されることを願うものです。

最後に、調査の実施にあたりご協力をいただいた内外の関係者の方々に深い感謝の意を表するとともに、引き続き一層のご支援をお願いする次第です。

平成28年8月

独立行政法人国際協力機構
農村開発部長 三次 啓都

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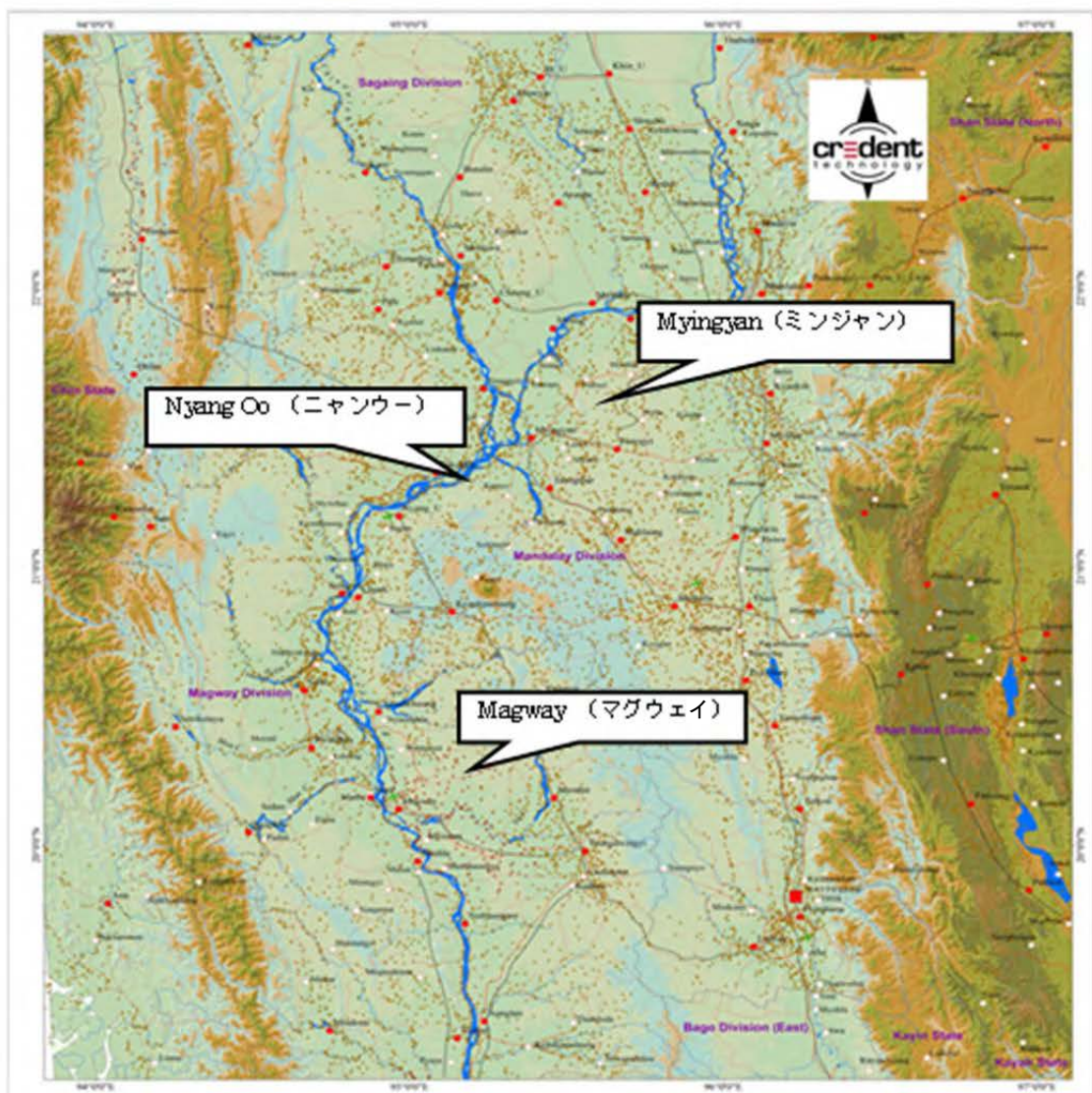
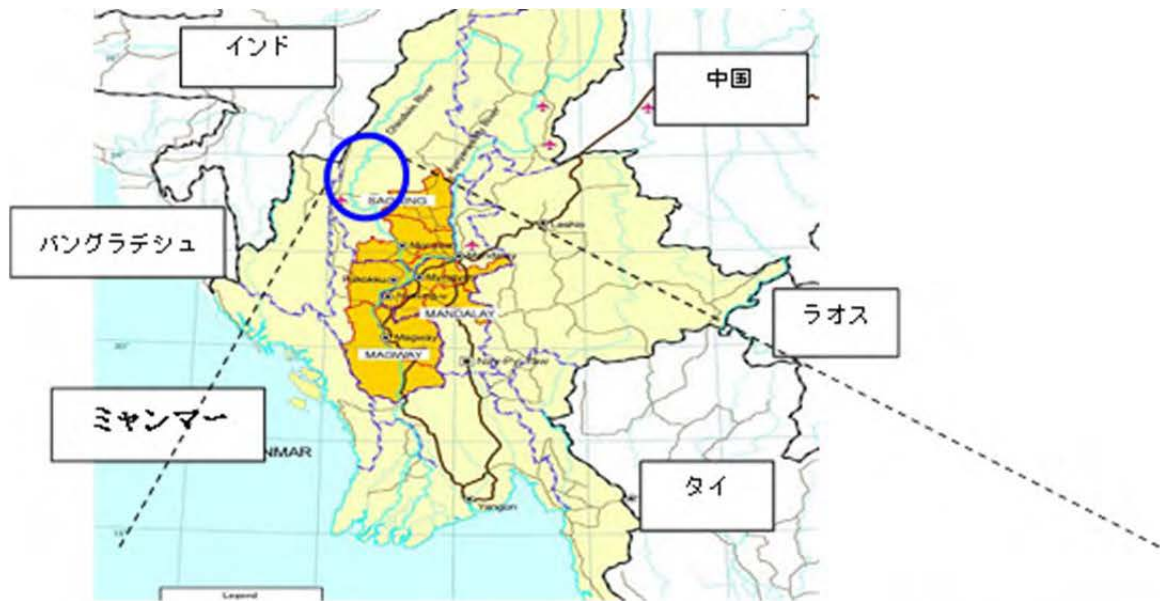
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地 図



写真



プロジェクトオフィス（ニャンウー）



節水農業技術の手法を説明するパネル



展示圃場視察（ニャンウー）



農家への聞き取り



ため池灌漑（ニャンウー）



FFS（農家圃場学校）での様子



試験圃場視察（マグウェイ）



C/P との協議



DOA 局長への聞き取り



合同評価委員会



合同評価レポート署名式



第4回合同調整会議

略 語 表

略 語	正式名称	日 本 語
ACIAR	Australian Centre for International Agricultural Research	オーストラリア国際農業研究センター
APO	Annual Plan of Operation	年間実施計画
CDZ	Central Dry Zone	中央乾燥地
CF	Contact Farmer	中核農家
C/P	Counterpart	カウンターパート
DAR	Department of Agricultural Research	農業畜産灌漑省農業研究局
DOA	Department of Agriculture	農業畜産灌漑省農業局
DOP	Department of Planning	農業畜産灌漑省計画局
FFS	Farmer Field School	農家圃場学校
FD	Field Day	展示圃場会
IDACA	The Institute for the Development of Agricultural Cooperation in Asia	財団法人アジア農業協同組合振興機関
IWUMD	Irrigation and Water Utilization Management Department	農業畜産灌漑省灌漑水利用管理局
JCC	Joint Coordinating Committee	合同調整委員会
JICA	Japan International Cooperation Agency	独立行政法人国際協力機構
Kyat	－	チャット（ミャンマーの通貨単位）
M/M	Minutes of Meeting	協議議事録
MoALI	Ministry of Agriculture Livestock and Irrigation	農業畜産灌漑省
MMM	Monthly Monitoring Meeting	月例モニタリング会合
NCDP	National Comprehensive Development Plan	国家基本開発計画
NF	Neighboring Farmer	周辺農家
OF	Ordinal Farmer	一般農家
OJT	On the Job Training	オン・ザ・ジョブ・トレーニング
PDM	Project Design Matrix	プロジェクト・デザイン・マトリックス
PO	Plan of Operations	実施計画
QMM	Quarterly Monitoring Meeting	四半期モニタリング会合
R/D	Record of Discussions	討議議事録
TG	Target Group	ターゲット・グループ
TS	Township	タウンシップ
WRUD	Water Resources Utilization Department	（旧）農業灌漑省水資源利用局

評価調査結果要約表

1. 概要の案件	
国名：ミャンマー連邦共和国	案件の概要：CDZにおける節水農業技術開発プロジェクト
分野：農業一般	援助形態：技術協力プロジェクト
所轄部署：農村開発部	協力金額：3億8,000万円
協力期間：5年 2013年11月～2018年11月（5年間）	先方関係機関：農業畜産灌漑省（MoALI） （実施機関）：農業畜産灌漑省農業局（DOA） 農業畜産灌漑省農業研究局（DAR） （先方関係機関）：同省灌漑水利用管理局（IWUMD）
	日本側協力機関： 外務省、農林水産省、筑波大学
1-1 協力の背景と概要	
<p>ミャンマー連邦共和国（以下、「ミャンマー」と記す）は、農業が国内総生産の32%、農業従事者が総人口の61%、農産物が総輸出額の17.5%を占めるASEANでも上位の農業国である（2009年度統計）。政府は国内の食料安全保障、経済を牽引する主産業の1つとして、また貧困対策の観点から、農業の発展を重要視し、農業分野の課題として、①国内需要の充実、②外貨獲得を目的とした農産品輸出促進、③農業開発による地方部の発展を掲げている。</p> <p>ミャンマーの地勢はエーヤーワディ川の河口にあたるデルタ地帯、中央部に位置する降水量が少なく比較的乾燥した地域〔以下、中央乾燥地（Central Dry Zone：CDZ）〕、これらを取り囲む山地山岳地帯、海岸線が延びる沿岸部と、大きく4つに分けることができる。なかでも、CDZは平均年間降水量が700mm～1,000mm（デルタ地帯では約3,000mm）と周辺地域に比べて少雨であることに加え、降雨パターンの年次変動が大きい。そのため、主に天水依存型農業を行っているCDZでの農業生産には、不安定さが常態化している。</p> <p>こうした農業生産の安定化を妨げる要因が多いCDZにおいては、農業生産及び収入が安定せず、貧困農家が多いとみなされている。今後、CDZで農業開発を進め、農業生産の安定、農家の収入向上を図るためには、当該地域の自然環境に適応可能な品種・栽培技術や限られた水資源を有効活用するための技術の開発・導入が強く求められている。</p> <p>これらの背景に基づき、JICAは技術協力プロジェクト「CDZにおける節水農業技術開発プロジェクト」（以下、「本プロジェクト」と記す）を2013年11月から5年間の予定で開始した。本プロジェクトは、作物栽培技術や圃場管理技術の改善、節水灌漑技術の開発・普及を組み合わせ、CDZの自然・社会環境に適した節水農業技術を開発することにより、パイロット地域における対象作物の生産量増大を図ることを目的とする。</p> <p>今回実施する中間レビュー調査は、プロジェクトの中盤を迎えるにあたって、現在までのプロジェクト活動の実績及び成果を評価・確認し、プロジェクトが効果発現に向けて順調に実施されているかを検証するとともに、今後のプロジェクト活動に対する提言を導くことを目的とする。</p>	
1-2 協力内容	
<p>本プロジェクトは、CDZにおいて農業収入を安定させるために、有望品種の特定、作物栽培方法の改善、圃場管理技術の改善、節水灌漑技術の開発を通じて、節水農業技術を普及することを目的とする。</p>	

(1) 上位目標

CDZ（特に非灌漑地域）に適した節水農業技術が普及され、農業収入が安定する。

(2) プロジェクト目標

CDZに適した節水農業技術が確立される。

(3) 成果

1. 新規・既存の作物から CDZ に適した有望品種が特定される。
2. CDZ の（社会経済・自然）環境に合致する作物栽培方法が改善される。
3. CDZ の（社会経済・自然）環境に合致する土壌環境（養分、保水性等）管理を含めた圃場管理技術が改善される。
4. CDZ のパイロットサイトに適用可能な節水灌漑技術が開発される。

(4) 投入（中間レビュー時点での実績）

1) 日本側

- 長期専門家：延べ合計 5 名
 - ・新旧チーフ・アドバイザー/乾燥地畑作物生産（2）
 - ・節水灌漑技術
 - ・総合防除
 - ・業務調整
 - 短期専門家：なし
 - 機材供与：
 - ・携行機材（USD 102,946 及び Kyat 21,603,000）
 - ・供与機材（USD 184,938）
 - 施設改修等：USD 80,000 及び Kyat 54,952,500
 - 本邦/第三国研修：なし
 - 在外事業強化費*：2013 年度：Kyat 243,562,996 = JPY 25,623,112 = USD 252,586
2014 年度：Kyat 385,893,388 = JPY 42,950,158 = USD 392,988
2015 年度：Kyat 236,630,000 = JPY 24,658,215 = USD 186,486
- *各年度の合計金額は、携行機、供与機材、施設改修等を含む数値である。各通貨（Kyat、JPY、USD）への換算は JICA 為替レートを使用した。

2) ミャンマー側

- プロジェクト・ダイレクター：延べ 3 名
 - プロジェクト・マネジャー：DAR（延べ 3 名）、DOA（延べ 4 名）
 - C/P：25 名（DAR11 名、DOA14 名）*2016 年 5 月 17 日付
 - JCC：議長（延べ 3 名）、委員（延べ 16 名）
 - 土地・施設等：プロジェクト事務所、会議室、倉庫、実験圃場、種子生産圃場、乾燥場等
 - 予算支出：2013 年度*：Kyat 166,467,000
2014 年度：Kyat 196,739,000
2015 年度：Kyat 260,365,600
 - その他：光熱水費、電気料、ベースライン調査と年度調査等
- * ミャンマーの予算年度は 4 月 1 日から 3 月 31 日までである。

2. 評価調査団の概要

調査者

【ミャンマー側】

担当分野	氏名	所属
団長	Dr. Nyi Nyi	Assistant Director, Extension Division, Department of Agriculture, MoALI
団員	Dr. Pau Sian Kam	Assistant Research Officer, Department of Agriculture Research, MoALI

【日本側】

担当分野	氏名	所属
総括/団長	鈴木 和哉	JICA 農村開発部 第一グループ次長
団長代理	小林 健一郎	ミャンマー農業畜産灌漑省 農業農村開発アドバイザー
節水灌漑技術	三澤 雄一朗	北陸農政局土地改良技術事務所
研究協力	河瀬 眞琴	筑波大学 グローバル・コモンズ機構 国際交流支援部門長
圃場管理	耳田 直純	筑波大学 遺伝子実験センター 生命環境系 助教授
協力企画	大城 華	JICA 農村開発部 第一グループ第一チーム 職員
評価分析	浜田 哲郎	A&M コンサルタント (有)

調査期間：2016年6月6日～6月24日

評価種類：中間レビュー

3. 評価結果の概要

3-1 実績の確認

(1) 成果

成果1：新規・既存の作物からCDZに適した有望品種が特定される。

指標	達成度	達成状況
1-1：プロジェクト開始後半年以内にベースライン調査が実施され、地域農産物に対する消費者のニーズが明らかになる。	達成済み	ベースライン調査とマーケット価格調査は2014年1月と9月に終了した。
1-2：消費者ニーズを踏まえてプロジェクトが推奨する既存・新規を含めた作物と同有望品種が10%以上の抽出農家により採択される。	計画どおり進捗中	有望品種の種子受領者〔中核農家（Contact Farmer：CF）及び周辺農家（Neighboring Farmer：NF）〕/3タウンシップの10%の農家世帯 =970/78,492（1.2%）
1-3：消費者ニーズを踏まえてプロジェクトが推奨する既存・新規を含めた作物と同有望品種の販売により、抽出農家の平均売上が10%以上増加する。	計画どおり進捗中	CFの平均農業粗所得（Kyat/acre）は2015年に10%以上増加している。

成果 2 : CDZ の (社会経済・自然) 環境に合致する作物栽培方法が改善される。		
指 標	達成度	達成状況
2-1 : 選定された既存・新規の作物と同有望品種に対して、CDZ に適した栽培技術が確立され、DAR 試験圃場で延べ 2 回 (年 2 回) 実施される。	おおむね達成	これまで DAR 試験圃場にて試験栽培が 2 回実施された。
2-2 : 栽培技術のマニュアルが作成される。	おおむね達成	各選定作物の栽培技術マニュアルが作成された。(修正予定)
2-3 : マニュアルに準拠した栽培技術を実践できる普及員が 30 名以上養成される。	計画どおり進捗中	26 名の普及員が研修を受けた。26/30=87%
2-4 : マニュアルの内容が CF 圃場で延べ 100 回 (年 1 回以上) 以上検証される。	計画どおり進捗中	これまで、63 回の検証実験が CF 圃場で行われた。63/100 回 (63%)
2-5 : 抽出農家の 10% 以上がマニュアルに準拠した栽培技術を実践する。	計画どおり進捗中	これまで、3,807 世帯農家が栽培技術を実践している。3,807/ 7,849= 49%

成果 3 : CDZ の (社会経済・自然) 環境に合致する土壌環境 (養分、保水性等) 管理を含めた圃場管理技術が改善される。		
指 標	達成度	達成状況
3-1 : プロジェクト開始後半年以内にベースライン調査が実施され、対象地域の土壌条件が明らかにされる。	おおむね達成	ベースライン調査結果を踏まえ、データ収集調査報告書が 2013 年に編集された。
3-2 : CDZ に適した土壌改良技術が確立される。	達成済み	<i>Gliricidia</i> (多目的樹脂) 適用による土壌改良技術が特定された。
3-3 : 土壌改良技術マニュアルが作成される。	おおむね達成	<i>Gliricidia</i> 普及マニュアルが作成され、使用されている。(修正予定)
3-4 : マニュアルに準拠した土壌改良技術を実践できる普及員が 30 名以上養成される。	おおむね達成	21 名の普及員が研修を受けた。 21/30=70%
3-5 : マニュアルの内容が CF 圃場で延べ 100 回 (年 1 回以上) 以上検証される	計画どおり進捗中	これまで、39 回の検証実験が CF 圃場で行われた。39/100=39%
3-6 : 抽出農家の 2% 以上がマニュアルに準拠した土壌改良を実践する。	計画どおり進捗中	これまで、599 世帯農家が栽培技術を実践している。599/ 1,570 =38%

成果4：CDZのパイロットサイトに適用可能な節水灌漑技術が開発される。		
指 標	達成度	達成状況
4-1：パイロットサイトの水資源と農家の水利用の実態調査報告書が作成される。	達成済み	これまで、3冊の調査報告書が作成された。
4-2：集水技術と節水灌漑技術のガイドライン/マニュアルが作成される。	おおむね達成	ガイドラインと普及マニュアルはドラフトされている。
4-3：節水栽培技術と節水灌漑技術を組み合わせた方法の提案書が作成される。	計画どおり進捗中	提案書に関して、そのための展示圃場を特定した。

(2) プロジェクト目標

プロジェクト目標：CDZに適した節水農業技術が確立される。		
指 標	達成度	達成状況
指標 1：本プロジェクトで開発された節水農業技術がプロジェクトサイトの農家15%に導入され、1作以上実施される。	おおむね達成	技術研修に参加した延べ農家数は4,605である。 4,605/11,774=39% (11,774は3つのタウンシップの農家数の15%)
指標 2：プロジェクトサイトにおいて、本プロジェクトで開発した節水農業技術を活用した農家の作物収量が10%増加する。	おおむね達成	中核農家の選定作物の平均収量は2015年に既に10%以上増加している。
指標 3：プロジェクトサイトにおいて、本プロジェクトで開発した節水農業技術を経験した農家の6割(60%)が有効だと評価する。	おおむね達成	CFとNFからの有効との評価の割合が、2014年と2015年の平均値で91%であった。

3-2 評価結果の要約

(1) 妥当性：高い

プロジェクトは受益者（農家世帯）とターゲット・グループ（ターゲットエリアの3カ所のDOA事務所とDAR実験圃場のスタッフ）のニーズに対応している。また、プロジェクトはミャンマーの開発政策と日本の援助政策に適合している。アプローチは、上位目標（乾燥地の農業収入の安定化）を達成する手段として適切であると判断できる。中間レビューの時点において、プロジェクトの妥当性を低下させる要因は存在しない。

(2) 有効性：高い

プロジェクト目標と各成果の間の論理性は確保されており論理的整合性がある。プロジェクト目標はほぼ達成されている状況にあり、プロジェクト終了までに達成されることが期待できる。

(3) 効率性：高い

成果は計画どおり産出されることが期待できる。しかし、プロジェクトが実施している種子増殖と配付の活動は、現行のPDMの成果1に設定されていない（インパクトが高い

のにもかかわらず)。実施プロセスは、プロジェクトの開始時に遅延がみられたが、全般的に効率的であり満足できる状況である。ミャンマー側と日本側からの投入はおおむね適切であり、供与機材や施設はよく活用され維持管理されている。

(4) インパクト：中程度

具体的なインパクトは、CF、NF、一般農家で確認でき、正のインパクトは農家圃場学校（Farmer Field School：FFS）や集水技術/節水技術の展示を通じて波及している。しかしながら、プロジェクト目標と上位目標の間にギャップ（時間的制約と地理的範囲）が存在することから、上位目標の達成が危ぶまれる。他方、負のインパクトと予期されない負の効果は、中間レビュー調査までに確認されていない。

(5) 持続性：中程度より高い

プロジェクトが開発した節水農業技術は、既存の技術を改善したうえで単純化していることから、技術的な持続性は高いと判断できる。他方、プロジェクトはミャンマー政府の農業開発政策に沿っているものの、乾燥地作物により高い関心が当てられるかどうか予想することが困難であることから、政策・法的持続性は中程度より高いと判断した。また、節水農業技術を普及するために既存のメカニズムを利用していることから組織・制度的持続性は中程度より高いとした。財政的な持続性はやや低く今後の予測も困難であることから中程度と推測した。

3-3 プロジェクトの促進要因

- 先方実施機関の幹部職員の指導力と積極的な態度
- 畑作作物の重要性、種子生産の必要性の認識
- C/P 及びターゲット・グループの熱意と規律（時間厳守）
- 成果4の産出のための技術C/PのDAR本部からNyaung Oo試験圃場への人事異動
- 展示圃場会（Field Day：FD）とFFSを通じたDARとDOAの連携・協力
- モチベーションの高いCFとNFの存在

3-4 プロジェクトの阻害要因

- 稲作に比較して国家農業政策の畑作作物の低い優先度
- 研修を受けたC/P及びターゲット・グループの頻繁な人事異動
- 不十分な普及員の移動手段と旅費
- 専任のC/P及びターゲット・グループの不在

3-5 結論

合同中間レビュー調査団は、プロジェクトはプロジェクト期間の前半においては着実に進捗しており、プロジェクト目標を達成する途上にあると判断している。また、調査団はプロジェクトが研修とFFSの実施を通じて、C/P、ターゲット・グループ、CFの能力向上に大きく貢献していることも確認した。彼らはプロジェクト活動の実施に非常に熱心で意欲的である。供与機材や施設はおおむねよく管理され活用されている。具体的なインパクトはNFや近隣農民に現れており、彼らは改善された技術を適用した結果、農業収入が増加している。さらに、MoALI（DOA、DAR、現地事務所）は畑作作物とプロジェクト・アプローチに興味と関心を示していることは特記されるべきである。

プロジェクト終了後から5年後に上位目標（農業収入の安定）を達成するには、ミャンマー側実施機関が節水農業技術を他のCDZにプロジェクトの残り期間に普及できるように、プロジェクトとともに実施可能な戦略を策定し、基礎を構築する必要がある。

3-6 提言

合同中間レビュー結果に基づき、評価団は以下の事項を提言する。

(1) PDM と PO の改訂

調査団は現行PDM (Ver.1) を改定し、改訂版PDM (Ver. 2) を提言する。

(2) プロジェクトによる種子生産の継続

ミャンマー全土的に畑作作物の種子の供給が不足している現状を受け、プロジェクトはターゲットエリアにて試験及び普及活動の継続に必要となる種子の生産を担ってきた。調査団は、プロジェクト目標達成のためにも、プロジェクト期間後半においても引き続きプロジェクトによる種子生産が必要であることを確認した。

(3) DAR 及び DOA への種子生産活動の移管

上位目標達成のためには、DAR・DOA による種子生産活動の継続が必要であり、プロジェクト終了後も自らのイニシアティブによって継続的に種子生産を実施することが期待される。加えて、プロジェクトからDAR・DOA への円滑な種子生産活動の移管を進めるためには、左記活動に係る予算の確保が求められ、2018/19 年度予算以降、種子生産活動に対するDAR 及びDOA による予算配分が必要であることを提言する。

(4) DAR・DOA 連携強化

調査団は、特にDAR・DOA にて権限を有する職員の率先により、FD等の活動をモデルケースとした現場レベルでのDAR・DOA の連携体制を、ターゲットエリア以外の地域へも波及させることを提言する。

(5) タウンシップ・マネジャーのC/P 任命

プロジェクト期間後半における普及業務のために、調査団は、ミャンマー側に対してニャンウー及びミンジャンのDOA タウンシップ・マネジャーをC/P として任命するよう要請する。

(6) 持続的開発のためのプロジェクト終了後戦略 (Post-Project Strategy) の検討

調査団は、ミャンマー側（政府、農家、民間セクター）が、プロジェクト期間後半において、各投入（予算、要員、資機材等）を段階的に増加していくことを提言する。したがって、ミャンマー側が日本人専門家の協力のもと、2017 年半ばをめどにプロジェクト終了後戦略（例：必要予算、要員、資機材の投入計画）を策定し、プロジェクト最終年次においてMoALI 主導のもと試験的に同戦略を実施することを提言する。

3-7 教訓

(1) 資機材の供与

プロジェクトはFD やFFS において、種子の供与とともに技術支援を行っている。その

結果、資機材を供与した後、DOA 普及員の支援を得ながら、農家が圃場においてプロジェクト活動から学んだことを実践している事例が数多く観察された。必要な資機材を受益者に供与する際には、農家の自発性を促進し資機材の活用を確実にするためにも、適切な技術支援を同時に行うべきである。

(2) 種子交換制度

農家の自助努力の意欲を高めるために、プロジェクトでは FFS において「種子交換制度」を導入し、FFS の参加者に生産した認証種子の一部を一般農家と交換する義務を設けている。こうした種子交換制度によって、農民から農民へ対する優良種子と関連技術の普及が可能となり、持続的な種子生産及び技術普及に寄与することが期待される。

(3) 関係機関の連携強化

プロジェクトにおいて、DAR・DOA 間の連携した活動の好事例が観察された。プロジェクト実施に際して、複数の関連機関との連携が求められる場合には、関連機関の連携強化を図るために、具体的な協働の場を提供することが必要である。

Summary Results of the Mid-term Review Study

I. Outline of the Project	
Country: The Republic of the Union of Myanmar	Project Title: Project for Development of Water Saving Agriculture Technology in the Central Dry Zone
Issues/Sector: Agriculture	Cooperation Scheme: Technical Cooperation Project
Division in Charge: Rural Development Department	Estimated Total Cost: 380 million JPY
Period of Cooperation: Five (5) years from November 2013	(Implementation Organizations in the Partner Country): Ministry of Agriculture, Livestock and Irrigation (MoALI) Department of Agricultural Research (DAR) Department of Agriculture (DOR) (Related Organization in the Partner Country): Irrigation and Water Utilization Management Department (IWUMD)
	Implementation Organizations in Japan: Ministry of Foreign Affairs Ministry of Agriculture, Forestry and Fisheries University of Tsukuba
1-1. Background of the Project	
<p>The mainstay of the primary industries of the Republic of the Union of Myanmar (hereafter referred to as “Myanmar”) represented by agriculture sector where 61% of the total labor population is engaged and 32% of GDP as well as 17.5% of the export earnings are produced (2009). The Government of Myanmar has given higher priority to the issues such as food self-sufficiency, export promotion, and rural development through agriculture development in order to achieve food security and poverty alleviation.</p> <p>In Central Dry Zone (CDZ) which is located in geographical center of Myanmar, there is merely 700 ~ 1,000 mm of annual rainfall (3,000 mm in Delta area) with erratic duration of rainy season and with wide annual deviation. Therefore, it causes crop failure which makes farmers livelihood unconcern, unstable and insecure. For increasing and stabilizing agricultural production in CDZ, MoALI is tackling development of water saving technologies from the aspects of: 1) to introduce adaptable crops and its varieties, 2) to conserve soil fertility by prevention of soil erosion and improvement of cultivation practices, and 3) to develop water saving irrigation on farm level in CDZ.</p> <p>Therefore, this project, the Project for Development of Water Saving Agriculture Technology in the Central Dry Zone (hereafter referred to as “the Project”), is proposed by MoALI to improve local livelihood through increasing and stabilizing agricultural production by combination and improvement of water saving technologies. The Project has been implemented since November 2013 and will complete in November 2018. To make the most effective use of the remaining period of the Project, JICA and the Government of Myanmar organize the Joint Mid-term Review.</p>	
1-2. Project Overview	
<p>The Project is aimed to disseminate the water-saving agriculture technologies for stabilization of agricultural income in CDZ through identification of suitable crops and varieties, improvement of cultivation technologies, improvement of farm maintenance technologies and development of</p>	

Water-saving irrigation technologies.

(1) Overall Goal

In CDZ (especially the non-irrigated areas where upland farming is a main form of agriculture), an agricultural income is stabilized as a result of the spread of water-saving agricultural technologies which are suitable to CDZ.

(2) Project Purpose

Water-saving agriculture technologies that are adapted to CDZ are established.

(3) Outputs

1. New and/or conventional crops and promising varieties that are adaptable to CDZ are identified.
2. Cultivation technologies are improved so that these can match the environments of CDZ.
3. Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.
4. Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.

(4) Inputs (as of Mid-Term Review)

Japanese Side:

- Long-term Experts: 5 persons in total
 - 2 Chief Advisor/ Dry Land Crop Cultivation in total
 - Water Saving Irrigation
 - Integrated Pest Management
 - Project Coordinator
- Short-term Expert: None
- Equipment Provision: (i) JICA Owned Equipment (USD 102,946 and Kyat 21,603,000)
(ii) Handover Equipment (USD 184,938)
- Renovation/ Rehabilitation of Infrastructure: USD 80,000 and Kyat 54,952,500
- Training in Abroad: None
- Budget Execution*: 2013 (Kyat 243,562,996 = JPY 25,623,112= USD 252,586 in total)
2014 (Kyat 385,893,388 = JPY 42,950,158= USD 392,988 in total)
2015 (Kyat 236,630,000 = JPY 24,658,215= USD 186,486 in total)

*The figures include JICA owned equipment, handover equipment and renovation/ rehabilitation of infrastructure. The value (Kyat, JPY and USD) is converted by JICA exchange rate.

Myanmar Side:

- Project Director : 3 persons in total
- Project Manager: DAR (3 persons in total), DOA (4 persons in total)
- Counterparts: 25 persons (DAR 11 persons, DOA 14 persons) (as of 17 May 2016)
- JCC: Chairperson (3 persons in total), Members (16 in total)
- Land, Building, Office and Facilities: Office Building, Office space, Warehouse, Experimental and seed production field, Drying yard, Meeting venue, Seed production field (sesame)
- Budget Execution: 2013 (Kyat 166,467,000)
2014 (Kyat 196,739,000)
2015 (Kyat 260,365,600)
- In-kind Contribution : water and electricity bills, baseline and end line surveys and other utility costs

II. Evaluation			
	Evaluator		
	Name	Position	Affiliation
Myanmar Team	Dr. Nyi Nyi	Leader	Assistant Director, Extension Division, Department of Agriculture, MoALI
	Dr. Pau Sian Kam	Member	Assistant Research Officer, Department of Agriculture Research, MoALI
Japanese Team	Kazuya SUZUKI	Leader	Deputy Director General and Group Director for Agric. and Rural Development Group 1 Rural Development Department, JICA
	Kenichiro KOBAYASHI	Deputy Leader	JICA Advisor for Agriculture and Rural Development, MoALI
	Yuichiro MISAWA	Water Saving Irrigation	Hokuriku Regional Agricultural Administration Office
	Makoto KAWASE	Research Cooperation	Professor, Faculty of Life and Environmental Sciences, University of Tsukuba
	Naozumi MIMIDA	Integrated Pest Management	Gene Research Center, Faculty of Life and Environmental Science, University of Tsukuba
	Hana OSHIRO	Cooperation Planning	Officer, Team 1, Group 1, Rural Development Department, JICA
	Tetsuro HAMADA	Evaluation Analysis	Senior Consultant, A&M Consultant. Inc.
Period of Evaluation: 6 Jun – 24 Jun. 2016		Type of Evaluation: Mid-term Review	
III. Results of Evaluation			
3-1. Achievements			
(1) Outputs:			
Output 1: New and/or conventional crops and promising varieties that are adaptable to CDZ are identified			
Indicators	Status	Achievement	
1-1 Within a half year from beginning of the project, the baseline study is conducted and consumer needs for the local agriculture products are identified.	Completed	The baseline and market price surveys were completed in January and September 2014.	
1-2 10% or more of the sampled farmers adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs.	Progressing as scheduled	Seed recipients (CFs and NFs) /10% of Farmers in 3 townships =970/78,492 (1.2%)	
1-3 By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the sampled farmers for such crops/varieties increases by 10% or more.	Progressing as scheduled	Average gross agricultural income (Kyat/ acre) of CFs has increased over 10% in 2015.	

Output 2: Cultivation technologies are improved so that these can match the environments of CDZ.		
Indicators	Status	Achievement
2-1. Cultivation technologies adapted to local conditions are established for the selected new and/or existing crops and their superior varieties, and these technologies are implemented 2 times in total (2 times per year) at DAR Experiment Farm.	Mostly Completed	The trials were conducted 2 times at the DAR farms.
2-2. Appropriate technical manual for cultivation technologies are prepared.	Mostly Completed	The manuals for each target crop were prepared.
2-3. 30 or more persons of the extension agents who can apply the above manual and implement cultivation technologies are built up.	Progressing as scheduled	26 extension agents have been trained (26/30=87%)
2-4. Verification test by applying the above manual is conducted 100 times or more (1 time or more per year) by the project at the contact farmer's field.	Progressing as scheduled	The 63 times verification tests (CFs) have been conducted. 63/100 (63%)
2-5. The cultivation that is applied with the above manual is implemented by 10% or more of the sampled farmers.	Progressing as scheduled	3,807 farmers have applied the technologies. 3,807/ 7,849 FH (49%)

Output 3: Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.		
Indicators	Status	Achievement
3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions of the project target area are identified.	Mostly Completed	Data Collection Survey Reports were compiled in August 2013.
3-2. The soil improvement technologies that are adapted to the local conditions are established	Completed	The approach based on application of <i>Gliricidia</i> has been identified.
3-3. Technical manual for the soil improvement technologies is prepared.	Mostly Completed	Extension material for <i>Gliricidia</i> was prepared and is being utilized.
3-4. 30 or more persons of the extension agents who can apply the above manual and implement the soil improvement technologies are built up	Progressing as scheduled	21 extension staff have been trained. (21/30=70%)
3-5. Verification test by applying the above manual is conducted 100 times or more (1 time or more per year) by the project at the contact farmers' field.	Progressing as scheduled	39 verification tests (CFs) have been conducted. 39% (39/100)
3-6. The soil improvement that is applied with the above manual is implemented by 2% or more of the sampled farmer	Progressing as scheduled	599 farmers applied the technology. 38% (599/ 1,570)

Output 4: Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.		
Indicators	Status	Achievement
4-1. The study report on water resources and water use by farmers at pilot sites is drafted.	Completed	The 3 study reports were prepared.
4-2. Technical guideline and/or manual for the water-harvesting and water-saving irrigation technologies are prepared.	Mostly Completed	Guideline and extension materials were drafted.
4-3. The recommendation for combined methods for water-saving cultivation and water-saving irrigation technologies is prepared.	Progressing as scheduled	For recommendations, demonstration plots are being identified.

(2) Project Purpose:

Project Purpose: Water-saving agriculture technologies that are adapted to CDZ are established.		
Indicators	Status	Level of Achievement
1. The water-saving agricultural technology developed in this project are introduced by the 15% farmer in Project Site and carried out more than 1 cropping seasons.	Mostly completed	The number of the cumulative participants: 4,605 4,605/11,774 (39%) (11,774=15 % of farmers in three TS)
2. In Project Site, crop yields increased 10% at the farmers who used the water-saving agricultural technology developed in this project.	Mostly completed	The average crop yield of CFs by target crops has increases already over 10 %.
3. In Project Site, 60% of Farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.	Mostly completed	The percentage of positive response from CFs and NFs are 91 % on average for 2014 and 2015.

3-2. Review by the Five Evaluation Criteria

(1) Relevance: High

The Project meets needs of the beneficiaries (farming households) and the target group (staff of three DOA offices and DAR research farms in the target area). The Project coincides with development policy of Myanmar and aid policy of Japan. The methodology as a means to achieve Overall Goal (stabilization of agricultural income in CDZ) is considered appropriate. There are no factors to lower relevance of the Project.

(2) Effectiveness: High

Logical sequence between Outputs and Project Purpose is secured and logically connected. The Project Purpose has been mostly achieved potentially and expected to be attained by the end of the Project

(3) Efficiency: High

Outputs are expected to be produced as planned. But Activities for seed-multiplication and distribution are not set for Output 1 in PDM (even impact is high). Implementation process is generally efficient and

satisfactory except for delay at the beginning of the Project. Inputs from both sides are generally appropriate, and equipment and infrastructure are well utilized and managed.

(4) Impact: Medium

The tangible impact is observed on CFs, NFs and OFs through FFS and demonstration of WH/WS technologies. Overall Goal is unlikely to be achieved due to a gap between Project Purpose and Overall Goal (on time-frame and geographic coverage). No negative impacts as well as no unexpected negative effects have been found.

(5) Sustainability: Medium High

Technical sustainability is “high”. Policy and administrative sustainability as well as organizational and institutional sustainability are “medium high”. Financial sustainability is “medium”.

3-3. Major supporting factors to achieve the Project Purpose

- Leadership and active attitude of senior officials in the implementing agencies
- Awareness of importance of upland crops, necessity of seed production
- Enthusiasm and disciplined (time consciousness) C/Ps and TG
- Transfer of technical C/P from DAR headquarters to Nyaung Oo research farm for production of Output 4
- Good collaboration and cooperation between DAR and DOA through FD and FFS
- Highly motivated CFs and NFs

3-4. Major hampering factors to achieve the Project Purpose

- Less attention of national agricultural policy on upland crops compared with rice sector
- Frequent transfer of trained C/Ps and TGs
- Insufficient means of transport and travel allowances for extension staff
- No full-time C/Ps and TGs

3-5. Conclusion

The Team confirmed that the Project has made steady progress and has been on track to achieve the Project Purpose. The Team also confirmed that the Project has greatly contributed to the capacity development of C/Ps, TGs and CFs through provision of trainings and FFS. They are enthusiastic and highly motivated to implement the Project activities. The equipment and facilities have generally well utilized and maintained. The tangible impact has been seen on CFs and NFs, since their agriculture incomes have been increasing as a result of application of the improved technologies. It should be noted that MoALI (DOA/DAR headquarters and their field offices) has shown its interests in the upland crops and the Project approach.

For the achievement of Overall Goal (stabilization of agricultural income) after five (5) years from the end of the Project, both sides are expected to develop practical strategy and pave the way in the remaining period of the Project in order for the Myanmar implementation agencies to disseminate the water-saving agriculture technology to other parts of CDZ.

3-6. Recommendations

Based on results of the Joint Mid-term Review, the Team makes following recommendations.

(7) Modification of PDM and PO

The Team recommends modifying the current version of PDM (ver.1) and proposing revised PDM (ver. 2).

(8) Continuation of Seed Production in the Project

The Project has conducted seed production for further verification tests since seed supply of upland crops is insufficient. The Team confirmed that the seed production would be necessary to achieve the Project Purpose during the second half of the Project period.

(9) Transfer of the Seed Production Activities to DAR and DOA

For achieving the Overall Goal, DAR and DOA are expected to establish sustainable seed production system during the second half of the Project period. In addition, for smooth taking over of the seed production activities, it is recommended necessary budget be allocated by DAR and DOA for those activities in the 2018/19 fiscal year's budget and afterward.

(10) Promotion of Stronger Linkage between DAR and DOA

The Team strongly recommends that the collaboration and cooperation between DAR and DOA such as FD shall be expanded to the areas other than the target area under authorization and encouragement of responsible officials of MoALI particularly of DAR and DOA.

(11) Assignment of the TS Managers to as C/Ps

For the extension work during the second half of the Project period, the Team requests the Myanmar side to additionally assign DOA TS managers in Nyaung Oo and Myingyan to as C/Ps.

(12) Consideration of the Post-Project Strategy for Sustainable Development

The Team recommends that the Myanmar side (government, farmers and private sector) increase their contributions (e.g. budget, personnel, materials and equipment) gradually during the second half of the Project period. Therefore, the Post-Project Strategy (i.e. a plan of input: necessary budget, personnel, materials and equipment) should be formulated in cooperation with Japanese experts until middle of 2017 and implemented preliminarily in the final year of the Project period by Myanmar side's initiative.

3-7. Lessons Learned

(4) Provision of Materials

The Project provides seed with necessary technical support in FD and FFS. As a result, it was observed that the beneficiaries of the Project could apply what they learned through the Project activities into their fields with support by DOA extension workers. When necessary materials are provided to beneficiaries, appropriate technical support should be provided together to encourage willingness and to ensure acceptance of farmers.

(5) Seed Exchange Mechanism

The Project has included a unique seed exchange mechanism in FFS for increasing farmers' self-effort

attitudes. The participants in FFS are obliged to share a part of produced certified seed with ordinary farmers. Seed exchange mechanism would enable farmer-to-farmer diffusion of quality seed and related technologies.

(6) Strengthening of Collaboration among Concerned Institutes

In the Project, some good practices for collaborating between DAR and DOA are observed. When a project is implemented and prospected to involve several concerned organizations, appropriate opportunities would be offered in order to strengthen collaboration among them.

-End-

第1章 中間レビュー調査の概要

1-1 背景

ミャンマー連邦共和国（以下、「ミャンマー」と記す）は、農業が国内総生産の32%、農業従事者が総人口の61%、農産物が総輸出額の17.5%を占めるといったASEANでも上位の農業国である（2009年度統計）。政府は国内の食料安全保障、経済を牽引する主産業の1つとして、また貧困対策の観点から、農業の発展を重要視し、農業分野の課題として、①国内需要の充実、②外貨獲得を目的とした農産品輸出促進、③農業開発による地方部の発展を掲げている。

ミャンマーの地勢はエーヤーワディ川の河口にあたるデルタ地帯、中央部に位置する降水量が少なく比較的乾燥した地域〔以下、中央乾燥地（Central Dry Zone：CDZ）〕、これらを取り囲む山地山岳地帯、海岸線が延びる沿岸部と、大きく4つに分けることができ、それぞれの地域環境特性に即した農業が展開されてきた。なかでも、CDZは平均年間降水量が700mm～1,000mm（デルタ地帯では約3,000mm）と周辺地域に比べて少雨であることに加え、降雨パターンの年次変動が大きい。そのため、主に天水依存型農業を行っているCDZでの農業生産には、不安定さが常態化している。

このような環境の下、ミャンマー政府はCDZに対して主に水稻を対象とした灌漑事業を計画・実施してきた。しかし、当地域では、灌漑用の水資源が十分にあるとはいえないうえに、揚水ポンプ使用等の稼働コストの負担が大きく、要水量が大きい水稻を対象とした灌漑開発の展開には限界があることが認識されつつある。

こうした農業生産の安定化を妨げる要因が多いCDZにおいては、農業生産及び収入が安定せず、貧困農家が多いとみなされている。今後、CDZで農業開発を進め、農業生産の安定、農家の収入向上を図るためには、当該地域の自然環境に適応可能な品種・栽培技術や限られた水資源を有効活用するための技術の開発・導入が強く求められている。

これらの背景に基づき、JICAは技術協力プロジェクト「CDZにおける節水農業技術開発プロジェクト」（以下、「本プロジェクト」と記す）を2013年11月から5年間の予定で開始した。本プロジェクトは、作物栽培技術や圃場管理技術の改善、節水灌漑技術の開発・普及を組み合わせ、CDZの自然・社会環境に適した節水農業技術を開発することにより、パイロット地域における対象作物の生産量増大を図ることを目的とする。

今回実施する中間レビュー調査は、プロジェクトの中盤を迎えるにあたって、現在までのプロジェクト活動の実績及び成果を評価・確認し、プロジェクトが効果発現に向けて順調に実施されているかを検証するとともに、今後のプロジェクト活動に対する提言を導くことを目的とする。

1-2 目的

本合同中間レビュー調査の目的は、プロジェクト期間の中間点において、プロジェクト目標と成果の達成度を確認・分析し、プロジェクトの残り期間の課題及び今後の方向性について確認したうえで、必要な提言を行うことである。合同中間レビュー調査の結果は、合同評価レポートとして取りまとめられ、関係者間で内容を確認・合意する。

1-3 合同中間レビュー調査団の構成

合同中間レビュー調査団（以下、「調査団」と記す）はミャンマー側と日本側のメンバーから

なる。調査団の構成を表1-1に示す。

表1-1 合同中間レビュー調査団の構成

【ミャンマー側】

担当分野	氏名	所属
団長	Dr. Nyi Nyi	Assistant Director, Extension Division, Department of Agriculture, MoALI
団員	Dr. Pau Sian Kam	Assistant Research Officer, Department of Agriculture Research, MoALI

【日本側】

担当分野	氏名	所属
総括/団長	鈴木 和哉	JICA 農村開発部 第一グループ次長
団長代理	小林 健一郎	ミャンマー農業畜産灌漑省 農業農村開発アドバイザー
節水灌漑技術	三澤 雄一郎	北陸農政局土地改良技術事務所
研究協力	河瀬 眞琴	筑波大学 グローバル・コモンズ機構 国際交流支援部門長
圃場管理	耳田 直純	筑波大学 遺伝子実験センター 生命環境系 助教授
協力企画	大城 華	JICA 農村開発部 第一グループ第一チーム 職員
評価分析	浜田 哲郎	A&M コンサルタント (有)

1-4 調査日程

ミャンマーでの現地調査は2016年6月6日から2016年6月24日にかけて実施した。現地調査日程は以下のとおりである。

月日	日程	参加者	宿泊
6月5日 日	【評価分析】 成田⇒ヤンゴン		ヤンゴン
6月6日 月	JICA ミャンマー事務所訪問 ヤンゴン⇒ネピドー	評価分析団員	ネピドー
6月7日 火	ミャンマー側評価団員との打合せ プロジェクトマネジャー〔農業畜産灌漑省農業局 (Department of Agriculture : DOA)、農業研究局 (Department of Agricultural Research : DAR)〕面談 ネピドー⇒ニャンウー	評価分析団員、ミャンマー側評価団員	ニャンウー
6月8日 水	プロジェクト専門家との打合せ・ヒアリング DOA、DAR ニャンウー事務所職員との面談 契約農家との面談 ニャンウー研究圃場視察 契約農家圃場視察	同上	ニャンウー
6月9日 木	DOA、DAR ミンジャン事務所職員との面談 ミンジャン研究圃場視察	同上	ニャンウー
6月10日 金	DOA、DAR マグウェイ事務所職員との面談 マグウェイ研究圃場視察	同上	ニャンウー

6月11日	土	資料整理	同上	ニャンウー
6月12日	日	【評価分析】 ニャンウー⇒ネピドー、書類整理 【評価分析、団長以外】 羽田⇒ネピドー	—	ネピドー
6月13日	月	団内打合せ チーフアドバイザー面談 イエジン農業大学視察 シードバンク視察 DOA 局長表敬訪問	団長以外全団員、ミ ャンマー側評価団 員	ネピドー
6月14日	火	第1回合同評価委員会 計画局 (Department of Planning : DOP) 局長・ DAR 局長表敬訪問	同上	ネピドー
6月15日	水	ネピドー⇒ニャンウー プロジェクト専門家との打合せ DAR ニャンウー事務所訪問 契約農家圃場及びFFS 視察	同上	ニャンウー
6月16日	木	プロジェクト専門家面談 DAR ミンジャン事務所視察	同上	ニャンウー
6月17日	金	【研究協力、圃場管理、節水灌漑技術】 DOA、DAR ミンジャン事務所視察 【団長代理、評価分析、協力企画】 書類整理 【団長】 成田⇒ヤンゴン	全団員、ミャンマー 側評価団員 (以下、団長代理か ら団長へ引き継ぎ)	ニャンウー
6月18日	土	【団長】 ヤンゴン⇒ネピドー 【団長以外】 団内打合せ 【全団員】 第2回合同評価委員会	同上	ニャンウー
6月19日	日	プロジェクト専門家との打合せ 書類整理	全団員	ニャンウー
6月20日	月	合同評価レポート(案)報告会(プロジェク トチーム) ニャンウー⇒ネピドー	全団員、ミャンマー 側評価団員	ネピドー
6月21日	火	合同評価レポート作成	同上	ネピドー
6月22日	水	第3回合同評価委員会、合同評価レポート署名	同上	ネピドー
6月23日	木	書類整理	—	ネピドー
6月24日	金	第4回合同調整会議 ネピドー⇒ヤンゴン⇒成田	全団員、ミャンマー 側評価団員	機中
6月25日	土	成田着	—	

1-5 主要面談者

中間レビュー現地調査期間中の主要面談者は以下のとおりである（敬称略・順不同）。

(1) 日本側面談者

・プロジェクト長期専門家

藤本 直也	チーフ・アドバイザー/乾燥地畑作物生産
水谷 勝広	節水灌漑
菊地 友	総合防除
山田 大	業務調整

・JICA ミャンマー事務所

西形 康太郎	次長
山崎 潤	主任調査役

(2) ミャンマー側面談者

Dr. Nyi Nyi	Leader of Myanmar Mid-term Review Team
Dr. Pau Sian Kam	Member of Myanmar Mid-term Review Team
Dr. Nwe Nwe Yin	DAR Project Manager
U Thura Soe	DOA Project Manager
Dr. Khin Mar Htay	C/P for Coordination, DAR
Daw Nilar Aung	C/P for Coordination, DOA
Daw Khin Htay Yi	DOA, Township Manager, Nyaung Oo
U Kyaw Phone Line	DOA, Nyaung Oo Township, C/P
Daw Mar Mar Cho	DAR, Farm Manager in Nyaung Oo
U Win Soe	DAR, C/P, Nyaung Oo
Daw Myint Thida	DAR, C/P, Nyaung Oo
Daw Thu Zar Aung	DAR, C/P, Nyaung Oo
Daw Tin Mar Than	DAR, C/P, Farm Manager in Myingyan
Daw San San Myint	DOA, Township Manager in Myingyan
U Nay Myo Aung	DOA, Extension Staff in Myingyan
Daw Moe Moe Zaw	DAR, Staff in Myingyan
U Myo Tun Tun	DOA, Staff in Myingyan
U Myo Thein	DOA, Deputy Staff Officer in Magway
Daw Hla Hla Win	DAR, Research Officer in Magway
Daw Win Win Mar	DAR, Senior Research Assistant in Magway
Daw Than Than Nwe	DAR, Senior Research Assistant in Magway
U Moe Min Aung	DOA, Deputy Assistant Staff Officer
U Naing Kyi Win	DAR, Director General (Project Director)
U Kyaw Min Oo	DOP, Director General (JCC chairperson)
U Lan Bo	Contact Farmer in Nyaung Oo
U Yang Aung Soe	Contact Farmer in Nyaung Oo

U Shwe Toe

Contact Farmer in Nyaung Oo

U Hla Cho

Contact Farmer in Nyaung Oo

1-6 合同中間レビューの手法

プロジェクトの中間レビューは「新 JICA 事業評価ガイドライン第 1 版」に従って実施する。調査団はプロジェクトを 3 つの断面、①実施プロセス、②達成度と進捗状況、③評価 5 項目の視点（妥当性、有効性、効率性、インパクト、持続性）からレビューする。中間レビューのために設定された質問と指標は付属資料 2. 合同評価レポート Appendix 3 の評価グリッドに記載されている。

データ収集のために、調査団はまず、文献調査を行い、続いて、プロジェクトに関係する農業畜産灌漑省（Ministry of Agriculture Livestock and Irrigation : MoALI）職員、カウンターパート（Counterpart : C/P）、ターゲット・グループ、中核農家（Contact Farmer : CF）や日本人専門家に対して質問票とインタビュー調査を実施した。さらに、調査団はプロジェクト関係者（DAR や DOA 職員）に対する聞き取り調査を行った。また、調査団は DAR 試験圃場と CF の圃場の視察を行った。

上記の調査結果に基づき、調査団は実施プロセスとプロジェクト進捗状況をレビューし、表 1-2 に示す評価 5 項目に基づきプロジェクトをレビューした。

表 1-2 評価 5 項目の基準

基準	内容
妥当性	「プロジェクト目標」「上位目標」は政府・実施機関・ターゲット・グループの政策・ニーズと合致しているか。
有効性	「アウトプット」（成果）によって「プロジェクト目標」がどこまで達成されたか。
効率性	「投入」が「アウトプット」（成果）にどのようにどれだけ転換されたか。投入の質、量、手段、方法、時期は適切か。
インパクト	プロジェクトが実施されたことにより生じる直接的、間接的な正負の影響。計画当初に予測されなかった影響や効果も含む。上位目標達成の見込み。
持続性	プロジェクト終了後もプロジェクト実施による効果が持続されるか。

第2章 プロジェクトの概要

2-1 プロジェクト・デザイン・マトリックス (PDM)

プロジェクト・デザイン・マトリックス (Project Design Matrix : PDM) は、プロジェクトの枠組みを規定する文書である。PDM (Ver.0) の原案は2012年12月20日に署名された討議議事録 (Record of Discussions : R/D) に添付されている。PDM (Ver.1) は、原案のPDM (Ver.0) に設定している指標に具体的な目標値を付すなどの修正を行い、2015年2月21日に開催された第3回合同調整委員会 (Joint Coordinating Committee : JCC) で公式に承認された (付属資料2. 合同評価レポート Appendix 4 参照)。今回の合同中間レビューはPDM (Ver.1) に基づき実施する。

2-2 プロジェクトの枠組み

PDM (Ver.1) に基づくプロジェクトの枠組みを表2-1に示した。

表2-1 プロジェクトの枠組み

(1) プロジェクトの範囲

実施期間	2013年11月から5年間
プロジェクトサイト	CDZの農業局試験圃場と3つのタウンシップ (ニャンウー、マグウェイ、ミンジャン) から選定された中核農家 (CF) の圃場
ターゲット・グループ	ニャンウー乾燥作物研究センター、他の農業研究局 (DAR) 試験圃場、3つのタウンシップの農業局支局 (DOA)
実施地域	ニャンウータウンシップ、ミンジャンタウンシップ、マグウェイタウンシップ
受益者 (2005年)	78,492 農家世帯: ニャンウー (25,713 世帯)、ミンジャン (32,607 世帯)、マグウェイ (20,172 世帯)
実施機関 (C/P 機関)	農業畜産灌漑省 (MoALI) DAR 農業畜産灌漑省 (MoALI) DOA

(2) プロジェクトの概要

プロジェクトの要約		外部条件
上位目標	CDZ (特に非灌漑地域) に適した節水農業技術が普及され、農業収入が安定する。	1. DOA による円滑な普及活動 2. プロジェクトが薦める栽培技術がパイロットサイト以外の農家に受け入れられる。 3. CDZ の主要作物の市場価格が暴落しない。 4. 農村開発、貧困緩和政策の大幅な変更がない。
プロジェクト目標	CDZ に適した節水農業技術が確立される。	1. 灌漑局を含む政府機関の支援が継続する。 2. DAR と DOA の円滑な連携が図られる。
成果 1	新規・既存の作物からCDZに適した有望品種が特定される。	1. 深刻な病虫害が発生しない。 2. 耕作・灌漑を妨げる極端な異常気象が発生しない。
0. ベースライン調査を実施する。		3. 種子・農業資材及び小規模灌漑のコストが急騰しない。 4. DARとDOAへの開発予算が削減されない。
1-1 ベースライン調査の一環として、CDZの作物・品種に対する農家及び地域の市場のニーズについて調査する。		
1-2 CDZ においてパイロットサイトと中核農家 (CF) を選定する。		

1-3	ニーズ調査の結果を踏まえ、国内外の農業研究機関が収集した作物と品種の中から有望な作物と品種を選択する。	
1-4	ニャンウーの乾燥地作物研究センターにて、品種比較試験を実施する。	
1-5	DAR 試験農場と CF 圃場の双方で、適応性検定試験を実施する。	
成果 2	CDZの（社会経済・自然）環境に合致する作物栽培方法が改善される。	
2-1	地域での適応性検定試験の結果を基に、CDZ に適した栽培技術を検討する。	
2-2	CF 圃場における試験を通じて、CDZ に適した栽培技術を検証し、その栽培マニュアル（普及資料）を作成する。	
2-3	普及員と CF に対して CDZ に適した栽培技術を研修する。	
成果 3	CDZの（社会経済・自然）環境に合致する土壌環境（養分、保水性等）を含めた圃場管理技術が改善される。	
3-1	ベースライン調査の一環として、肥沃度及び物理性の側面からプロジェクトサイトの土壌調査を実施する。	
3-2	土壌肥沃度と物理性改善のための試験を実施し、改善方法を検討する。	
3-3	農家が実施可能な土壌肥沃度及び物理性の改善方法（土壌改良技術）を検証する。	
3-4	CF 圃場での試験を通じて、土壌改良技術の適応性を検証し、土壌改良マニュアルを作成する。	
3-5	普及員と CF に対して CDZ に適した土壌改良技術を研修する。	
成果 4	CDZのパイロットサイトに適用可能な節水灌漑技術が開発される。	前提条件 プロジェクト実施に必要なC/Pが配置される。
4-1	ベースライン調査の一環として、パイロットサイト内の水資源や農家の水利用を調査し、課題を特定する。	
4-2	ニャンウーの乾燥地作物研究センターと CF 圃場にて、CDZ に適用可能な集水技術について検証を行う。	
4-3	ニャンウーの乾燥地作物研究センターと CF 圃場にて、CDZ の農家圃場で適用可能な節水灌漑技術の検証を行う。	

<p>4-4 上記の検証を通じて、CDZ で適用可能な集水技術及び節水灌漑技術のガイドライン/マニュアルを作成する。</p> <p>4-5 パイロットサイトの農家に適用可能な節水栽培技術と節水灌漑技術を組み合わせた方法を推奨する。</p>	
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第3章 実施プロセス

3-1 実施管理体制

2012年12月20日付R/Dの署名以降、プロジェクト運営管理のミャンマー側責任官庁のMoALIは以下のように組織再編された。

- ・農業計画局（DAP）は2015年に計画局（DOP）に改組された。
- ・灌漑局（ID）と水資源利用局は（WRUD）は2016年に灌漑水利用管理局（Irrigation and Water Utilization Management Department : IWUMD）に再編された。
- ・2016年に農業灌漑省、家畜飼育・漁業省、農業組合省が統合して新たにMoALIが再編された。
- ・図3-1は合同中間レビュー時のプロジェクト実施管理体制を示している。

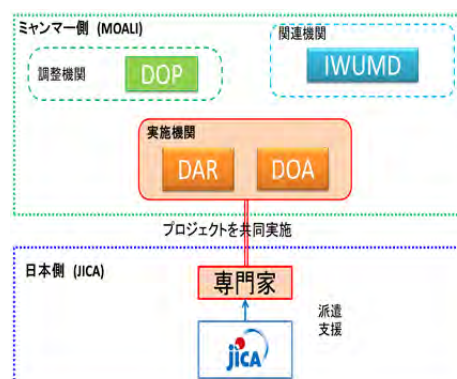


図3-1 プロジェクト実施管理体制

3-2 運営管理と意思決定

(1) JCC 会合

2012年12月20日署名のR/Dに記載されているように、JCC会合は表3-1に示した委員で構成される。

表3-1 JCCの機能と委員

会合	JCCは以下の機能を果たすために必要が生じた際に開催する。	
機能	<ul style="list-style-type: none"> ・プロジェクト年間活動計画を承認すること。 ・R/Dと上記の計画に従って、プロジェクトの全般的な進捗状況をモニター・レビューすること。 ・プロジェクトの円滑な実施に関連する事項について議論すること。 	
JCC委員		
議長	DOP総局長	
	<ミャンマー側委員> : 6名 ・DAR総局長 ・DOA総局長 ・IWUMD ・DAR総局副局長 ・DOA総局副局長	<日本側委員> ・JICAミャンマー事務所長 ・プロジェクトに派遣されている専門家 ・JICAから派遣されている日本人が必要がある場合。 * 日本大使館館員はJCC会合にオブザーバーとして出席可能。

JCCは合同中間レビュー調査までに3回会合が開催された。JCCで議論された主要な議題を表3-2に取りまとめた。

表 3-2 JCC 会合の主要議題

日 付	主要議題
1 回目：2014 年 1 月 24 日	JCC 委員の任命 プロジェクト要員の任命 ターゲットエリア、ターゲット・グループ、受益者の定義
2 回目：2014 年 3 月 13 日	各タウンシップの対象作物の決定
3 回目：2015 年 2 月 21 日	各タウンシップの対象作物の決定 対象品種の決定 指標設定を通じて PDM (Ver.1) の改定 プロジェクト 活動のローリングプランの承認

第 1 回 JCC 会合では、「ターゲットエリア、ターゲット・グループ、受益者の定義」の議題において以下の事項が定義された。なお、これらは PDM (Ver.1) に記載されていない。

上位目標の地域	CDZ で行われた JICA 開発調査 (2010 年) で特定されている類型 I、II、III に属する 27 タウンシップ
直接的受益者	ターゲットエリアの CF と周辺農家 (Neighboring Farmer : NF)
間接的受益者	上位目標地域において畑作物を栽培している農家

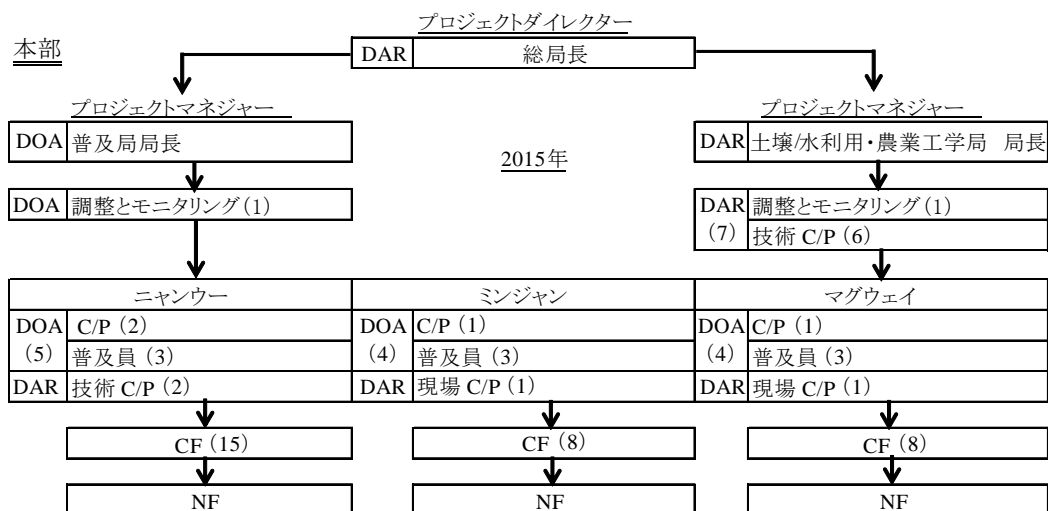
プロジェクトの運営管理において、効果的で迅速な行動のために、ターゲットエリアでプロジェクト活動に従事している職員に権限を委譲することが望まれる。中央集権型意思決定システムはタイムリーで円滑な実施に常に効果的であるとは限らない。

(2) 運営指導調査団の派遣

プロジェクトの運営指導調査団が 2014 年 7 月 8 日～14 日まで派遣され、プロジェクトの運営管理と活動について議論が行われた。その後、プロジェクトダイレクターの監督下、2014 年 8 月 19 日、プロジェクト関係者の間でフォローアップ会合が開催された。同会合でプロジェクトの普及志向型の実施戦略を確認した。

3-3 プロジェクト活動の実施体制

図 3-2 は 2015 年のプロジェクト活動の実施体制を示す。



プロジェクトディレクター	全般的なプロジェクトの運営管理と実施に責任を有する。
プロジェクトマネージャー	プロジェクトの業務と技術的事項に責任を有する。
	四半期モニタリング会合（Quarterly Monitoring Meeting：QMM）をニャンウーのプロジェクト事務所、もしくはDAR本部で開催する。QMMはプロジェクトの進捗をモニターするとともに、四半期モニタリング報告書（QMR）をプロジェクトディレクターとプロジェクトマネージャー所属の総局長に提出する。

図 3-2 プロジェクト活動の実施体制

DAR 農業研究センターの実験圃場及びニャンウー、ミンジャン、マグウェイのタウンシップの DOA 事務所がプロジェクト活動の拠点となる。プロジェクト事務所はニャンウーの乾燥作物研究センターに置かれ、4名の日本人専門家が同センターに勤務している。

3-4 普及活動（FFS：農家圃場学校）

DOA タウンシップ事務所は、有望な農家＝CF を戦略的普及サービスの入り口としている。プロジェクトはこの実施方法を継続し、CF と連携した農家圃場学校（Farmer Field School：FFS）アプローチを採用した。FFS に参加した農家をプロジェクトでは NF と表現している。プロジェクトが採用した普及サービス（FFS）の実施の流れを図 3-3 で図解した。



図 3-3 FFS 実施の流れ

FFS は 4 コマの講習（研修）から成り、各講習は CF の展示圃場で NF のためにプロジェクトによって開催される。図 3-4 に講習内容を図解した。



図 3-4 FFS の講習内容

20名から30名のNFがFFSの各講習に出席し、ここで改良農業技術の普及と投入・資料の配付が行われる。

3-5 コミュニケーションと情報共有

JCC 会合のもと、以下の会合が開催され、プロジェクト活動の円滑な実施と関係者間の情報共有が図られている。

表 3-3 コミュニケーション・情報共有を目的とした会合のタイプ

会合タイプ	内容
週別会合	定例会合はニャンウーの DAR と DOA からの参加を得て毎週開催されている。会合ではプロジェクト活動のスケジュールと進捗を確認している。新技術は参加者が知識と経験を互いに補完できるような方法で確認している。
月例モニタリング会合 (Monthly Monitoring Meeting : MMM)	MMM はプロジェクト事務所で開催され、本部の DAR プロジェクトマネージャー、調整・モニタリング担当 C/P (2名) に加えて、ミンジャンとマグウェイの DAR/DOA 職員 (例: 普及員) が参加し、プロジェクト進捗と事務的準備を確認する。会合は情報共有だけでなく現地研修として機能している。MMM は 2014 年に参加者の技術スキルを向上させる研修であったが、2015 年から農家に普及するために試験圃場間で展示圃場会 (フィールドデイ) の開催を持ち回りしている。
四半期モニタリング会合 (QMM)	QMM は四半期ごとに、プロジェクトマネージャーを招へいしてプロジェクト事務所で開催される会合である。圃場の視察を含むプロジェクトの進捗を確認し、プロジェクトの円滑な実施に関して懸案事項があれば協議する。同時に、情報共有のために、QMM 報告書が JCC の委員に配付される。

3-6 技術移転の手法

プロジェクトは国内研修と能力構築を通じて、C/P、ターゲット・グループ、CF に対して技術移転を行っている。このために、表 3-4 で示した国内研修と能力構築の 4 タイプが活用されている。

表 3-4 国内研修と能力構築のタイプ

No.	タイプ	定義	事例
1	研修コース	これは国内で企画される連続的な研修を指す。	・2014 年度の月例研修 (MT) と 2015 年度の MMM
2	ワークショップ (WS)	これはプロジェクトマネージャーと C/P と特別な事案について協議する、あるいはプロジェクトに関連する経験やアイデアを説明する機会を指す。	・ベースライン調査と準備 WS ・2014 年 2 月開催の年間実施計画 (Annual Plan of Operation : APO) WS ・QMM
3	業務会合	これはプロジェクトダイレクターや JCC の委員と特別な事案や運営管理の事項に関して協議する機会を指す。	・キック・オフ 会合 ・フォローアップ会合 ・JCC
4	オン・ザ・ジョブ・トレーニング (OJT)	これはサイト訪問などを含むさまざまなタイプである。企画された研修からブレインストーミングまで幅広い職員の研修活動を指す。	・展示圃場会 ・2014 年度の PC 研修 ・種子の現地検査 ・種子の増殖 ・気象データの記録

第4章 計画の達成度

4-1 投入

ミャンマー側と日本側からの投入の詳細は、それぞれ、付属資料2. 合同評価レポート Appendix 5・Appendix 6に記載した。ミャンマーと日本の予算年度は4月1日から開始し翌年3月末に終了する。

(1) ミャンマー側からの投入

ミャンマー側からの投入の概要を表4-1に示した。

表4-1 ミャンマー側からの投入概要

人材配置	プロジェクトダイレクター		Dr. Thein Lwin (DAR 総局長) 2013.11.8~2014.9.12			
			Dr. Ye Tint Tun (DAR 総局長) 2015.5.15~2016.2.26			
			U Naing Kyi Win (DAR 総局長) 2016.2.26~現在			
	プロジェクトマネジャー	DAR	Dr. Nwe Nwe Yin (Director, Soil/ Water Utilization and Agricultural Engineering) 2013.11.8~2014.9.9			
			Dr. Nwe Nwe Yin (Director, Biotechnology, Plant Genetic Resources and Plant Protection) 2014.9.9~現在			
		DOA	Dr. Kyi Myint (普及局長) 2013.11.8~2014.1.19			
			U Aye Ko Ko (普及局長) 2014.1.25~2015.4.10			
	U Hla Myint Aung (普及局長) 2015.9.10~2016.2.26					
			U Thura Soe (普及局長兼園芸・バイオ技術局長) 2016.2.26~現在			
	C/P 配置 (25名)		DAR (11)	本部7名、地方事務所4名		
			DOA (14)	本部1名、地方事務所13名		
	JCC	議長	DOP 総局長	U Hla Kyaw 2013.11.8~2014.7.17		
				Dr. Tin Htut 2014.8.29~2016.2.20		
				U Kyaw Min Oo 2016.2.20~現在		
		委員	DAR (1)	Dr. Aung Kyi 2013.11.8~2014.3.14		
				Dr. Ye Tint Tun 2014.3.14~2014.9.15		
				Dr. Ye Tint Tun 2014.9.15~2015.5.15		
				Daw Tin Tin Myint 2015.6.08~現在		
			DOA (3)	U Kyaw Win 2013.11.8~2015.5.2		
				U Kyaw Shwe 2015.5.2~2016.2.26		
Dr. Ye Tint Tun 2016.2.26~現在						
U Aye Ko Ko 2015.4.10~現在						
IWUMD (1)			U Hla Myint Aung 2016.2.26~現在			
			U Kyaw Myint Hlaing (ID) 2013.11.8~2016.2.20			
			U Kyaw Min Oo (WRUD) 2013.11.8~2015.1.16			
	U Kyaw Min Oo (WRUD) 2015.1.16~2016.2.20					
		U Kyaw Myint Hlaing 2016.2.20~現在				
土地、建物、執務室、施設	執務室		プロジェクト事務所			
	事務スペース		専門家作業場			
	倉庫		DAR ニャンウー	種子保管、農業資機材、農業機械		
	試験及び種子生産圃場			圃場試験と種子増殖		
	乾燥場			圃場試験と種子増殖の収穫後処理		
	会議場		DAR 本部	kick-off 会合、JCC		
	種子生産圃場 (ゴマ)		DAR マグウェイ	圃場試験と種子増殖		
予算支出	2013	Kyat 166,467,000	<現物の供与> : 高熱水料、ベースラインとエンドライン調査、その他 (Tel/fax、整地、ジーゼル)			
	2014	Kyat 196,739,000				
	2015	Kyat 260,365,600				

(2) 日本側からの投入

日本側からの投入の概要を表4-2に示した。

表4-2 日本側からの投入概要

専門家派遣 (5名)	長期専門家 (5名)	松本 満夫、チーフ・アドバイザー/乾燥地畑作物生産：2013.11.3～2015.11.3
		藤本 直也、チーフ・アドバイザー/乾燥地畑作物生産：2015.11.5～現在
		水谷 勝広、節水灌漑技術：2013.11.3～現在
		菊池 友、総合防除：2013.11.3～現在
	短期専門家	山田 大、業務調整：2013.10.27～現在
本邦/第三国研修		派遣されていない。
機材供与	携行機材	USD 102,946 及び Kyat 21,603,000
	供与機材	USD 184,938
施設改修等		USD 80,000 及び Kyat 54,952,500
在外事業強化 費*	2013	合計：Kyat 243,562,996 = JPY 25,623,112 = USD 252,586
	2014	合計：Kyat 385,893,388 = JPY 42,950,158 = USD 392,988
	2015	合計：Kyat 236,630,000 = JPY 24,658,215 = USD 186,486

*各年度の合計金額は、携行機、供与機材、施設改修等を含む数値である。各通貨（Kyat、JPY、USD）への換算はJICA為替レートを使用した。

4-2 活動

(1) 全般的状況

調査団は実際のプロジェクト活動と活動計画（PO）、さらに第3回JCCで承認されたローリングプランを比較した。プロジェクトは実施プロセスにおいて、いくつかの制約要因と困難性に直面したが、円滑なプロジェクトの実施に向けて、ミャンマー側とプロジェクト側の努力により克服してきた。その結果、付属資料2. 合同評価レポート Appendix 7に示したように、プロジェクト活動は全般的に順調に進捗しており、著しい遅れは確認されていない。

(2) 成果の進捗状況

成果を産出するための活動の進捗状況を表4-3に示した。

表4-3 成果に対する活動の進捗状況

成果 1：新規・既存の作物からCDZに適した有望品種が特定される。		
活動	進捗度	進捗状況
1-1 ベースライン調査の一環として、CDZの作物・品種に対する農家及び地域の市場のニーズについて調査する。	終了	調査は2014年2月に終了。作物と品種に対する農家及び現地市場の選好を特定した。対象作物の市場価格は2014年2月に調査した。
1-2 CDZにおいてパイロットサイトとCFを選定する。	計画どおり進捗中	パイロットサイトとCFはDOAタウンシップ事務所によって選定された。
1-3 ニーズ調査の結果を踏まえ、国内外の農業研究機関が収集した作物・品種の中から有望な作物・品種を選択する。	終了	各タウンシップの対象作物（落花生、キマメ、ゴマ、リョクトウ）が特定され、第3回JCCで承認された。また、有望品種はDOAと協議のうえ、特定され第3回JCCで承認された。

1-4 ニャンウーの乾燥地作物研究センターにて、品種比較試験を実施する。	計画どおり進捗中	34種の落花生と24種のキマメの品種比較試験が2014年に実施された。
1-5 DAR 試験農場とCF圃場の双方で、適応性試験を実施する。	計画どおり進捗中	DAR 試験農場での適応性試験は2014年末に終了した。CFでの適応性試験の数は100件に達した。

成果 2：CDZの（社会経済・自然）環境に合致する作物栽培方法が改善される。		
活動	進捗度	進捗状況
2-1 地域での適応性検定試験の結果を基に、CDZに適した作物栽培技術を検討する。	終了	栽培技術（根粒菌接種、種子更新、播種量、播種時期）は特定された。
2-2 CF圃場における試験を通じて、CDZに適した栽培技術を検証し、その栽培マニュアルを作成する。	おおむね終了	第3回JCCで承認されたFFS（試験）を通じて、作物栽培技術を普及し検証した。普及材料は作成し使用されている。
2-3 普及員とCFに対してCDZに適した作物栽培の研修を実施する。	計画どおり進捗中	月例研修とFFSの開催を通じて、普及員とCFは研修を受けた。

成果 3：CDZの（社会経済・自然）環境に合致する土壌環境（養分、保水性等）管理を含めた圃場管理技術が改善される。		
活動	進捗度	進捗状況
3-1 ベースライン調査の一環として、肥沃度及び物理性の側面からプロジェクトサイトの土壌調査を実施する。	おおむね終了	調査は2013年8月に終了した（Data Collection Survey Report）。土壌分析報告書は作成された。ターゲットエリアの2003～2014年の雨量データ（日ごと）を入手し分析した。2015年1月に気象観測所と土壌水分量センサーを設置した。
3-2 土壌肥沃度及び物理性改善のための試験を実施し、改善方法を検討する。	終了	多目的樹種（ <i>Gliricidia</i> ）を特定し、緑肥、土壌改善手法の開発、防風効果の試験を行ったうえで、普及を開始した。
3-3 農家が利用可能な土壌肥沃度及び物理性の改善手法（土壌改良技術）を検証する。	終了	緑肥効果を含む <i>Gliricidia</i> の長所をDARニャンウー試験圃場で検証した。普及計画（ローリングプラン）は策定され、第3回JCCで承認された。
3-4 CF圃場での試験を通じて、土壌改良技術の適応性を検証し、土壌改良マニュアルを作成する。	おおむね終了	<i>Gliricidia</i> は第3回JCCで土壌改良技術として承認された。 <i>Gliricidia</i> の普及マニュアル（FFS）は作成された。種苗場は、農家に配付するために、2014年に3カ所のDAR試験圃場に整備された。
3-5 普及員とCFに対してCDZに適した土壌改良技術を研修する。	計画どおり進捗中	月例研修とFFSの開催を通じて、普及員とCFは研修を受けている。

成果 4：CDZ のパイロットサイトに適用可能な節水灌漑技術が開発される。		
活 動	進捗度	進捗状況
4-1 ベースライン調査の一環として、パイロットサイト内の水資源や農家の水利用を調査し、課題を特定する。	終了	ターゲットエリアの水資源と水利用に関する調査は終了し、ベースライン調査報告書とデータ収集調査報告書としてまとめられた。また、ターゲットエリアの試みは“Water Resources and Utilization in the Central Dry Zone of Myanmar”に記述されている。
4-2 ニャンウーの乾燥地作物研究センターと CF 圃場にて、CDZ に適用可能な集水技術について検証を行う。	おおむね終了	適用可能な集水技術（管井戸、集水池、ルーフトank、土盛り、溝）は 3 カ所の DAR 試験圃場に展示されている。
4-3 ニャンウーの乾燥地作物研究センターと CF 圃場にて、CDZ の農家圃場で適用可能な節水灌漑技術の検証を行う。	おおむね終了	適用可能な節水灌漑技術（スプリンクラー、点滴灌漑、グリーンマルチ）は特定され、3 カ所の DAR 試験圃場に展示されている。
4-4 上記の検証を通じて、CDZ で適用可能な集水技術及び節水灌漑技術のガイドライン/マニュアルを作成する。	計画どおり進捗中	研修教材は作成され、2014 年の月例研修で使用された。集水技術と節水技術の普及資料とガイドラインは作成された。
4-5 パイロットサイトの農家に適用可能な節水栽培技術と節水灌漑技術を組み合わせた方法を推奨する。	計画どおり進捗中	C/P とターゲット・グループと相談のうえ、CF 圃場の展示場は特定された。ターゲットエリアでの集水技術と節水灌漑技術の組み合わせの事例研究を計画している。

4-3 成果物

プロジェクト活動と成果産出の実施プロセスにおいて、多種多様な報告書、資料、普及マニュアルが作成され、ターゲット・グループ、CF、NF によって幅広く受け入れられている。プロジェクト成果物のリストを付属資料 2. 合同評価レポート Appendix 8 に示した。

4-4 成果の達成度

各成果の達成度は、それぞれの成果に設定された指標の達成状況によって測定される。各成果の達成度を表 4-4 に記述した。

表 4-4 成果の達成度

成果 1：新規・既存の作物から CDZ に適した有望品種が特定される。		
指 標	達成度	達成状況
1-1 プロジェクト開始後半年以内にベースライン調査が実施され、地域農産物に対する消費者のニーズが明らかになる。	達成済み	ベースライン調査とマーケット価格調査は 2014 年 1 月と 9 月に終了した。それぞれ、“Baseline Survey Report”と“Market Price Survey Data”としてまとめられている。
1-2 消費者ニーズを踏まえてプロジェクトが推奨する既存・新規を含めた作物と同有望品種が 10%以上の抽出農家により採択される。	計画どおり進捗中	優良品種の種子受領者（CF 及び NF） 2014 年：26 名 2015 年：818 名 2016 年：126 名（2016 年 3 月 31 日）合計：970 名 ニャンウー、ミンジャン、マグウェイ TS の抽出農家数は 78,492 農家（受益者）（970/78,492=1.2%）

1-3 消費者ニーズを踏まえてプロジェクトが推奨する既存・新規を含めた作物と同有望品種の販売により、抽出農家の平均売上高が10%以上増加する。	計画どおり進捗中	CFの優良品種の平均農業粗所得 (Kyat/ acre) を以下の表に示した。			
		TS	作物	開始前	2015年
		ニャンウー	落花生	180,528	423,793
			キマメ	241,120	498,294
			リョクトウ	341,541	513,333
		ミンジャン	落花生	220,687	415,228
			ゴマ	208,613	314,587
マグウェイ	落花生	312,794	558,588		
	ゴマ	360,471	559,053		

成果 2 : CDZ の (社会経済・自然) 環境に合致する作物栽培方法が改善される。		
指標	達成度	達成状況
2-1 選定された既存・新規の作物と同有望品種に対して、CDZ に適した栽培技術が確立され、DAR 試験圃場で延べ2回 (年2回) 実施される。	おおむね達成	DAR 試験圃場での試験栽培数は以下のとおり。 (Ny+My+Mg=合計) 2014年: 1+0+0=1回 2015年: 1*+0+0=1回 合計: 2回 *落花生栽培: スプリンクラーを使用し、1穴に1粒の播種密度。
2-2 栽培技術のマニュアルが作成される。	おおむね達成	以下の各対象作物の栽培技術マニュアルが作成された。(修正予定) 1. 落花生の普及資料 (FFS) 2. ゴマの普及資料 (FFS) 3. キマメの普及資料 (FFS) 4. リョクトウの普及資料 (FFS)
2-3 マニュアルに準拠した栽培技術を実践できる普及員が30名以上養成される。	計画どおり進捗中	研修を受けた普及員数は以下のとおり。 (Ny+My+Mg=合計) 2014年: 12+4+5=21名 2015年: 3+1+1=5名 合計: 26名 (26/30=87%)
2-4 マニュアルの内容がCF圃場で延べ100回 (年1回以上) 以上検証される。	計画どおり進捗中	中核農家圃場での検証実験数は以下のとおり。 (Ny+My+Mg=合計) 2014年: 18+4+4=26回 2015年: 15+8+8=31回 2016: 6回 合計: 63回/100回 (63%)
2-5 抽出農家の10%以上がマニュアルに準拠した栽培技術を実践する。	計画どおり進捗中	栽培技術を実践した農家数は以下のとおりである。 (農家数 =対象作物のFFS + 種子交換) 2014年: 1,216世帯 2015年: 2,390世帯 2016年: 201世帯 合計: 3,807世帯/7,849世帯 (49%) (7,849世帯: 3つのTSの全農家数の10%)

成果 3 : CDZ の (社会経済・自然) 環境に合致する土壌環境 (養分、保水性等) 管理を含めた圃場管理技術が改善される。		
指 標	達成度	達成状況
3-1 プロジェクト開始後半年以内にベースライン調査が実施され、対象地域の土壌条件が明らかにされる。	おおむね達成	“Data Collection Survey Report” は 2013 年 8 月に取りまとめられた。さらに、以下の報告書が作成された。 1. Climate in the Target Area 2. A Soil Condition in Project Site
3-2 CDZ に適した土壌改良技術が確立される。	達成済み	<i>Gliricidia</i> (多目的樹種) 適用による土壌改良技術が特定された。
3-3 土壌改良技術マニュアルが作成される。	おおむね達成	<i>Gliricidia</i> 普及マニュアル (FFS) が作成され、使用されている。(修正予定)
3-4 マニュアルに準拠した土壌改良技術を実践できる普及員が 30 名以上養成される。	計画どおり進捗中	研修を受けた普及員数は以下のとおりである。 (Ny+My+Mg=合計) 2014 年: 10+4+5=19 名 2015 年: 0+1+1=2 名 合計: 21 名 (21/30=70%) 注: 指標 2-3 の差異はリョクトウの普及員数である。
3-5 マニュアルの内容が CF 圃場で延べ 100 回(年 1 回以上)以上検証される。	計画どおり進捗中	CF 圃場で実施された検証試験の数は以下のとおりである。 (Ny+My+Mg=合計) 2014 年: 11+0+0=11 名 2015 年: 12+8+8=28 名 合計: 39 名 (39/100=39%)
3-6 抽出農家の 2%以上がマニュアルに準拠した土壌改良を実践する。	計画どおり進捗中	The number of farmers who adopted the technologies (農家数=土壌改良の FFS + FD) 2014 年: 11 名 2015 年: 588 名 合計: 599 名 (599/1,570=38%) (1,570 農家: 3 つの TS の全農家数の 2%)

成果 4 : CDZ のパイロットサイトに適用可能な節水灌漑技術が開発される。		
指 標	達成度	達成状況
4-1 パイロットサイトの水資源と農家の水利用の実態調査報告書が作成される。	達成済み	調査は終了し以下の報告書が作成された。 1. Baseline Survey Report 2. Data Collection Survey Report 3. Water Resources and Utilization in the Central Dry Zone of Myanmar
4-2 集水技術と節水灌漑技術のガイドライン/マニュアルが作成される。	おおむね達成	3 カ所の DAR 圃場と 1 カ所の CF の圃場において展示を行った。それらの分析と教訓を踏まえ、以下のガイドライン (普及マニュアル) と普及資料がドラフトされている。 1. Extension material for “Water-harvesting and water saving technology” 2. Extension Scheme
4-3 節水栽培技術と節水灌漑技術を組み合わせた方法の提案書が作成される。	計画どおり進捗中	提案書を作成するにあたって、C/P とターゲット・グループを協議し、節水栽培技術と節水灌漑技術の組み合わせ方法を示す展示圃場を特定した。

4-5 プロジェクト目標の達成度

プロジェクト目標の達成度は設定された指標の達成状況によって測定される。プロジェクト目標の達成度を表4-5に記述した。

表4-5 プロジェクト目標の達成度

プロジェクト目標：CDZに適した節水農業技術が確立される。																															
指標	達成度	達成状況																													
1. 本プロジェクトで開発された節水農業技術がプロジェクトサイトの農家15%に導入され、1作以上実施される。	おおむね達成	<p>節水農業技術を紹介した延べ参加者数は以下のとおりである。 (数値=対象作物のFFS + 種子交換 + 土壌管理のFFS + 展示圃場会) 2014年：1,227名 2015年：3,177名 2016年：201名 合計：4,605名/11,774農家(39%) (11,774は3つのタウンシップの農家数の15%)</p>																													
2. プロジェクトサイトにおいて、本プロジェクトで開発した節水農業技術を活用した農家の作物収量が10%増加する。	おおむね達成	<p>CFの対象作物の平均収量(kg/acre)は以下のとおりである。</p> <table border="1"> <thead> <tr> <th>TS</th> <th>作物</th> <th>開始前</th> <th>2015年</th> </tr> </thead> <tbody> <tr> <td rowspan="3">ニャンウー</td> <td>落花生</td> <td>292</td> <td>405</td> </tr> <tr> <td>キマメ</td> <td>447</td> <td>382</td> </tr> <tr> <td>リョクトウ</td> <td>459</td> <td>436</td> </tr> <tr> <td rowspan="2">ミンジャン</td> <td>落花生</td> <td>357</td> <td>388</td> </tr> <tr> <td>ゴマ</td> <td>136</td> <td>221</td> </tr> <tr> <td rowspan="2">マグウェイ</td> <td>落花生</td> <td>506</td> <td>827</td> </tr> <tr> <td>ゴマ</td> <td>235</td> <td>263</td> </tr> </tbody> </table> <p>不規則の雨量の天水農業は潜在的な脅威である。</p>		TS	作物	開始前	2015年	ニャンウー	落花生	292	405	キマメ	447	382	リョクトウ	459	436	ミンジャン	落花生	357	388	ゴマ	136	221	マグウェイ	落花生	506	827	ゴマ	235	263
TS	作物	開始前	2015年																												
ニャンウー	落花生	292	405																												
	キマメ	447	382																												
	リョクトウ	459	436																												
ミンジャン	落花生	357	388																												
	ゴマ	136	221																												
マグウェイ	落花生	506	827																												
	ゴマ	235	263																												
3. プロジェクトサイトにおいて、本プロジェクトで開発した節水農業技術を経験した農家の6割(60%)が有効だと評価する。	おおむね達成	<p>CFとNFから節水農業技術が有効と評価された割合は以下のとおりである。 2014年：100% 2015年：82% 平均：91%</p>																													

第5章 評価5項目によるレビュー

5-1 妥当性

プロジェクトの妥当性は「高い」。

(1) 政策の優先度

1) ミャンマー政府の開発政策

2011年から2031年までの20カ年長期の国家基本開発計画（National Comprehensive Development Plan：NCDP）に基づき、第2次5カ年計画（2016/17～2020/21）が策定された。この計画は、工業化のプロセスを通じて高い現地の生産性を確保するために、公的セクターと民間セクターへの投資を促進させ、経済成長を増大させることを目的としている。そのため、計画では農業を優先分野の1つとして焦点を当てている。農業開発はアグロ産業の統合と農村と都市の相互連携を通じて成し遂げられる。こうした計画内容から判断して、プロジェクトはミャンマー政府開発戦略と適合しているといえる。

2) ミャンマーに対する日本の援助基本政策

日本政府は2012年に対ミャンマー援助政策を見直し、3つの重点分野の1つとして、少数民族と貧困層、さらに農業と農村開発への支援を含む住民の生計向上に焦点を当てている。このことから、プロジェクトは日本の援助政策の優先事項と合致しているといえる。

(2) 受益者とターゲット・グループのニーズ

1) 受益者

受益者は中央乾燥地のニャンウー、ミンジャン、マグウェイのタウンシップの農家世帯と定義されている。CDZの農家の所得は、不規則な雨量の環境下での天水農業に依存していることから不安定である。結果として、国内の貧困多発地域の1つとして見なされている。それゆえに、受益者は安定的で持続的な農業生産に関連する技術への強い要求がある。

2) ターゲット・グループ

ターゲット・グループは3カ所のDAR試験圃場の職員とニャンウー、ミンジャン、マグウェイのDOAタウンシップ事務所の職員である。プロジェクト活動はMoALIの3つの主要目的、すなわち①高収量で良質な種子の生産と提供、②研修と教育の提供、③調査研究活動を含んでいる。このことから、プロジェクトはターゲット・グループのニーズに合致しているといえる。

(3) 方法論

プロジェクトは節水農業技術を構築し、上位目標を達成するために普及サービス制度を整備するように設計されている。この目的に向けて、プロジェクトは、継続してプロジェクト効果を普及していくために、以下の3つのアプローチを採用している。

<既存技術の改良>：プロジェクトは、新しい技術を開発するのではなく、ターゲットエリアの既存技術を改良することで節水農業技術を構築することをねらっている。

<普及サービスシステムの継続>：プロジェクトはDOAタウンシップ事務所が実践してきた普及サービスに準拠してFFSを運営している。

<CDZ のアグロ・環境の条件の研究>： ターゲットエリアは、①雨量、分布、パターン、②適正作物と品種、③作物カレンダーなどの CDZ の異なる条件に基づき選定されている。

上記の事項から判断して、プロジェクトが採用した方法論は上位目標（CDZ での農業所得の安定）を達成するための手段として適切であると思料できる。

5-2 有効性

プロジェクトの有効性は「高い」。

(1) プロジェクト目標達成の見込み

各指標の達成度を勘案すれば、プロジェクト目標はプロジェクト終了までに達成される見込みである。各指標達成の見込みは表 5-1 に記載した。

表 5-1 プロジェクト目標達成の見込み

プロジェクト目標：CDZ に適した節水農業技術が確立される。		
指標	予見	達成の見込み
1. 本プロジェクトで開発された節水農業技術がプロジェクトサイトの農家 15% に導入され、1 作以上実施される。	達成が見込まれる	既に指摘したように、農家 15% は 11,774 農家であるが、これまで農家数 4,605（数値目標の 39%）はカバーされ、農家数 7,169 は残りの期間で FFS、展示圃場会、種子交換制度を通じてカバーされる予定である（毎年 2,390 農家）。
2. プロジェクトサイトにおいて、本プロジェクトで開発した節水農業技術を活用した農家の作物収量が 10% 増加する。	達成が見込まれる	プロジェクトサイトの 2015 年の各対象作物の平均収量（kg/acre）は既に目標収量（10% 増加）を超えている。しかし、ターゲットエリアでは不規則な雨量がつきものであることから、毎年、作物収量をモニターする必要がある。
3. プロジェクトサイトにおいて、本プロジェクトで開発した節水農業技術を経験した農家の 6 割（60%）が有効だと評価する。	達成が見込まれる	既に指摘したように、2014 年と 2015 年にインタビューした農民の 91% は、FFS を通じて普及した技術が効果的であると評価している。残りの期間においても、農家から肯定的な反応が得られるように、プロジェクトの努力が継続的に必要である。

(2) 成果とプロジェクト目標の論理的整合性

成果とプロジェクト目標の間の論理的整合性は確保されており、図 5-1 に示したように論理的に結合している。

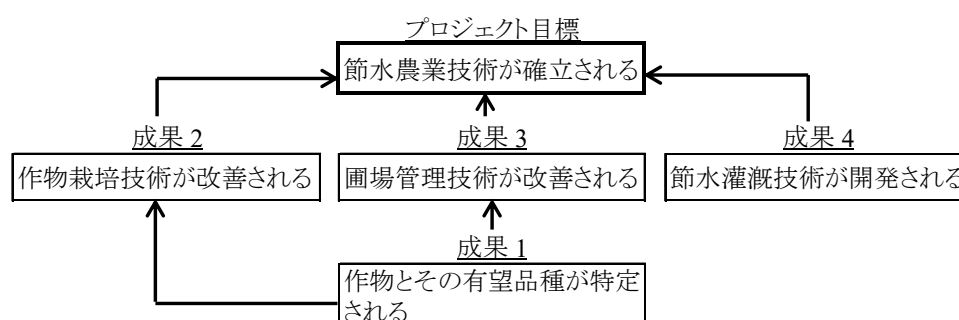


図 5-1 成果とプロジェクト目標の論理的整合性

(3) プロジェクト目標達成のための外部条件

外部条件の実現状況については表 5 - 2 に記述した。

表 5 - 2 プロジェクト目標達成のための外部条件の実現状況

外部条件	実現状況
1. 深刻な病虫害が発生しない。	外部条件は現在も有効であり、今後も満たされる可能性が極めて高い。ただし、不規則な気象条件について予測することは困難。
2. 耕作・灌漑を妨げる極端な異常気象が発生しない。	
3. 種子・農業資材及び小規模灌漑のコストが急騰しない。	
4. DARとDOAへの開発予算が削減されない。	

2014 年、ターゲットエリアの年間雨量は過去 10 年間の最低レベルとなり、おそらく収量が減少したと思われる。

(4) 貢献要因と阻害要因

1) 貢献要因

- ・以下がプロジェクト目標を達成するうえでの主要な貢献要因である。
- ・実施機関の幹部職員の指導力と積極的な態度
- ・畑作作物の重要性と種子生産の必要性の認識
- ・C/P 及びターゲット・グループの熱意と規律（時間厳守）
- ・成果 4 の産出のための技術 C/P の DAR 本部からニャンウー試験圃場への人事異動
- ・FD と FFS を通じた DAR と DOA の連携・協力
- ・モチベーションの高い CF と NF の存在

2) 阻害要因

- 以下がプロジェクト目標を達成するうえでの主要な阻害要因である。
- ・稲作に比較して国家農業政策の畑作作物の低い優先度
 - ・研修を受けた C/P 及びターゲット・グループの頻繁な人事異動
 - ・不十分な普及員の移動手段と旅費
 - ・専任の C/P 及びターゲット・グループの不在

5 - 3 効率性

プロジェクトの効率性は「高い」。

(1) 成果達成の見込み

活動はそれぞれの成果を産出できるように適切に設定されている。ベースライン調査での受益者のニーズの認識を受け、成果 1 の活動には含まれていないが、プロジェクトは優良種子の増殖と CF への配付を行ってきた。この活動はプロジェクト目標達成に大きく貢献するとともに、FFS で農家の参加を促進する入り口として役立っている。

成果達成の見込みについては表 5 - 3 に記載した。

表 5 - 3 成果達成の見込み

成 果	予 想	達成の見込み
成果 1：新規・既存の作物からCDZに適した有望品種が特定される。	達成が見込まれる	以下の対象作物と優良品種は第3回 JCC で承認された。 (1) 落花生：Sinpadaethar 11 and Sinpadaethar 6 (2) ゴマ：Sinyadanar 3 (3) キマメ：Shwe dinga and Yezin 10 (4) リョクトウ：Yezin 14 合同中間レビューの時点での成果 1 の指標の達成状況を以下に示した。 指標 1-1：達成済み 指標 1-2：計画どおり進捗中 指標 1-3：達成済み 指標 1-4：計画どおり進捗中
成果 2：CDZの(社会経済・自然)環境に合致する作物栽培方法が改善される。	達成が見込まれる	栽培技術として根粒菌の配付はローリングプランの一部として第3回 JCC で承認された。合同中間レビューの時点での成果 2 の指標の達成状況を以下に示した。 指標 2-1：おおむね達成 指標 2-2：おおむね達成 指標 2-3：計画どおり進捗中 指標 2-4：計画どおり進捗中 指標 2-5：計画どおり進捗中
成果 3：CDZの(社会経済・自然)環境に合致する土壌環境(養分、保水性等)管理を含めた圃場管理技術が改善される。	達成が見込まれる	土壌管理技術として <i>Gliricidia</i> の苗木の配付はローリングプランの一部として第3回 JCC で承認された。合同中間レビューの時点での成果 3 の指標の達成状況を以下に示した。 指標 3-1：おおむね達成 指標 3-2：達成済み 指標 3-3：おおむね達成 指標 3-4：計画どおり進捗中 指標 3-5：計画どおり進捗中 指標 3-6：計画どおり進捗中
成果 4：CDZのパイロットサイトに適用可能な節水灌漑技術が開発される。	達成が見込まれる	開発された技術(集水と節水)と普及方法はローリングプランの一部として第3回 JCC で承認された。合同中間レビューの時点での成果 4 の指標の達成状況を以下に示した。 指標 4-1：達成済み 指標 4-2：おおむね達成 指標 4-3：計画どおり進捗中 節水栽培技術と節水灌漑技術を組み合わせた手法は、今後設定される展示圃場で特定されることが期待できる。

(2) 成果達成のための外部条件

PDM (Ver.1) には成果達成のための外部条件は設定されていない。

(3) 実施プロセス

実施プロセスは、プロジェクト初期段階での手続き上の遅延を除いて、おおむね効率的で

あり満足できる状況である。

- ・ JCC は、合同中間レビューまでに効果的に 3 回開催されており、実施機関と連携して重要な決断を下している。一方で、JCC 議長や委員が頻繁に交代している。
- ・ DAR プロジェクトマネジャー、DAR 調整担当の C/P、DOA 調整担当の C/P は交代しておらず、2 名の調整担当 C/P はニャンウーで開催されている QMM に毎回出席している。このような事例は本部と現地事務所の間の円滑なコミュニケーションに寄与している。
- ・ プロジェクトモニタリングは定期的に行われ、年度ごとのエンドライン調査はミャンマー側によって実施されている。モニタリングと調査結果は取りまとめられ、月例報告書、四半期別報告書、半期別報告書、年度別報告書としてプロジェクト関係者に配付されている。
- ・ プロジェクト関係者の間で、週別会議、MMM、QMM、キック・オフ会合、フォローアップ会合を通して、コミュニケーションはよくとられている。同様に、特定目的のための会合が関連するプロジェクト関係者の間で開催されている。
- ・ C/P とターゲット・グループへの技術移転と能力構築は、研修コース（例：2014 年の月例研修や 2015 年の MMM など）、ワークショップ、ワーク会合、OJT によって十分に行われている。CF や NF のために、FFS がよく計画された方法で開催されている。

(4) 投入と活用

ミャンマー・日本国側双方からの投入は計画された活動を実施するうえで、質、量、タイミングにおいておおむね適切である。活動を実施するにあたって、ミャンマー側実施機関の専門性、知識、情報などを含む現地資源を活用している。供与された資機材と補修/修復された施設はおおむねよく管理されプロジェクト活動実施のために活用されている。

5-4 インパクト

プロジェクトのインパクトは「中程度」である。

(1) 上位目標達成の見込み

上位目標達成の見込みは、プロジェクト終了から 5 年後に、設定した指標の達成見込みを測定することで予想する。上位目標達成の見込みを表 5-4 に記載した。

表 5-4 上位目標達成の見込み

上位目標：CDZ*（特に非灌漑地域）に適した節水農業技術が普及され、農業収入が安定する。		
指標	予想	達成の見込み
1. プロジェクト終了5年後、CDZにおいて、本プロジェクトで開発した節水農業技術を導入し、1作以上継続実施する農家数が、5%増える。	達成することは困難	上位目標の達成は困難であると予期される。上位目標で対象とする地理的範囲は5年間の期間であり、ターゲットエリアと比較して広すぎる。
2. プロジェクト終了後5年間、本プロジェクトで開発した節水農業技術を導入した農家の平均農業収入がプロジェクト終了時の農家の農業収入を継続して上回る。		

*上位目標での対象地域は、ターゲットエリア（3カ所のタウンシップ）を含む CDZ の 27 タウンシップと定義されている。

上記の予想は、プロジェクト目標と上位目標の間にギャップ（時間的制約と地理的範囲）があることを示している。それゆえに、上位目標を達成するために、そして2つの指標のデータを収集するために、プロジェクト期間の後半に対応策を検討し準備する必要があるだろう。

(2) 上位目標達成のための外部条件

外部条件の実現状況については表5-5に記述した。

表5-5 上位目標達成のための外部条件の実現状況

外部条件	実現状況
1. 灌漑局を含む政府機関の支援が継続する*。	外部条件は現在も有効であり、今後も満たされる可能性が極めて高い。
2. DAR と DOA の円滑な連携が図られる。	

* 灌漑局（ID）と水資源利用局（WRUD）は2016年に統合し、灌漑水利用管理局（IWUMD）となった。

(3) 正と負のインパクト

正のインパクトは受益者、特にCFとNFにおいて確認できる。受益者は、FFSや集水技術/節水技術の展示圃から学んだ農業技術を適用することにより、農業所得が増加している。正のインパクトの事例は「4-4 成果の達成度」に記述しているが、何名かの農民はCFから集水技術/節水技術を学び、トマトのような園芸作物を生産している。

他方、負のインパクトは合同中間レビューまでに観察されていない。

(4) 正と負の予期されない効果

1) 正の予期されない効果

- ・ FFS と種子増殖で使用する根粒菌の調達や有望品種の選定においてオーストラリア国際農業研究センター（Australian Centre for International Agricultural Research : ACIAR）と連携した。
- ・ CDZ の Wundwin タウンシップにあるアジア農業協同組合振興機関（The Institute for the Development of Agricultural Cooperation in Asia : IDACA）はプロジェクトにスタディツアーで訪れ、何名かの参加者は自分の圃場に8つの小規模ため池を設置した。
- ・ 2014年1月から2016年4月までのミャンマー訪問者は総計で171調査団と訪問者（合計で955名）で、そのなかには24回のプロジェクト訪問（合計で742回）があり、それらは活動のモニタリング、サイト訪問、現場訪問、メディアツアーであった。特記事項として、MoALI 連邦大臣である Dr. Aung Thu、DOA 総局長の Dr. Ye Tint Tun、DAR 局長の Dr. Htun Shwe が2016年4月16日にプロジェクトを訪問している。

2) 負の予期されない効果

合同中間レビューまでに負の予期されない効果は確認されていない。正と負の両面において、ジェンダー間、民族間、階級間のギャップの拡大は合同中間レビューまでに確認されていない。

5-5 持続性

プロジェクトの持続性は「中程度より高い」。

(1) 政策・行政：中程度より高い

プロジェクトのアプローチは、ミャンマー政府の農業開発計画と合致しており、20カ年長期のNCDP下の第2次5カ年計画（2016/17～2020/21）とも一致している。しかしながら、国家農業政策が畑作物への関心がより高まるかどうかを予想することはいまだ困難である。それゆえに、プロジェクトの政策・行政的持続性は「中程度より高い」と予見される。

(2) 組織・制度：中程度より高い

MoALI 連邦大臣、DOA と DAR の本部の幹部、ミンジャン郡の3つのタウンシップ・マネージャーがプロジェクトサイトを訪問している。これらの事例はプロジェクト活動の関心とプロジェクト実施のコミットメントを示している。また、ターゲットエリアはCDZのアグロ・環境条件の多様性を取り入れているため、実施機関はそれほど困難性を感じることなく、CDZの他の地域に適用してきた技術を複製できると思料する。したがって、プロジェクトの組織・制度的持続性は「中程度より高い」と推定できる。

(3) 財政：中程度

「4-1(1) ミャンマー側からの投入」で指摘したように、MoALI はプロジェクト前半に、実施機関のプロジェクト活動にかかる経常経費の負担に努力してきた。ただし、普及員に対する交通手段や旅費については限界があることがわかっている。一方で、ベースライン調査や年度末エンドライン調査についてはミャンマー側で実施されている。これまでの予算処置状況から判断すれば、プロジェクトの財政的持続性は「中程度」と考慮される。

(4) 技術：高い

プロジェクトが採用した技術は、プロジェクトがCDZの既存技術を改良し農家が受入れやすいように簡素化して導入したものであることから、C/P やターゲット・グループにとって全く新しいものではない。また、プロジェクトが採用したFFSは、DOAの既存の普及制度に準拠しているため、C/P やターゲット・グループになじみ深いものである。このことから、プロジェクトの技術的持続性は「高い」と想定される。

5-6 結論

合同中間レビュー調査団は、プロジェクトはプロジェクト期間の前半においては着実に進捗しており、プロジェクト目標を達成する途上にあると判断した。また、調査団はプロジェクトが研修とFFSの実施を通じて、C/P、ターゲット・グループ、CFの能力向上に大きく貢献していることも確認した。彼らはプロジェクト活動の実施に非常に熱心で意欲的である。供与機材や施設はおおむねよく管理され活用されている。具体的なインパクトはCFやNFに現れており、改善された技術を適用した結果、農業収入が増加している。さらに、MoALI（DOA、DAR、現地事務所）が畑作物とプロジェクト・アプローチに興味と関心を示していることは特筆されるべきである。

プロジェクト終了後から5年後に上位目標（農業収入の安定）を達成するには、ミャンマー側実施機関が節水農業技術を他のCDZにプロジェクトの残り期間に普及できるように、プロジェクトとともに実施可能な戦略を策定し、実施基盤を整備する必要がある。

5項目評価基準からのレビュー結果を表5-6に取りまとめた。

表5-6 レビュー結果の要約

基準	評価	まとめ
妥当性	高い	プロジェクトは、ターゲット・グループと受益者のニーズに対応しており、ミャンマーの開発政策と日本の援助政策に適合している。プロジェクトの妥当性を低下させる要因は確認されていない。
有効性	高い	成果とプロジェクト目標の間の論理的整合性は確保されており、論理的に結びついている。プロジェクト目標は達成されることが予想される。
効率性	高い	成果達成の可能性は高い。実施プロセスは系統的でコスト・パフォーマンスも高い。
インパクト	中程度	具体的なインパクトはCF、NF、一般農家（Ordinal Farmer：OF）で確認されているが、上位目標とプロジェクト目標の間にギャップがあることから、上位目標の達成は困難であると予見できる。中間レビューの時点で、負のインパクトや予期できない効果は確認されていない。
持続性	中程度より高い	技術的持続性は高い。政策・法的持続性、さらに組織・制度的持続性は「中高」である。財政的持続性は「中」と評価した。

*5段階評価（高い、中高、中中、中低、低い）によってランク付けを行った。

第6章 提言

合同中間レビュー結果に基づき、評価団は以下の事項を提言した。

(1) PDM と PO の改訂

調査団は現行 PDM (Ver.1) を改定し、改訂版 PDM (Ver.2) を提言した (付属資料 2. 合同評価レポート Appendix 9 参照)。

(2) プロジェクトによる種子生産の継続

プロジェクトは現在、対象作物・優良品種の適応性検定試験に必要となる種子生産を行っている。ミャンマーで全土的に畑作作物の種子の供給が不足している現状を受け、プロジェクトはターゲットエリアにて試験及び普及活動の継続に必要となる種子を担ってきた。調査団は、プロジェクト目標達成のためにも、プロジェクト期間後半においても引き続きプロジェクトによる種子生産が必要であることを確認した。

(3) DAR 及び DOA への種子生産活動の移行

上位目標達成のためには、DAR・DOA による種子生産活動の継続が必要であり、プロジェクト終了後も自らのイニシアティブによって継続的に種子生産を実施することが期待される。よって、プロジェクト期間後半においては、DAR 及び DOA の主導のもと、持続的な種子生産システムを構築することが望まれる。加えて、プロジェクトから DAR・DOA への円滑な種子生産活動の移管を進めるためには、左記活動に係る予算の確保が求められ、2018/19 年度予算以降、種子生産活動に対する DAR 及び DOA による予算配分が必要であることを提言した。

(4) DAR・DOA の連携強化

本プロジェクトにおいては、農家への技術普及を目的とした展示圃場会等の活動を通して、DAR と DOA の協働体制の好事例を観察することができた。例えば、展示圃場会開催にあたっては、DAR が展示圃場を準備し、DOA 普及員が NF を動員し、農家に技術移転を行っている。このような DAR・DOA 間の連携と協力は、現地条件に基づいた農業技術開発の成功に結びついており、また、今後の成果にも影響する重要な要件の 1 つである。

調査団は、特に DAR・DOA にて権限を有する職員の率先により、展示圃場会等の活動をモデルケースとした現場レベルでの DAR・DOA の連携体制を、ターゲットエリア以外の地域へも波及させることを提言した。また、地方政府職員が可能な限りタウンシップまたは郡レベルでの月例会議へ参加し、DAR・DOA の垣根をまたいだ協働の場をもつことで、さらなる連携の促進が期待される。

(5) タウンシップ・マネジャーの C/P 任命

ターゲットエリアのうち、マグウェイを除いたニャンウー及びミンジャンの DOA タウンシップ・マネジャーは C/P として任命されていない状況にあった。プロジェクト期間後半の活動においては、より各タウンシップでの主導的な普及活動が求められるところ、調査団は、

ミャンマー側に対してニャンウー及びミンジャンの DOA タウンシップ・マネジャーを C/P として任命するよう要請した。両タウンシップ・マネジャーが公的にも結束してプロジェクト活動に参加することにより、さらなる成果の向上が期待される。

(6) 持続的開発のためのプロジェクト終了後戦略 (Post-Project Strategy) の検討

プロジェクト後半期間において、ミャンマー側は節水農業技術の応用研究及び普及活動においてさらなる指導的役割を果たすことが期待され、プロジェクト終了後の持続性確保においても重要な要素となる。

これまで、プロジェクトが資機材（種子、根粒菌、*Gliricidia* 苗木、集水/節水施設建設資材等）の調達/配付に係る費用を負担してきたが、プロジェクト終了後もこれらの取り組みが継続されるよう、プロジェクト後半期間ではミャンマー側（政府、民間セクター、農家等）による各投入（予算・人員・資機材等）の配分を段階的に増加させていく必要がある。よって、調査団は、ミャンマー側が日本人専門家の協力のもと、2017年半ばをめどにプロジェクト終了後戦略（例：必要予算、要員、資機材の投入計画）を策定し、プロジェクト最終年次において MoALI 主導のもと、試験的に同戦略を実施することを提言した。

第7章 教訓

(1) 資機材の供与

農家による資機材の活用を確実にし、自発性を促進するためにも、必要な資機材を受益者に供与する際には、適切な技術支援を同時に行うべきである。

プロジェクトはFDやFFS等の活動において、種子の供与と同時に技術指導を実施し、指導を受けて初めて種子が受け取れるようにする等の工夫をしている。その結果、資機材を供与した後、DOA普及員の支援を得ながら、農家が圃場においてプロジェクト活動から学んだことを実践している事例が数多く観察された。

(2) 種子交換制度

農家の自助努力の意欲を高めるために、プロジェクトではFFSにおいて「種子交換制度」を導入している。種子交換制度では、まず、プロジェクトより、FFSにおいて節水農業技術の指導を行うと同時に、優良種子をCFとNFへ提供する。CFとNFは優良種子を用いて栽培し種子を収穫するが、生産した種子の一部をOFが保有する既存の種子と交換する義務がある。こうした種子交換制度によって、農民から農民へ対する優良種子と関連技術の普及が可能となり、持続的な種子生産及び技術普及に寄与することが期待される。

(3) 関係機関の連携強化

第6章(4)に示したとおり、FDやFFS等の実施において、DAR・DOA間の連携した活動の好事例が観察された。DARは旧MAS(現在のDOA)から分離した組織であり、旧来DARとDOAは同傘下の関係性の強い組織であったが、現在は異なる所掌をもつ別部局として機能しており、連携が希薄化している。プロジェクトは、FDやFFS等のさまざまな活動を通して、両局が協力して業務に取り組む機会を意識的に提供することにより、こうした関係のDAR・DOA間の協力・連携をスムーズにしている。

プロジェクト実施に際して、複数の関連機関との連携が求められる場合には、関連機関の連携強化を図るために、具体的な協働の場を提供することが必要である。

第8章 総括

8-1 団長総括

本プロジェクトの目的は、CDZにおける農業生産の安定化、及び、収入の安定のための節水農業技術の確立にある。中間レビュー調査を実施した結果、本プロジェクトは現時点においておおむね順調に進捗しており、また、プロジェクト目標の達成見込みは高いと判断した。DOA、DARのC/Pとの協働を進めてきたプロジェクト専門家のフィールドベースの地道な活動の成果ということができる。評価調査を通して感じたことをいくつか以下に示す。

(1) プロジェクトの触媒機能

本プロジェクトは、DOAとDARの地方事務所レベルでの協働を促す触媒として機能し、中間レビューにおいて、ミャンマー側評価団より、その触媒機能について、提言として特筆すべきとの提案もあり、提言の1つとして加えた。比較的近い組織間でも業務実施時における協働には心理的、予算的、物理的な障害がある。プロジェクトが、それらの障害をとりのぞく役割を果たしたことは特筆されるべきことである。

(2) 優良種子の配付

プロジェクト活動の前提条件として、普及すべき種子の存在があったが、プロジェクト開始時に判明したのは、配付すべき種子の増産システムが存在しないということであった。第1回JCCにおいて承認された品種により、成果2~4のための活動を実施するため、プロジェクトはDAR圃場及びCF圃場における原種子(Foundation Seed:FS)、認証種子(Certified Seed:CS)、優良種子の増産システムの確立に試行錯誤することとなった。おおむね増産システムの枠組みが確立しつつある、中間レビュー時はそのような状況であった。FFSにおいて優良種子を配付・増産し、農民間の横への優良種子、適正技術の広がり加速化させるプロジェクトの取り組みはこれからが正念場である。

(3) プロジェクト後の普及戦略

プロジェクトのターゲット地区における種子配付・増産システムが確立しつつある一方で、FFSにおける優良種子の無料配付(収穫時、一定量の種子をDOAに還元する仕組みがあるので無償配付ではない)はプロジェクト経費により行われているため、プロジェクト終了後、異なる枠組みにより継続される必要がある。①農民が有償で優良種子を購入、②政府予算で無料配付を継続、③製油業者等の第三者が(契約栽培等の枠組みの導入とともに)種子配付を継続といった選択肢のうち、どのようなかたちがCDZにおける営農形態として適切なのか、ミャンマー側が真剣かつ慎重に考える必要がある。

本評価団では、プロジェクト後の普及戦略の必要性について指摘するとともに、プロジェクト期間中に何らかの試行的な取り組みを開始するよう提言を行った。本戦略の策定は、上位目標の達成に大きく影響するものであり、今後も注意深く見守る必要がある。

8-2 研究協力団員所感

ミャンマーにはたびたび来ているが、6月のミャンマーは久しぶりだ。ネピドーやイエジンは

予想どおりであったが、ニャンウーで強い雨に遭うとは予想していなかった。農家にとっては嬉しい雨で、この雨水を逃さぬようと耕起や播種で忙しくなっていたに違いない。CDZでの激しい降雨の写真を撮り忘れたことは返す返すも残念である。

さて、プロジェクト・サイトを見て非常に驚き、強い感銘を受けた。予想以上に進捗しているのである。事前の打合せの折に、評価分析団員から「よく進捗している」と聞いてもあまり期待していなかった。それは、プロジェクト開始以前から、はかばかしい進捗は極めて困難との強い懸念を抱いていたからである。なぜなら、CDZは降雨が極めて少なく、しかもどこでいつ降るか予測し難い。大規模な灌漑施設や利用できる水源もなく、それどころか電気や通信インフラも未熟である。そして容赦なく暑い。プロジェクト・サイトを結ぶ道路も良いとはいえない。正直な話、派遣された日本人専門家は途方に暮れ、現地スタッフの士気も上がらないのではないかと危惧していた。プロジェクト・サイトのニャンウー、ミンジャン、マグウェイのDAR試験所はいずれも以前訪問したことがあったが、そのときにはイエジンにあるDAR本局の指示に従って与えられた試験を実施し、自発的に研究を工夫するという雰囲気は正直に言って感じ難かった。

今、自らの不明を恥じると同時に、専門家やC/P、そして地元の農家の努力に対し大いに敬意と感謝を表したい。来て見て本当に良かったと感じている。特記しておきたいのは、DARとDOAの現場レベルでの協力がこの進捗を支えていると感じたことである。DARはミャンマー農業公社（Myanmar Agriculture Service : MAS）傘下の中央農業研究所（Central Agricultural Research Institute : CARI）が独立、昇格して組織され、その後MASはDOAと改名したという経緯から、DOAとDARは本来近い関係にあるが、所掌、分担をめぐって両方の職員から、異なる組織となったがゆえに意見交換はともかく協力はやり難いといった声も仄聞していた。

現地視察中にC/Pの話の聞いていると、報告書に書かれたこと以外に初代の松本専門家リーダーの貢献を強く感じた。複数のC/Pが彼の名前を繰り返し、圃場に出てC/Pや農家とコミュニケーションをとった彼に大きな信頼を寄せている。現場のC/Pには、若く、組織の中では自発的に発言する自信や度胸をもっていない者も少なくない。しかしリーダーの前で発言し、実演し、リーダーに肯定的に扱われたことは自信になり、また、他の若い職員や農家からの信頼にもつながっているようだ。

もちろん、水谷、菊池両専門家や山田業務調整員に対するC/Pの信頼も確かである。これらは知識に対する敬意もあるだろうが、それ以上に圃場で一緒に考え、努力している専門家チーム全体の姿勢から得られたもののように思える。藤本新リーダーには初代リーダーとは違うアプローチも必要だと思うが、ニャンウー、ミンジャン、マグウェイの試験場やFFS、FDの現場に頻繁に立っていただいて若手C/Pのモチベーションをより高めていただきたい。現場でのリーダーの存在はC/Pばかりでなく専門家、特に今後交代して着任する若手専門家にとっても力強いサポートとなる。

研究的側面でのプロジェクトをみるとどうであろうか。今までは専門家が中心になって導入すべき技術を判断し、技術指導やマニュアル作成もその指導の影響が強かったと思う。また、実際の農業生産につながる技術の向上に対する総合的なアプローチであり、いくつもの条件をふって実験計画法に従って計画することは簡単ではない。実際の農業生産は播種期や収穫期の気象条件によって大きく影響される。気象条件も1年や2年の結果では結論を導き難いほど毎年変動する。

多様な新技術の導入というよりは、既存の特に現地の技術を取捨選択しどう組み合わせるか、

また、低い投資で可能な技術をいかに効率的に導入するかという点は、本プロジェクトにおける研究的要素として重要である。最先端の技術ではないから論文にならないという先入観を専門家ももっているかもしれないが、統計的処理には向かない実験計画であっても少なくとも事例紹介として重要なものとする。1つの要素を変えることによって大きな効果が得られるといった一点突破型の研究ではなく、多目的樹種（*Gliricidia* 属植物）の導入、播種時の根粒菌の塗布、小型のため池、小規模灌漑といった多くは既存の技術の組み合わせなど等によるいわゆる総合農業研究的アプローチは、より多くの農家で採用可能な方法を開発、提供し、今後、農家レベルでの自発的な取捨選択や改善にもつながると期待される。

C/P のなかには、時間をかけながらデータを出し、エビデンスに基づいて農業技術を改良しようという意欲も少しずつ出ているようだし、いままでに得られた成果の公表も検討されている。このような公表は個人の意欲の上昇ばかりでなく本プロジェクトの広報につながる。また、灌漑の有無や方法による種子生産の差異等は専門家の指導を受けながら研究課題として計画され始めており、計画の立案、実施、解析、公表といった研究のサイクルを理解し実践する場となることが期待される。

最後に、プロジェクトにて雇用している U Sein Win についてだが、彼をもっと活用すべきと感じた。彼は CARI 時代から DAR のジョッゴン事務所に勤務していた。ジョッゴンはヤンゴン北部に位置し、イエジンに移転する前の CARI が置かれていた場所にある。今の DAR・DOA 局長クラスもヤンゴンに出張した際には彼の世話になっている。また、海外からの来訪者の対応も長く彼が担当しており、ぼそぼそとしゃべる彼の英語は日本人には少々聞き取り難いかもしれないが、実は英語の理解力も高い。DAR はもちろん DOA においても過去に彼に世話になった者は非常に多い。今回の調査中も、問題になったところや問題になりそうな部分を現地の C/P より早くに察知して、その回答になりそうな情報を用意し教えてくれた。よく気がつくし回転も早い。

彼はヤンゴン時代からずっと縁の下力持ちな業務を担当してきたが、正当に評価すべきだし、自分から前が出るタイプではないが本人も評価されることを望んでいる。幅広い人脈に加え、事務部門に長くいたがゆえに農業の実相や研究面にも知識をもっている。専門家チーム、とくにリーダーの相談役としてうってつけであり、活用するとプロジェクトの効率が倍増するだろう。主流からちょっと離れた位置で DAR や DOA の人間模様を見てきただけに、ちょっとシニカルなところもあるが、その人間観察眼たるやなかなかのものだ。

U Sein Win から得られる知識、例えば DOA、DAR の幹部の考え方、過去から現在に至る行動・嗜好、家族・知人等の情報は彼らとのコミュニケーションに非常に重要なマテリアルを与えるものだ。本プロジェクトで今まで以上の彼の活用を行わない場合は、他の JICA 事業（特に農業関係）においても幅広く活躍できる価値ある人材であることを付け加えておきたい。

8-3 圃場管理団員所感

今回の中間レビューにおいて、現地スタッフ、DOA 職員、DAR 職員、CF、NF との意見交換、並びにニャンウー、ミンジャン、及びマグウェイの圃場視察を実施した。これらの結果は PDM Ver.2 や合同中間レビュー報告書にまとめられているが、私が担当した圃場管理と普及活動のレポートで記述できなかった意見や事項、個人的感想を所感として補足する。

(1) 圃場管理

土壌成分分析は詳細に実施されており、かつ各選抜植物に対して支障がないことが示されており、十分な結果が得られていた。しかし、雨期は乾燥地で懸念される土壌中の塩類集積濃度（EC）が変動するため、視察とともにEC調査を実施した。その結果、各拠点圃場のEC値は0.1～0.8であり許容範囲内であった。ただし、DAR職員によるとミンジャンの地下水は塩を含んでいるため、今後も注意が必要である。

(2) 土壌改良、栽培方法改良、及びその技術指導

根粒菌、及び*Gliricidia*の現地に適した利用方法がとられており、容易に利用できるよう工夫されていた。コスト面でも十分に考慮されており、根粒菌は安価で利用でき増資増益が見込めることが期待できる。これを利用したラッカセイ普及説明会（FFS）では教材に従った講習と実習が実施されており、参加農家は今年度より根粒菌を利用すると高い関心を示していた。*Gliricidia*は既に農家に配付されており、教材により適切に利用方法が説明され各農家で簡単に増殖もできるよう指導されていた。これらの農家普及は始まったばかりであり、後期のデータに反映されることが期待される。

(3) 普及活動

普及活動視察では、土曜日早朝にもかかわらずDOA普及員らが熱心に農業指導を行っており農家とも高い信頼関係が築けているように見受けられた。また、現地スタッフによると、これまで農家が一堂に会する機会がなかったことから、この集会は農業に対する情報交換の場としても機能しているらしい。今後はタウンシップ・マネジャーの指導の下、普及員と農家とのコミュニケーションで得られるフィードバックコメントに従い教材を発展・改訂していくことで、さらなる普及活動を望む。

実際に現地を視察することで本プロジェクトの乾燥地農業支援が非常に困難で重要であることが理解できた。本プロジェクトにより大きな成果が得られつつあるが、その一方、この国は開発途上国が歩む過渡期でもあり、それに由来する農業問題の複雑さも感じた。また、今回の視察を終えて印象に残ったのは、乾燥したイラワジ川周辺に植林されたユーカリである。本格的に植林されたものではないが、商業樹種のグランディスであることから持続可能な森林づくりをめざしていると考えられる。目先の発展を追うばかりでなく、環境への配慮・改善をめざそうというこの国の意思が感じられた。

8-4 節水灌漑技術団員所感

(1) ガイドライン、マニュアルについて

節水灌漑施設（小規模ため池、スプリンクラー、ドリップ灌漑）について、3タウンシップ（ニャンウー、ミンジャン、マグウェイ）の試験場において施工方法、注意点等がポスターにより展示されていた。CF等への聞き取りでは、冊子等のマニュアルよりも、ポスターの方がわかりやすくよいとの回答が多くあった。

今後、各農家によっては、圃場の規模も違い、拡大していく場合も想定される。ため池の場合、その規模を決めるには、用水の必要量を算定（用水計算等）が必要である。冊子でのマニュアルについて、専門家との調整を踏まえて作成がなされていくことを期待する。

(2) 施設の施工について（主に小規模ため池）

試験圃場や地元農家が施工、あるいは施工中の現場を視察した。そのなかで、ため池内に上降用の階段や、ため池周辺を囲む安全策が設置されていない箇所がいくつか確認された（早急に建設が行われることを専門家等の聞き取りから確認している）。

ポスターには、設置について掲載されていることを確認したが、このような安全対策施設が建設されなければ、転落等の事故の発生が高くなってしまう。このような危険性を認識することは重要であり、マニュアル類の充実も含めた取り組みが図られていくことを期待する。

また、ため池の施工後、数カ月を経過した後のひび割れ（幅 3～4mm、長さ 4cm 程度）発生が確認された（乾燥収縮ひび割れと想定される）。専門家からの聞き取り等から、施工時の気象条件を踏まえたコンクリートの配合計算が適切でないことや、材料の練り混ぜ不十分等の施工不良の可能性があることが確認された（早急にひび割れ発生箇所の補修が行われることを専門家等の聞き取りから確認済み）。

(3) 最後に

ミャンマー側の C/P、CF 等をはじめ、聞き取りにおいて、灌漑施設については前向きな意見が多うかがえた（例：施設をさらに導入したい等）。そのためにも、マニュアルの充実や説明会の開催等によって、適切な技術の移転、及び普及が行われていくことを期待する。

付 属 資 料

1. 協議議事録 (M/M)
2. 合同評価レポート
3. 合同評価結果プレゼンテーション内容
4. 評価グリッド (和文)

MINUTES OF MEETING
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
MINISTRY OF AGRICULTURE, LIVESTOCK AND IRRIGATION
OF THE REPUBLIC OF THE UNION OF MYANMAR
ON
THE FOURTH JOINT COORDINATING COMMITTEE MEETING
FOR
THE PROJECT FOR DEVELOPMENT OF WATER SAVING AGRICULTURE
TECHNOLOGY IN THE CENTRAL DRY ZONE

The fourth Joint Coordinating Committee (JCC) meeting for the Project for Development of Water Saving Agriculture Technology in the Central Dry Zone (hereinafter referred to as “Project”) was held June 24, 2014. As a result of the discussion, the Japan International Cooperation Agency (hereinafter referred to as “JICA”) and Ministry of Agriculture, Livestock and Irrigation (hereinafter referred to as “MoALI”) recorded the points stipulated in the attached document.

Yezin, June 24, 2016



Mr. Keiichiro NAKAZAWA
Chief Representative
JICA Myanmar Office



U Kyaw Min Oo
Director General
Department of Planning
Ministry of Agriculture, Livestock and
Irrigation
The Republic of the Union of Myanmar

The Attached Document

1. Joint Mid-term Review

JICA dispatched the Japanese Mid-term Review Team (hereinafter referred to as “the Japanese Team”), headed by Mr. Kazuya Suzuki, to Myanmar from 6 to 24 June 2016, for the purpose of conducting the Mid-term Review for the Project in accordance with the Record of Discussions on the Project.

The Joint Mid-term Review Team, which consists of members from the Japanese Team and the Myanmar Mid-term Review Team, headed by Dr. Nyi Nyi, was jointly organized for the purpose of conducting the Joint Mid-term Review.

After review and analysis of the activities and achievements of the Project, the Joint Mid-term Review Team prepared the Joint Mid-term Review Report attached as ANNEX 1, which was presented to the fourth JCC meeting.

The JCC accepted the Report and agreed to recommend to the respective governments the matters referred to in the Report as below.

1.1 The List of Project Personnel

JCC approved the update of the personnel shown in the ANNEX 2 and assignment of the two (2) township managers of Nyaung Oo and Myingyan to as C/Ps.

1.2 Revision of Project Design Matrix

JCC approved the revised PDM with the amended points shown in the ANNEX 3.

2. Summary of the Project activities in 2015

The summary of the Project activities in 2015 attached as ANNEX 4 was presented to JCC meeting.

3. Monthly Work Plan in 2016

The JCC approved the monthly work plan in 2016 attached as ANNEX 5

ANNEX 1: Joint Mid-term Review Report

ANNEX 2: List of Project Personnel

ANNEX 3: PDM version 2 and Record of Amendment on PDM

ANNEX 4: Summary of 2015

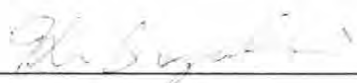
ANNEX 5: Monthly Work plan 2016

The End of the Document

Joint Mid-term Review Report
on
Technical Cooperation for Development of
Water Saving Agriculture Technology
in the Central Dry Zone

Note: The cover of the report is attached hereto only. Please refer the separate document for the contents of the report.

Nay Pyi Taw, June 22, 2016



Mr. Kazuya SUZUKI
Team Leader of Japanese Side
Japan-Myanmar Joint Mid-term Review Team
Deputy Director General
Rural Development Department
Japan International Cooperation Agency



Dr. Nyi Nyi
Team Leader of Myanmar Side
Myanmar-Japan Joint Mid-term Review Team
Assistant Director, Extension Division
Department of Agriculture
Ministry of Agriculture, Livestock and Irrigation
The Republic of the Union of Myanmar

Project Design Matrix (PDM)

Project Title: Project for Development of Water Saving Agriculture Technology in the Central Dry Zone
 Target Group: Dryland Crop Research Centre in Nyaung Oo, other DAR Experiment Farms and DOA Township Offices in the three townships

Duration: Five (5) years from November 2013
 Project Sites: DAR Experiment Farms and contact farmers' field selected from the three townships (Nyaung Oo, Magway, Myingyan) in the Central Dry Zone

Version 2, Date: 24 June 2016

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal In CDZ (especially the non-irrigated areas where upland farming is a main form of agriculture), an agricultural income is stabilized as a result of the spread of water-saving agricultural technologies which are suitable to CDZ.</p>	<p>1. After <u>5</u> years from the end of this project, the number of farmers who introduced and continued to use water-saving agricultural technologies developed in this project more than <u>1</u> cropping seasons, increased 5%. 2. For <u>5</u> years after the end of this project, the average agricultural income of the farmers who introduced the water-saving agricultural technology developed in this project continuously exceeds.</p>	<p>- Annual reports by DOA Township Offices - Upland crop production data classified by TS - Weather statistics - Related study reports</p>	<p>1. Effective implementation of the extension services by DOA 2. Cultivation technologies developed in the Project are accepted by farmers including other than the target area. 3. No extreme fall of market price of the main crops in CDZ 4. No drastic change on the policy related to rural development and poverty alleviation in Myanmar</p>
<p>Project Purpose Water-saving agriculture technologies that are adapted to CDZ are established.</p>	<p>1. The water-saving agricultural technology developed in this project are introduced by the <u>15%</u> farmer in Project Site and carried out more than <u>1</u> cropping seasons. 2. In Project Site, crop yields increased <u>10%*1</u> at the farmers who used the water-saving agricultural technology developed in this project. 3. In Project Site, <u>60%</u> of Farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.</p>	<p>- Annual reports by DOA Township Offices - Annual reports by DAR Experiment Farms - Monitoring reports and others prepared by the project - Sample survey (end line survey)</p>	<p>1. Continued support extended by the government organizations including ID 2. Cooperation of DAR and DOA is carried out smoothly</p>
<p>Outputs 1. New and/or conventional crops and promising varieties that are adaptable to CDZ are identified and prepared.</p>	<p>1-1. Within a half year from beginning of the project, the baseline study is conducted and consumer needs for the local agriculture products are identified. 1-2. <u>10%</u> or more of the farmers in the target area adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs. 1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the contact farmers for such crops/varieties increases by <u>10%</u> or more.</p>	<p>- Study reports of Dryland Crop Research Centre - Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts - Sample survey (end line survey)</p>	<p>1. No severe outbreak of diseases and pest 2. No extreme weather anomalies that obstruct farming and irrigation 3. No surge of costs for seeds, production materials, and small-scale irrigation 4. No reduction in the development budgets of DAR and DOA</p>
<p>2. Cultivation technologies are improved so that these can match the environments of CDZ.</p>	<p>2-1. Cultivation technologies adapted to local conditions are established for the selected new and/or existing crops and their superior varieties, and these technologies are implemented 2 times in total (2 times per year) at DAR Experiment Farm. 2-2. Appropriate technical manual for cultivation technologies are prepared. 2-3. <u>30</u> or more persons of the extension agents who can apply the above manual and implement cultivation technologies are built up. 2-4. Verification test by applying the above manual is conducted <u>100</u> times or more (1 time or more per year) by the project at the contact farmer's field. 2-5. The cultivation that is applied with the above manual is implemented by <u>10%</u> or more of the farmers in the target area.</p>	<p>- Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts - Sample survey (end line survey)</p>	
<p>3. Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.</p>	<p>3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions in the target area are identified. 3-2. The soil improvement technologies that are adapted to the local conditions are established. 3-3. Technical manual for the soil improvement technologies is prepared. 3-4. <u>30</u> or more persons of the extension agents who can apply the above manual and implement the soil improvement technologies are built up.</p>	<p>- Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts - Sample survey (end line survey)</p>	

	<p>3-5. Verification test by applying the above manual is conducted <u>100</u> times or more (1 time or more per year) by the project at the contact farmers' field.</p> <p>3-6. The soil improvement that is applied with the above manual is implemented by <u>2%</u> or more of the farmers in the target area.</p>		
<p>4. Water-saving irrigation technologies that are adaptable to project sites in CDZ are developed.</p>	<p>4-1. The study report on water resources and water use by farmers at project sites is drafted.</p> <p>4-2. Technical guideline and/or manual for the water-harvesting and water-saving irrigation technologies are prepared.</p> <p>4-3. The recommendation for combined methods for water-saving cultivation and water-saving irrigation technologies is prepared.</p>	<p>- Progress reports of the project</p> <p>- Records on workshops and training prepared by the project</p> <p>- Progress reports of the individual experts</p>	
Activities		Inputs	Pre-conditions
<p>0. The baseline study is conducted.</p> <p>1-1 As part of the baseline study, a study on the needs of farmers for and local markets for crops and varieties of CDZ is conducted.</p> <p>1-2 Contact farmers (CF) are selected in CDZ.</p> <p>1-3 Based on results of the baseline study, potential crops and varieties are selected from those collected at international and domestic agriculture research institutes.</p> <p>1-4 Varietal trials are conducted at Dryland Crop Research Centre in Nyaung Oo.</p> <p>1-5 Adaptability tests are conducted at DAR Experiment Farms.</p> <p>1-6 Seed production is conducted.</p> <p>2-1 Based on the regional adaptability tests, cultivation technologies are tested and studied for localizing cultivation technologies.</p> <p>2-2 Through trials at the CF's field, cultivation technologies adapted to local conditions are proved, and the cultivation manual is drafted.</p> <p>2-3 Extension agents and CF are trained for cultivation technologies adapted to local conditions.</p> <p>3-1 As part of the baseline study, the soil study is conducted in the project sites from aspects of fertility and physical properties.</p> <p>3-2 Testing for improving soil fertility and physical properties is conducted, and methods for the improvement are studied.</p> <p>3-3 The methods for improving soil fertility and physical properties that are affordable to farmers (soil improvement technologies) are examined.</p> <p>3-4 Through trials at the CF's fields, the methods for the soil improvement technologies that are adapted to the soil conditions are proved, and the soil improvement manual is drafted.</p> <p>3-5 Extension agents and CF are trained for the soil improvement technologies that are adapted to local conditions.</p> <p>4-1 As part of the baseline study, water resources and water use by farmers are studied at project sites, and challenges are identified.</p> <p>4-2 Water-harvesting technologies applicable to CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field.</p> <p>4-3 Water-saving irrigation technologies applicable to farmer field in CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field.</p> <p>4-4 Through the above verification tests, guideline and/or manual for water-harvesting technologies and water-saving irrigation technologies applicable to CDZ are drafted.</p> <p>4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the project sites are recommended.</p>		<p>Inputs from Myanmar</p> <p>a. Human Resources</p> <ul style="list-style-type: none"> - Project Director, Project Managers - Counterpart Personnel - Members of JCC <p>b. Facilities</p> <ul style="list-style-type: none"> - Conference rooms for workshops and seminars - Office space for experts and support staff <p>c. Equipment</p> <ul style="list-style-type: none"> - Materials necessary for administrative work for the Project <p>d. Project counterpart budget</p> <ul style="list-style-type: none"> - Costs for communication and coordination, and administrative tasks related to the Project. - Daily allowances, accommodation and transportation costs of the project counterpart personnel during project implementation. <p>Inputs from Japan</p> <p>a. Human Resources</p> <ul style="list-style-type: none"> - Long-term Experts as the Project Chief Advisor (Dry land Crop Cultivation), Water-Saving Irrigation, Integrated Pest Management and Project Coordinator - Short-term Experts (Socio-economic Survey, Agro-environmental Survey, Horticulture, Seed valuation, Pest and Disease Control, Farmland conservation, Soil Analysis, Post-harvest Technology, etc..) - Project office staff personnel <p>b. Short-term training opportunities for the project counterpart personnel in Japan and/or third countries</p> <p>c. Equipment</p> <ul style="list-style-type: none"> - Vehicles - Equipment for laboratory and experimental fields - Machineries and equipment for pre-harvest to post-harvest - Computers, office equipment etc. <p>d. Project operation costs</p> <p>Expenses for local activities.</p>	<p>- Counterparts are arranged to implement this Project.</p>

Foot Note

Table 1. Table 1. Yield for each target crop (kg/ acre)

Township	Crop	Before Project*1	After Project*2
Nyaung-U	Groundnut	292	321
	Pigeon pea	447	492
	Green gram	459	505
Myingyan	Groundnut	357	393
	Sesame	136	150
Magway	Groundnut	506	557
	Sesame	235	259

Table 2. Gross agricultural income from target variety per acre (Kyat/ care)

Township	Crop	Before Project*3	After Project*4
Nyaung-U	Groundnut	180,528	198,580
	Pigeon pea	241,120	265,232
	Green gram	341,541	375,695
Myingyan	Groundnut	220,687	242,755
	Sesame	208,613	229,474
Magway	Groundnut	312,794	344,074
	Sesame	360,471	396,518

Note: Note: *1 The township six-year average from 2007/8 to 2012/13. *2 10% increase from the before project. Otherwise the baseline survey data 2013/4. *3 the average yield on Table 1 multiplied by an average selling price obtained from the baseline survey and market price survey by the project. *4 10% increase from the before project.

Table.3 Target Area and Beneficiaries

Duration:	Five (5) years from November 2013 to November 2018
Target Area:	Nyaung-U, Myingyan and Magway townships
Beneficiaries:	78,492 farming households; Nyaung-U (25,713), Myingyan (32,607), Magway (20,172) as of 2005

The Project for Development of Water Saving Agriculture Technology in the Central Dry Zone (WSAT)
Record of Amendment on PDM (PDM改訂記録)

Prepared by the project implementing office, 24 June 2016

Background history

Version 1	The Project Design Matrix (PDM), as a project frame work, was attached to the Record of Discussion (R/D) signed 20 December 2012, but those indicators on the PDM, however, remained blank. Thus, upon the completion of first year at the occasion of the third JCC meeting, the indicators were decided as appears on the PDM version 1 and hereunder.
Version 2	Some words and phrases were amended as per attached hereunder at the occasion of the fourth JCC meeting 24 June 2016.

No.	Item	Original as per attached to R/D	Update/amendment	Note
		R/D添付版	更新・変更点	変更理由等
1	Notes on the margin Duration	Five (5) years from xx 2013	Five (5) years from <u>November 2013 to November 2018</u>	Version 1 The Japanese experts arrived in the country 4 November 2013, and the kick-off meeting was held at DAR headquarters, Yezin 8 November 2013.
2	Ditto Version	Version 0.2 Dates: 20 December 2012	Version <u>1</u> , Dates: 21 February 2015	Version 1 The third JCC meeting 21 February 2015 is to be recorded.
3	Ditto Target Area	Not mentioned	Nyaung-U, Myingyan and Magway townships	Version 1 The target area is clarified in accordance with R/D (page5) and M/M signed 24 January 2014.
4	Ditto Beneficiaries	Not mentioned	78,492 farming households; Nyaung-U (25,713), Myingyan (32,607), Magway (20,172) as of 2005	Version 1 The beneficiaries are clarified according to available statistics and baseline survey.
5	Objectively Verifiable Indicators Overall Goal	1. After <u>X</u> years from the end of this project, the number of farmers who introduced and continued to use water-saving agricultural technologies developed in this project more than	1. After <u>5</u> years from the end of this project, the number of farmers who introduced and continued to use water-saving agricultural technologies developed in this project	Version 1 <u>The blank(s) is/are filled up.</u> The post project evaluation usually takes place 5 years after the project completion. This (1) is necessary to include those farmers enrolled (received
6	Ditto Overall Goal	2. For <u>X</u> years after the end of this project, the average agricultural income of the farmers who introduced the water-saving agricultural technology developed in this project	2. For <u>5</u> years after the end of this project, the average agricultural income of the farmers who introduced the water-saving agricultural technology developed in this	Version 1 <u>The blank(s) is/are filled up.</u> Expected effects of distributed seeds may last for 5 years.
7	Ditto Project Purpose	1. The water-saving agricultural technology developed in this project are introduced by the <u>X</u> % farmer in Project Site and carried out more than <u>X</u> cropping seasons.	1. The water-saving agricultural technology developed in this project are introduced by the <u>15</u> % farmer in Project Site and carried out more than <u>1</u> cropping seasons.	Version 1 <u>The blank(s) is/are filled up.</u> Enrolled farmers/ year: 31 CFs+2,480 NFs+1,302 Ordinal Farmer (OFs)=3,813. 80% of this =3,050. 3,050 x 4 years = 12,200. 12,200/ 78,492 farmers = 15.5%.
8	Ditto Project Purpose	2. In Project Site, crop yields increased <u>X</u> % at the farmers who used the water-saving agricultural technology developed in this project.	2. In Project Site, crop yields increased <u>10%*1</u> at the farmers who used the water-saving agricultural technology developed in this project.	Version 1 <u>The blank(s) is/are filled up.</u> 10% increase is decent for the drought prone target area. Please see Table 1 attached to the PDM.
9	Ditto Project Purpose	3. In Project Site, <u>X</u> % of Farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.	3. In Project Site, <u>60</u> % of Farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.	Version 1 <u>The blank(s) is/are filled up.</u> 60% is necessary and sufficient to confirm a positive response from the majority.
10	Ditto Output 1	1-2. <u>X</u> % or more of the sampled farmers adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs.	1-2. <u>10</u> % or more of the sampled farmers adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer	Version 1 <u>The blank(s) is/are filled up.</u> This is necessary and sufficient to observe significance of the project. The recipient of the certified seeds / year: 31CFs+620NFs+ 1,302OFs =1,953. 1,953 x 4 years= 7,812.
11	Ditto Output 1	1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of	1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount	Version 1 <u>The blank(s) is/are filled up.</u> This is necessary and sufficient to observe significance of the project. Please see Table 2 attached to the PDM.
12	Ditto Output 2	2-1. Cultivation technologies adapted to local conditions are established for the selected new and/or existing crops and their superior varieties, and these technologies are	2-1. Cultivation technologies adapted to local conditions are established for the selected new and/or existing crops and their superior varieties, and these	Version 1 <u>The blank(s) is/are filled up.</u> This is the minimum number and request raised during the meeting with the Project Consultative Mission in July 2014.
13	Ditto Output 2	2-3. <u>X</u> or more persons of the extension agents who can apply the above manual and implement cultivation technologies are built up.	2-3. <u>30</u> or more persons of the extension agents who can apply the above manual and implement cultivation technologies are built up.	Version 1 <u>The blank(s) is/are filled up.</u> This is a reasonable figure since each DOA township office has 10 to 15 extension staff for upland crops. 10 extension staff x 3 townships =30 staff.
14	Ditto Output 2	2-4. Verification test by applying the above manual is conducted <u>X</u> times or more (1 time or more per year) by the project at the contact farmer's field.	2-4. Verification test by applying the above manual is conducted <u>100</u> times or more (1 time or more per year) by the project at the contact farmer's field.	Version 1 <u>The blank(s) is/are filled up.</u> This is decent and manageable figure to verify. 31 CFs x 4 years =124 times

No.	Item	Original as per attached to R/D	Update/amendment	Note
		R/D添付版	更新・変更点	変更理由等
15	Ditto Output 2	2-5. The cultivation that is applied with the above manual is implemented by <u>X</u> % or more of the sampled farmers.	2-5. The cultivation that is applied with the above manual is implemented by <u>10</u> % or more of the sampled farmers.	Version 1 The blank(s) is/are filled up. This is necessary and sufficient to observe significance of the project. Enrolled farmers (those applied technologies)/ year: 31 CFs+2,480 NFs=2,511. 80% is 2,008. 2,008 x
16	Ditto Output 3	3-4. <u>X</u> or more persons of the extension agents who can apply the above manual and implement the soil improvement technologies are built up.	3-4. <u>30</u> or more persons of the extension agents who can apply the above manual and implement the soil improvement technologies are built up.	Version 1 The blank(s) is/are filled up. This is a reasonable figure since each DOA township office has 10 to 15 extension staff for upland crops. 10 extension staff x 3 townships =30 staff.
17	Ditto Output 3	3-5. Verification test by applying the above manual is conducted <u>X</u> times or more (1 time or more per year) by the project at the contact farmers' field.	3-5. Verification test by applying the above manual is conducted <u>100</u> times or more (1 time or more per year) by the project at the contact farmers' field.	Version 1 The blank(s) is/are filled up. This is decent and manageable figure to verify. 28CFs x 4 years=112.
18	Ditto Output 3	3-6. The soil improvement that is applied with the above manual is implemented by <u>X</u> % or more of the sampled farmers.	3-6. The soil improvement that is applied with the above manual is implemented by <u>2</u> % or more of the sampled farmers.	Version 1 The blank(s) is/are filled up. This is necessary and sufficient to observe significance of the project considering necessary inputs and extension work load. Enrolment/ year: 28 CFs+560 NFs=588 farmers.
19	Margin Version	Version <u>1</u> , Dates: 21 February 2015	Version <u>2</u> , Dates: 24 June 2016	Version 2 The date of the fourth JCC meeting 24 June 2016
20	Important Assumptions Overall Goal	2. Cultivation technologies developed in the Project are accepted by farmers including other than Pilot Site.	2. Cultivation technologies developed in the Project are accepted by farmers including other than the target area.	Version 2 Correct wording.
21	Outputs Output 1	1. New and/or conventional crops and promising varieties that are adaptable to CDZ are identified.	1. New and/or conventional crops and promising varieties that are adaptable to CDZ are identified and prepared.	Version 2 Correct wording.
22	Objectively Verifiable Indicators Output 1	1-2. 10% or more of the sampled farmers adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs.	1-2. 10% or more of the farmers in the target area adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the	Version 2 Correct wording.
23	Objectively Verifiable Indicators Output 1	1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the sampled farmers for such crops/varieties increases by 10% or more.	1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the contact farmers for such crops/varieties increases by 10% or more.	Version 2 Correct wording.
24	Objectively Verifiable Indicators Output 2	2-5. The cultivation that is applied with the above manual is implemented by 10% or more of the sampled farmers.	2-5. The cultivation that is applied with the above manual is implemented by 10% or more of the farmers in the target area.	Version 2 Correct wording.
25	Objectively Verifiable Indicators Output 3	3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions of the project target area are identified.	3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions in the target area are identified.	Version 2 Correct wording.
26	Objectively Verifiable Indicators Output 3	3-6. The soil improvement that is applied with the above manual is implemented by 2% or more of the sampled farmers.	3-6. The soil improvement that is applied with the above manual is implemented by 2% or more of the farmers in the target area.	Version 2 Correct wording.
27	Outputs Output 4	4. Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.	4. Water-saving irrigation technologies that are adaptable to project sites in CDZ are developed.	Version 2 Correct wording.
28	Objectively Verifiable Indicators Output 4	4-1. The study report on water resources and water use by farmers at pilot sites is drafted.	4-1. The study report on water resources and water use by farmers at project sites is drafted.	Version 2 Correct wording.
29	Activities Output 1	1-2 Pilot sites and contact farmers (CF) are selected in CDZ.	1-2 Contact farmers (CF) are selected in CDZ.	Version 2 Correct wording.
30	Activities Output 1	1-5 Adaptability tests are conducted both at DAR Experiment Farms and CF's fields.	1-5 Adaptability tests are conducted at DAR Experiment Farms.	Version 2 Delete the words (redundant). At the CF's field, activity 2-2 (trials) is to be conducted instead.
31	Activities Output 1	n.a.	1-6 Seed production is conducted.	Version 2 Newly added.

No.	Item	Original as per attached to R/D	Update/amendment		Note
		R/D添付版	更新・変更点		変更理由等
32	Activities Output 4	4-1 As part of the baseline study, water resources and water use by farmers are studied at pilot sites, and challenges are identified.	4-1 As part of the baseline study, water resources and water use by farmers are studied at project sites, and challenges are identified.	Version 2	Correct wording.
33	Activities Output 4	4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the pilot sites are recommended.	4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the project sites are recommended.	Version 2	Correct wording.

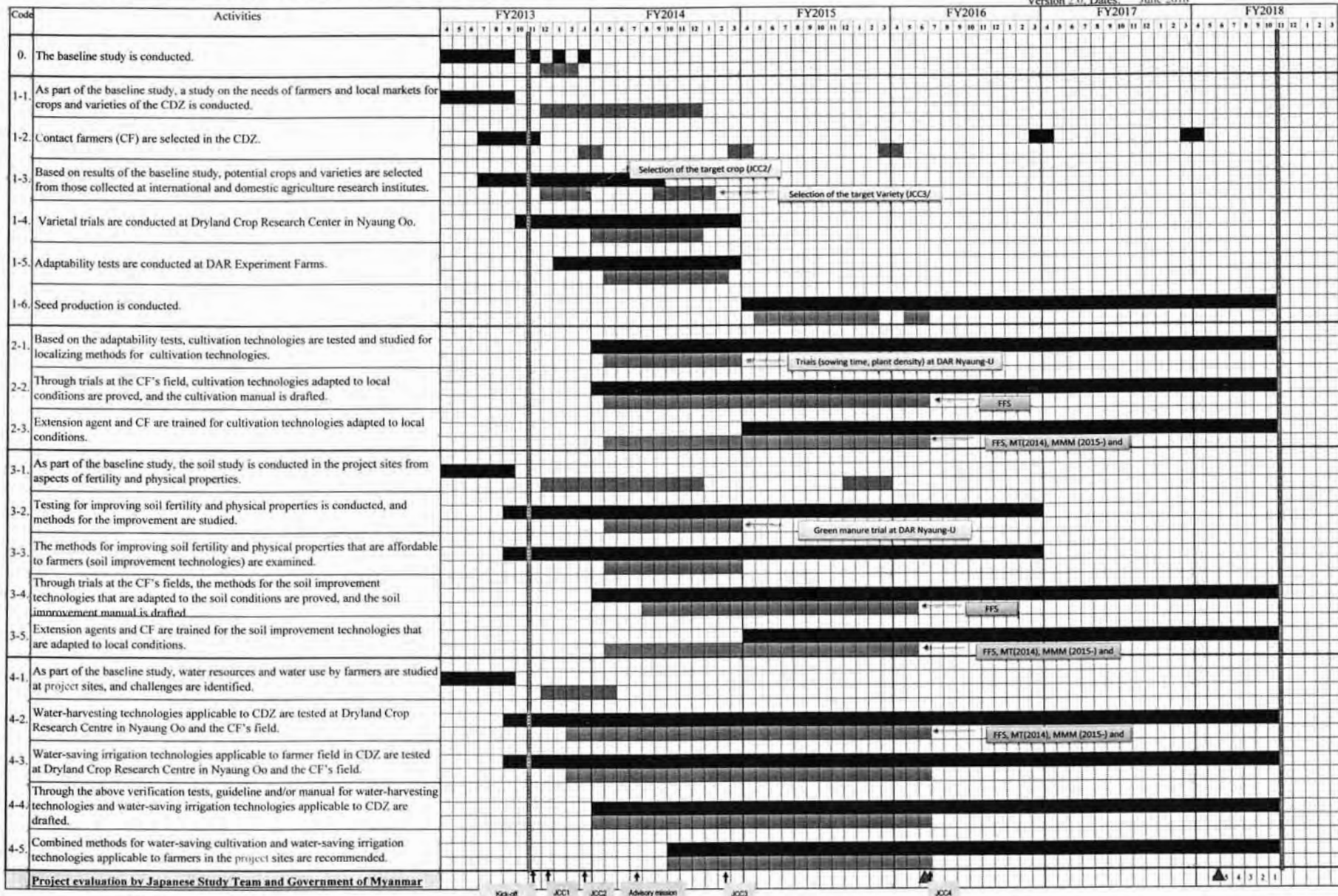
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Appendix 9 Revised Plan of Operation (PO)


Project Name: The Project for Development of Water Saving Agriculture Technology in the Central Dry Zone

Legend ■ Planned ■ Actual

Version 2.0, Dates: June 2016





The Project for Development of Water Saving Agriculture Technology in the Central Dry Zone (WSAT) 

Summary of activities in FY2015

4th JCC Meeting
June 2016
DAR-HQ, Yezin

1

Summary of Output 1

Foundation seed and certified seed production were continuously implemented.



Foundation seed plot at DAR Nyaung-U

2

Foundation Seed Production

Unit: Basket

Crop	Variety	Production	Project Requirement/Year	Selection for Elite Line
Groundnut	Sinpadaethar11	447	414 (4,720kg)	77
Pigeon pea	Shwe dinga	4.0	0.056 (2kg)	100 plants
Sesame	Sinyadanar 3	3.5	0.375 (9kg)	-



Pigeon pea FS, Field Day



Groundnut FS, Field Day

3

Certified Seed Production

Unit: Basket

Crop	2015	Requirement for FFS	Note
Groundnut	1,830	1,764 (20,110kg)	Multiplied at SG's site in LawKaNanda
Pigeon pea	32	32 (1,046kg)	Multiplied in DAR Nyaung-U, Myingyan
Sesame	27	27 (662kg)	Multiplied in DAR Magway

4

Summary of Output 2

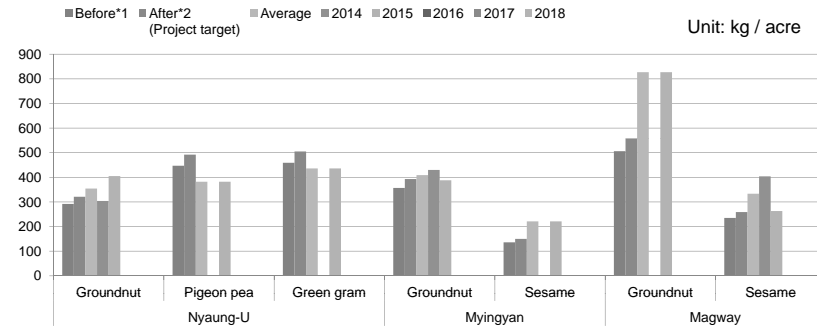
Improved cultivation technology is promoted.



Contact Farmer in Nyaung-U

5

Result of FFS 2015 CF's Yield



Source: DOA township office.

6

Result of FFS 2015 Participation

Township	Crop	No. Participants (CF + NF)
Nyaung-U	Groundnut (6*)	304
	Pigeon pea (6)	278
	Green gram (3)	156
Myingyan	Groundnut (4)	268
	Sesame (4)	174
Magway	Groundnut (4)	189
	Sesame (4)	203
Total		1,572

* The number of the CFs



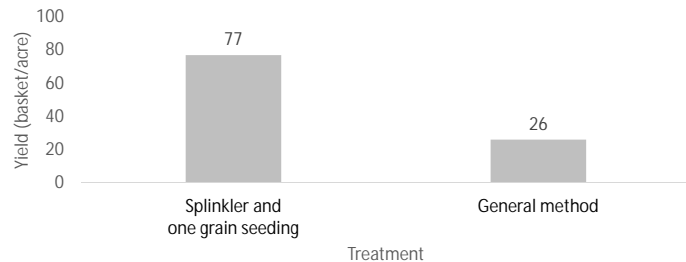
Result of FFS 2015 Seed Distribution



Township	Crop	No. Recipient Quality seed CF	No. Recipient NF	No. Recipient OF (Seed Exchange)	Total No. Recipient	Distributed amount (Basket)
Nyaung-U	Groundnut	6	121	52	179	573
	Pigeon pea	6	120	126	252	47
	Green gram	3	60	-	63	12
Myingyan	Groundnut	4	-	4	8	48
	Sesame	4	80	42	126	9
Magway	Groundnut	4	-	4	8	48
	Sesame	4	87	91	182	12
Total		31	468	319	818	749

Result of 2015 Cultivation Technologies

Average Yield of Groundnut Seed Production in DAR Nyaung-U



Observation:

1. In groundnut seed production, sprinkler and one grain seeding (reducing seed rate) are confirmed as effective cultivation technologies.
2. Completed Indicator 2-1 (the technology was implemented for two years).



Summary of Output 3

Soil management technology is promoted.



Gliricidia (Myae Pyant Cherry) seedling distribution in Nyaung-U

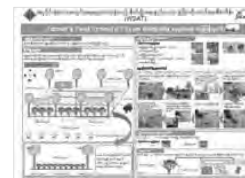
10

Result of Gliricidia Seedling Distribution

Township	CF			NF			Total No. of Distributed Seedlings
	No. Farmer	No. Seedlings/ Farmer	Sub-Total	No. Farmer	No. Seedlings/ Farmer	Sub-Total	
Nyaung-U	12	90	1,080	240	32	7,680	8,760
Myingyan	8	90	720	160	27	4,320	5,040
Magway	8	90	720	160	45	7,200	7,920
Total	28		2,520	560		19,200	21,720



Manual and Field Monitoring



Manual and Seedlings are prepared and distributed to CF and NF thorough FFS



One year old, CF01



Two year old, CF09

Field Monitoring: Myae Pyant Cherry takes one and half years to grow enough for effective.

Summary of Output 4

Water -harvesting and water-saving irrigation technologies



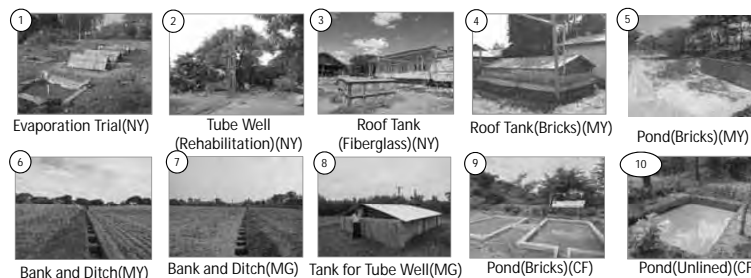
Small pond at Contact farmer's field

Tomato cultivation with drip irrigation at Contact farmer's field

13

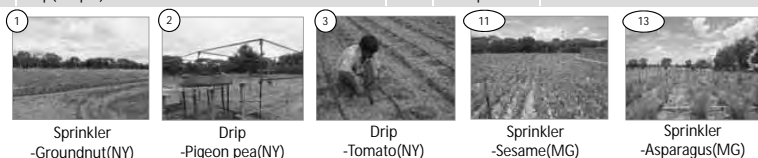
Water Harvesting Technology – Total 10 Activities

	Activities	Site	Schedule	Status
1	Evaporation Trial(for roof)	DAR NY	Mar-Jun	Completed
2	Tube Well(Rehabilitation)		May-Jul	Established and being studied
3	Roof Tank(Fiberglass)		Apr-Jun	Established and being studied
4	Roof Tank(Bricks)	DAR MY	Apr-Jul	Established and being studied
5	Pond(Bricks)		Nov-Feb	Established and being studied
6	Bank and Ditch		Jun-Aug	Established and being studied
7	Bank and Ditch	DAR MG	Dec-Jan	Established and being studied
8	Tank(Bricks) for Tube Well		Sep-Oct	Established and being studied
9-10	Pond(Bricks, Unlined)	CF	Apr-Jul	Established and being studied



Water-saving Irrigation Technology – Total 15 Activities

	Activities	Site	Schedule	Status
1	Sprinkler-Groundnut(Seed Production) :with OP1	DAR NY	Jul-Nov	Installed and being studied
2	Drip-Pigeon pea(Seed Production) :with OP1		May-Dec	ditto
3	Drip(simple)-Tomato(year-round culture) : with OP3 (green mulch and manure)		Dec-Apr	ditto
5			Apr-Aug Aug-Dec	
6	Drip(simple)-Tomato (roof tank): with OP3		Aug-Dec	ditto
7	Drip(simple)-Cowpea: with OP3	Jan-Mar	ditto	
8	Sprinkler-Sesame(Seed) Production :with OP1	Oct-Jan	ditto	
9	Drip(simple)-Tomato	DAR MY	Apr-Aug	ditto
10	Drip(simple)-Tomato: with OP3		Aug-Dec	ditto
11	Sprinkler-Sesame(Seed Production) : with OP1	May-Sep	ditto	
12	Drip(simple)-Tomato: with OP3	DAR MG	Sept-Feb	ditto
13	Sprinkler-Asparagus		Apr-Mar	ditto
14	Sprinkler- Sesame		Feb-May	ditto
15	Drip(Simple)-Tomato: with OP3	CF	Sep-Jan	ditto



Major Inputs

Item	FY 2015	Note
Financial execution	Projected 236,630,000 Kyat	
Procurement	Pickup car (1)	
In-country training	719 person day, in other words 1,175 day person	Mainly participants of the Monthly Monitoring Meeting (MMM) and Field Day (FD)

No. Participants in Nyaung-U	No. Participants in Myingyan	No. Participants in Magway	Total
77	45	77	199

Field Day at Nyaung-U



16



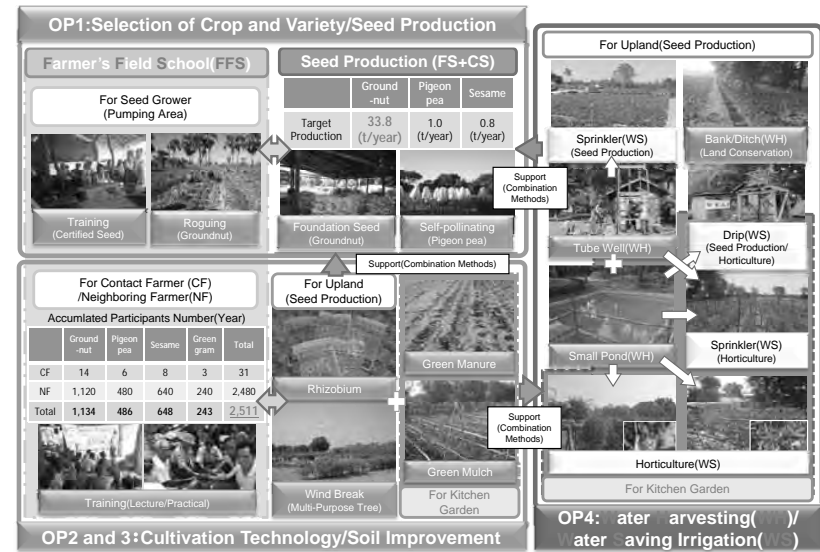
The Project for Development of Water Saving Agriculture Technology in the Central Dry Zone



Monthly Operation Plan in FY2016

4th JCC Meeting
23rd June 2016
DAR-HQ, Yezin

The Project for Development of Water Saving Agriculture Technology in the Central Dry Zone (WSAT)



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Monthly Operation Plan FY2016 – Output 1

Crop	Agency	Seed class	Acre	Requirement	4	5	6	7	8	9	10	11	12	1	2	3	
Groundnut	DAR NY	Foundation	14.0	430		▲	●	×	○	★	■	■	■	■	○	○	
	Seed Grower / DOA	Certified	60.0	2,040								▲	●	×	○	○	
Pigeon pea	DAR NY	Foundation	0.3	0.25		▲	●	×	○	★	■	■	■	■	○	○	
	DAR NY	Certified	3.9	32		▲	●	×	○	×	○	■	■	■	○	○	
Sesame	DAR MG	Foundation	0.1	0.375		▲	●	×	○	■	■	■	■	○	○		
	DAR MG	Certified	4.0	27		▲	●	×	○	■	■	■	■	○	○		

*) ▲ Land preparation, ● Sowing, × Field inspection, ○ Harvesting, ★ Elite selection, ■ Post-harvest operations
●—○ Duration of cultivation

Monthly Operation Plan FY2016 – Output 2 and 3 (FFS)

Township	Crop	No. Site	Month													
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		
Nyaung-U	Groundnut	6				FFS1	FFS2	FFS3			FFS4	SE				
	Pigeon pea	8		FFS1	FFS2					FFS3		FFS4	SE			
	Green gram	6	FFS4											FFS1	FFS2	FFS3
Myingyan	Gliricidia	14		●	---	---	---	---	---	---	---	---	---	---	---	---
	Groundnut	4			FFS1	FFS2	FFS3			FFS4	SE					
	Sesame	2					FFS1	FFS2	FFS3			FFS4	SE			
Magway	Gliricidia	6		●	---	---	---	---	---	---	---	---	---	---	---	---
	Groundnut	4				FFS1	FFS2	FFS3			FFS4	SE				
	Sesame	8	FFS1	FFS2	FFS3				FFS4	SE						

Contents of FFS

FFS1: Germination test, Rhizobium inoculation

FFS3: Establishment rate survey, Observation of flowering

FFS2: Emergence rate survey

FFS4: Yield survey

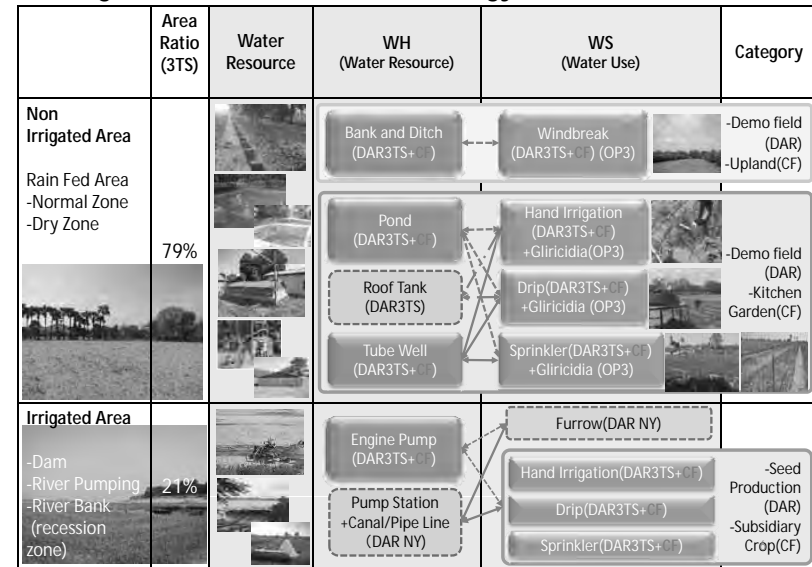
SE: Seed Exchange

Inputs for FFS

Item	Break down	Groundnut	Pigeon pea	Sesame	Green gram	(Gliricidia) ^{*1} Myae Pyant Cherry
Seeds (basket)	Each farmer	6	0.188 (3pyi)	0.125 (2pyi)	0.188 (3pyi)	-
	No. Farmer	294	168	210	126	CF:32 NF:640
	Total	1,764 (20,110 kg)	32 (1,046 kg)	27 (662 kg)	24 (785 kg)	-
Rhizobium (bag)	Each farmer	2	1	-	1	-
	Total	588	168	-	126	-
Seedlings (plant)	Each farmer	-	-	-	-	20 or 200 ^{*2}
	Total	-	-	-	-	19,200

Note: ^{*1} Except FFS on green gram
^{*2} 20 for NF, and 200 for CF

Target Area of WH/WS Technology(DAR3TS+CF's Field)



Monthly Operation Plan FY2016 - Output 4

[Water Harvesting Technology(WH)] Total: 13Activities

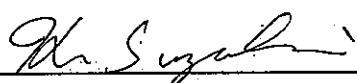
No.	Activities	Agency	4	5	6	7	8	9	10	11	12	1	2	3
1	Tube Well:with OP1	DAR NY(3)				Construction					Monitoring			
2	Tank:with OP1					Construction					Monitoring			
3	Pond(Plastic)Rehabilitation			Construction								Monitoring		
4	Pond(Bricks)	DAR MG(1)	Construction								Monitoring			
5-13	Pond(Bricks, Plastic)	CF(6+3-9)	Construction								Monitoring			

[Water Saving Irrigation Technology(WS)] Total: 75Activities

No.	Activities	Agency	4	5	6	7	8	9	10	11	12	1	2	3
1	Sprinkler-GN:with OP1	DAR NY (6)				Sowing					Harvesting			
2	Drip-P.P:with OP1			Sowing									Harvesting	
3-4	Drip-Tomato, Cowpea:with OP3				Sowing		Transplanting					Harvesting		Harvesting
5	Micro Irrigation(Drip)-Crop?												Sowing	
6	Sprinkler(simple)-Crop?													
7-9	Drip-Tomato, Cowpea:with OP3		DAR MY(4)	Sowing		Harvesting		Sowing	Transplanting		Harvesting		Harvesting	
10	Sprinkler(simple)-Crop?				Sowing	Transplanting								
11-12	Sprinkler-Sesame:with OP1	DAR MG(5)		Harvesting								Sowing		
13	Drip-Tomato:with OP3			Sowing								Harvesting		
14	Sprinkler-Asparagus				Sowing		Transplanting					Harvesting		
15	Sprinkler(simple)-Crop?													
16-45	Drip-Crop?:with OP3		CF(30)											
45-75	Sprinkler(simple)-Crop?	CF(30)												

Joint Mid-term Review Report
on
Technical Cooperation for Development of
Water Saving Agriculture Technology
in the Central Dry Zone

Nay Pyi Taw, June 22, 2016



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A handwritten signature and a set of initials are present at the bottom center of the page. The signature is written in black ink and appears to be 'S. J.' with a flourish. To its right are the initials 'M'.

List of Abbreviations

ACIAR	Australian Centre for International Agricultural Research
APO	Annual Plan of Operation
CDZ	Central Dry Zone
CFs	Contact Farmers
C/Ps	Counterparts
DAR	Department of Agricultural Research
DOA	Department of Agriculture
DOP	Department of Planning
DYDG	Deputy Director General
FFS	Farmer Field School
FD	Field Day
IDACA	The Institute for the Development of Agricultural Cooperation in Asia
IWUMD	Irrigation and Water Utilization Management Department
JCC	Joint Coordinating Committee
JICA	Japan International Cooperation Agency
M/M	Minutes of Meeting
MoALI	Ministry of Agriculture Livestock and Irrigation
MMM	Monthly Monitoring Meeting
NCDP	National Comprehensive Development Plan
NFs	Neighboring Farmers
NGOs	Non-Governmental Organizations
OFs	Ordinal Farmers
OJT	On the Job Training
PDM	Project Design Matrix
PO	Plan of Operations
QMM	Quarterly Monitoring Meeting
R/D	Record of Discussions
TG	Target Group
TOR	Terms of Reference
TS	Township
WM	Work Meeting
WRUD	Water Resources Utilization Department

-end-

1. Outline of Mid-term Review

1.1 Background

The mainstay of the primary industries of the Republic of the Union of Myanmar (hereafter referred to as “Myanmar”) represented by agriculture sector where 61% of the total labor population is engaged and 32% of GDP as well as 17.5% of the export earnings are produced (2009). The Government of Myanmar has given higher priority to the issues such as food self-sufficiency, export promotion, and rural development through agriculture development in order to achieve food security and poverty alleviation.

In Central Dry Zone (CDZ) which is located in geographical center of Myanmar, there is merely 700 ~ 1,000 mm of annual rainfall (3,000 mm in Delta area) with erratic duration of rainy season and with wide annual deviation. Therefore, it causes crop failure which makes farmers livelihood unconcern, unstable and insecure. In CDZ, ratio of lowland farm and upland farm is 28%:72%, implying as much as about 30% of the whole farmlands could be cultivated with rice if sufficient rain or irrigation water is available. A vast paddy area in Shwebo (Sagaing Region) and Meikthila (Mandalay Region) are well equipped with irrigation facilities. On the other hand, leguminous crops and oil crops are grown in upland with rain-fed condition which has been exposed to unpredictable severe drought and degradation of soil fertility. This is because of weakness of agriculture technologies which are adaptable to agro-environmental conditions of CDZ. For increasing and stabilizing agricultural production in CDZ, MoALI is tackling development of water saving technologies from the aspects of: 1) to introduce adaptable crops and its varieties, 2) to conserve soil fertility by prevention of soil erosion and improvement of cultivation practices, and 3) to develop water saving irrigation on farm level in CDZ.

Therefore, this project, the Project for Development of Water Saving Agriculture Technology in the Central Dry Zone (hereafter referred to as “the Project”), is proposed by MoALI to improve local livelihood through increasing and stabilizing agricultural production by combination and improvement of water saving technologies. The Project has been implemented since November 2013 and will complete in November 2018. To make the most effective use of the remaining period of the Project, JICA and the Government of Myanmar organize the Joint Mid-term Review.

1.2 Objective

The objectives of the Joint Mid-term Review are to confirm and analyze achievements of Project Purpose and Outputs at the mid-period, and make necessary recommendations to the Project. The results of the Joint Mid-term Review are compiled in the Joint Mid-term Review Report by incorporating findings of the study and recommendations.

1.3 Members of Joint Mid-term Review Team

The Joint Mid-term Review Team (hereinafter referred to as “the Team”) is composed of both Myanmar and Japanese members. The members of the Team are shown in Table 1.1.

Table1.1 Members of Joint Mid-term Review Team

	Name	Position	Affiliation
Myanmar Team	Dr. Nyi Nyi	Leader	Assistant Director, Extension Division, Department of Agriculture, MoALI
	Dr. Pau Sian Kam	Member	Assistant Research Officer, Department of Agricultural Research, MoALI
Japanese Team	Mr. Kazuya SUZUKI	Leader	Deputy Director General and Group Director for Agric. and Rural Development Group 1 Rural Development Department, JICA
	Mr. Kenichiro KOBAYASHI	Deputy Leader	JICA Advisor for Agriculture and Rural Development, MoALI
	Mr. Yuichiro MISA WA	Water Saving Irrigation	Hokuriku Regional Agricultural Administration Office
	Dr. Makoto KAWASE	Research Cooperation	Professor, Faculty of Life and Environmental Sciences, University of Tsukuba
	Dr. Naozumi MIMIDA	Integrated Pest Management	Gene Research Center, Faculty of Life and Environmental Sciences, University of Tsukuba
	Ms. Hana OSHIRO	Cooperation Planning	Officer, Team 1, Group 1, Rural Development Department, JICA
	Dr. Tetsuro HAMADA	Evaluation Analysis	Senior Consultant, A&M Consultant. Inc.

1.4 Schedule and Major Interviewees

The field survey in Myanmar commenced on June 6, 2016 and is schedule to be completed on June 24, 2016 as shown in Appendix 1 for the details. List of major survey interviewees is attached in Appendix 2.

1.5 Methodology of Mid-term Review

The Mid-tem Review for Project is carried out in accordance with “JICA Guideline for the Project Evaluation”. The Team reviews the Project from three sections, (a) implementation process, (b) achievement and progress, and (c) review by the five (5) evaluation criteria, namely “Relevance”, “Effectiveness”, “Efficiency”, “Impact” and “Sustainability”. The questions and indicators for the review are indicated in Evaluation Grid as shown in Appendix 3.

For data collection, the Team conducted the literature survey, questionnaire survey and interviews with the officials in MoALI concerned with the Project, counterpart personnel, target group (TG), contact farmers (CFs) and the Japanese experts. The Team also conducted the field visits of DAR and CFs farms.

Based on the results of the survey, the Team reviewed implementation process and achievements and progress of the Project, and evaluated and analyzed the Project from five (5) criteria described below.

Table 1.2 Five Evaluation Criteria

Criterion	Explanation
Relevance	Validity of the Project Purpose and the Overall Goal in connection with development policies of Myanmar and Japan as well as needs of the beneficiaries
Effectiveness	Degree of accomplishing the Project Purpose. It also examines whether these benefits have really been brought by the Project.
Efficiency	Productivity of the implementation process. It analyzes whether inputs of the Project have been effectively converted into the Outputs.
Impact	Direct and indirect impact, positive and negative unexpected effects of the Project. It also examines possibility of accomplishing the Overall Goals.
Sustainability	Possibility of generating benefits by the Project related activities even after the Project period.

2. Summary of the Project

2.1 Project Design Matrix (PDM)

PDM is a document that presents the main contents of the Project. The original PDM (version 0) was prepared for the Record of Discussion (R/D) which was signed on December 20, 2012. Then, PDM (version 1) was prepared by establishing Objectively Verifiable Indicators with concrete target figures, and officially approved in the third Joint Coordinating Committee (JCC) meeting on February 21, 2015 as shown in Appendix 4. The Mid-term Review is conducted based on PDM (version 1).

2.2 Project Framework

The framework of the Project based on PDM (version 1) is described in Table 2.1 below.

Table 2.1 Project Framework

Scope of the Project	
Duration	Five (5) years from November 2013
Project Sites	DAR Experiment Farms and contact farmers' field selected from the three townships (Nyaung Oo, Magway, Myingyan) in the Central Dry Zone
Target Group	Dryland Crop Research Centre in Nyaung Oo, Other DAR Experiment Farms and DOA Township Offices in the three townships
Target Area	Nyaung Oo, Myingyan and Magway townships
Beneficiaries	78,492 farming households; Nyaung Oo (25,713), Myingyan (32,607), Magway (20,172) as of 2005
Implementation Agency	Management under Ministry of Agriculture, Livestock and Irrigation (MoALI) Department of Agricultural Research (DAR) Department of Agriculture (DOA)

Outline of the Project

Narrative Summary		Important Assumptions
Overall Goal	In CDZ (especially the non-irrigated areas where upland farming is a main form of agriculture), an agricultural income is stabilized as a result of the spread of water-saving agricultural technologies which are suitable to CDZ.	<ol style="list-style-type: none"> 1. Effective implementation of the extension services by DOA 2. Cultivation technologies developed in the Project are accepted by farmers including other than Pilot Site. 3. No extreme fall of market price of the main crops in CDZ 4. No drastic change on the policy related to rural development and poverty alleviation in Myanmar
Project Purpose	Water-saving agriculture technologies that are adapted to CDZ are established.	<ol style="list-style-type: none"> 1. Continued support extended by the government organizations including ID. 2. Cooperation of DAR and DOA is carried out smoothly
Output 1	New and/or conventional crops and promising varieties that are adaptable to CDZ are identified.	<ol style="list-style-type: none"> 1. No severe outbreak of diseases and pest 2. No extreme weather anomalies that obstruct farming and irrigation 3. No surge of costs for seeds, production materials, and small-scale
	0. The baseline study is conducted.	
	1-1 As part of the baseline study, a study on the needs of farmers for and local markets for crops and varieties of CDZ is conducted.	

<p>1-2 Pilot sites and contact farmers (CF) are selected in CDZ. 1-3 Based on results of the baseline study, potential crops and varieties are selected from those collected at international and domestic agriculture research institutes. 1-4 Varietal trials are conducted at Dryland Crop Research Centre in Nyaung Oo. 1-5 Adaptability tests are conducted both at DAR Experiment Farms and CF's fields.</p>	<p>irrigation 4.No reduction in the development budgets of DAR and DOA</p>
<p>Output 2</p>	<p>Cultivation technologies are improved so that these can match the environments of CDZ.</p>
<p>2-1 Based on the regional adaptability tests, cultivation technologies are tested and studied for localizing cultivation technologies. 2-2 Through trials at the CF's field, cultivation technologies adapted to local conditions are proved, and the cultivation manual is drafted. 2-3 Extension agents and CF are trained for cultivation technologies adapted to local conditions.</p>	
<p>Output 3</p>	<p>Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.</p>
<p>3-1 As part of the baseline study, the soil study is conducted in the project sites from aspects of fertility and physical properties. 3-2 Testing for improving soil fertility and physical properties is conducted, and methods for the improvement are studied. 3-3 The methods for improving soil fertility and physical properties that are affordable to farmers (soil improvement technologies) are examined. 3-4 Through trials at the CF's fields, the methods for the soil improvement technologies that are adapted to the soil conditions are proved, and the soil improvement manual is drafted 3-5 Extension agents and CF are trained for the soil improvement technologies that are adapted to local conditions.</p>	
<p>Output 4</p>	<p>Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.</p>
<p>4-1 As part of the baseline study, water resources and water use by farmers are studied at pilot sites, and challenges are identified. 4-2 Water-harvesting technologies applicable to CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field. 4-3 Water-saving irrigation technologies applicable to farmer field in CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field. 4-4 Through the above verification tests, guideline and/or manual for water-harvesting technologies and water-saving irrigation technologies applicable to CDZ are drafted. 4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the pilot sites are recommended.</p>	<p>Pre-condition Counterparts are arranged to implement this Project.</p>

3. Implementation Process

3.1 Institutional Arrangement for Project Implementation

After signing the R/D on December 20, 2012, Ministry of Agriculture and Irrigation (MOAI), responsible Ministry in Myanmar side for the Project management, has been re-organized as described below.

- The name of Department of Agricultural Planning (DAP) was changed to Department of Planning (DOP) in 2015.
- The Department of Irrigation (ID) and Water Resources Utilization Department (WRUD) were merged into Irrigation and Water Utilization Management Department (IWUMD) in 2016.
- MoALI was newly organized by combining Ministry of Agriculture and Irrigation, Ministry of Livestock Breeding and Fisheries and Ministry of Cooperative in 2016.

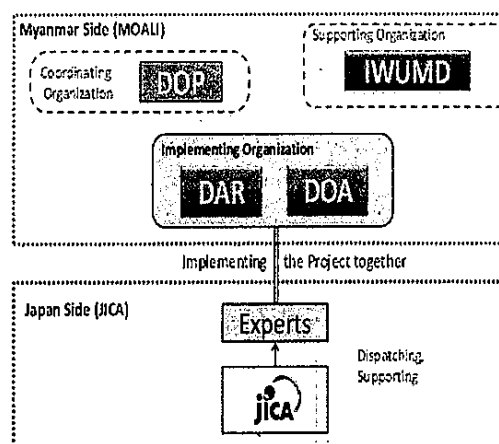


Figure 3.1 Institutional Arrangement of Project Implementation.

Figure 3.1 shows the institutional arrangement for the Project implementation at the time of Joint Mid-term Review.

3.2 Project Management and Decision Making

3.2.1 JCC Meeting

As stipulated in the R/D on December 20, 2012, the JCC was established and composed of the members listed below.

Table 3.1 Function and Members of JCC

Meeting	JCC will meet whenever necessity arises in order to fulfill the following function.	
Function	<ul style="list-style-type: none"> • To endorse the annual work plan of the Project. • To review and monitor overall progress of the Project in accordance with the R/D and the above mentioned plan. • To discuss any other issue(s) pertain to the smooth implementation of the Project. 	
JCC Members		
Chairperson	Director General of the DOP	
	<p style="text-align: center;"><Myanmar Members> :6 Personnel</p> <ul style="list-style-type: none"> • Director General of DAR • Director General of DOA • IWUMD • Deputy Director General of DAR • Deputy Director General of DOA 	<p style="text-align: center;"><Japanese Members></p> <ul style="list-style-type: none"> • Chief Representative of JICA Myanmar Office • Experts assned to the Project • Other Japanese personnel concerned dispatched by JICA when required <p>* Officials from Embassy of Japan and others may attend JCC meetings as observers.</p>

The JCC has held its meetings three (3) times before the Joint Mid-term Review. Major issues

discussed in the JCC are summarized in Table 3.2.

Table 3.2 Major Issues discussed in JCC Meetings

	Date	Major issues
1st	January 24, 2014	<ul style="list-style-type: none"> • Assignment of the JCC members • Assignment of Project personnel • Settlement of target area, TG and Beneficiary
2nd	March 13, 2014	<ul style="list-style-type: none"> • Determination of Target Crops for each township
3rd	February 21, 2015	<ul style="list-style-type: none"> • Determination of Target Crops for each township • Determination of Target Variety • Update of PDM (version 1) through establishment of Indicators • Endorsement of Rolling Plan of the Project activities

In the first JCC meeting, the following points were defined under the agenda for “Settlement of Target Area, Target Group and Beneficiary”, which are not indicated in the PDM (version 1).

Overall Goal Area	Central-Dry Zone, i.e. the twenty seven (27) townships under typology I, II and III specified by Development Study Report of JICA (2010)
Primary Beneficiary	CFs and Neighboring Farmers (NFs) in the target area
Secondary Beneficiary	Farmers engaged in upland crops in the Overall Goal Area

It is desirable to delegate the power for staff engaged in the Project activities in the target area for effective and prompt action in respect to the Project management. The centralized decision making might not always be effective for timely and smooth implementation.

3.2.2 Project Consultative Mission

A project consultative mission was dispatched from Japan for July 8-14, 2014 and discussed managerial and operational issues of the Project. After that, a follow-up meeting was held among those who were concerned on August 9, 2014 under the supervision of Project Director. The meeting confirmed the extension-oriented implementation strategy of the Project.

3.3 Implementation Structure for Project Activities

Figure 3.2 shows the implementation structure for the Project activities in 2015.

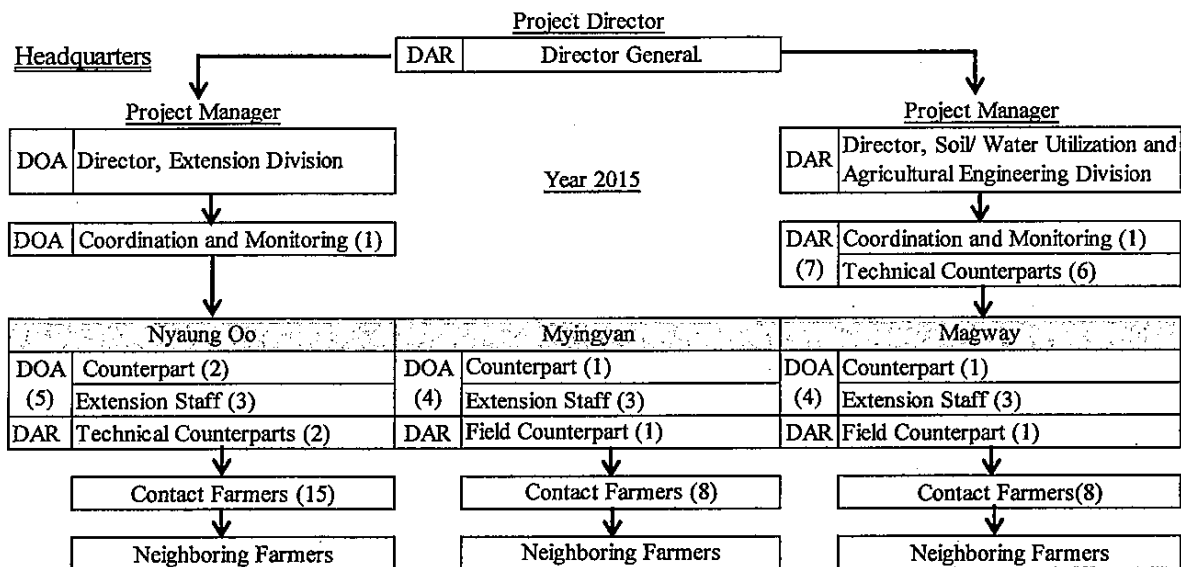


Figure 3.2 Implementation Structure for Project Activity.

Project Director	Shall be responsible for overall administration and implementation of the Project.
Project Manager	Shall be responsible for the managerial and technical matters of the Project.
	Shall organize a Quarterly Monitoring Meeting (QMM) either at the Project office in Nyaung Oo or DAR Headquarters in order to monitor progress of the Project and submit the Quarterly Monitoring Report (QMR) to the Project Director as well as the Director General of their department.

The experimental farms of DAR Agricultural Research Centers and DOA offices in the townships of Nyaung Oo, Myingyan and Magway are bases of the field activities. The Project office has been established in the Dryland Crop Research Centre in Nyaung Oo and the four (4) Japanese experts have been assigned in the Centre.

3.4 Extension Activities (Farmer Field School)

The township office of DOA identifies prominent farmers, CFs as an entry point for its strategic extension service. The Project follows this practice and employs FFS approaches in collaboration with the CFs. The farmers who participate in the FFS are termed NFs by the Project. The flow of extension service (FFS) employed by the Project is illustrated in Figure 3.3.



Figure 3.3 Flow of FFS.

The FFS composed of four sessions (training) is organized by the Project at CF's demonstration plots for the NFs as illustrated in Figure 3.4.



Figure 3.4 FFS Sequence.

It is expected that ten to thirty NFs to attend each session of the FFS in order to disseminate the improved agricultural technologies and to distribute inputs and materials.

3.5 Communication and Information Sharing

Under the JCC meeting, the following meetings are organized for the smooth implementation of the Project activities and information sharing among stakeholders.

Table 3.3 Type of Meeting for Communication and Information Sharing

Type of Meeting	Contents
Weekly Meeting	The regular meeting is held weekly with the participation from DAR and DOA in Nyaung Oo in order to confirm schedule and progress for the Project activities. The new technology is confirmed in the way that the participants complement each other their knowledge and experiences.
Monthly Monitoring Meeting (MMM)	MMM is held at the Project office with the participation of the two (2) C/Ps responsible for coordination and monitoring, and DAR Project Manager in the headquarters and staff (ex: extension officers) of DAR/DOA offices in Myingyan and Magway for the Project progress with administrative arrangements. The meeting functions not only for information sharing but also for the field training. The MMM was used for monthly training to improve technical skills of the participants in 2014 and for hosting farm demonstrations (Field Day) rotating among developing experimental farms in order to disseminate to farmers from 2015.
Quarterly Monitoring Meeting (QMM)	QMM is organized every quarter at the Project office by inviting the Project Managers. In the meeting, the Project progress including visits to the farms is confirmed and the issues arisen are discussed for the smooth operation of the Project. Together, the report is distributed to the JCC members for information sharing.

3.6 Method of Technology Transfer

The Project tries to transfer technologies to C/Ps, TGs and CFs through in-country training and capacity building. To this end, four (4) types of in-country training and capacity building have been utilized as described in Table 3.4.

Table 3.4 Types of In-country Training and Capacity Building

No	Type	Definition	Examples
1	Training Course	It refers to as an organized series of training in the country.	Monthly Training (MT) in FY2014 MMM in FY2015.
2	Workshop (WS)	It refers to as an occasion to discuss the specific issues with the Project Managers and C/Ps, or to present experiences and ideas related to the Project.	<ul style="list-style-type: none"> • Baseline survey preparatory workshop • Annual Plan of Operation (APO) workshop held in February 2014 • QMM
3	Work Meeting (WM)	It refers to as an occasion to discuss specific issues and managerial matters with the Project Director or a member of the JCC.	<ul style="list-style-type: none"> • Kick-off meeting • Follow-up meeting • JCC meetings

4	On The Job Training (OJT)	This is a miscellaneous category including a site observation. It refers to as a wide range of staff training activities from organized working sessions to brain storming.	<ul style="list-style-type: none">• FD• PC training in FY2014• Field inspection on seed multiplication• Weather data recording
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4. Achievements

4.1 Inputs

The detailed Inputs contributed from Myanmar and Japanese sides are described in Appendix 5 and Appendix 6 respectively. A fiscal year starts in April and ends in March in both Myanmar and Japan.

4.1.1 Inputs from Myanmar Side

Summary of Inputs from Myanmar side is shown in Table 4.1 below.

Table 4.1 Summary of Inputs from Myanmar Side

Personnel Assignment	Project Director		Dr. Thein Lwin (Director General, DAR) 2013.11.08 - 2014.09.12			
			Dr. Ye Tint Tun (Director General, DAR) 2015.05.15 - 2016.02.26			
			U Naing Kyi Win (Director General, DAR) 2016.02.26 - Up-to-date			
	Project Manager	DAR	Dr. Nwe Nwe Yin (Director, Soil/ Water Utilization and Agricultural Engineering) 2013.11.08 - 2014.09.09			
			Dr. Nwe Nwe Yin (Director, Biotechnology, Plant Genetic Resources and Plant Protection) 2014.09.09 - Up-to-date			
		DOA	Dr. Kyi Myint (Director, Extension) 2013.11.08 - 2014.01.19			
			U Aye Ko Ko (Director, Extension) 2014.01.25 - 2015.04.10			
			U Hla Myint Aung (Director, Extension) 2015.09.10 - 2016.02.26			
			U Thura Soe (Director, Extension, Horticulture and Biotechnology) 2016.02.26 - Up-to-date			
	C/P personnel (25 Persons)		DAR (11)	7 in Headquarters and 4 in field office		
			DOA (14)	1 in Headquarters and 13 in field office		
	JCC Members	Chairperson	DOP Director General	U Hla Kyaw 2013.11.08 - 2014.07.17		
				Dr. Tin Htut 2014.08.29 - 2016.02.20		
				U Kyaw Min Oo 2016.02.20 - Up-to-date		
		Members	DAR (1)	Dr. Aung Kyi 2013.11.08 - 2014.03.14		
				Dr. Ye Tint Tun 2014.03.14 - 2014.09.15		
				Dr. Ye Tint Tun 2014.09.15 - 2015.05.15		
				Daw Tin Tin Myint 2015.06.08 - Up-to-date		
			DOA (3)	U Kyaw Win 2013.11.08 - 2015.05.02		
				U Kyaw Shwe 2015.05.02 - 2016.02.26		
Dr. Ye Tint Tun 2016.02.26 - Up-to-date						
U Aye Ko Ko 2015.04.10 - Up-to-date						
IWUMD (1)			U Hla Myint Aung 2016.02.26 - Up-to-date			
			U Kyaw Myint Hlaing (ID) 2013.11.08 - 2016.02.20			
			U Kyaw Min Oo (WRUD) 2013.11.08 - 2015.01.16			
	U Kyaw Min Oo (WRUD) 2015.01.16 - 2016.02.20					
U Kyaw Myint Hlaing 2016.02.20 - Up-to-date						
Land, Building, Office, and Facilities	Office Building		For the project office			
	Office space		For working space for experts			
	Warehouse		Storing seeds, agricultural inputs, farm machinery			
	Experimental and seed production field		Field experiment and seed multiplication			
	Drying yard		Post-harvest work for experiment and seed			

			production
	Meeting venue	DAR HQ.	For kick-off meeting and the JCC meetings
	Seed production field (sesame)	DAR Magway	Field experiment and seed multiplication
Budget Execution	2013	Kyat 166,467,000	<In-kind Contribution>: water and electricity bills, baseline and end line surveys and other utility costs (Installation of Tel/fax line, Land preparation, Ten-drum of diesel)
	2014	Kyat 196,739,000	
	2015	Kyat 260,365,600	

4.1.2 Inputs from Japanese Side

Summary of Inputs from Japanese side is shown in Table 4.2 below.

Table 4.1 Summary of Inputs from Japanese Side

Expert Dispatch (5 Persons)	Long-term Expert (5 Persons)	Mr. Mitsuo Matsumoto, Chief Advisor/ Dryland Crop Cultivation: 2013.11.03 -2015.11.03
		Dr. Naoya Fujimoto, Chief Advisor/ Dryland Crop Cultivation: 2015.11.5- Up-to-date
		Mr. Katsuhiko Mizutani, Water Saving Irrigation: 2013.11.03 – Up-to-date
		Ms. Yu Kikuchi, Integrated Pest Management : 2013.11.03- Up-to-date
		Mr. Masaru Yamada, Project Coordinator: 2013.10.27 - Up-to-date
	Short-term Expert	No short-term experts have been dispatched yet.
Training in Japan and Abroad		No trainings in Japan and abroad have been conducted yet.
Procured Equipment		JICA Owned Equipment USD 102,946 and Kyat 21,603,000
		Handover Equipment USD 184,938
Renovation/ Rehabilitation of Infrastructure		USD 80,000 and Kyat 54,952,500
Budget Execution*	2013	Total: Kyat 243,562,996 = JPY 25,623,112= USD 252,586
	2014	Total: Kyat 385,893,388 = JPY 42,950,158= USD 392,988
	2015	Total: Kyat 236,630,000 = JPY 24,658,215= USD 186,486

*The figures include JICA Owned Equipment, Handover Equipment and Renovation/ Rehabilitation of Infrastructure. The value (Kyat, JPY and USD) is converted by the JICA exchange rate.

4.2 Implementation of Activities

4.2.1 Overall Progress of Activities

The Team compared actual implementation of the Project activities with Plan of Operation (PO) as well as the rolling plan endorsed in the third JCC meeting. Even though the Project has faced several constraints and difficulties in the implementation process of the Project, both sides have made efforts to overcome them for smooth implementation of the Project. As a result, the Project activities have been going steadily and significant delay was not identified as shown in Appendix 7.

4.2.2 Performance of Activities for Outputs

The performance of the activities to produce Outputs is shown in Table 4.3.

Table 4.3 Performance of Activities for Outputs

Output 1: New and/or conventional crops and promising varieties that are adaptable to CDZ are identified.		
Activities	Status	Performance
1-1 As part of the baseline study, a study on the needs of farmers for and local markets for crops and varieties of CDZ is conducted.	Completed	The study was completed in February 2014. The preferences of farmers and local markets for crops and varieties were identified. The market price of the target crops was surveyed in February 2014.
1-2 Pilot sites and contact farmers (CF) are selected in CDZ	Progressing as scheduled	Pilot sites and CFs are being selected with township offices of DOA.
1-3 Based on results of the baseline study, potential crops and varieties are selected from those collected at international and domestic agriculture research institutes.	Completed	The target crops (groundnuts, pigeon pea, sesame, greengram) for each township were identified and endorsed in the second JCC meeting. The target varieties were identified reflecting DOA recommendations and endorsed in the third JCC meeting.
1-4 Varietal trials are conducted at Dryland Crop Research Centre in Nyaung Oo.	Progressing as scheduled	Variety trials of 34 groundnut and 24 pigeon pea varieties were conducted in 2014.
1-5 Adaptability tests are conducted both at DAR Experiment Farms and CF's fields.	Progressing as scheduled	Adaptability tests at DAR farms were conducted and completed at the end of 2014. The number of CFs (adaptability test sites) reached 100.

Output 2: Cultivation technologies are improved so that these can match the environments of CDZ.		
Activities	Status	Performance
2-1 Based on the regional adaptability tests, cultivation technologies are tested and studied for localizing cultivation technologies.	Completed	The cultivation technologies (rhizobium, renewal of seed, sowing rate, sowing time) were identified.
2-2 Through trials at the CF's field, cultivation technologies adapted to local conditions are proved, and the cultivation manual is drafted.	Mostly Completed	Through FFS (trials) endorsed in the third JCC meeting, the technologies (for yield) were disseminated and verified. The extension materials were prepared and are being used.
2-3 Extension agents and CF are trained for cultivation technologies adapted to local conditions.	Progressing as scheduled	Through monthly trainings and organization of FFS, extension staff and CFs have been trained.

Output 3: Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.		
Activities	Status	Performance
3-1 As part of the baseline study, the soil study is conducted in the project sites from aspects of fertility and physical properties.	Mostly Completed	The survey was completed in August 2013 (Data Collection Survey Report). A soil analysis report was prepared. The daily rainfall data 2003-2014 for the target area were obtained and analyzed. Weather station and soil moisture sensor have been installed since January 2015.
3-2 Testing for improving soil fertility and physical properties is conducted, and methods for the improvement are studied.	Completed	A multi-purpose tree (<i>Gliricidia</i>) was identified and disseminated through trials on green manure, development of soil improvement approach and study on wind break trees.

3-3 The methods for improving soil fertility and physical properties that are affordable to farmers (soil improvement technologies) are examined.	Completed	An advantage of <i>Gliricidia</i> including green manure was verified at DAR Nyaung Oo. Extension plan (rolling plan) was prepared and endorsed in the third JCC meeting.
3-4 Through trials at the CF's fields, the methods for the soil improvement technologies that are adapted to the soil conditions are proved, and the soil improvement manual is drafted.	Mostly Completed	<i>Gliricidia</i> was endorsed in the third JCC meeting. Extension material (FFS) for <i>Gliricidia</i> was prepared. The nursery was established at the three DAR farms in 2014 for distribution to farmers.
3-5 Extension agents and CF are trained for the soil improvement technologies that are adapted to local conditions.	Progressing as scheduled	Through monthly trainings and organization of FFS, extension staff and CFs have been trained.

Output 4: Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.		
Activities	Status	Performance
4-1 As part of the baseline study, water resources and water use by farmers are studied at pilot sites, and challenges are identified.	Completed	A study on water resources and utilization in the target area was conducted and compiled in baseline survey report and data collection survey report. Also, challenges in the target area were documented in "Water Resources and Utilization in the Central Dry Zone of Myanmar".
4-2 Water-harvesting technologies applicable to CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field.	Mostly Completed	The recommended technologies (tube well, water-harvesting pond, roof tank, and banks & ditches) were demonstrated in three DAR farms.
4-3 Water-saving irrigation technologies applicable to farmer field in CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field.	Mostly completed	The recommended water-saving irrigation technologies (sprinkler, drip irrigation and green mulch) were identified and demonstrated in three DAR farms.
4-4 Through the above verification tests, guideline and/or manual for water-harvesting technologies and water-saving irrigation technologies applicable to CDZ are drafted.	Progressing as scheduled	Training materials were prepared and used in the monthly training in 2014. Extension materials for water-harvesting and water-saving technology and extension scheme (guideline) were prepared.
4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the pilot sites are recommended.	Progressing as scheduled	Demonstration plots in CFs farms are being identified in consultation with the C/Ps and TG. A case study on combination of water-harvesting and water-saving irrigation technologies in the target area has been planned.

4.3 Project Products

On the process of implementation of the Project activities and production of Outputs, various types of reports, materials and extension manuals have been prepared and widely accepted by TGs, CFs and NFs. A list of the Project products is shown in Appendix 8.

4.4 Achievement and Progress of Outputs

The achievement of each Output is measured by the degree of fulfillment of the indicators established for respective Outputs.

The achievement and progress for Outputs are presented in Table 4.4.

Table 4.4 Achievements and Progress of Outputs

Output 1: New and/or conventional crops and promising varieties that are adaptable to CDZ are identified																														
Indicators	Status	Achievement and Progress																												
1-1 Within a half year from beginning of the project, the baseline study is conducted and consumer needs for the local agriculture products are identified.	Completed	The baseline survey and market price survey were completed in January and September 2014, respectively. These were compiled in Baseline Survey Report and Market Price Survey Data, respectively.																												
1-2 10% or more of the sampled farmers adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs.	Progressing as scheduled	The number of seed recipients (CFs and NFs) of the quality seed of the target varieties. 2014: 26, 2015: 818, 2016: 26 (as of 31 March 2016) Total:970 Sampled farmers are 78,492 farming households (beneficiaries) in Nyaung Oo, Myingyan and Magway TS ($970/78,492=1.2\%$)																												
1-3 By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the sampled farmers for such crops/varieties increases by 10% or more.	Progressing as scheduled	The average gross agricultural income (Kyat/acre) from the target variety of the CFs is shown in the table below. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>TS</th> <th>Crop</th> <th>Before</th> <th>2015</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Nyaung Oo</td> <td>Groundnut</td> <td>180,528</td> <td>423,793</td> </tr> <tr> <td>Pigeon pea</td> <td>241,120</td> <td>498,294</td> </tr> <tr> <td>Greengram</td> <td>341,541</td> <td>513,333</td> </tr> <tr> <td rowspan="2">Myingyan</td> <td>Groundnut</td> <td>220,687</td> <td>415,228</td> </tr> <tr> <td>Sesame</td> <td>208,613</td> <td>314,587</td> </tr> <tr> <td rowspan="2">Magway</td> <td>Groundnut</td> <td>312,794</td> <td>558,588</td> </tr> <tr> <td>Sesame</td> <td>360,471</td> <td>559,053</td> </tr> </tbody> </table>	TS	Crop	Before	2015	Nyaung Oo	Groundnut	180,528	423,793	Pigeon pea	241,120	498,294	Greengram	341,541	513,333	Myingyan	Groundnut	220,687	415,228	Sesame	208,613	314,587	Magway	Groundnut	312,794	558,588	Sesame	360,471	559,053
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	Sesame	208,613	314,587																											
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	Sesame	360,471	559,053																											

Output 2: Cultivation technologies are improved so that these can match the environments of CDZ.		
Indicators	Status	Achievement and Progress
2-1. Cultivation technologies adapted to local conditions are established for the selected new and/or existing crops and their superior varieties, and these technologies are implemented 2 times in total (2 times per year) at DAR Experiment Farm.	Mostly Completed	The number of trials conducted at DAR farms (Ny+My+Mg=Total) 2014: 1+0+0=1 2015: 1*+0+0=1 Total: 2 *Groundnut cultivation: seed rate (1 seed per hole) with sprinkler.
2-2. Appropriate technical manual for cultivation technologies are prepared.	Mostly Completed	Manual of cultivation technologies by each target crop was prepared. 1. Extension material (FFS) for groundnut 2. Extension material (FFS) for sesame 3. Extension material (FFS) for pigeon pea 4. Extension material (FFS) for greengram
2-3. 30 or more persons of the extension agents who can apply the above manual and implement cultivation technologies are built up.	Progressing as scheduled	The number of extension staff trained (Ny+My+Mg=Total): 2014: 12+4+5=21 2015: 3+1+1=5 Total: 26 (26/30=87%)
2-4. Verification test by applying	Progressing	The number of verification tests (CFs)

the above manual is conducted 100 times or more (1 time or more per year) by the project at the contact farmer's field.	as scheduled	conducted. (Ny+My+Mg=Total) 2014:18+4+4=26 2015:15+8+8=31 2016: 6 Total: 63/100 (63%)
2-5. The cultivation that is applied with the above manual is implemented by 10% or more of the sampled farmers.	Progressing as scheduled	The number of farmers who adopted the technologies (Number =FFS on target crops + Seed exchange) 2014: 1,216 2015: 2,390 2016: 201 Total: 3,807/7,849 (49%) (Target: 10% of farming households in three TS)

Output 3: Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.

Indicators	Status	Achievement and Progress
3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions of the project target area are identified.	Mostly Completed	Data Collection Survey Report was compiled in August 2013. In addition, the following reports were prepared. 1. Climate in the Target Area 2. A Soil Condition in the Project Site
3-2. The soil improvement technologies that are adapted to the local conditions are established	Completed	The approach based on application of <i>Gliricidia</i> has been identified.
3-3. Technical manual for the soil improvement technologies is prepared.	Mostly Completed	Extension material (FFS) for <i>Gliricidia</i> was prepared and is being used.
3-4. 30 or more persons of the extension agents who can apply the above manual and implement the soil improvement technologies are built up	Progressing as scheduled	The number of extension staff trained (Ny+My+Mg=Total): 2014: 10+4+5=19 2015: 0+1+1=2 Total: 21 (21/30=70%) Note: Differences with Indicator 2-3 (the agents for greengram),
3-5. Verification test by applying the above manual is conducted 100 times or more (1 time or more per year) by the project at the contact farmers' field.	Progressing as scheduled	The number of verification tests (CFs) conducted (Ny+My+Mg=Total): 2014: 11+0+0=11 2015: 12+8+8=28 Total: 39% (39/100)
3-6. The soil improvement that is applied with the above manual is implemented by 2% or more of the sampled farmer	Progressing as scheduled	The number of farmers who adopted the technologies (Number =FFS on soil management+ FD) 2014: 11 2015: 588 Total: 599/1,570 (38%) (Target: 2% of farming households).

Output 4: Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.

Indicators	Status	Achievement and Progress
4-1. The study report on water resources and water use by farmers at pilot sites is drafted.	Completed	The studies were completed, and the reports were prepared. 1. Baseline Survey Report

		2. Data Collection Survey Report 3. Water Resources and Utilization in the Central Dry Zone of Myanmar
4-2. Technical guideline and/or manual for the water-harvesting and water-saving irrigation technologies are prepared.	Mostly Completed	Demonstration was conducted at the three DAR farms and one CF's plot. Upon analyzing those experience and lessons learned, the guideline (extension scheme) and extension materials were drafted. 1. Extension material for "Water-harvesting and water saving technology" 2. Extension Scheme
4-3. The recommendation for combined methods for water-saving cultivation and water-saving irrigation technologies is prepared.	Progressing as scheduled	Prior to drawing up recommendations, demonstration plots on combined methods for water-saving cultivation and water-saving irrigation technologies are being identified in consultation with C/Ps and TG.

4.5 Achievement Level of Project Purpose

The achievement level of Project Purpose is measured by the degree of fulfillment of the established indicators.

The level of accomplishment of Project Purpose is presented in Table 4.5.

Table 4.5 Achievement Level of Project Purpose

Project Purpose: Water-saving agriculture technologies that are adapted to CDZ are established.																														
Indicators	Status	Level of Achievement																												
1. The water-saving agricultural technology developed in this project are introduced by the 15% farmer in Project Site and carried out more than 1 cropping seasons.	Mostly completed	The number of the cumulative participants (Number =FFS on target crops + Seed exchange + FFS on soil management + FD) 2014: 1,227 2015: 3,177 2016: 201 Total: 4,605/11,774 (39%) (Target: 15% of farming households in three TS)																												
2. In Project Site, crop yields increased 10% at the farmers who used the water-saving agricultural technology developed in this project.	Mostly completed	The average yield of CFs by each target crop (kg/acre) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>TS</th> <th>Crop</th> <th>Before</th> <th>2015</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Nyaung Oo</td> <td>Groundnut</td> <td>292</td> <td>405</td> </tr> <tr> <td>Pigeon pea</td> <td>447</td> <td>382</td> </tr> <tr> <td>Greengram</td> <td>459</td> <td>436</td> </tr> <tr> <td rowspan="2">Myingyan</td> <td>Groundnut</td> <td>357</td> <td>388</td> </tr> <tr> <td>Sesame</td> <td>136</td> <td>221</td> </tr> <tr> <td rowspan="2">Magway</td> <td>Groundnut</td> <td>506</td> <td>827</td> </tr> <tr> <td>Sesame</td> <td>235</td> <td>263</td> </tr> </tbody> </table> <p>The rain-fed farming under erratic rainfall is potential drawback.</p>	TS	Crop	Before	2015	Nyaung Oo	Groundnut	292	405	Pigeon pea	447	382	Greengram	459	436	Myingyan	Groundnut	357	388	Sesame	136	221	Magway	Groundnut	506	827	Sesame	235	263
TS	Crop	Before	2015																											
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Myingyan	Groundnut	357	388																											
	Sesame	136	221																											
Magway	Groundnut	506	827																											
	Sesame	235	263																											
3. In Project Site, 60% of Farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.	Mostly completed	The percentage of positive response from CFs and NFs 2014: 100% 2015: 82% Average: 91%																												

5. Review by Five Evaluation Criteria

5.1 Relevance

Relevance of the Project is “high”.

5.1.1 Priority on Policy

(1) Development Policy of Government of Myanmar

Based on the 20-year long-term National Comprehensive Development Plan (NCDP) from 2011 to 2031, the second five-year plan (2016/17 to 2020/21) was formulated aiming to boost economic growth by encouraging investments in the public and private sectors to ensure higher local productivity through the process of industrialization. The plan focuses on agriculture as one of the priority areas. The agricultural development is to be carried out through agro-industrial integration and rural-urban interconnection. Judging from the plan, the Project is in line with development policy of Government of Myanmar.

(2) Basic Policy of Japan’s Assistance to Myanmar

Japan reviewed its assistance policy in 2012 and one of the three priority areas focuses on the improvement of people's livelihoods, including assistance for ethnic minorities and poverty groups as well as agricultural and rural development. Therefore, the Project is consistent with the priority on Japanese assistance policy.

5.1.2 Needs of Beneficiaries and Target Group

(1) Beneficiaries

It is defined that the beneficiaries are farming households in Nyaung Oo, Myingyan and Magway TS of CDZ. The income of the farming household in CDZ is not stable due to relying on rain-fed agriculture in an erratic rain environment. As a result, it is perceived as one of the poverty prone areas in the country. Therefore, there has been a great demand in the beneficiaries for technologies addressing stabilized and sustainable agricultural production.

(2) Target Group

It is defined that TG is staff of three (3) DAR farms and three (3) DOA offices in Nyaung Oo, Myingyan and Magway TS. The Project activities include the three major objectives of MoALI, namely (i) production and provision of high-yield quality seed, (ii) provision of training and education and (iii) research and development activities. Therefore, it is considered that the Project meets needs of TG.

5.1.3 Methodology

The Project is designed to establish water-saving agricultural technology and an extension service mechanism for the achievement of Overall Goal. Towards this objective, the Project adopted the following three approaches to continuously disseminate Project effects to the beneficiaries.

<Improvement of existing technology>: The Project tries to establish water-saving technology by improving existing agricultural technologies in the target area without introducing or developing new technologies.

<Following of existing extension system>: The Project conducts FFS following an extension service which has been practiced by DOA TS offices.

<Study of CDZ agro-environmental conditions>: The target area was selected based on different conditions such as (i) rainfall amount, distribution and pattern, (ii) suitable crops and varieties and (iii) cropping patterns.

The methodology adopted by the Project as a means to achieve Overall Goal (stabilization of agricultural income in CDZ) is considered appropriate judging from above-mentioned points.

5.2 Effectiveness

Effectiveness of the Project is “high”.

5.2.1 Expectation of Achievement of Project Purpose

Taking into consideration fulfillment of each indicator, it is likely that the Project Purpose will be attained by the end of the Project. The expectation of achievement of each indicator is described in Table 5.1.

Table 5.1 Expectation of Achievement of Project Purpose

Project Purpose: Water-saving agriculture technologies that are adapted to CDZ are established.		
Indicators	Prospect	Expectancy of Achievement
1. The water-saving agricultural technology developed in this project are introduced by the 15% farmer in Project Site and carried out more than 1 cropping seasons.	To be achieved	As already indicated, 15 % of farmers set at 11,774 households. 4,605 have been covered (39% of the target) and another 7,169 will be covered in the remaining period (2,390 households per year) through FFS, FD and seed exchange mechanism.
2. In Project Site, crop yields increased 10% at the farmers who used the water-saving agricultural technology developed in this project.	To be achieved	The average yield of each target crop (kg/acre) in Project sites in 2015 has already increased over the target yield. However, it should monitor crop yields every year due to erratic rainfall in the target area.
3. In Project Site, 60% of farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.	To be achieved	As already indicated, 91% of the interviewed farmers in 2014 and 2015 affirmed that the technologies disseminated through FFS were effective. The continued efforts of the Project may keep positive response of the farmers in the remaining period.

5.2.2 Logical Sequence between Outputs and Project Purpose

Logical sequence between Outputs and Project Purpose is secured and they are logically connected as shown in Figure 5.1.

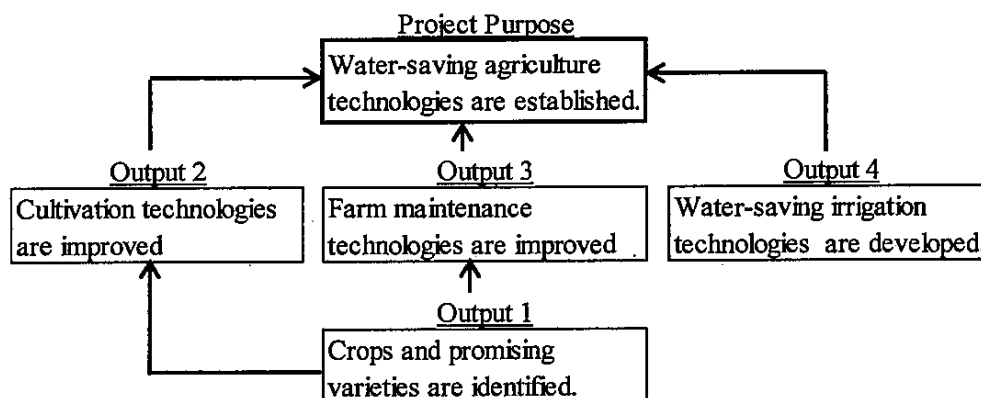


Figure 5.1 Logical Connections of Outputs with Project Purpose.

5.2.3 Important Assumption from Outputs to Project Purpose

The situation of fulfillment of Important Assumption is described in the Table 5.2.

Table 5.2 Situation of Fulfilment of Important Assumption for Project Purpose

Important Assumption	Situation of Fulfilment
No severe outbreak of diseases and pest	They are still effective and highly likely to be met except for erratic weather condition.
No extreme weather anomalies that obstruct farming and irrigation	
No surge of costs for seeds, production materials, and small-scale irrigation	
No reduction in the development budgets of DAR and DOA	

In 2014, the annual rainfalls in the target area were close to the lowest in the last decade, which may arguably decrease the yield.

5.2.4 Contributing and Hampering Factors for Project Purpose

(1) Contributing Factors

The followings are the major contributing factors in achieving Project Purpose.

- Leadership and active attitude of senior officials in the implementing agencies
- Awareness of importance of upland crops, necessity of seed-multiplication and distribution system
- Enthusiasm and disciplined (time consciousness) C/Ps and TG
- Transfer of technical C/P from Soil Science Section, Soil Science, Water Utilization and Agricultural Engineering Division, headquarters of DAR to Dryland Crop Research Centre in Nyaung Oo for production of Output 4
- Good collaboration and cooperation between DAR and DOA through FD and FFS
- Highly motivated CFs and NFs

(2) Hampering Factors

The followings are the major hampering factors in achieving Project Purpose.

- Less attention of national agricultural policy on upland crops compared with rice sector
- Frequent transfer of trained C/Ps and TGs
- Insufficient means of transport and travel allowances for extension staff
- No full-time C/Ps and TGs

5.3 Efficiency

Efficiency of the Project is “high”.

5.3.1 Expectancy of Achieving of Outputs

The Activities are appropriately set to produce respective Outputs. Recognizing the needs of beneficiaries from the baseline survey, the Project has conducted seed multiplication and distribution of target varieties to CFs, although these were not included in Activities for Output 1. This activity contributes greatly to achieve Project Purpose and also serves as entry-point of FFS to attract farmers.

The expectation of achievement of Outputs is described in Table 5.3.

Table 5.3 Expectation of Achievement of Outputs

Outputs	Prospect	Expectancy of Achieving
Output 1: New and/or conventional crops and promising varieties that are adaptable to CDZ are identified	To be completed	The recommended crops and promising varieties below were endorsed in the third JCC meeting. (1) Groundnut: Sinpadaethar 11 and Sinpadaethar 6 (2) Sesame: Sinyadanar 3 (3) Pigeon Pea: Shwe dinga and Yezin 10 (4) Greengram: Yezin 14 At the time of Joint Mid-term Review, achievement level of each indicator for Output 1 is stated below. Indicator 1-1: Completed Indicator 1-2: Progressing as scheduled Indicator 1-3: Completed Indicator 1-4: Progressing as scheduled
Output 2: Cultivation technologies are improved so that these can match the environments of CDZ.	To be completed	The distribution of rhizobium for cultivation technologies was endorsed as a part of rolling plan in the third JCC meeting. At the time of Joint Mid-term Review, achievement level of each indicator for Output 2 is stated below. Indicator 2-1: Mostly Completed Indicator 2-2: Mostly Completed Indicator 2-3: Progressing as scheduled Indicator 2-4: Progressing as scheduled Indicator 2-5: Progressing as scheduled
Output 3: Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.	To be completed	The distribution of seedlings of <i>Gliricidia</i> for soil maintenance technologies was endorsed as a part of rolling plan in the third JCC meeting. At the time of Joint Mid-term Review, achievement level of each indicator for Output 3 is stated below. Indicator 3-1: Mostly Completed Indicator 3-2: Completed Indicator 3-3: Mostly Completed Indicator 3-4: Progressing as scheduled

		Indicator 3-5: Progressing as scheduled Indicator 3-6: Progressing as scheduled
Output 4: Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.	To be completed	The developed technologies (water-harvesting and water-saving) and extension mechanism were endorsed as a part of rolling plan in the third JCC meeting. At the time of Joint Mid-term Review, achievement level of each indicator for Output 4 is stated below. Indicator 4-1: Completed Indicator 4-2: Mostly Completed Indicator 4-3: Progressing as scheduled The combined methods for water-saving cultivation and water-saving irrigation technologies are expected to be identified in demonstration plots.

5.3.2 Important Assumption from Activities to Outputs

There is no Important Assumption established for Outputs in PDM version 1.

5.3.3 Implementation Process

Implementation process has been generally efficient and satisfactory except for delay in administrative procedures at the beginning of the Project.

- The JCC meeting has been effectively organized three (3) times before the Joint Mid-term Review and made important decisions with collaboration of implementation agencies. However, frequent changes of JCC chairperson and members have been observed.
- DAR Project Manager, DAR coordinator C/P and DOA coordinator C/P have not been changed and also the two coordinators have always participated in QMM in Nyaung Oo. These facts have contributed to smooth communication between the headquarters and the field offices.
- The Project monitoring has been conducted periodically and the annual end-line survey has been conducted by the Myanmar side. The monitoring and survey results have been compiled and distributed to the Project stakeholders through monthly reports, quarterly monitoring reports, biannual reports and annual report.
- The communication among the Project stakeholders has been well shared through weekly meeting, MMM, QMM, kick-off meeting and follow-up meeting as well as *ad-hoc* meetings among the concerned Project stakeholders.
- Technology transfer and capacity building for C/Ps and TGs have been sufficiently conducted through training courses (e.g. monthly training in 2014 and MMM in 2015), workshops, work meetings and OJT. For training of CFs and NFs, FFS has been organized in a well-coordinated manner.

5.3.4 Inputs Delivery and Utilization

Inputs from both Myanmar and Japanese sides have been generally appropriate in terms of quantity, quality and timeliness to contribute to planned activities. Activities have utilized local resources including expertise, knowledge and information of the implementing agencies. The provided equipment and renovated / rehabilitated infrastructure have been generally well managed and utilized

for implementation of the Project activities.

5.4 Impact

Impact of the Project is “medium”

5.4.1 Expectancy of Achieving Overall Goal

The expectancy of achievement level of Overall Goal is measured by the degree of fulfillment of the established indicators after 5 years from the end of the Project.

Perspective of accomplishment of Overall Goal is presented in Table 5.4.

Table 5.4 Perspective of Accomplishment of Overall Goal

Overall Goal: In CDZ (especially the non-irrigated areas where upland farming is a main form of agriculture), an agricultural income is stabilized as a result of the spread of water-saving agricultural technologies which are suitable to CDZ*.		
Indicators	Prospect	Expectancy of Achievement
1. After 5 years from the end of this project, the number of farmers who introduced and continued to use water-saving agricultural technologies developed in this project more than 1 cropping seasons, increased 5%.	Difficult to be achieved	It is prospected that Overall Goal is difficult to be achieved. The geographic coverage of Overall Goal is too large for five (5) years compared with the target area.
2. For 5 years after the end of this project, the average agricultural income of the farmers who introduced the water-saving agricultural technology developed in this project continuously exceeds.		

*Overall Goal Area is defined for the twenty seven (27) townships in CDZ, including the target area (three townships).

The fact above indicates there is a gap between Project Purpose and Overall Goal (on time-frame and geographic coverage). Therefore, it may be necessary to consider and prepare measures in the second half of the Project period in order to achieve Overall Goal and also to collect data on the two (2) indicators.

5.4.2 Important Assumption from Project Purpose to Overall Goal

The situation of fulfillment of Important Assumption is described in the Table 5.5.

Table 5.5 Situation of Fulfillment of Important Assumption for Overall Goal

Important Assumption	Situation of Fulfilment
Continued support extended by the government organizations including ID*.	They are still effective and highly likely to be met.
Cooperation of DAR and DOA is carried out smoothly	

* Department of Irrigation (ID) and Water Resources Utilization Department (WRUD) were merged into Irrigation and Water Utilization Management Department (IWUMD) in 2016.

5.4.3 Positive and Negative Impacts

Positive impacts have been observed in the beneficiaries, particularly of CFs and NFs through FFS and demonstration plots with both water-harvesting and water-saving technologies, who have increased agriculture income by applying the agriculture technologies. Examples of positive impacts are described in 4.4 Achievement and Progress of Outputs. Some farmers introduced water-harvesting and water-saving technologies from CFs farms and produced horticultural crops such as tomato.

On the other hand, no negative impacts have been found by the time of the Joint Mid-term Review.

5.4.4 Positive and Negative Unexpected Effects

(1) Positive Unexpected Effects

- Collaboration with Australian Centre for International Agricultural Research (ACIAR) was made in selection of target varieties and procurement of rhizobium for seed multiplication and agriculture extension services (FFS).
- The Institute for the Development of Agricultural Cooperation in Asia (IDACA) in Wundwin TS of CDZ conducted study tours to the Project and some participants imitated eight (8) small ponds in their fields.
- In respect to Myanmar visitors for January 2014-April 2016, out of 171 missions and visitors (955 persons in total), 24 visitors (742 persons in total) have visited the Project for monitoring, site visits, field trip and media tour. Notably H.E. Dr. Aung Thu, Union Minister of MoALI, Dr. Ye Tint Tun, Director General of DOA and Dr. Htun Shwe, Director of DAR visited on April 18, 2016.

(2) Negative Unexpected Effects

There are no negative unexpected effects observed before the time of the Joint Mid-term Review. There are no widening gaps have been found in gender, ethnicity, or classes, either positive or negative before the time of the Joint Mid-term Review.

5.5 Sustainability

Sustainability of the Project is “medium high”

5.5.1 Policy and Administration Aspects: “medium high”

The Project approach has been consistent with the agricultural development plan and is in line with the second five-year plan (2016/17 to 2020/21) under the 20-year long-term National Comprehensive Development Plan (NCDP) of the Government of Myanmar. However, it is still difficult to prospect whether or not the national agricultural policy turns to pay higher attention to upland crops. Therefore, policy and administrative sustainability is prospected to be “medium high”.

5.5.2 Organizational and Institutional Aspects: “medium high”

The Union Minister of MoALI and high-ranking officials of DOA and DAR as well as the three (3) TS managers in Myingyan District visited the Project sites. These examples indicate their concerns on the Project activities and the commitments of the Project implementation. The implementation agencies may replicate the applied technologies here to other parts of CDZ with less constraint since the target area includes diversity of agro-environmental conditions in CDZ. Consequently, organizational and institutional sustainability of the Project is presumed to be “medium high”.

5.5.3 Financial Aspects : “medium”

As indicated in 4.1.1 Inputs from Myanmar Side, MoALI has made efforts to provide recurrent expenditures with implementation agencies for the Project activities during the first half of the Project period. It is found that means of transport and travel allowances for extension staff are limited. The

baseline survey and annual end-line survey were conducted by the Myanmar side. Judging from the budget allocation, financial sustainability of the Project is considered “medium”.

5.5.4 Technical Aspects: “high”

The technologies adopted by the Project are not completely new to C/Ps and TGs since the Project has improved some existing technologies in CDZ and some introduced ones to enhance farmers acceptance. Also, the extension mechanism adopted by the Project is familiar with C/Ps and TGs, because it employs the existing extension mechanism (FFS) of DOA. To this end, technical sustainability of the Project is assumed to be “high”.

5.6 Conclusion

The Team confirmed that the Project has made steady progress and has been on track to achieve the Project Purpose. The Team also confirmed that the Project has greatly contributed to the capacity development of C/Ps, TGs and CFs through provision of trainings and FFS. They are enthusiastic and highly motivated to implement the Project activities. The equipment and facilities have generally well utilized and maintained. The tangible impact has been seen on CFs and NFs, since their agriculture incomes have been increasing as a result of application of the improved technologies. It should be noted that MoALI (DOA/DAR headquarters and their field offices) has shown its interests in the upland crops and the Project approach.

For the achievement of Overall Goal (stabilization of agricultural income) after five (5) years from the end of the Project, both sides are expected to develop practical strategy and pave the way in the remaining period of the Project in order for the Myanmar implementation agencies to disseminate the water-saving agriculture technology to other parts of CDZ.

Results of review by the five (5) evaluation criteria are summarized in Table 5.6.

Table 5.6 Summary of the Review Results

Criteria	Evaluation	Summary
Relevance	High	The Project has been responding to needs of TGs/beneficiaries and it coincides with policies of Myanmar and Japan. There are no factors to lower relevance of the Project.
Effectiveness	High	Logical sequence between Outputs and Project Purpose is secured and logically connected. Project Purpose is predicted to be achieved.
Efficiency	High	Expectancy of achieving Outputs is high. Implementation process is systematic and cost-performance is high.
Impact	Medium	The tangible impact is observed on CFs, NFs and OFs. Overall Goal is unlikely to be achieved due to a gap between Project Purpose and Overall Goal. There are no negative impact and unexpected effects identified at the time of Joint Mid-term Review.
Sustainability	Medium High	Technical sustainability is “high”. Policy and administrative sustainability as well as organizational and institutional sustainability are “medium high”. Financial sustainability is “medium”.

* Ranking according to the five-grade evaluation, High, Medium High, Medium, Medium Low and Low.

6. Recommendations

Based on results of the Joint Mid-term Review, the Team makes following recommendations.

6.1 Modification of PDM and PO

The Team recommends modifying the current version of PDM (ver.1) and proposing revised PDM (ver. 2) shown in Appendix 9. Comparison chart of PDM ver.1 and ver.2 (Draft) is shown in Appendix 9.

6.2 Continuation of Seed Production in the Project

The Project has conducted seed production of selected crops and superior varieties for further verification tests. Since seed supply of upland crops is insufficient in Myanmar, the Project has produced the necessary seed for the target area.

The Team confirmed that the seed production would be necessary to achieve the Project Purpose during the second half of the Project period.

6.3 Transfer of the Seed Production Activities to DAR and DOA

For achieving the Overall Goal, the seed production activities are expected to be conducted by DAR and DOA, and continuously implemented on their own initiative after the Project completion. DAR and DOA are expected to contribute to establishment of sustainable seed production system during the second half of the Project period. In addition, for smooth taking over of the seed production activities, it is recommended necessary budget be allocated by DAR and DOA for those activities in the 2018/19 fiscal year's budget and afterward.

6.4 Promotion of Stronger Linkage between DAR and DOA

Good practices of collaboration and cooperation between DAR and DOA such as the FD for technique transfer to farmers have been observed, in which DAR staff prepared the demonstration farm and DOA staff mobilized neighboring farmers into the FD. Such collaboration and cooperation between DAR and DOA is taken as one of the important factors which has led and will lead successful development of agricultural technology in accordance with local conditions.

The Team strongly recommends that the collaboration and cooperation between DAR and DOA such as FD shall be expanded to the areas other than the target area under authorization and encouragement of responsible officials of MoALI particularly of DAR and DOA. Monthly meeting or some other cooperative attempts between DAR and DOA in TS level and district level might promote future development, if appropriate inviting local government personnel.

6.5 Assignment of the TS Managers to as C/Ps

Within the target area, DOA TS managers in Nyaung Oo and Myingyan have not been assigned as C/Ps but in Magway. For the extension work during the second half of the Project period, the Team requests the Myanmar side to additionally assign DOA TS managers in Nyaung Oo and Myingyan to as C/Ps and let them officially and cohesively participate in the Project activities for more fruitful achievements.

6.6 Consideration of the Post-Project Strategy for Sustainable Development

In the second half of the Project, the Myanmar side is expected to take initiative more on application research and extension activities of water-saving agricultural technology. It can contribute to assure the sustainability after the completion of the Project.

So far, the Project covers most of the cost for procurement/distribution of materials and equipment such as seed, rhizobium, *Gliricidia* seedlings, and water-harvesting/water-saving facilities. Since these activities are expected to mainstream in CDZ, especially in the target area after the Project completion, the Team recommends that the Myanmar side (government, farmers and private sector) increase their contributions (e.g. budget, personnel, materials and equipment) gradually during the second half of the Project period. Therefore, the Post-Project Strategy (i.e. a plan of input: necessary budget, personnel, materials and equipment) should be formulated in cooperation with Japanese experts until middle of 2017 and implemented preliminarily in the final year of the Project period by Myanmar side's initiative. The Team requests responsible officials of MoALI to implement the Post-Project Strategy.

7. Lessons Learned

7.1 Provision of Materials

Needless to say, when donors provide necessary materials to beneficiaries, in parallel, the donors should provide appropriate technical support to encourage willingness and to ensure acceptance of farmers.

The Project provides seed with necessary technical support in FD and FFS. It was observed that the beneficiaries of the Project could apply what they learned through the Project activities into their fields with support by DOA extension workers.

7.2 Seed Exchange Mechanism

The Project has included a unique seed exchange mechanism in FFS for increasing farmers' self-effort attitudes.

In the seed exchange mechanism, the first, the Project provides certified seed (CS) to the CFs and NFs through FFS together with transferring water-saving technologies so as to multiply the seed from CS. Then, after harvesting seed, CFs and NFs are obliged to share a part of produced seed with ordinary farmers. Such kind of seed exchange mechanism would enable farmer-to-farmer diffusion of quality seed and related technologies, and might contribute to sustainable seed production.

7.3 Strengthening of Collaboration among Concerned Institutes

In the Project, some good practices for collaborating between DAR and DOA are observed, for example, in the implementation of FD and FFS as shown in 6.4. The Project has smoothed cooperation developed between DAR and DOA that are separate institutions with different responsibilities, even though DAR has been split from former MAS (present DOA) and they have a family-like relationship. When a project is implemented and prospected to involve several concerned organizations, appropriate opportunities would be offered in order to strengthen collaboration among them.

Appendix 1 Schedule for Joint Mid-term Review

As of June 23, 2016

			Japanese Mid-term Review Team					Myanmar Mid-term Review Team			
			Mr. Suzuki (Leader) *Jun 17-Jun 25	Mr. Kobayashi (Deputy Leader) *Jun 13-Jun 18	Mr. Misawa (Water Saving Irrigation)	Ms. Oshiro (Cooperation Planning)	Dr. Kawase (Research Cooperation)	Dr. Mimida (Integrated Pest Management)	Dr. Hamada (Evaluation Analysis)	Dr. Nyi Nyi (Leader)	Dr. Pau Sian Kam (Member)
1	Jun 5	Sun						Tokyo to Yangon			
2	Jun 6	Mon						Meeting at JICA Myanmar Office Move YGN to Nay Pyi Taw (NPT) by			
3	Jun 7	Tue						Brief with two Myanmar Evaluators Meeting with DAR and DOA Project Manager Move to Nyaung Oo from NPT by car			
4	Jun 8	Wed						Meeting with the Project expert team (Only for Hamada) Meeting with DAR/DOA staffs in Nyaung Oo Meeting with four Contact Farmers Site Visit (Nyaung Oo Research Farm) 1. Seed Production (Groundnut): OP1 2. Seed Production (Pigeon pea): OP1 3. Sprinkler simple type: OP4 (Water saving) Site Visit (Contact Farmer Field) 1. Pond: OP4 (Water harvest)			
5	Jun 9	Thu						Day trip to Myingyan 1. Meeting with DAR/DOA in Myingyan 2. Site Visit in Myingyan			
6	Jun 10	Fri						Day trip to Magway 1. Meeting with DAR/DOA staff in Magway 2. Site Visit in DAR Magway			
7	Jun 11	Sat						Preparation for Field Survey Report			
8	Jun 12	Sun						Tokyo to NPT		Documentation Move to NPT to Nyaung Oo by car	
9	Jun 13	Mon	Meeting with JICA team (Mr. Kobayashi, Advisor; Mr. Yamazaki) Meeting with WSAT Chief Advisor Visit to YAU Project Visit to Seed Bank Courtesy call to DOA							Courtesy call upon DOA DG	
10	Jun 14	Tue	1st Joint Evaluation Meeting (incl: DAR Project Manager and C/P in DAR for coordination) Courtesy call to JCC chairman (DOP Director General) and Project Director (Director General, DAR)								
11	Jun 15	Wed	Move to Nyaung Oo from NPT by car Meeting with the Project expert team Site visit at DAR Office in Nyaung Oo Site visit at Contact Farmers Field Site visit at FFS							Move to Nyaung Oo from NPT by car Visit at CFs Farm and FFS	
12	Jun 16	Thu	Meeting with the Project expert team Move to Myingyan from Nyaung Oo Site visit at DAR Myingyan							Move to Myingyan from Nyaung Oo Site visit at DAR Myingyan	
13	Jun 17	Fri	Tokyo to Yangon		Day trip to Magway (Dr. Kawase, Mr. Misawa, Dr. Mimida) Documentation (Mr. Kobayashi, Ms. Oshiro, Dr. Hamada) Discussion on Joint Mid-term Review Report (ch.1- ch.5)					Discussion on Joint Mid-term Review Report (ch.1- ch.5) with the Japanese evaluators.	
14	Jun 18	Sat	Yangon to Nyaung Oo by flight / Join the		Meeting in the Japanese side 2nd Joint Evaluation Meeting					2nd Joint Evaluation Meeting	
15	Jun 19	Sun	Meeting with the Team and Project experts Documentation								
16	Jun 20	Mon	Presentation of the Report (draft final) to the Project team at DAR Nyaung Oo Move to NPT by car								
17	Jun 21	Tue	Finalize the Joint Mid-term Review Report and M/M								
18	Jun 22	Wed	3rd Joint Evaluation Meeting (Presentation to the DG), at DOA Signature the Report with Japanese side and Myanmar side.								
19	Jun 23	Thu	Documentation								
20	Jun 24	Fri	4th JCC meeting at DAR headquarters, Yezin Move to Yangon from NPT Yangon to Tokyo							4th JCC meeting at DAR headquarters, Yezin	
21	Jun 25	Sat	Arrival at Tokyo								

Appendix 2 List of Major Survey Interviewees

1. Japanese Side

SN	Name	Affiliation
1	Dr. Naoya Fujimoto	Chief Advisor/ Dry Land Crop Cultivation
2	Mr. Katsuhiro Mizutani	Water Saving Irrigation
3	Ms. Yu Kikuchi	Integrated Pest Management
4	Mr. Masaru Yamada	Project Coordinator
5	Mr. Jun Yamazaki	Representative, JICA Myanmar Office

2. Myanmar Side

SN	Name	Position
1	Dr. Nyi Nyi	Leader of Myanmar Mid-term Review Team
2	Dr. Pau Sian Kam	Member of Myanmar Mid-term Review Team
3	Dr. Nwe Nwe Yin	DAR Project Manager
4	U Thura Soe	DOA Project Manager
5	Dr. Khin Mar Htay	C/P for Coordination, DAR
6	Daw Nilar Aung	C/P for Coordination, DOA
7	Daw Khin Htay Yi	DOA, Township manager, Nyaung Oo
8	U Kyaw Phone Line	DOA, Nyaung Oo Township, C/P
9	Daw Mar Mar Cho	DAR, Farm Manager in Nyaung Oo
10	U Win Soe	DAR, C/P, Nyaung Oo
11	Daw Myint Thida	DAR, C/P, Nyaung Oo
12	Daw Thu Zar Aung	DAR, C/P, Nyaung Oo
13	Daw Tin Mar Than	DAR, C/P, Farm Manager in Myingyan
14	Daw San San Myint	DOA, Township Manager in Myingyan
15	U Nay Myo Aung	DOA Extension Staff in Myingyan
16	Daw Moe Moe Zaw	DAR staff in Myingyan
17	U Myo Tun Tun	DOA staff in Myingyan
18	U Myo Thein	DOA Deputy Staff Officer in Magway
19	Daw Hla Hla Win	DAR Research Officer in Magway
20	Daw Win Win Mar	DAR Senior Research Assistant in Magway
21	Daw Than Than Nwe	DAR Senior Research Assistant in Magway
22	U Moe Min Aung	DOA Deputy Assistant Staff Officer
23	U Naing Kyi Win	DAR Director General (Project Director)
24	U Kyaw Min Oo	DOP Director General (JCC chairperson)

Note:

DOP Department of Planning

DAR Department of Agriculture Research

DOA Department of Agriculture

3. Other

SN	Name	Position
1	U Lan Bo	Contact Farmer in Nyaung Oo
2	U Yang Aung Soe	Contact Farmer in Nyaung Oo
3	U Shwe Toe	Contact Farmer in Nyaung Oo
4	U Hla Cho	Contact Farmer in Nyaung Oo

Appendix 3

The Republic of the Union of Myanmar
Project for Development of Water Saving Agriculture Technology in the Central Dry Zone

Evaluation Grid

Criteria	Evaluation Items	Confirmation Items/ Methods	Necessary information and Data	Information Sources	Data Collection and Methods	Remarks		
1. Implementation Process								
Implementation Mechanism	How are the Project activities implementing?	Way of Project Implementation	Information on Division of Labor of Stakeholders	Project Experts, Myanmar Implementation Agencies	Literature Survey, Interview Survey			
	Is it clear and appropriate in division of labor and responsibility of Project Implementation Agencies?	Appropriateness of Division of Labor in Myanmar Implementation Agencies						
	Are Myanmar Implementation Agencies fulfilling their expected responsibilities?	Degree of Participation of Myanmar Implementation Agencies	Information of Participation					
	Do Myanmar Implementation Agencies make cooperation and collaboration each other?	Degree of Cooperation and collaboration	Examples of Collaboration					
	How many JCC meetings have organized by the time of Mid-Term review? What were the major agenda?	Frequency and Major Agenda	Records of JCC Meeting				Project Experts	Literature Survey
	How decisions are made to implement the Project?	Existence of Problems on Decision-making	Examples of Problems				Project Experts Myanmar Implementation Agencies	Questionnaire Survey, Interview Survey
Schedule	Has each activity been carried out as planned? (Implementation Schedule)	Comparison of Implementation Schedule Plan and Actual Progress	PO, Data on Activities	Project Experts	Project-provided Documents, Interview Survey			
Monitoring	What means have been utilized for monitoring?	—	Monitoring Report	Project Experts, Myanmar Implementation Agencies				
	Are there any problems for the Project monitoring?	Existence of Problems on Monitoring						
Ownership	Is budge of Myanmar side adequately disbursed?	Data on Budge Disbursements and Timeliness of Budge Disbursements	Amount and Time of Budget Disbursements	Project Experts, Myanmar Implementation Agencies	Questionnaire Survey, Interview Survey			
	Do Myanmar Implementation Agencies participate positively in the Project activities? (including assignment of C/P)	Degree of Participation in Activities	Information of Participation					
	Are there any differences in concept of the Project	Difference of Concept on	Recognition of Project					

Criteria	Evaluation Items	Confirmation Items/Methods	Necessary information and Data	Information Sources	Data Collection and Methods	Remarks	
	implementation between Japan and Myanmar?	Project Implementation	Activities				
Public Relations	For public relations for Myanmar, what activities are conducted?	—	—	C/P, TG, Project Experts	Interview Survey		
	For public relations for Japan, what activities are conducted?	—	—				
Communication	What tools are utilized for communication between Japanese side and Myanmar side?	—	—		Examples of Problems	Questionnaire Survey, Interview Survey	
	Are there any problems in communication between Japanese side and Myanmar side?	Existence of Communication Problems					
Technology Transfer	How has technology transfer been conducted to C/P and TG?	Degree of Understanding of C/P, and TG	Data on Degree of Understanding of C/P and TG	C/P, TG, Project Experts	Project-provided Document, Interview Survey		
	Is way of technology transfer effective?						
Other Problems on Management	For project management, are there other problems and difficulties?	Existence of Management Problems	—	Japan & Myanmar Stakeholders			
2. Input Delivery							
Japanese Side	What inputs have been provided from Japanese side? (quantity, quality, timeliness)	—	Human Resources	Project Experts, Myanmar Implementation Agencies	Project-provided Document, Interview Survey, Observations		
		—	Equipment				
		—	Training				
		—	Local cost				
Myanmar Side	What inputs have been provided from Myanmar side? (quantity, quality, timeliness)	—	Personnel (C/P)				
		—	Facilities, etc.				
		—	Local Cost				
Other problems	Are there any problems in delivering Inputs?	Existence of Input Problems	—				
3. Implementation of Activities							
Progress	Has each Activities been progressing smoothly?	—	Results of each Activity	Project Experts, Myanmar Implementation Agencies	Project-provided Document, Interview Survey	—	
Hampering Factors	Are there any hampering factors in implementing Activities?	—	Existence of Factors			—	
Contributing Factors	Are there any contributing factors in implementing Activities?	—				—	
Project Products	What products have been provided as a result of implementation of Activities?	—	List of Project Products			—	
4. Achievement of Outputs							
Degree of	Have Outputs been achieved up to target level?	Degree of Fulfillment of	Degree of fulfillment of	Project Experts, Myanmar	Project-provided	—	

Criteria	Evaluation Items	Confirmation Items/ Methods	Necessary information and Data	Information Sources	Data Collection and Methods	Remarks
achievement of Outputs		Indicators	Indicators and Prospect	Implementation Agencies	Document, Interview Survey	
Hampering Factor	Are there any hampering factors in producing Outputs?	--	Existence of Factors			--
Contributing Factor	Are there any contributing factors in producing Outputs?	--				--
5. Achievement of Project Purpose						
Degree of achievement of Project Purpose	Has Project Purpose been achieved up to target level?	Degree of Fulfillment of Indicators	Degree of Fulfillment of Indicators and Prospect	Project Experts, Myanmar Implementation Agencies	Project-provided Document, Interview Survey	--
Hampering Factor	Are there any hampering factors in achieving Project Purpose?	--	Existence of Factors			--
Contributing Factor	Are there any contributing factors in achieving Project Purpose?	--				--
6. Evaluation from Relevance						
Appropriateness of selection	Are there significant changes on needs of Target Group?	Confirmation on Changes of Needs	Needs of TG	Baseline Survey, TG Project Experts, Myanmar Implementation Agencies	Interview Survey Questionnaire Survey, Interview Survey	--
	Are there significant changes on needs of Myanmar Implementation Agencies?		Needs of Implementation Agencies			--
	Has Target Area been selected appropriately?		Changes on Selection Reasons			Recognition of Stakeholder
Consistency with policy	Are there significant changes on Agriculture Development Policy of Government of Myanmar?	Confirmation of Agriculture Development Plan	Agriculture Development Plan	Project Experts, Myanmar Implementation Agencies	Literature Survey Interview Survey	--
	Are there significant changes on Japanese assistance policy for Myanmar?	Confirmation of Assistance Policy	Assistance Policy			Documents of Assistance Policy
Appropriateness as means	Is implementation of the Project appropriate as strategy or approach in order to address development issues of Myanmar?	Importance · Priority	Agriculture Development Plan	Project Experts, Myanmar Implementation Agencies	Literature Survey Interview Survey Literature Survey, Interview Survey	--
	Is selection of Target Area appropriate to achieve development strategy?	Comparison with Other Areas	Information of Comparative Advantages			--
	Is selection of Target Group appropriate to achieve development strategy?	Comparison with Other Groups				--
	Are there Japanese comparative advantages in providing assistance?	Existence of Comparative Advantage of Japanese Assistance				--
Other	Has the Project got significant changes in political, social,	Existence of Changes	Recognition of		Questionnaire	---

Criteria	Evaluation Items	Confirmation Items/ Methods	Necessary information and Data	Information Sources	Data Collection and Methods	Remarks
	economic, and natural environment after Project start?		Stakeholder		Survey, Interview Survey	
7. Evaluation from Effectiveness						
Perspective of Achievement of Project Purpose	Will Project Purpose be achieved? (Prospective)	Analytical Results on Progress	Prospect on Fulfillment of Indicators	Project Stakeholders	Project-provided Document	--
Logical relations between Outputs and Project Purpose	Outputs are set up logically to attain Project Purpose?	Existence of Cause-effect Relations	Documents of Project Design	PDM, etc	Literature Survey, Interview Survey	--
	Are Important Assumptions from Outputs to Project Purpose still effective at present? Are they highly likely to be met?	Possibility of Meeting of Important Assumptions	Concrete Examples and Prospect	Project Experts, Myanmar Implementation Agencies	Interview Survey, Observations	--
Requirements of Attainment of Project Purpose	Are there any factors and conditions necessary to attain Project purpose?	Existence of Necessity	Prospect		Questionnaire Survey, Interview Survey	--
8. Evaluation from Efficiency						
Production of Outputs	Have Outputs been achieved up to target level?	Analytical Results of Progress	Prospect on Fulfillment of Indicators	Project Stakeholders	Project-provided Document	--
Inputs	Are Inputs set up sufficiently to attain Outputs? (quantity, quality and timelines)	Existence of Insufficient or Surplus Inputs	Data of Inputs	Project Experts, Myanmar Implementation Agencies	Interview Survey, Observations	--
	Is timing of Inputs delivery appropriate?	Existence of Inappropriate Timings of Inputs	Examples of Inappropriate Timeliness of Inputs			--
	Have equipment and materials provided been managed well?	Utilization and Situation of Management	Register, Manager and Rules			--
Activities	Are Activities set up sufficiently to attain Outputs? (fulfillment with necessary and sufficient condition)	Existence of Inappropriateness or Surplus Inputs	Records of Activities			--
	Is timing of Activities appropriate?	Existence of Inappropriate Timing of Inputs	Examples of Inappropriate Timeliness of Inputs			--
Cause-effect relations of Input and Outputs	Are Outputs set up logically to attain Project Purpose?	Existence of Cause-Effect Relations	PDM		Literature Survey, Interview Survey	--
	Are Important Assumptions from activities to Outputs are still effective at present? Are they highly likely to be met?	Possibility of Meeting of Important Assumptions	Concrete Example and Prospect			--

Criteria	Evaluation Items	Confirmation Items/ Methods	Necessary information and Data	Information Sources	Data Collection and Methods	Remarks
Cost Performance	Project Purpose and Outputs are matched with Inputs in terms of cost-performance?	Existence of Alternatives with Low Cost-performance	Alternatives with Low Cost-performance			--
	Is the Project relevant in terms of total cost even compared with other similar projects?	Existence of Alternatives with Higher Degree of Achievement	Alternatives with Higher Degree of Achievement		Interview Survey, Observations	--
9. Evaluation from Impact						
Prospect in achieving Overall Goal	Will Overall Goal be achieved? (Prospective)	Analytical Records of Progress	Prospect on fulfillment of Indicators	Project experts, Myanmar Implementation Agencies	Project-provided Document, Questionnaire Survey, Interview Survey	--
	Have efforts been made to attain Overall Goal?	Existence of Efforts	Concrete Example			--
	Are Important Assumptions from Project Purpose to Overall Goal are still effective at present? Are they highly likely to be met?	Existence of Factors	Prospect			--
Impact	Has Impact been prospected to influence to development plan by achieving Overall Goal?	Existence of Influence	Example of Influence			--
	Are direct influence and effects to the beneficiaries and Myanmar Implementation Agencies (CF&TG) anticipated?	Existence of Impact	Concrete Example			--
	Are indirect influence and effects to the beneficiaries and Myanmar Implementation Agencies (CF&TG) anticipated?					--
Cause-effect relations of Project Purpose and Overall Goal	Are there any gaps between Project Purpose and Overall Goal?	Existence of Logical Consequence	Documents of Project Design		Literature Survey, Interview Survey	--
	Are Important Assumptions are still effective at present? Are they highly likely to be met?	Possibility of Fulfillment of Important Assumptions	Concrete Example and Prospect			Interview Survey, Observations
Ripple Effects	Are positive ripple effects (Impact except for Overall Goal) to Myanmar side anticipated?	Existence of Ripple Effects	Examples of Positive Ripple Effects		Interview Survey, Observations	--
	Are negative ripple effects (Impact except for Overall Goal) to Myanmar side anticipated? (particularly gender, ethnics, culture, and environment)		Examples of Negative Ripple Effects			--
10. Evaluation from Sustainability						
Policy and Administrative aspects	Is continuation of policy support after the end of the Project anticipated?	Description of Development Plan	Development Plan and Strategy	Myanmar Implementation Agencies	Literature Survey, Interview Survey	--
	Are establishment of necessary laws and regulations after	Necessary laws and regulation	Law and Regulations			--

Criteria	Evaluation Items	Confirmation Items/Methods	Necessary information and Data	Information Sources	Data Collection and Methods	Remarks
	the end of the Project anticipated?					
	Is establishment of extension service system to continue the Project effects after the end of the Project anticipated?	Necessary Extension Services	Personnel Assignment, Implantation Structure and Commitment			
Institutional and Financial Aspects	Is organizational capacity to continue the Project effects after the end of the Project existed? (ownership)	Necessary Management Capacity				
	Are budget supports necessary to continue the Project effects after the end of the Project anticipated?	Prospect of Ensuring Necessary Budget	Commitment and Budget Perspective	Project experts, Myanmar Implementation Agencies	Interview Survey	—
Technical Aspect	Is sustainable extension service mechanism put in use in the Project implementation plan?	Establishment of Extension System after the End of Project	Concrete Examples			
	Are Knowledge and technologies transferred to Myanmar Implementation Agencies, CP and CFs taken root?	Technology Stability	Monitoring Results	Myanmar Implementation Agencies, TG, CFs		—
	Will Knowledge and technologies transferred to Myanmar Implementation Agencies, CP and CFs be disseminated?	Technical Level of CFs and Number of CPs				
Other	Any other factors which decrease sustainability of Project?	Existence of Influence from Social , Culture and Environment	Recognition of Stakeholders	Project experts, Myanmar Implementation Agencies	Questionnaire Survey, Interview Survey	—
Total Sustainability	Is Sustainability high or low judging from the above aspects as a whole?	—	—	—	—	—

-Over-

Appendix 4 PDM_Version1

Project Design Matrix (PDM)

Project Title: Project for Development of Water Saving Agriculture Technology in the Central Dry Zone
 Target Group: Dryland Crop Research Centre in Nyaung Oo, other DAR Experiment Farms and DOA Township Offices in the three townships

Duration: Five (5) years from November 2013
 Project Sites: DAR Experiment Farms and contact farmers' field selected from the three townships (Nyaung Oo, Magway, Myingyan) in the Central Dry Zone

Version 1, Date: 21 February 2015

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal In CDZ (especially the non-irrigated areas where upland farming is a main form of agriculture), an agricultural income is stabilized as a result of the spread of water-saving agricultural technologies which are suitable to CDZ.</p>	<p>1. After <u>5</u> years from the end of this project, the number of farmers who introduced and continued to use water-saving agricultural technologies developed in this project more than <u>1</u> cropping seasons, increased 5%.</p> <p>2. For <u>5</u> years after the end of this project, the average agricultural income of the farmers who introduced the water-saving agricultural technology developed in this project continuously exceeds.</p>	<p>- Annual reports by DOA Township Offices - Upland crop production data classified by TS - Weather statistics - Related study reports</p>	<p>1. Effective implementation of the extension services by DOA 2. Cultivation technologies developed in the Project are accepted by farmers including other than Pilot Site. 3. No extreme fall of market price of the main crops in CDZ 4. No drastic change on the policy related to rural development and poverty alleviation in Myanmar</p>
<p>Project Purpose Water-saving agriculture technologies that are adapted to CDZ are established.</p>	<p>1. The water-saving agricultural technology developed in this project are introduced by the <u>15%</u> farmer in Project Site and carried out more than <u>1</u> cropping seasons. 2. In Project Site, crop yields increased <u>10%</u>*1 at the farmers who used the water-saving agricultural technology developed in this project. 3. In Project Site, <u>60%</u> of Farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.</p>	<p>- Annual reports by DOA Township Offices - Annual reports by DAR Experiment Farms - Monitoring reports and others prepared by the project</p>	<p>1. Continued support extended by the government organizations including ID 2. Cooperation of DAR and DOA is carried out smoothly</p>
<p>Outputs 1. New and/or conventional crops and promising varieties that are adaptable to CDZ are identified.</p>	<p>1-1. Within a half year from beginning of the project, the baseline study is conducted and consumer needs for the local agriculture products are identified. 1-2. <u>10%</u> or more of the sampled farmers adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs. 1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the sampled farmers for such crops/varieties increases by <u>10%</u> or more.</p>	<p>- Study reports of Dryland Crop Research Centre - Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts</p>	<p>1. No severe outbreak of diseases and pest 2. No extreme weather anomalies that obstruct farming and irrigation 3. No surge of costs for seeds, production materials, and small-scale irrigation 4. No reduction in the development budgets of DAR and DOA</p>
<p>2. Cultivation technologies are improved so that these can match the environments of CDZ.</p>	<p>2-1. Cultivation technologies adapted to local conditions are established for the selected new and/or existing crops and their superior varieties, and these technologies are implemented 2 times in total (2 times per year) at DAR Experiment Farm. 2-2. Appropriate technical manual for cultivation technologies are prepared. 2-3. <u>30</u> or more persons of the extension agents who can apply the above manual and implement cultivation technologies are built up. 2-4. Verification test by applying the above manual is conducted <u>100</u> times or more (1 time or more per year) by the project at the contact farmer's field. 2-5. The cultivation that is applied with the above manual is implemented by 10% or more of the sampled farmers.</p>	<p>- Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts</p>	
<p>3. Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.</p>	<p>3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions of the project target area are identified. 3-2. The soil improvement technologies that are adapted to the local conditions are established. 3-3. Technical manual for the soil improvement technologies is prepared. 3-4. <u>30</u> or more persons of the extension agents who can apply the above manual and implement the soil improvement technologies are built up. 3-5. Verification test by applying the above manual is conducted <u>100</u> times or more (1 time or more per year) by the project at the contact farmers' field.</p>	<p>- Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts</p>	

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	3-6. The soil improvement that is applied with the above manual is implemented by 2% or more of the sampled farmers.		
4. Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.	4-1. The study report on water resources and water use by farmers at pilot sites is drafted. 4-2. Technical guideline and/or manual for the water-harvesting and water-saving irrigation technologies are prepared. 4-3. The recommendation for combined methods for water-saving cultivation and water-saving irrigation technologies is prepared.	- Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts	
Activities		Inputs	Pre-conditions
0. The baseline study is conducted.		Inputs from Myanmar	- Counterparts are arranged to implement this Project.
1-1 As part of the baseline study, a study on the needs of farmers for and local markets for crops and varieties of CDZ is conducted. 1-2 Pilot sites and contact farmers (CF) are selected in CDZ. 1-3 Based on results of the baseline study, potential crops and varieties are selected from those collected at international and domestic agriculture research institutes. 1-4 Varietal trials are conducted at Dryland Crop Research Centre in Nyaung Oo. 1-5 Adaptability tests are conducted both at DAR Experiment Farms and CF's fields.		a. Human Resources - Project Director, Project Managers - Counterpart Personnel - Members of JCC b. Facilities - Conference rooms for workshops and seminars - Office space for experts and support staff c. Equipment - Materials necessary for administrative work for the Project d. Project counterpart budget	
2-1 Based on the regional adaptability tests, cultivation technologies are tested and studied for localizing cultivation technologies. 2-2 Through trials at the CF's field, cultivation technologies adapted to local conditions are proved, and the cultivation manual is drafted. 2-3 Extension agents and CF are trained for cultivation technologies adapted to local conditions.		- Costs for communication and coordination, and administrative tasks related to the Project. - Daily allowances, accommodation and transportation costs of the project counterpart personnel during project implementation.	
3-1 As part of the baseline study, the soil study is conducted in the project sites from aspects of fertility and physical properties. 3-2 Testing for improving soil fertility and physical properties is conducted, and methods for the improvement are studied. 3-3 The methods for improving soil fertility and physical properties that are affordable to farmers (soil improvement technologies) are examined. 3-4 Through trials at the CF's fields, the methods for the soil improvement technologies that are adapted to the soil conditions are proved, and the soil improvement manual is drafted. 3-5 Extension agents and CF are trained for the soil improvement technologies that are adapted to local conditions.		Inputs from Japan a. Human Resources - Long-term Experts as the Project Chief Advisor (Dry land Crop Cultivation), Water-Saving Irrigation, Integrated Pest Management and Project Coordinator - Short-term Experts (Socio-economic Survey, Agro-environmental Survey, Horticulture, Seed valuation, Pest and Disease Control, Farmland conservation, Soil Analysis, Post-harvest Technology, etc..) - Project office staff personnel b. Short-term training opportunities for the project counterpart personnel in Japan and/or third countries c. Equipment - Vehicles - Equipment for laboratory and experimental fields - Machineries and equipment for pre-harvest to post-harvest - Computers, office equipment etc. d. Project operation costs Expenses for local activities.	
4-1 As part of the baseline study, water resources and water use by farmers are studied at pilot sites, and challenges are identified. 4-2 Water-harvesting technologies applicable to CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field. 4-3 Water-saving irrigation technologies applicable to farmer field in CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field. 4-4 Through the above verification tests, guideline and/or manual for water-harvesting technologies and water-saving irrigation technologies applicable to CDZ are drafted. 4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the pilot sites are recommended.			

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Foot Note

Table 1. Table 1. Yield for each target crop (kg/ acre)

Township	Crop	Before Project*1	After Project*2
Nyaung-U	Groundnut	292	321
	Pigeon pea	447	492
	Green gram	459	505
Myingyan	Groundnut	357	393
	Sesame	136	150
Magway	Groundnut	506	557
	Sesame	235	259

Table 2. Gross agricultural income from target variety per acre (Kyat/ care)

Township	Crop	Before Project*3	After Project*4
Nyaung-U	Groundnut	180,528	198,580
	Pigeon pea	241,120	265,232
	Green gram	341,541	375,695
Myingyan	Groundnut	220,687	242,755
	Sesame	208,613	229,474
Magway	Groundnut	312,794	344,074
	Sesame	360,471	396,518

Note: Note: *1 The township six-year average from 2007/8 to 2012/13. *2 10% increase from the before project. Otherwise the baseline survey data 2013/4. *3 the average yield on Table 1 multiplied by an average selling price obtained from the baseline survey and market price survey by the project. *4 10% increase from the before project.

Table.3 Target Area and Beneficiaries

Duration:	Five (5) years from November 2013 to November 2018
Target Area:	Nyaung-U, Myingyan and Magway townships
Beneficiaries:	78,492 farming households; Nyaung-U (25,713), Myingyan (32,607), Magway (20,172) as of 2005

Appendix 5 Inputs from Myanmar

1. Counterparts (C/P)

Sl. No.	Mr/Ms	Name	Task	Title	Institute	Township	Duty Station/ Division	Assigned Period
1	Dr.	Tin Htut		Permanent Secretary				2015.09.07 - Up-to-date
2	U	Hla Kyaw	JCC Chairperson	Director General	DOP	Naypyitaw	Headquarters	2013.11.08 - 2014.07.17
3	Dr.	Tin Htut	JCC Chairperson	Director General	DOP	Naypyitaw	Headquarters	2014.08.29 - 2016.02.20
4	U	Kyaw Min Oo	JCC Chairperson	Director General	DOP	Naypyitaw	Headquarters	2016.02.20 - Up-to-date
5	Dr.	Thein Lwin	Project Director	Director General	DAR	Yezin	Headquarters	2013.11.08 - 2014.09.12
6	Dr.	Ye Tint Tun	Project Director	Director General	DAR	Yezin	Headquarters	2015.05.15 - 2016.02.26
7	U	U Naing Kyi Win	Project Director	Director General	DAR	Yezin	Headquarters	2016.02.26 - Up-to-date
8	Dr.	Ye Tint Tun	JCC member	Acting Director General	DAR	Yezin	Headquarters	2014.09.15 - 2015.05.15
9	U	Kyaw Win	JCC member	Director General	DOA	Naypyitaw	Headquarters	2013.11.08 - 2015.05.02
10	U	Kyaw Shwe	JCC member	Director General	DOA	Naypyitaw	Headquarters	2015.05.02 - 2016.02.26
11	Dr.	Ye Tint Tun	JCC member	Director General	DOA	Naypyitaw	Headquarters	2016.02.26 - Up-to-date
12	U	Kyaw Myint Hlaing	JCC member	Director General	ID	Naypyitaw	Headquarters	2013.11.08 - 2016.02.20
13	U	Kyaw Myint Hlaing	JCC member	Director General	IWUMC	Naypyitaw	Headquarters	2016.02.20 - Up-to-date
14	U	Kyaw Min Oo	JCC member	Director General	WRUD	Naypyitaw	Headquarters	2015.01.16 - 2016.02.20
15	U	Kyaw Min Oo	JCC member	Deputy Director General	WRUD	Naypyitaw	Headquarters	2013.11.08 - 2015.01.16
16	Dr.	Aung Kyi	JCC member	Deputy Director General	DAR	Yezin	Headquarters	2013.11.08 - 2014.03.14
17	Dr.	Ye Tint Tun	JCC member	Deputy Director General	DAR	Yezin	Headquarters	2014.03.14 - 2014.09.15
18	Daw	Tin Tin Myint	JCC member	Deputy Director General	DAR	Yezin	Headquarters	2015.06.08 - Up-to-date
19	U	Naing Kyi Win	JCC member	Deputy Director General	DOA	Naypyitaw	Headquarters	2013.11.08 - 2016.02.26
20	U	Aye Tun	JCC member	Deputy Director General	DOA	Naypyitaw	Headquarters	2013.11.08 - 2015.04.10
21	U	Aye Ko Ko	JCC member	Deputy Director General	DOA	Naypyitaw	Headquarters	2015.04.10 - Up-to-date
22	U	Hla Myint Aung	JCC member	Deputy Director General	DOA	Naypyitaw	Extension	2016.02.26 - Up-to-date
23	U	Hla Myint Aung	Project Manager	Director	DOA	Naypyitaw	Extension	2015.09.10 - 2016.02.26
24	U	Aye Ko Ko	Project Manager	Director	DOA	Naypyitaw	Extension	2014.01.25 - 2015.04.10
25	Dr.	Kyi Myint	Project Manager	Director	DOA	Naypyitaw	Extension	2013.11.08 - 2014.01.19
26	U	Aye Ko Ko	Project Manager	Director	DOA	Naypyitaw	Extension	2014.01.25 - 2015.04.10
27	U	Hla Myint Aung	Project Manager	Director	DOA	Naypyitaw	Extension	2015.09.10 - 2016.02.26
28			Project Manager	Director	DOA	Naypyitaw	Extension	xxx - Up-to-date
29	Dr.	Nwe Nwe Yin	Project Manager	Director	DAR	Yezin	Soil Water Utilization and Agricultural Engineering	2013.11.08 - 2014.09.09
30	Dr.	Nwe Nwe Yin	Project Manager	Director	DAR	Yezin	Biotechnology, Plant Genetic Resources and Plant Protection	2014.09.09 - Up-to-date
31	U	Thant Lwin Oo		Director	DAR	Yezin	Oil Seed Crops and Food Legumes	2013.11.08 - 2015.11.17
32	Dr.	Htun Shwe		Director	DAR	Yezin	Oil Seed Crops and Food Legumes	2015.11.17 - Up-to-date
33	Daw	Nilar Aung	Counterpart	Assistant Director	DOA	Naypyitaw	Planning	2013.11.08 - Up-to-date
34	Dr.	Khin Mar Htay	Counterpart	Deputy Director	DAR	Yezin	Soil Water Utilization and Agricultural Engineering	2013.11.08 - Up-to-date
35	Dr.	Mar Mar Win	Counterpart	Deputy Staff Officer	DAR	Yezin	Oil Seed Crops and Food Legumes	2013.11.08 - Up-to-date
36	Daw	Sein Lei Mon	Counterpart	Deputy Staff Officer	DAR	Yezin	Biotechnology, Plant Genetic Resources and Plant Protection	2013.11.08 - 2016.02.01
37	U	Htin Kyaw	Counterpart	Deputy Staff Officer	DAR	Yezin	Oil Seed Crops and Food Legumes	2016.02.01 - Up-to-date
38	U	Naing Myo Aung	Counterpart	Deputy Staff Officer	DAR	Yezin	Agronomy, Agricultural Economics and Statistics	2013.11.08 - Up-to-date
39	Daw	Win Su Min	Counterpart	Deputy Staff Officer	DAR	Yezin	Biotechnology, Plant Genetic Resources and Plant Protection	2013.11.08 - 2016.02.01
40	Daw	Nay Nay Oo	Counterpart	Deputy Staff Officer	DAR	Yezin	Biotechnology, Plant Genetic Resources and Plant Protection	2016.02.01 - Up-to-date
41	Daw	Khin Mar Myaing	Counterpart	Deputy Staff Officer	DAR	Yezin	Biotechnology, Plant Genetic Resources and Plant Protection	2013.11.08 - 2016.02.01
42	Daw	Yin Yin Theint	Counterpart	Deputy Staff Officer	DAR	Yezin	Biotechnology, Plant Genetic Resources and Plant Protection	2016.02.01 - Up-to-date
43	Daw	Myat Nwe Nwe	Counterpart	Assistant Director	DAR	Yezin	Oil Seed Crops and Food Legumes	2013.11.08 - Up-to-date
44	Daw	Mar Mar Cho	Counterpart	Farm Manager/ Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - Up-to-date
45	Daw	Myint Thidar	Counterpart	Deputy Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - Up-to-date
46	Daw	Aye Aye Khaing	Target Group	Deputy Assistant Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - Up-to-date
47	Daw	Ei Ei Thein	Target Group	Assistant Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - Up-to-date
48	Daw	Mi Mi Aung	Target Group	Assistant Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2014.08.04 - Up-to-date
49	Daw	Lei Wai Tun	Target Group	Deputy Assistant Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - 2015.11
50	Daw	May Lwin Oo	Target Group	Deputy Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2014.01 - Up-to-date
51	Daw	Myint Myint Khaing	Target Group	Deputy Assistant Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - Up-to-date

Sl. No.	Mr/Ms	Name	Task	Title	Institute	Township	Duty Station/ Division	Assigned Period
52	Daw	Ni Ni Win	Target Group	Deputy Assistant Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - 2014.05.14
53	Daw	Taw Shin	Target Group	Deputy Assistant Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - Up-to-date
54	U	Win Soe	Target Group	Deputy Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2013.11.08 - Up-to-date
55	Daw	Thu Zar Aung	Target Group	Staff Officer	DAR	Nyaung-U	Dry Zone Agricultural Research Centre	2015.06.03 - Up-to-date
56	Daw	Ei Phyu Hnin	Target Group	Daily Wage Staff	DAR	Nyaung-U		2016.02.10 - Up-to-date
57	U	Htay Naing	Target Group	District Manager/ District Sta	DOA	Nyaung-U	DOA District Office	2014.08.03 - Up-to-date
58	U	Kyaw Myint	Target Group	District Manager/ District Sta	DOA	Nyaung-U	DOA District Office	2013.11.08 - 2014.08.03
59	Daw	Khin Htay Yee	Target Group	Township Manager/ Townsh	DOA	Nyaung-U	DOA Township Office	2014.06.12 - Up-to-date
60	U	Kyaw Phone Lin	Counterpart	Assistant Staff Officer	DOA	Nyaung-U	DOA Township Office	2013.11.08 - Up-to-date
61	Daw	Hlaing Zar Oo	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.01 - Up-to-date
62	Daw	Kay Thwe Soe	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2014.12.23- Up-to-date
63	Daw	Nwe Ni Hlaing	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
64	Daw	Nyunt Nyunt Mar	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
65	Daw	Ohmmar Nyein	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
66	Daw	San San Hla	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
67	Daw	Si Si Myaing	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
68	Daw	Su Mon Han	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
69	Daw	Swe Swe Oo	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
70	Daw	Wai Wai Mar	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
71	Daw	War War Mon	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - 2015.07.20
72	Daw	Win Khaing	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2015.07.20 - Up-to-date
73	Daw	Zin Hlaing Thein	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2014.12.18 - Up-to-date
74	Daw	Htar Ei Ei Hlaing	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
75	Daw	Thwe Thwe Aung	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
76	U	Maung Maung Oo	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - 2014.05.16
77	U	Myo Htet Htan	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2014.05.16 - Up-to-date
78	U	Tun Min Thein	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - Up-to-date
79	U	Soe Moe Pyi Sone	Target Group	Assistant Staff Officer	DOA	Nyaung-U	Township Office	2014.12.18 - 2016.03.31
80	Daw	Moh Moh Aung	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - 2014.08.03
81	Daw	Hla Hla Tint	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - 2014.08.03
82	Daw	Hlaing	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013.11.08 - 2014.08.03
83	Daw	Aye Thida Moe	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2014 - Up-to-date
84	Daw	May Phyu Aung	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2014 - Up-to-date
85	Daw	Yin Pa Ba Soe	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013 - Up-to-date
86	Daw	Thi Thi Win	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2013 - Up-to-date
87	U	Win Kyaw Oo	Target Group	Deputy Assistant Staff Officer	DOA	Nyaung-U	Township Office	2014.12.23- Up-to-date
88	U	Aung Hein Ko	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
89	U	Aung Htet Htet Kyaw	Target Group	Daily Alliance	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
90	U	Aung Naing	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
91	U	Aung Niang	Target Group	Township Manager/ Townsh	DOA	Myingyan	DOA Township Office	2015.12 - Up-to-date
92	Daw	Aye Myat Mon	Target Group	Deputy Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
93	Daw	Aye Thida Theint	Target Group		DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
94	Daw	Aye Thu	Target Group	Deputy Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
95	Daw	Hinn Hinn Khaing	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
96	Daw	Htet Htet Wai	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2014.11.14 - 2015.07.20
97	Daw	Htwe Htwe	Target Group	Deputy Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
98	Daw	Khin Myat Thant	Target Group	Deputy Assistant Staff Officer	DOA	Myingyan	Township Office	2016.01 - Up-to-date
99	Daw	Khin Myo Aye	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
100	U	Kyaw Shwe	Target Group	Deputy Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
101	Daw	Kyi	Target Group	Township Manager/ Townsh	DOA	Myingyan	DOA Township Office	2013.11.08 - 2015.12
102	Daw	Kyi Kyi Mar	Target Group	Deputy Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
103	Daw	Kyin Khaing Win	Target Group	Daily Alliance	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
104	Daw	Lwin Mar Oo	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date

No.	M/Ths	Name	Task	Title	Institute	Township	Duty Station/ Division	Assigned Period
105	Daw	May Phyo Paing T	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
106	Daw	Mi Mi Tint Lwin	Target Group	Deputy Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
107	Daw	Moe Moe Zaw	Target Group	Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
108	Daw	Myint Myint Wai	Target Group	Deputy Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
109	U	Myo Tun	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2014.01.13 - Up-to-date
110	U	Nay Myo Aung	Counterpart	Deputy Assistant Staff Officer	DOA	Myingyan	DOA Township Office	2013.11.08 - Up-to-date
111	U	Nay Myo Htun	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
112	Daw	Ni Ni Win (1)	Target Group	Deputy Assistant Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
113	Daw	Ni Ni Win (2)	Target Group	Deputy Assistant Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
114	Daw	Nu Nu Kyi	Target Group	Deputy Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
115	Daw	Swe Mar Lwin	Target Group	Assistant Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
116	Daw	Theint Theint Hmu	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
117	Daw	Thin Myat Khaing	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
118	Daw	Thu Zar Aung	Target Group	Deputy Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - 2015.06.03
119	Daw	Tin Mar Than	Counterpart	Farm Manager/ Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
120	Daw	Toe Toe Wint	Target Group	Assistant Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
121	U	Tun Tun Naing	Target Group	Deputy Assistant Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
122	Daw	War War Khaing	Target Group	Deputy Assistant Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
123	U	Win Myint	Target Group	Assistant Staff Officer	DOA	Myingyan	Township Office	2016.01 - Up-to-date
124	Daw	Yi Yi Maw	Target Group	Deputy Staff Officer	DOA	Myingyan	Township Office	2013.11.08 - Up-to-date
125	Daw	Yin Yin Aye	Target Group	Assistant Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
126	U	Zaw Win	Target Group	Staff Officer	DAR	Myingyan	Myingyan Agricultural Research Farm	2013.11.08 - Up-to-date
127	U	Thein Htay Oo	Counterpart	Farm Manager/ Senior Rese	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
128	Daw	Ei Ei Nwai	Target Group	Deputy Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - 2016.01
129	Daw	Ei Ei Phyu	Target Group	Deputy Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - 2016.01
130	Daw	Hla Hla Win	Target Group	Assistant Director	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
131	Daw	Hla Mwme Kyu	Target Group	Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
132	Daw	Latt Moe Swe	Target Group	Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
133	Daw	Maw Maw Thi	Target Group	Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
134	Daw	Myint Myint	Target Group	Assistant Director	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
135	Daw	Myint Myint Thein	Target Group	Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
136	Daw	Pa Pa Win	Target Group	Deputy Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
137	Daw	Phyo Phyo Win	Target Group	Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
138	Daw	Than Than Moe	Target Group	Deputy Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
139	Daw	Than Than Nwe	Target Group	Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
140	Daw	Tin Zar Phyu	Target Group	Deputy Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - 2014.01
141	Daw	Win Win Mar	Target Group	Deputy Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
142	U	Aung Lwin	Target Group	Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - Up-to-date
143	U	Hla Myo Thun	Target Group	Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - 2014.01
144	U	Thint Wai	Target Group	Assistant Staff Officer	DAR	Magway	Oil Seed Crop Research Centre	2013.11.08 - 2014.01
145	U	Khaing Min	Counterpart	Township Manager/ Staff Of	DOA	Magway	Township Office	2013.11.08 - Up-to-date
146	Daw	Mya Mu	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - Up-to-date
147	Daw	Shwe Zin Myat	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - Up-to-date
148	Daw	Zar Zar Khaing	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - 2016.01
149	Daw	Aye Aye Khaing	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - Up-to-date
150	Daw	Ei Phyu Kyi	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - Up-to-date
151	Daw	Hlaing Mar Myint	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - 2016.01
152	Daw	Kay Thwe Soe	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - Up-to-date
153	Daw	Mar Mar Soe	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - Up-to-date
154	Daw	Thant Sin Myo	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - Up-to-date
155	U	Myo Min Zaw	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2013.11.09 - Up-to-date
156	U	Pyage Khaing	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2013.11.09 - 2014.07.01
157	U	Aung Naing Lin	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2014.07.01 - Up-to-date

Sl. No.	Mr/Ms	Name	Task	Title	Institute	Township	Duty Station/ Division	Assigned Period	
158	U	Myo Thein Tun	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2013.11.12 - Up-to-date	
159	U	Win Hlaing	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2013.11.08 - Up-to-date	
160	U	Thiha Aung	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2014 - Up-to-date	
161	Daw	Nu Ngwe Yin	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2014 - Up-to-date	
162	Daw	Zin Mar Oo	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2014 - Up-to-date	
163	Daw	Thidar	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2014 - Up-to-date	
164	Daw	May Mayt Swe	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2014 - Up-to-date	
165	Daw	Thin Thin Mar	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2014 - Up-to-date	
166	U	Ye Min Han	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2014 - Up-to-date	
167	Daw	Khain Thin Zar Oo	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2015 - Up-to-date	
168	Daw	May Thu Hlaing	Target Group	Deputy Assistant Staff Officer	DOA	Magway	Township Office	2015 - Up-to-date	
169	U	Moe Min Aung	Target Group	Assistant Staff Officer	DOA	Magway	Township Office	2015.04.22 - Up-to-date	
170	U	Sein Win		Project Assistant	WSAT	Nyaung-U	Project Office	2013.11- Up-to-date	
171	U	Naing Moe Tint		Project Assistant	WSAT	Nyaung-U	Project Office	2013.12- Up-to-date	
172	Daw	Aye Nyein Thant		Junior Project Assistant	WSAT	Nyaung-U	Project Office	2013.11- Up-to-date	
173	U	Win Moe Thu		Project Worker	WSAT	Nyaung-U	Project Office	2013.11- 2014.11	
174	U	Chang Nyein Kyaw		Project Driver	WSAT	Nyaung-U	Project Office	2015.11.11 - Up-to-date	
175	U	Chang Nyein Zaw		Project Driver	WSAT	Nyaung-U	Project Office	2015.11.11 - Up-to-date	
			166					TOTAL	
		Note: TG: Target Group; CP: Counterpart							

2. Land, Building, Office, and Facilities provided by Myanmar

No.	Fiscal Year	Item	Site	Component
1	2013	Office building	DAR Nyaung-U	For the project office (office for experts and CPs)
2	2013	Meeting venue	DAR	For the kick-off meeting and the first and second JCC mee
3	2014	Office building	DAR Nyaung-U	For the project office (office for experts and CPs)
4	2014	Warehouse	DAR Nyaung-U	Storing seeds, agricultural inputs, farm machinery
5	2014	Experimental and seed production field	DAR Nyaung-U	Field experiment and seed multiplication
6	2014	Drying yard	DAR Nyaung-U	Post harvest work for experiment and seed production
7	2014	Meeting venue	DAR	For the kick-off meeting and the third JCC meeting
8	2015	Office space	DOA Nyaung-U	For working space for experts
9	2015	Office building	DAR Nyaung-U	For the project office (office for experts and CPs)
10	2015	Warehouse	DAR Nyaung-U	Storing seeds, agricultural inputs, farm machinery
11	2015	Demonstration and seed production field	DAR Nyaung-U	Field experiment and seed multiplication
12	2015	Drying yard	DAR Nyaung-U	Post harvest work for experiment and seed production
13	2015	Seed production field (sesame)	DAR Magway	Field experiment and seed multiplication

3. Budget Execution

Unit: Kyat

Fiscal Year	Unit	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	Total
DAR Nyaung-U	Kyat	49,291,100	59,927,500	79,259,200				
DAR Myingyan	Kyat	47,950,400	57,000,200	82,596,500				
DAR Magway	Kyat	69,225,500	79,811,300	98,509,900				
TOTAL	Kyat	166,467,000	196,739,000	260,365,600	0	0	0	0
Notable in-kind contribution*4		water and electricity bills, and baseline survey	water, electricity and other utility costs	water, electricity and other utility costs				

Note: *4 A Fiscal Year starts in April in both Myanmar and Japan. In-kind contribution: (1) Contribution by DOA in conducting the baseline survey and end line survey every year; (2) Tel/fax line has been installed at DAR Nyaung-U since April 2015; (3) Land preparation for DAR

Appendix 6 Inputs from Japan

1. Dispatched Experts

No.	Name	Expertise	Name	Expertise	Assigned Period	Organization
1	藤本 直也	チーフアドバイザー/ 乾燥地作物栽培	Dr. Naoya Fujimoto	Chief Advisor/ Dry Land Crop Cultivation	2015.11.05 - 2017.11.04	NTC International Co., Ltd. NTCインターナショナル株式会社
2	松本 満夫	チーフアドバイザー/ 乾燥地作物栽培	Mr. Mitsuo Matsumoto	Chief Advisor/ Dry Land Crop Cultivation	2013.11.03 - 2015.11.03	n.a.
3	水谷 勝広	節水灌漑技術	Mr. Katsuhiro Mizutani	Water Saving Irrigation	2013.11.03 - 2016.11.02	MAFF 農林水産省農村振興局整備部設計課
4	菊池 友	総合防除	Ms. Yu Kikuchi	Integrated Pest Management	2013.11.03 - 2016.11.02	n.a.
5	山田 大	業務調整	Mr. Masaru Yamada	Project Coordinator	2013.10.27 - 2016.10.26	n.a.

2. Procured Equipment - JICA Owned

No	Item	Make	Specification	Unit	Amount (\$)	Amount (Kyo)	Registered No.	Budget Article	Purchase Date	Supplier	Agency	Township	Condition	変更	User
1	Projector	Sony	VPL-DX120	USD	525		13-3-000159	旅行機材	2013/07/08	TMW Enterprise Limited	DAR	Nyaung-U			
2	Copier	Canon	IR-2520, Duplex, Finisher	USD	4,505		13-3-000265	旅行機材	2013/07/29	Myanmar golden Rock International Co.Ltd.	DAR	Nyaung-U			
3	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000266	旅行機材	2013/07/29	KMD Company Ltd.	DAR	Nyaung-U			Nang Nang
4	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000267	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Nyaung-U			Weather Station
5	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000268	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Nyaung-U			Common
6	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000269	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Nyaung-U			Aye Nyan
7	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000270	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Yezin			IR section
8	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000271	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Magaay			Farm Manager
9	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000272	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Myingyan			Farm Manager
10	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000273	旅行機材	2013/08/12	KMD Company Ltd.	DOA	Myintzen			Township Manager
11	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000274	旅行機材	2013/08/12	KMD Company Ltd.	DOA	Nay Pyi Taw			DOA Coordinator
12	Computer Desktop	Lenovo	Ideapad H520, Core i5, 4GB DDR3 Ram, DVD-RW, 500GB HDD, 21.5" Monitor, Windows 7 Professional, MS Office Home& Business 2013, ProLink wireless adapter (PAN2001) 150Mbps	USD	1,010		13-3-000275	旅行機材	2013/08/12	KMD Company Ltd.	DOA	Nyaung-U			Township Manager
13	Computer Notebook	Lenovo	Ideapad Z400, Core i5, 4GB DDR3 SDRam, DVD-RW, 1TB HDD, 14" display, Windows 7 Professional, MS Office Home& Business 2013	USD	1,126		13-3-000276	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Myingyan			WISATOB Farm Manager
14	Computer Notebook	Lenovo	Ideapad Z400, Core i5, 4GB DDR3 SDRam, DVD-RW, 1TB HDD, 14" display, Windows 7 Professional, MS Office Home& Business 2013	USD	1,126		13-3-000277	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Nyaung-U			CP
15	Computer Notebook	Lenovo	Ideapad Z400, Core i5, 4GB DDR3 SDRam, DVD-RW, 1TB HDD, 14" display, Windows 7 Professional, MS Office Home& Business 2013	USD	1,126		13-3-000278	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Magaay			Farm Manager
16	Computer Notebook	Lenovo	Ideapad Z400, Core i5, 4GB DDR3 SDRam, DVD-RW, 1TB HDD, 14" display, Windows 7 Professional, MS Office Home& Business 2013	USD	1,126		13-3-000279	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Yezin			FM
17	Printer - LaserJet	HP	401dn, duplex A4 size	USD	594		13-3-000280	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Nyaung-U			Project
18	Printer - LaserJet	HP	401dn, duplex A4 size	USD	594		13-3-000281	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Nyaung-U			Project
19	Printer - Ink Jet	Epson	1390 A3 size	USD	650		13-3-000282	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Nyaung-U			Project
20	Printer - Ink Jet	Epson	1390 A3 size	USD	650		13-3-000283	旅行機材	2013/08/12	KMD Company Ltd.	DAR	Nyaung-U			Project

Appendix 6 Inputs from Japan.xlsx/ 2 JICA Owned/ 2016/6/17

No	Item	Make	Specification	Unit	Amount (\$)	Amount (Kyat)	Registered No.	Budget Article	Purchase Date	Supplier	Agency	Township	Condition	変更	Use
21	Printer - Ink Jet	Epson	1390 A3 size	USD	650		13-3-000284	執行機材	2013/08/12	KMD Company Ltd	DAR	Yezi			PM
22	Printer - Ink Jet	Epson	1390 A3 size	USD	650		13-3-000285	執行機材	2013/08/12	KMD Company Ltd	DOA	Nay Pyi Taw			DOA Coordinator
23	Scanner	Canon	DRC125	USD	700		13-3-000286	執行機材	2013/08/12	KMD Company Ltd	DAR	Nyaung U			
24	Generator	Denyo	DCA-15LSX Kubota V2203KB	USD	12,000		13-3-000487	執行機材	2013/12/07	Eiser Soko Trading Co.Ltd	DAR	Nyaung U			
25	Safety Box	Leeeco	Steel	Kyaf		345,000	13-3-000488	在外事業強化費	2013/10/31	SINMA Furnishings	DAR	Nyaung U			
26	Chlorophyll Meter	Konica Minolta	SPAD meter SPAD 502 Plus	USD	2,950		13-3-000629	執行機材	2014/01/27	AMTT Co., Ltd	DAR	Myingyan			
27	Chlorophyll Meter	Konica Minolta	SPAD meter SPAD-502	USD	2,950		13-3-000630	執行機材	2014/01/27	AMTT Co., Ltd	DAR	Magway			
28	Chlorophyll Meter	Konica Minolta	SPAD meter SPAD-502	USD	2,950		13-3-000631	執行機材	2014/01/27	AMTT Co., Ltd	DAR	Nyaung U			
29	Chain saw	Makita	DCS5410 (DCS6410)	Kyaf		490,000	13-3-000711	在外事業強化費	2014/01/07	Tong Tai	DAR	Nyaung U			
30	Electronic Oven	Sanyo	MOV - 212	USD	3,500		13-3-000713	執行機材	2014/01/20	Sun Lion Co., Ltd	DAR	Nyaung U			
31	Grain Moisture Tester	KETT	PM-650	USD	2,100		13-3-000783	執行機材	2014/2/17	AMTT Co., Ltd	DAR	Myingyan			
32	Grain Moisture Tester	KETT	PM-650	USD	2,100		13-3-000784	執行機材	2014/2/17	AMTT Co., Ltd	DAR	Magway			
33	Grain Moisture Tester	KETT	PM-650	USD	2,100		13-3-000785	執行機材	2014/2/17	AMTT Co., Ltd	DAR	Nyaung U			
34	Soil Hardness Meter (Push cone)	Fujihiro Industry Co., Ltd	DIK-5553, range 0-49Mpa	USD	667		13-3-000882	執行機材	2014/02/27	MAST Myanmar Technology Co., Ltd	DAR	Yezi		1	
35	Soil Hardness Meter (Push cone)	Fujihiro Industry Co., Ltd	DIK-5553, range 0-49Mpa	USD	667		13-3-000883	執行機材	2014/02/27	MAST Myanmar Technology Co., Ltd	DAR	Yezi		1	
36	Soil Hardness Meter (Push cone)	Fujihiro Industry Co., Ltd	DIK-5553, range 0-49Mpa	USD	667		13-3-000884	執行機材	2014/02/27	MAST Myanmar Technology Co., Ltd	DAR	Nyaung U			
37	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000886	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Myingyan			Disposal
38	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000887	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Myingyan			Use
39	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000888	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Myingyan			Use
40	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000889	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Myingyan			Use
41	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000890	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Magway			Use
42	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000891	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Magway			Use
43	Soil sampling apparatus	Fujihiro Industry Co., Ltd	1 m. DIK- 1640	USD	1,050		13-3-000892	執行機材	2014/2/27	MAST Myanmar Technology Co., Ltd	DAR	Nyaung U			
44	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000893	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Magway			Use
45	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000894	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Nyaung U			Stock
46	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000895	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Nyaung U			Stock
47	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000896	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Nyaung U			Stock
48	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000897	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Nyaung U			Stock
49	Soil analysis kit	Fujihiro Industry Co., Ltd	Dr. Soil (No.46041000)	USD	1,214		13-3-000898	執行機材	2014/03/03	MAST Myanmar Technology Co., Ltd	DAR	Magway			Use

Appendix 6 Inputs from Japan.xlsx/ 2 JICA Owned/ 2016/6/17

No	Item	Make	Specification	Unit	Amount (\$)	Amount (Kyat)	Registered No.	Budget Article	Purchase Date	Supplier	Agency	Township	Condition	変更	Use
50	Generator	Sujsawa	SH4600 EX, Elemax, Honda engine	USD	1,500		13-3-000899	執行機材	2013/11/26	Ayeyar Kyaw Agricultural Machinery	DAR	Nyaung U			
51	EC Meter	Horiba	ES-71, LAQUA act, Electrode 338095	USD	1,250		13-3-001165	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Yezi			Use
52	EC Meter	Horiba	ES-71, LAQUA act, Electrode 338095	USD	1,250		13-3-001166	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Yezi		1	
53	EC Meter	Horiba	ES-71, LAQUA act, Electrode 338095	USD	1,250		13-3-001167	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Yezi		1	
54	EC Meter	Horiba	ES-71, LAQUA act, Electrode 338095	USD	1,250		13-3-001168	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Nyaung U			
55	EC Meter	Horiba	ES-71, LAQUA act, Electrode 338095	USD	1,250		13-3-001169	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Myingyan			
56	EC Meter	Horiba	ES-71, LAQUA act, Electrode 338095	USD	1,250		13-3-001170	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Magway			
57	pH Meter	Horiba	D-71, Water quality meter, LAQUA act, Electrode K7DY2DG3	USD	865		13-3-001171	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Yezi			
58	pH Meter	Horiba	D-71, Water quality meter, LAQUA act, Electrode K7DY2DG3	USD	865		13-3-001172	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Yezi		Use	1
59	Data logger	Davis, USA	EM-50, Decagon	USD	700		13-3-001173	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Nyaung U			Stock
60	pH Meter	Horiba	D-71, Water quality meter, LAQUA act, Electrode K7DY2DG3	USD	865		13-3-001174	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Yezi			1
61	pH Meter	Horiba	D-71, Water quality meter, LAQUA act, Electrode K7DY2DG3	USD	865		13-3-001175	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Yezi			1
62	pH Meter	Horiba	D-71, Water quality meter, LAQUA act, Electrode K7DY2DG3	USD	865		13-3-001176	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Nyaung U			
63	pH Meter	Horiba	D-71, Water quality meter, LAQUA act, Electrode K7DY2DG3	USD	865		13-3-001177	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Myingyan			
64	pH Meter	Horiba	D-71, Water quality meter, LAQUA act, Electrode K7DY2DG3	USD	865		13-3-001178	執行機材	2014/03/14	AMTT Co., Ltd	DAR	Magway			
65	Meteorological instrument	Davis, USA	Vintage Pro 2 Plus; Automatic Weather Observation System, AWOS	USD	2,030		13-3-001179	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Nyaung U			
66	Meteorological instrument	Davis, USA	Vintage Pro 2 Plus; Automatic Weather Observation System, AWOS	USD	2,030		13-3-001180	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Myingyan			
67	Meteorological instrument	Davis, USA	Vintage Pro 2 Plus; Automatic Weather Observation System, AWOS	USD	2,030		13-3-001181	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Magway			
68	Meteorological instrument	Davis, USA	Vintage Pro 2 Plus; Automatic Weather Observation System, AWOS	USD	2,030		13-3-001182	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Nyaung U			1
69	Data logger	Davis, USA	EM-50, Decagon	USD	700		13-3-001183	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Nyaung U			Stock
70	Data logger	Davis, USA	EM-50, Decagon	USD	700		13-3-001184	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Nyaung U			Stock
71	Data logger	Davis, USA	EM-50, Decagon	USD	700		13-3-001185	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Nyaung U			Disposal
72	Data logger	Davis, USA	EM-50, Decagon	USD	700		13-3-001186	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Nyaung U			Stock
73	Data logger	Davis, USA	EM-50, Decagon	USD	700		13-3-001187	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Myingyan			Use
74	Data logger	Davis, USA	EM-50, Decagon	USD	700		13-3-001188	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Magway			Use
75	Data logger	Davis, USA	EM-50, Decagon	USD	700		13-3-001189	執行機材	2014/02/27	Santac International Trading Co., Ltd	DAR	Yezi			Use
76	Water distilling apparatus	Labtech, Korea	LWD-3008	USD	1,780		13-3-001926	執行機材	2014/3/18	AMTT Co., Ltd	DAR	Yezi			1
77	Water Tank	Royal	8' x 4' x 4' (800 gallons)	Kyaf		815,000	14-3-000428	在外事業強化費	2014/08/25	Ko Hyi	DAR	Myingyan			
78	Water Tank	Royal	8' x 4' x 4' (800 gallons)	Kyaf		815,000	14-3-000429	在外事業強化費	2014/08/26	Ko Hyi	DAR	Myingyan			

No	Item	Make	Specification	Country	Amount (\$)	Amount (Kyat)	Registered No.	Budget Article	Purchase Date	Supplier	Agency	Township	Condition	変更	User
79	Water Tank		8' x 4' x 4' (800 gallons)	Kyats		820,000	14-3-000873	在外事業強化費	2014/12/14	No.Nya	DAR	Magway			
80	Water Tank		8' x 4' x 4' (800 gallons)	Kyats		820,000	14-3-000874	在外事業強化費	2014/12/14	No.Nya	DAR	Magway			
81	Water Tank		8' x 4' x 4' (800 gallons)	Kyats		820,000	14-3-000875	在外事業強化費	2014/12/14	No.Nya	DAR	Magway			
82	Stabilizer	Standa	15KVA	Kyats		700,000	14-3-000967	在外事業強化費	2015/01/24	Rigel Star	DAR	Nyaung-U			
83	Stabilizer	Standa	10KVA	Kyats		480,000	14-3-000968	在外事業強化費	2015/01/24	Rigel Star	DAR	Nyaung-U			
84	Water Tank		8' x 4' x 4' (800 gallons)	Kyats		820,000	14-3-001049	在外事業強化費	2015/01/11	No.Nya	DAR	Yazun			f
85	Water Tank		8' x 4' x 4' (800 gallons)	Kyats		820,000	14-3-001050	在外事業強化費	2015/01/11	No.Nya	DAR	Nyaung-U			
86	Water Tank		8' x 4' x 4' (800 gallons)	Kyats		820,000	14-3-001051	在外事業強化費	2015/01/11	No.Nya	DAR	Yazun			f
87	Data logger	Davis, USA	For WeatherLink for Vantage Pro 2; P/N: 94545	Kyats		499,500	15-3-000056	在外事業強化費	2015/05/16	Surbitz International Trading Co., Ltd	DAR	Myingyan	Use		
88	Data logger	Davis, USA	For WeatherLink for Vantage Pro 2; P/N: 94545	Kyats		499,500	15-3-000057	在外事業強化費	2015/05/16	Surbitz International Trading Co., Ltd	DAR	Nyaung-U			
89	Tipper Trailer	n.a	5 Ton, 2 wheel hydraulic	Kyats		4,200,000	15-3-000058	在外事業強化費	2015/05/12	Farmers Choice Tractor Co., Ltd	DAR	Magway	Use		
90	Data logger	Davis, USA	For WeatherLink for Vantage Pro 2; P/N: 94545	Kyats		499,500	15-3-000065	在外事業強化費	2015/05/16	Surbitz International Trading Co., Ltd	DAR	Nyaung-U			
91	Data logger	Davis, USA	For WeatherLink for Vantage Pro 2; P/N: 94545	Kyats		499,500	15-3-000066	在外事業強化費	2015/05/16	Surbitz International Trading Co., Ltd	DAR	Nyaung-U			
92	Water Tank		8' x 4' x 4' (800 gallons)	Kyats		820,000	15-3-001106	在外事業強化費	2015/07/07	No.Nya	DAR	Nyaung-U			
93	Water Tank		8' x 4' x 4' (800 gallons)	Kyats		820,000	15-3-001107	在外事業強化費	2015/07/07	No.Nya	DAR	Nyaung-U			
94	Submersible pump		3 HP, Summo motor	Kyats		2,400,000	15-3-001108	在外事業強化費	2015/08/28	Approximately Tube and gear	DAR	Nyaung-U			
95	Submersible pump		12.5 HP	Kyats		2,800,000	13-3-002145	在外事業強化費	2014/02/17	Gosten...	DAR	Magway			
Summary						102,946	21,603,000								
						US\$	Kyat								

3. Procured Equipment - Handover Equipment

No.	Date	Item	Model/Specification	Make	Unit price (\$)	Sub-total(\$)	Qty	User	Installed	Procured	Purpose	Running condition
1	2014.12.11	Tractor	L4708 (Tractor HP44.7, Diesel Engine - Center Direction, Injection Type: 4-Cylinder, 4-Cycle) L4708SP612865 with FD185F (Front dozer) FD-185F-51767	Kubota	21,000	21,000	1	WSAT	DAR Nyaung-U	Local	Project	Good
2	2014.12.11	Rotary plough	RX 182F (RX182F-129298)	Kubota	2,130	2,130	1	WSAT	DAR Nyaung-U	Local	Project	Good
3	2014.12.11	Disc plough	DP224F (DP224FH-7473)	Kubota	1,360	1,360	1	WSAT	DAR Nyaung-U	Local	Project	Good
4	2014.12.11	Disc Harrow	DH246F (DH246FH-1012119)	Kubota	1,520	1,520	1	WSAT	DAR Nyaung-U	Local	Project	Good
5	2014.12.11	Tractor	L4708 (Tractor HP44.7, Diesel Engine - Center Direction, Injection Type: 4-Cylinder, 4-Cycle) L4708 SP616135 with FD185F (Front dozer) FD-185F-55102	Kubota	21,000	21,000	1	WSAT	DAR Myingyan	Local	Project	Good
6	2014.12.11	Rotary plough	RX 182F (RX182F-130053)	Kubota	2,130	2,130	1	WSAT	DAR Myingyan	Local	Project	Good
7	2014.12.11	Disc plough	DP224F (DP224FH-7523)	Kubota	1,360	1,360	1	WSAT	DAR Myingyan	Local	Project	Good
8	2014.12.11	Disc Harrow	DH246F (DH246FH-1011584)	Kubota	1,520	1,520	1	WSAT	DAR Myingyan	Local	Project	Good
9	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89313, Engine No.E 464143964, Chassis No.MLCBE - 4DR 000143964	Suzuki	1,698	1,698	1	WSAT	DAR Nyaung-U	Local	Project	Good
10	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89316, Engine No.E 464144291, Chassis No.MLCBE - 4DR 000144291	Suzuki	1,698	1,698	1	WSAT	DAR Nyaung-U	Local	Project	Good
11	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89317, Engine No.E 464144293, Chassis No.MLCBE - 4DR 000144293	Suzuki	1,090	1,090	1	WSAT	DAR Nyaung-U	Local	Project	Good
12	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89318, Engine No.E 464144299, Chassis No.MLCBE - 4DR 000144299	Suzuki	1,698	1,698	1	WSAT	DAR Nyaung-U	Local	Project	Good
13	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89319, Engine No.E 464144300, Chassis No.MLCBE - 4DR 000144300	Suzuki	1,698	1,698	1	WSAT	DAR Myingyan	Local	Project	Good
14	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89320, Engine No.E 464144306, Chassis No.MLCBE - 4DR 000144306	Suzuki	1,698	1,698	1	WSAT	DAR Magway	Local	Project	Good
15	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89321, Engine No.E 464144307, Chassis No.MLCBE - 4DR 000144307	Suzuki	1,698	1,698	1	WSAT	DOA Nyaung-U	Local	Project	Good
16	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89329, Engine No.E 464144540, Chassis No.MLCBE - 4DR 000144540	Suzuki	1,698	1,698	1	WSAT	DOA Nyaung-U	Local	Project	Good
17	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89330, Engine No.E 464144544, Chassis No.MLCBE - 4DR 000144544	Suzuki	1,698	1,698	1	WSAT	DOA Nyaung-U	Local	Project	Good
18	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89331, Engine No.E 464144545, Chassis No.MLCBE - 4DR 000144545	Suzuki	1,698	1,698	1	WSAT	DOA Nyaung-U	Local	Project	Good

18	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89332, Engine No.E 464144763, Chassis No.MLCBE - 4DR 000144763	Suzuki	1,698	1,698	1	WSAT	DOA Myingyan	Local	Project	Good
20	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89336, Engine No.E 464144767, Chassis No.MLCBE - 4DR 000144767	Suzuki	1,698	1,698	1	WSAT	DOA Myingyan	Local	Project	Good
21	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89346, Engine No.E 464144779, Chassis No.MLCBE - 4DR 000144779	Suzuki	1,698	1,698	1	WSAT	DOA Myingyan	Local	Project	Good
22	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89348, Engine No.E 464144789, Chassis No.MLCBE - 4DR 000144789	Suzuki	1,698	1,698	1	WSAT	DOA Magway	Local	Project	Good
23	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89340, Engine No.E 464144790, Chassis No.MLCBE - 4DR 000144790	Suzuki	1,698	1,698	1	WSAT	DOA Magway	Local	Project	Good
24	2015.03.12	Motorbike	Smash-FW 110SD, 4 strokes, 113 cc Registration No.45 Ya/ 89350, Engine No.E 464144794, Chassis No.MLCBE - 4DR 000144794	Suzuki	1,698	1,698	1	WSAT	DOA Magway	Local	Project	Good
26	2015.04.02	Minibus	Uvan NV350. White, 2,500cc, 2014 Model, long wheel, wide body and high roof. Registration No. 3J 8752 (NPW), Engine No. YD25-361144A, Chassis No. JN1JC4E26Z0002238	Nissan	35,500	35,500	1	WSAT	DAR Nyaung-U	Local	Project	Good
26	2015.05	Wagon (SUV)	Pajero GLS 4x4. Warm White Mica. 3,200cc, 2015 Model, Registration No. 4J 1319 (NPW), Engine No. 4M1JAN4627, Chassis No. JMYLYV88WF001036	Mitsubishi	44,750	44,750	1	WSAT	DAR Nyaung-U	Local	Project	Good
27	2016.04	Pick up (Double Cab)	Mitsubishi L200-SU 4x4 2016 Model	Mitsubishi	24,500	24,500	1	WSAT	DAR Nyaung-U	Local	Project	Good
					TOTAL	183,938						

4. Renovation/ Rehabilitation of Infrastructure

No	Fiscal Year	Output	Site	Item	Cost (Kyat)	Cost (US\$)	Details
1	2013.Q4		DAR Nyaung-U	Toilet construction	891,100		Construction of self toilet behind old building
2	2013.Q4		DAR Nyaung-U	Guest house power cabling	899,550		DAR guest house for training participants. Replace old cabling with new one.
3	2013.Q4		DAR Nyaung-U	Repairing DAR truck	1,612,000		Old office used till 2015 March. Repair body, driver's seat, doors, front window screen and lights.
4	2014.Q1		DAR Nyaung-U	Office power cabling	1,189,850		Replace old cabling with new one and installing 4 units of the air conditioner.
5	2014.Q1	3	DAR Nyaung-U	Nursery for seedling	1,454,500		Provision of consumable materials: nets, wire, pole and timbers
6	2014.Q1	4	DAR Nyaung-U	Drip irrigation	62,400		Provision of consumable materials. Durability is 2 to 3 years. Under the harsh weather of the site, the item is replaced when necessary.
7	2014.Q1	4	DAR Nyaung-U	Small pond behind the A2 plot	512,000		A small pond for water harvest established for the demonstration (provision of material)
8	2014.Q2	1	DAR Nyaung-U	Dry yard	2,995,000		Repairing the old drying floor (16 meter x 37 meter)
9	2013.Q4	1	DAR Nyaung-U	Working shade (space) Warehouse roof	4,492,000		Provision of materials (corrugate iron sheet, timber and pole)
10	2014.Q4		DAR Nyaung-U	Office building		80,000	Construction of the new office building
11	2014.Q4	1	DAR Nyaung-U	Sprinkler irrigation	3,869,000		For groundnut foundation seed production (G1 plot 1.2 acre)
12	2015.Q1	1	DAR Nyaung-U	Nel house	3,740,000		For pigeon pea foundation seed production (P1 plot 0.25 acre)
13	2015.Q2	3	DAR Nyaung-U	Repairing the tube well and pump	3,700,000		Repairing existing tube well
20	2015.Q1	3	DAR Myingyan	Nursery for seedling	161,500		Provision of consumable materials: nets, wire and pole
21	2014.Q1	4	DAR Myingyan	Drip irrigation	62,400		Provision of consumable materials. Durability is 2 to 3 years. Under the harsh weather of the site, the item is replaced when necessary.
22	2015.Q3	4	DAR Myingyan	Brick pond (reservoir) for water harvest - Surface runoff	7,828,000		Provision of materials
23	2015.Q2	4	DAR Myingyan	Water tank (reservoir) for water harvest	4,862,500		The capacity of 80 cubic meter (4m*8m*2.5m) storing water harvested from the building roof and providing water for a demonstration plot there.
30	2013.Q4	4	DAR Magway	Repairing a water pump system	4,441,500		Repairing an old pump system at the DAR Magway.

No.	Fiscal Year	Output	Site	Item	Cost (Kyat)	Cost (US\$)	Details
31	2014.Q4	4	DAR Magway	Sprinkler irrigation	2,970,000		For sesame seed production (1 acre)
32	2015.Q2	4	DAR Magway	Water tank (reservoir) for tube well	6,064,500		The capacity of 72 cubic meter (6m×6m×2m) storing water harvested from the building roof and providing water for a demonstration plot there.
33	2015.Q2	3	DAR Magway	Nursery for seeding	721,500		Provision of consumable materials: nets, wire, pole and timbers
34	2014.Q1	4	DAR Magway	Drip irrigation	62,400		Provision of consumable materials. Durability is 2 to 3 years. Under the harsh weather of the site, the item is replaced when necessary.
40	2015.Q3	4	DAR Yezin	Tube well and pump	945,000		Material: Electric motor, compressor, PVC pipes and assorted joints and parts
41	2014.Q1	4	DAR Yezin	Drip irrigation	62,400		Provision of consumable materials. Durability is 2 to 3 years. Under the harsh weather of the site, the item is replaced when necessary.
42	2014.Q2	4	DAR Yezin	Sprinkler irrigation	263,400		Provision of consumable materials
TOTAL					54,952,500	80,000	

6. Local Cost

Budget Execution by JICA

No.	JFY	Unit	JFY 2013	JFY 2014	JFY 2015	JFY 2016	JFY 2017	JFY 2018	Total Amount
1	Local Cost including renovation of building and procurement of equipment	Kyat	126,351,200	229,484,710	236,630,000				592,465,910
		JPY*1	13,300,018	25,542,749	24,658,215				63,500,982
		US\$*1	130,997	233,550	186,486				551,033
2	JICA Owned Equipment Cost*2 (携行機材)	Kyat*1	117,211,796	0	n.a.	n.a.	n.a.	n.a.	117,211,796
		JPY*1	12,323,094	0	n.a.	n.a.	n.a.	n.a.	12,323,094
		US\$	121,589	0	n.a.	n.a.	n.a.	n.a.	121,589
3	Handover Equipment*3 (供与機材)	Kyat*1	0	156,408,678					156,408,678
		JPY*1	0	17,407,409					17,407,409
		US\$	0	159,438					
4	TOTAL	Kyat*1	243,562,996	385,893,388	236,630,000	0	0	0	866,086,384
		JPY*1	25,623,112	42,950,158	24,658,215	0	0	0	93,231,485
		US\$*1	252,586	392,988	186,486	0	0	0	832,060

Note: *1 The local cost is executed in terms of Myanmar Kyat. The value is converted by the JICA exchange rate (foissi rate). *2 See ANNEX 4A. Procured Equipment - JICA Owned. According to the JICA accounting system, this expenditure is separated from the local cost. The items are to be handed over to the counterpart agencies upon the completion of the project. *3 See ANNEX 4B. Procured Equipment - Handover Equipment.

Appendix 7 Plan of Operation (PO) and Actual Performance

Legend ■ Planned ■ Actual

Version 1.0, Dates: 31 May 2016

Code	Activities	2013				2014				2015				2016				2017			
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
0.	The baseline study is conducted.	■	■	■	■																
1-1.	As part of the baseline study, a study on the needs of farmers and local markets for crops and varieties of the CDZ is conducted.	■	■	■	■																
1-2.	Pilot sites and contact farmers (CF) are selected in the CDZ.																				
1-3.	Based on results of the baseline study, potential crops and varieties are selected from those collected at international and domestic agriculture research institutes.																				
1-4.	Varietal trials are conducted at Dryland Crop Research Center in Nyaung Oo.																				
1-5.	Adaptability tests are conducted both at DAR Experiment Farms and CF's fields.																				
2-1.	Based on the adaptability tests, cultivation technologies are tested and studied for localizing methods for cultivation technologies.																				
2-2.	Through trials at the CF's field, cultivation technologies adapted to local conditions are proved, and the cultivation manual is drafted.																				
2-3.	Extension agents and CF are trained for cultivation technologies adapted to local conditions.																				
3-1.	As part of the baseline study, the soil study is conducted in the project sites from aspects of fertility and physical properties.																				
3-2.	Testing for improving soil fertility and physical properties is conducted, and methods for the improvement are studied.																				
3-3.	The methods for improving soil fertility and physical properties that are affordable to farmers (soil improvement technologies) are examined.																				
3-4.	Through trials at the CF's fields, the methods for the soil improvement technologies that are adapted to the soil conditions are proved, and the soil improvement manual is drafted.																				
3-5.	Extension agents and CF are trained for the soil improvement technologies that are adapted to local conditions.																				
4-1.	As part of the baseline study, water resources and water use by farmers are studied at pilot sites, and challenges are identified.																				
4-2.	Water-harvesting technologies applicable to CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field.																				
4-3.	Water-saving irrigation technologies applicable to farmer field in CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field.																				
4-4.	Through the above verification tests, guideline and/or manual for water-harvesting technologies and water-saving irrigation technologies applicable to CDZ are drafted.																				
4-5.	Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the pilot sites are recommended.																				
Project evaluation by Japanese Study Team and Government of Myanmar																					

Appendix 8 List of Project Products

Item No	Output	Report No.	English	Burmese	Japanese	Item/ Title
1		Report No.8	1			Baseline Survey Report
2	1		1			Market Price Survey Data
3	1		1			Target Crop Matrix
4	1		1			Matrix on Variety Trial - Groundnut
5	1		1			Matrix on Variety Trial - Pigeon pea
6	2		1			FFS Monitoring Matrix
7	1		1			Target Variety Matrix
8			1			Rolling Plan
9	2		1	1		Extension material (FFS) for groundnut
10	2		1	1		Extension material (FFS) for sesame
11	2		1	1		Extension material (FFS) for pigeon pea
12	2		1	1		Extension material (FFS) for green gram
13	2		1			Cropping calendar (3 townships for their target crops)
14	2		1			Monitoring matrix for sowing time trial
15	2		1			Monitoring matrix for plant density trial
16	3		1			Monitoring matrix for green manure trial
17	2		1			Monitoring matrix for Rhizobium trial
18	3		1			Rainfall Data 2003-2015 of 3 Townships
19		Report No.9			1	Data collection survey
20	4	Report No.1	1		1	Water Resources and Utilization in the Central Dry Zone of Myanmar
21	4	Report No.2	1		1	Evaporation and Percolation Test at Nyaung-U
22	4	Report No.3	1		1	Design of Small-scale Reservoir for Water Harvest
23	4	Report No.4	1		1	<i>Designed Irrigation Water</i> for Tomato Cultivation in Nyaung-U
24	4	Report No.5	1		1	Demonstration of Water-saving Irrigation at DAR Nyaung-U
25	4	Report No.6	1		1	<i>Designed Irrigation Water</i> for Tomato Cultivation in Nyaung-U -Verification
26	3	Report No.7	1		1	Climate in the Target Area
27	3		1	1		Extension material (FFS) for Multi-purpose tree (Gliricidia)
28	3	Report No.11	1		1	A Soil Condition in the Project Site
29	4	Report No.10	1		1	Evaporation and percolation trial with types of roofing
30	4		1			Extension material for Water-harvesting and water saving technology
31	4		1			Extension Scheme

Project Design Matrix (PDM)

Project Title: Project for Development of Water Saving Agriculture Technology in the Central Dry Zone
 Target Group: Dryland Crop Research Centre in Nyaung Oo, other DAR Experiment Farms and DOA Township Offices in the three townships

Duration: Five (5) years from November 2013
 Project Sites: DAR Experiment Farms and contact farmers' field selected from the three townships (Nyaung Oo, Magway, Myingyan) in the Central Dry Zone

Version 2, Date: June 22, 2016

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal In CDZ (especially the non-irrigated areas where upland farming is a main form of agriculture), an agricultural income is stabilized as a result of the spread of water-saving agricultural technologies which are suitable to CDZ.</p>	<p>1. After <u>5</u> years from the end of this project, the number of farmers who introduced and continued to use water-saving agricultural technologies developed in this project more than <u>1</u> cropping seasons, increased 5%. 2. For <u>5</u> years after the end of this project, the average agricultural income of the farmers who introduced the water-saving agricultural technology developed in this project continuously exceeds.</p>	<ul style="list-style-type: none"> - Annual reports by DOA Township Offices - Upland crop production data classified by TS - Weather statistics - Related study reports - Sample survey (end line survey) 	<ol style="list-style-type: none"> 1. Effective implementation of the extension services by DOA 2. Cultivation technologies developed in the Project are accepted by farmers including other than the target area. 3. No extreme fall of market price of the main crops in CDZ 4. No drastic change on the policy related to rural development and poverty alleviation in Myanmar
<p>Project Purpose Water-saving agriculture technologies that are adapted to CDZ are established.</p>	<p>1. The water-saving agricultural technology developed in this project are introduced by the <u>15%</u> farmer in Project Site and carried out more than <u>1</u> cropping seasons. 2. In Project Site, crop yields increased <u>10%*1</u> at the farmers who used the water-saving agricultural technology developed in this project. 3. In Project Site, <u>60%</u> of Farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.</p>	<ul style="list-style-type: none"> - Annual reports by DOA Township Offices - Annual reports by DAR Experiment Farms - Monitoring reports and others prepared by the project - Sample survey (end line survey) 	<ol style="list-style-type: none"> 1. Continued support extended by the government organizations including ID 2. Cooperation of DAR and DOA is carried out smoothly
<p>Outputs 1. New and/or conventional crops and promising varieties that are adaptable to CDZ are identified and prepared.</p>	<p>1-1. Within a half year from beginning of the project, the baseline study is conducted and consumer needs for the local agriculture products are identified. 1-2. <u>10%</u> or more of the farmers in the target area adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs. 1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the contact farmers for such crops/varieties increases by <u>10%</u> or more.</p>	<ul style="list-style-type: none"> - Study reports of Dryland Crop Research Centre - Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts - Sample survey (end line survey) 	<ol style="list-style-type: none"> 1. No severe outbreak of diseases and pest 2. No extreme weather anomalies that obstruct farming and irrigation 3. No surge of costs for seeds, production materials, and small-scale irrigation 4. No reduction in the development budgets of DAR and DOA
<p>2. Cultivation technologies are improved so that these can match the environments of CDZ.</p>	<p>2-1. Cultivation technologies adapted to local conditions are established for the selected new and/or existing crops and their superior varieties, and these technologies are implemented 2 times in total (2 times per year) at DAR Experiment Farm. 2-2. Appropriate technical manual for cultivation technologies are prepared. 2-3. <u>30</u> or more persons of the extension agents who can apply the above manual and implement cultivation technologies are built up. 2-4. Verification test by applying the above manual is conducted <u>100</u> times or more (1 time or more per year) by the project at the contact farmer's field. 2-5. The cultivation that is applied with the above manual is implemented by <u>10%</u> or more of the farmers in the target area.</p>	<ul style="list-style-type: none"> - Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts - Sample survey (end line survey) 	
<p>3. Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the</p>	<p>3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions in the target area are identified. 3-2. The soil improvement technologies that are adapted to the local conditions are established. 3-3. Technical manual for the soil improvement technologies is prepared. 3-4. <u>30</u> or more persons of the extension agents who can apply the above manual and</p>	<ul style="list-style-type: none"> - Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts - Sample survey (end line) 	

Appendix 9-1

environments of CDZ.	implement the soil improvement technologies are built up. 3-5. Verification test by applying the above manual is conducted <u>100</u> times or more (1 time or more per year) by the project at the contact farmers' field . 3-6. The soil improvement that is applied with the above manual is implemented by <u>2%</u> or more of the farmers in the target area.	survey)	
4. Water-saving irrigation technologies that are adaptable to project sites in CDZ are developed.	4-1. The study report on water resources and water use by farmers at project sites is drafted. 4-2. Technical guideline and/or manual for the water-harvesting and water-saving irrigation technologies are prepared. 4-3. The recommendation for combined methods for water-saving cultivation and water-saving irrigation technologies is prepared.	- Progress reports of the project - Records on workshops and training prepared by the project - Progress reports of the individual experts	
Activities		Inputs	
0. The baseline study is conducted.		Inputs from Myanmar	
1-1 As part of the baseline study, a study on the needs of farmers for and local markets for crops and varieties of CDZ is conducted. 1-2 Contact farmers (CF) are selected in CDZ. 1-3 Based on results of the baseline study, potential crops and varieties are selected from those collected at international and domestic agriculture research institutes. 1-4 Varietal trials are conducted at Dryland Crop Research Centre in Nyaung Oo. 1-5 Adaptability tests are conducted at DAR Experiment Farms. 1-6 Seed production is conducted.		a. Human Resources - Project Director, Project Managers - Counterpart Personnel - Members of JCC b. Facilities - Conference rooms for workshops and seminars - Office space for experts and support staff c. Equipment - Materials necessary for administrative work for the Project d. Project counterpart budget	
2-1 Based on the adaptability tests, cultivation technologies are tested and studied for localizing cultivation technologies. 2-2 Through trials at the CF's field, cultivation technologies adapted to local conditions are proved, and the cultivation manual is drafted. 2-3 Extension agents and CF are trained for cultivation technologies adapted to local conditions.		- Costs for communication and coordination, and administrative tasks related to the Project. - Daily allowances, accommodation and transportation costs of the project counterpart personnel during project implementation.	
3-1 As part of the baseline study, the soil study is conducted in the project sites from aspects of fertility and physical properties. 3-2 Testing for improving soil fertility and physical properties is conducted, and methods for the improvement are studied. 3-3 The methods for improving soil fertility and physical properties that are affordable to farmers (soil improvement technologies) are examined. 3-4 Through trials at the CF's fields, the methods for the soil improvement technologies that are adapted to the soil conditions are proved, and the soil improvement manual is drafted. 3-5 Extension agents and CF are trained for the soil improvement technologies that are adapted to local conditions.		Inputs from Japan a. <u>Human Resources</u> - Long-term Experts as the Project Chief Advisor (Dry land Crop Cultivation), Water-Saving Irrigation, Integrated Pest Management and Project Coordinator - Short-term Experts (Socio-economic Survey, Agro-environmental Survey, Horticulture, Seed valuation, Pest and Disease Control, Farmland conservation, Soil Analysis, Post-harvest Technology, etc..) - Project office staff personnel b. <u>Short-term training opportunities for the project counterpart personnel in Japan and/or third countries</u> c. <u>Equipment</u> - Vehicles - Equipment for laboratory and experimental fields - Machineries and equipment for pre-harvest to post-harvest - Computers, office equipment etc. d. <u>Project operation costs</u> Expenses for local activities.	
4-1 As part of the baseline study, water resources and water use by farmers are studied at project sites, and challenges are identified. 4-2 Water-harvesting technologies applicable to CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field. 4-3 Water-saving irrigation technologies applicable to farmer field in CDZ are tested at Dryland Crop Research Centre in Nyaung Oo and the CF's field. 4-4 Through the above verification tests, guideline and/or manual for water-harvesting technologies and water-saving irrigation technologies applicable to CDZ are drafted. 4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the project sites are recommended.			

Appendix 9-1

Foot Note

Table 1. Table 1. Yield for each target crop (kg/ acre)

Township	Crop	Before Project*1	After Project*2
Nyaung-U	Groundnut	292	321
	Pigeon pea	447	492
	Green gram	459	505
Myingyan	Groundnut	357	393
	Sesame	136	150
Magway	Groundnut	506	557
	Sesame	235	259

Table 2. Gross agricultural income from target variety per acre (Kyat/ care)

Township	Crop	Before Project*3	After Project*4
Nyaung-U	Groundnut	180,528	198,580
	Pigeon pea	241,120	265,232
	Green gram	341,541	375,695
Myingyan	Groundnut	220,687	242,755
	Sesame	208,613	229,474
Magway	Groundnut	312,794	344,074
	Sesame	360,471	396,518

Note: Note: *1 The township six-year average from 2007/8 to 2012/13. *2 10% increase from the before project. Otherwise the baseline survey data 2013/4. *3 the average yield on Table 1 multiplied by an average selling price obtained from the baseline survey and market price survey by the project. *4 10% increase from the before project.

Table.3 Target Area and Beneficiaries

Duration:	Five (5) years from November 2013 to November 2018
Target Area:	Nyaung-U, Myingyan and Magway townships
Beneficiaries:	78,492 farming households; Nyaung-U (25,713), Myingyan (32,607), Magway (20,172) as of 2005

Appendix 9-2

The Project for Development of Water Saving Agriculture Technology in the Central Dry Zone (WSAT)

Record of Amendment on PDM

Prepared by the project implementing office, 22 June 2016

Background history

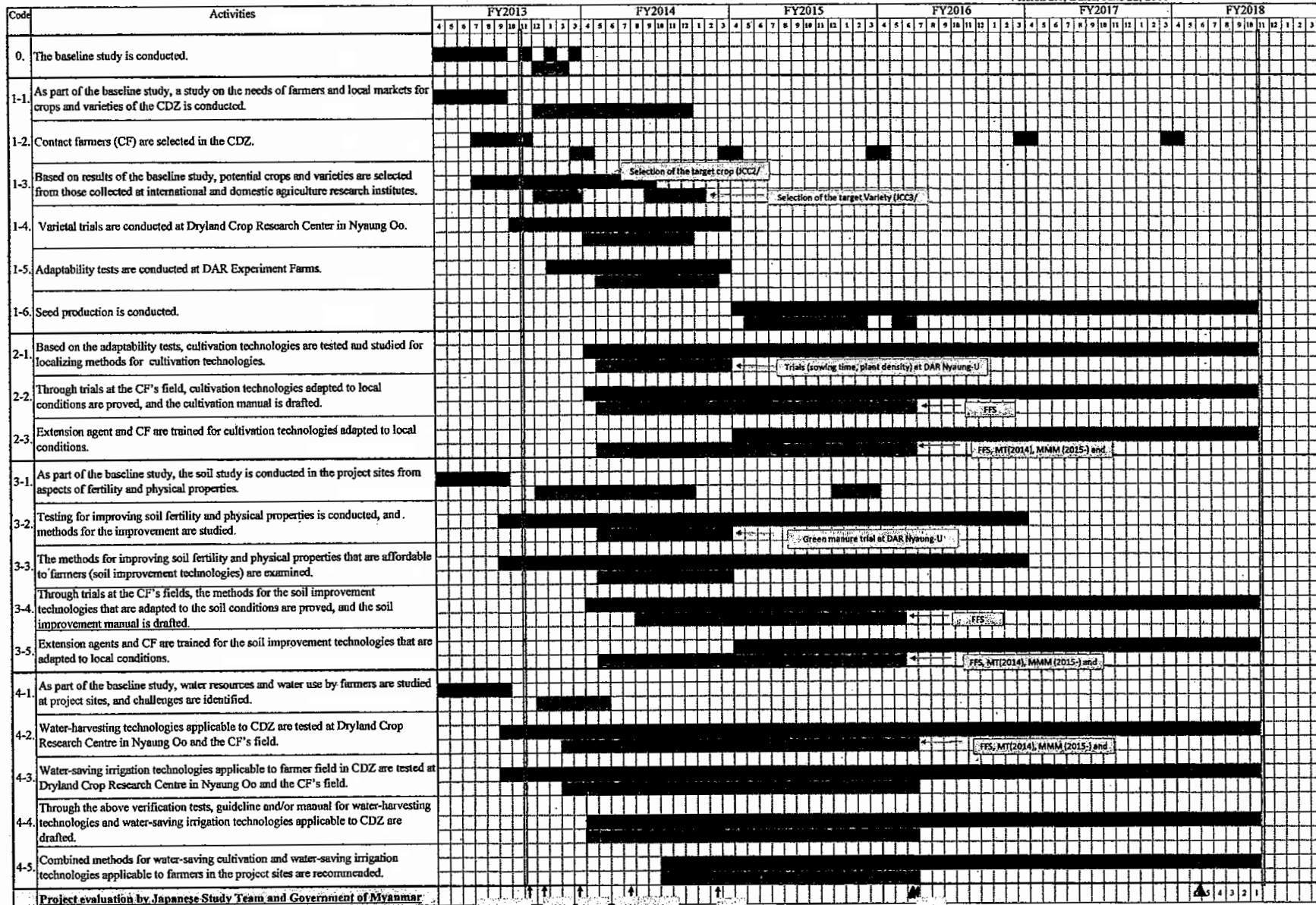
Version 1	The Project Design Matrix (PDM), as a project frame work, was attached to the Record of Discussion (R/D) signed 20 December 2012, but those indicators on the PDM, however, remained blank. Thus, upon the completion of first year at the occasion of the third JCC meeting, the indicators are to be decided as appears on the
Version 2	The definition of the <i>sampled farmers</i> is added in the note on the margin at the occasion of the fourth JCC meeting 24 June 2016.

No.	Item	Original as per attached to R/D	Update/amendment	Note
1	Margin Version	Version 1, Dates: 21 February 2015	Version 2, Dates: 24 June 2016	Version 2 The date of the fourth JCC meeting 24 June 2016
2	Important Assumptions Overall Goal	2. Cultivation technologies developed in the Project are accepted by farmers including other than Pilot Site.	2. Cultivation technologies developed in the Project are accepted by farmers including other than the target area.	Version 2 Correct wording.
3	Means of Verification Project Purpose	n.a.	- Sample survey (end line survey)	Version 2 Addition (clarification)
4	Outputs Output 1	1. New and/or conventional crops and promising varieties that are adaptable to CDZ are identified.	1. New and/or conventional crops and promising varieties that are adaptable to CDZ are identified and prepared.	Version 2 Correct wording.
5	Objectively Verifiable Indicators Output 1	1-2. 10% or more of the sampled farmers adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs.	1-2. 10% or more of the farmers in the target area adopt the new and/or existing crops and their superior varieties that are recommended by the project based on	Version 2 Correct wording.
6	Objectively Verifiable Indicators Output 1	1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the sampled farmers for such crops/varieties increases by 10% or more.	1-3. By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the contact farmers for such crops/varieties increases by 10% or more.	Version 2 Correct wording.
7	Means of Verification Output 1	n.a.	- Sample survey (end line survey)	Version 2 Addition (clarification)
8	Objectively Verifiable Indicators Output 2	2-5. The cultivation that is applied with the above manual is implemented by 10% or more of the sampled farmers.	2-5. The cultivation that is applied with the above manual is implemented by 10% or more of the farmers in the target area.	Version 2 Correct wording.
9	Means of Verification Output 2	n.a.	- Sample survey (end line survey)	Version 2 Addition (clarification)
10	Objectively Verifiable Indicators Output 3	3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions of the project target area are identified.	3-1. Within a half year from beginning of the project, the baseline study is conducted and soil conditions in the target area are identified.	Version 2 Correct wording.
11	Objectively Verifiable Indicators Output 3	3-6. The soil improvement that is applied with the above manual is implemented by 2% or more of the sampled farmers.	3-6. The soil improvement that is applied with the above manual is implemented by 2% or more of the farmers in the target area.	Version 2 Correct wording.
12	Means of Verification Output 3	n.a.	- Sample survey (end line survey)	Version 2 Addition (clarification)
13	Outputs Output 4	4. Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.	4. Water-saving irrigation technologies that are adaptable to project sites in CDZ are developed.	Version 2 Correct wording.
14	Objectively Verifiable Indicators Output 4	4-1. The study report on water resources and water use by farmers at pilot sites is drafted.	4-1. The study report on water resources and water use by farmers at project sites is drafted.	Version 2 Correct wording.

Appendix 9-2

No.	Item	Original as per attached to R/D	Update/amendment	Note
15	Activities Output 1	1-2 Pilot sites and contact farmers (CF) are selected in CDZ.	1-2 Contact farmers (CF) are selected in CDZ. Version 2	Correct wording.
16	Activities Output 1	1-5 Adaptability tests are conducted both at DAR Experiment Farms and CF's fields.	1-5 Adaptability tests are conducted at DAR Experiment Farms. Version 2	Delete the words (redundant). At the CF's field, activity 2-2 (trials) is to be conducted instead.
17	Activities Output 1	n.a.	1-6 Seed production is conducted. Version 2	Newly added.
18	Activities Output 4	4-1 As part of the baseline study, water resources and water use by farmers are studied at pilot sites, and challenges are identified.	4-1 As part of the baseline study, water resources and water use by farmers are studied at project sites, and challenges are identified. Version 2	Correct wording.
19	Activities Output 4	4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the pilot sites are recommended.	4-5 Combined methods for water-saving cultivation and water-saving irrigation technologies applicable to farmers in the project sites are recommended. Version 2	Correct wording.

The end of the document



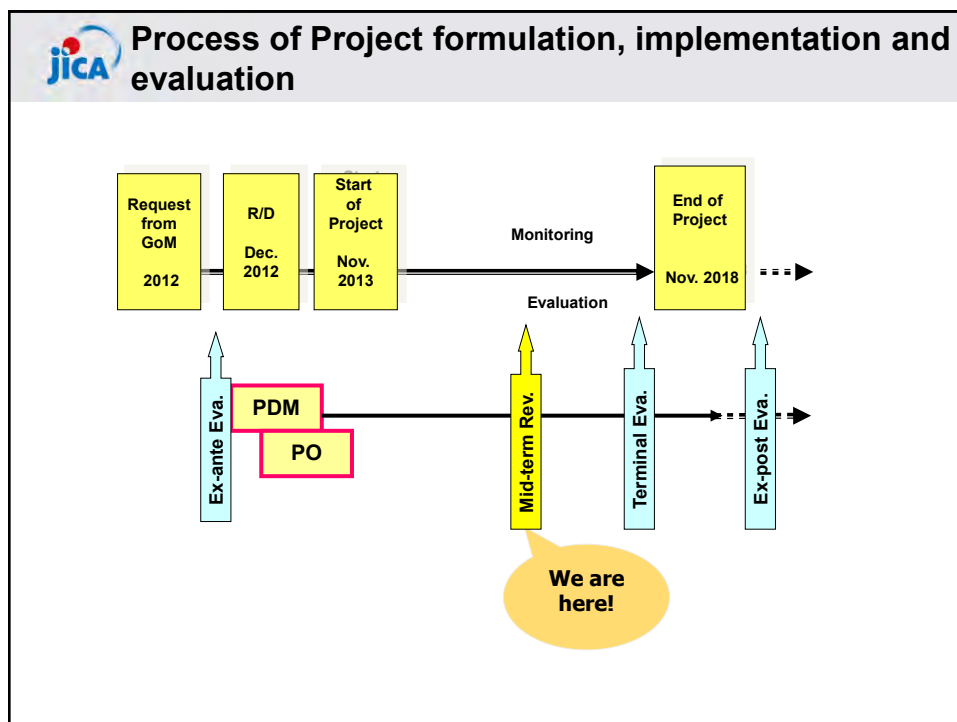
3. 合同評価結果プレゼンテーション内容

Joint Mid-term Review Summary

**4th Joint Coordinating Committee on
“Technical Cooperation for Development of Water
Saving Agriculture Technology
in the Central Dry Zone”**

June 24, 2016
Auditorium, DAR, Yezin

Joint Mid-term Review Team





Contents of Joint Mid-term Review

1. Outline of Joint Mid-term Review - p 1~3
2. Summary of the Project - p 4,5
3. Implementation Process - p 6~10
4. Achievements - p 11~17
5. Review by Five Evaluation Criteria - p 18~25
6. Recommendations - p 26,27
7. Lessons Learned - p 28



1. Outline of Joint Mid-term Review

1.1 Background

1.2 Objective

1.3 Members of Joint Mid-term Review Team

1.4 Schedule and Measure Interviewees

1.5 Methodology of Joint Mid-term Review



1. Outline of Joint Mid-term Review

The objectives are

- to confirm and analyze achievements of Project Purpose and Outputs at the mid-period,
- to make necessary recommendations to the Project, and
- to compile its results in the Mid-term Review report by incorporating findings of the study and recommendations.



1. Outline of Joint Mid-term Review

Members of Joint Mid-term Review Team

Myanmar Members

1. Dr. Nyi Nyi (DOA, MoALI)
2. Dr. Pau Sian Kam (DAR, MoALI)

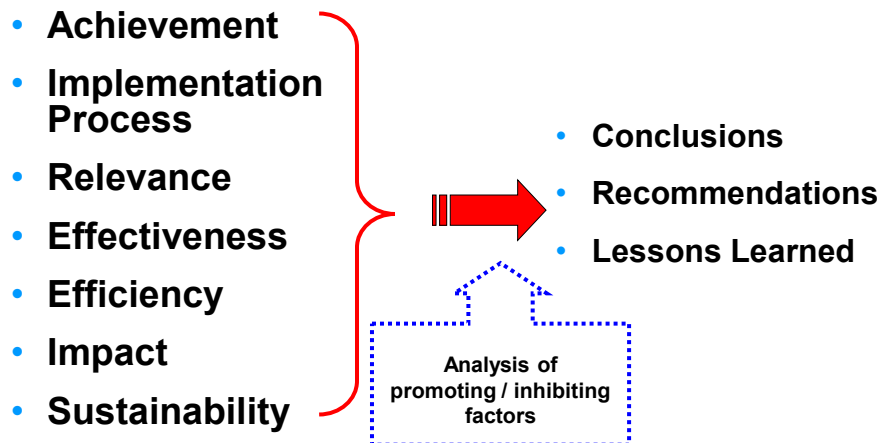
Japanese members

1. Mr. Kazuya SUZUKI (JICA)
2. Mr. Kenichiro KOBAYASHI (JICA Expert, MoALI)
3. Mr. Yuchiro MISAWA (MAFF, Japan)
4. Dr. Makoto KAWASE (University of Tsukuba)
5. Dr. Naozumi MIMIDA (University of Tsukuba)
6. Dr. Tetsuro HAMADA (JICA consultant)
7. Ms. Hana OSHIRO (JICA)

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1. Outline of Joint Mid-term Review

Methodology of Mid-term Review



2. Summary of the Project

- 2.1 Project Design Matrix (PDM)
- 2.2 Project Framework



3. Implementation Process

- 3.1 Institutional Arrangements for Project Implementation
- 3.2 Project Management and Decision Making
- 3.3 Implementation Structure for Project Activities
- 3.4 Extension Activities (FFS)
- 3.5 Communication and Information Sharing
- 3.6 Methodology of Technology Transfer

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4. Achievements

- 4.1 Inputs
- 4.2 Implementation of Activities
- 4.3 Project Products
- 4.4 Achievement and Progress of Outputs**
- 4.5 Achievement Level of Project Purpose**

10



4. Achievements

4.4 Achievement and Progress of Outputs

Output 1:

New and/or conventional crops and promising varieties that are adaptable to CDZ are identified.

Indicator 1-1:

Within a half year from beginning of the project, the baseline study is conducted and consumer needs for the local agriculture products are identified.

Completed

Completed in January and September 2014

Indicator 1-2:

10% or more of the sampled farmers adopt the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs.

Progressing as scheduled

Seed recipients / Farmers in 3 townships =970/78,492 (1.2%)

Indicator 1-3:

By selling the new and/or existing crops and their superior varieties that are recommended by the project based on the consumer needs, an average sales amount of the sampled farmers for such crops/varieties increases by 10% or more.

Progressing as scheduled

Average gross agricultural income (Kyat/acre) of CFs is over 10% in 2015



4. Achievements

4.4 Achievement and Progress of Outputs

Output 2:

Cultivation technologies are improved so that these can match the environments of CDZ.

Indicator 2-1:

Cultivation technologies adapted to local conditions are established for the selected new and/or existing crops and their superior varieties, and these technologies are implemented 2 times in total (2 times per year) at DAR Experiment Farm.

Mostly Completed

The trials were conducted 2times at the DAR farms

Indicator 2-2:

Appropriate technical manual for cultivation technologies are prepared.

Mostly Completed

The manuals for each target crop were prepared.

Indicator 2-3:

30 or more persons of the extension agents who can apply the above manual and implement cultivation technologies are built up.

Progressing as schedule

26 persons (26/30=87%)



4. Achievements

4.4 Achievement and Progress of Outputs

Indicator 2-4:

Verification test by applying the above manual is conducted 100 times or more (1 time or more per year) by the project at the contact farmer's field.

Progressing as schedule

The 63 times verification tests (CFs) have been conducted.
63/100 (63%)

Indicator 2-5:

The cultivation that is applied with the above manual is implemented by 10% or more of the sampled farmers.

Progressing as schedule

3,807 farmers have applied the technologies.
3,807/ 7,849 HH (49%)

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4. Achievements

4.4 Achievement and Progress of Outputs

Output 3:

Technologies for farm maintenance including control of soil environment (nutrients, water retention, etc.) are improved so that these can match the environments of CDZ.

Indicator 3-1:

Within a half year from beginning of the project, the baseline study is conducted and soil conditions of the project target area are identified.

Mostly Completed

Survey report was completed in August 2013.

Indicator 3-2:

The soil improvement technologies that are adapted to the local conditions are established

Completed

Gliricidia has been identified.

Indicator 3-3:

Technical manual for the soil improvement technologies is prepared.

Mostly Completed

Extension material for Gliricidia was prepared and is being utilized.

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4. Achievements

4.4 Achievement and Progress of Outputs

<p>Indicator 3-4: 30 or more persons of the extension agents who can apply the above manual and implement the soil improvement technologies are built up</p>	<p>Progressing as schedule 21 extension staff has been trained. (21/30=70%)</p>
<p>Indicator 3-5: Verification test by applying the above manual is conducted 100 times or more (1 time or more per year) by the project at the contact farmers' field.</p>	<p>Progressing as schedule 39 verification tests (CFs) have been conducted. 39% (39/100)</p>
<p>Indicator 3-6: The soil improvement that is applied with the above manual is implemented by 2% or more of the sampled farmer</p>	<p>Progressing as schedule 599 farmers applied the technology. 599/ 1,570 farmers (38%)</p>

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4. Achievements

4.4 Achievement and Progress of Outputs

<p>Output 4: Water-saving irrigation technologies that are adaptable to pilot sites in CDZ are developed.</p>	
<p>Indicator 4-1: The study report on water resources and water use by farmers at pilot sites is drafted.</p>	<p>Completed The study reports were prepared.</p>
<p>Indicator 4-2: Technical guideline and/or manual for the water-harvesting and water-saving irrigation technologies are prepared.</p>	<p>Mostly Completed Guideline and extension material were drafted.</p>
<p>Indicator 4-3: The recommendation for combined methods for water-saving cultivation and water-saving irrigation technologies is prepared.</p>	<p>Progressing as schedule For recommendations, demonstration plots are being identified.</p>

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4. Achievements

4.5 Achievement Level of Project Purpose

Project Purpose :

Water-saving agriculture technologies that are adapted to CDZ are established.

Indicator 1:

The water-saving agricultural technology developed in this project are introduced by the 15% farmer in Project Site and carried out more than 1 cropping seasons.

Mostly completed
4,605 farmers /target
11,774 farmers (39%)

Indicator 2:

In Project Site, crop yields increased 10% at the farmers who used the water-saving agricultural technology developed in this project.

Mostly completed
Average yield of CFs by each target crop (kg/ acre) is already over 10%.

Indicator 3:

In Project Site, 60% of Farmers, who used the water-saving agricultural technology developed in this project, evaluate that this technology is effective.

Mostly completed
Positive response from CFs and NFs are 91% on average



5. Review by Five Evaluation Criteria

Relevance: Validity of Project Purpose and the Overall Goal in connection with needs and development policies.

Effectiveness: Expectancy of achieving the Project Purposes.

Efficiency: Productivity of the implementation process. It analyzes whether inputs of the Project have been effectively converted into the Outputs.

Impact: Positive and negative unexpected effects. It also examines possibility of accomplishing the Overall Goal.

Sustainability: Possibility of generating benefits by the Project related activities even after the Project period.

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5. Review by Five Evaluation Criteria

Criteria	Evaluation	Summary
Relevance	High	The Project has been responding to needs of TGs/beneficiaries and it coincides with policies of Myanmar and Japan. There are no factors to lower relevance of the Project.
Effectiveness	High	Logical sequence between Outputs and Project Purpose is secured and logically connected. Project Purpose is predicted to be achieved.
Efficiency	High	Expectancy of achieving Outputs is high. Implementation process is systematic and cost-performance is high.
Impact	Medium	The tangible impact is observed on CFs, NFs and OFs. Overall Goal is unlikely to be achieved due to a gap between Project Purpose and Overall Goal. There are no negative impact and unexpected effects identified at the time of Joint Mid-term Review.
Sustainability	Medium High	Technical sustainability is "high". Policy and administrative sustainability as well as organizational and institutional sustainability are "medium high". Financial sustainability is "medium".

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5. Review by Five Evaluation Criteria - Conclusion-

- *The Team confirmed that the Project has made steady progress and has been on track to achieve the Project Purpose.*
- *The Team also confirmed that the Project has greatly contributed to the capacity development of C/Ps, TGs and CFs through provision of trainings and FFS.*
- *The tangible impact has been seen on CFs and NFs as a result of application of the improved technologies.*
- *For achieving Overall Goal, it is expected to develop practical strategy for sustainably disseminating the water-saving agriculture technology to other parts of CDZ.*

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6. Recommendations

- 6.1 Modification of PDM and PO
- 6.2 Continuation of Seed Production in the Project
- 6.3 Transfer of the Seed Production Activities to DAR and DOA
- 6.4 Promotion of Stronger Linkage between DAR and DOA
- 6.5 Assignment of the TS Managers to as C/Ps
- 6.6 Consideration of the Post-Project Strategy for Sustainable Development

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6. Recommendations

6.1 Modification of PDM and PO

- The Team recommends modifying the current version of PDM (ver. 1) and proposing revised PDM (ver. 2).

6.2 Continuation of Seed Production in the Project

- The Project has conducted seed production of selected crops and superior varieties for further verification tests. Since seed supply of upland crops is insufficient in Myanmar, the Project has produced the necessary seed for the target area.
- The Team confirmed that the seed production would be necessary to achieve the Project Purpose during the second half of the Project period.

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6. Recommendations

6.3 Transfer of the Seed Production Activities to DAR and DOA

- For achieving the Overall Goal, the seed production activities are expected to be conducted by DAR and DOA, and continuously implemented on their own initiative after the Project completion. DAR and DOA are expected to contribute to establishment of sustainable seed production system during the second half of the Project period. In addition, for smooth taking over of the seed production activities, it is recommended necessary budget be allocated by DAR and DOA for those activities in the 2018/19 fiscal year's budget and afterward.

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6. Recommendations

6.4 Promotion of Stronger Linkage between DAR and DOA

- Good practices of collaboration and cooperation between DAR and DOA such as the FD for technique transfer to farmers have been observed
- The Team strongly recommends that the collaboration and cooperation between DAR and DOA such as FD shall be expanded to the areas other than the target area under authorization and encouragement of responsible officials of MoALI particularly of DAR and DOA. Monthly meeting or some other cooperative attempts between DAR and DOA in TS level and district level might promote future development, if appropriate inviting local government personnel.

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6. Recommendations

6.5 Assignment of the TS Managers to as C/Ps

- Within the target area, DOA TS managers in Nyaung Oo and Myingyan have not been assigned as C/Ps but in Magway. For the extension work during the second half of the Project period, the Team requests the Myanmar side to additionally assign DOA TS managers in Nyaung Oo and Myingyan to as C/Ps and let them officially and cohesively participate in the Project activities for more fruitful achievements.

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6. Recommendations

6.6 Consideration of the Post-Project Strategy for Sustainable Development

- In the second half of the Project, the Myanmar side is expected to take initiative more on application research and extension activities of water-saving agricultural technology. It can contribute to assure the sustainability after the completion of the Project.
- Since these activities are expected to mainstream in CDZ, especially in the target area after the Project completion, the Team recommends that the Myanmar side increase their contributions gradually during the second half of the Project period. Therefore, the Post-Project Strategy should be formulated in cooperation until middle of 2017 and implemented preliminarily in the final year of the Project period by Myanmar side's initiative.
- The Team requests responsible officials of MoALI to implement the Post-Project Strategy.

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7. Lessons Learned

1. Provision of Materials
2. Seed Exchange Mechanism
3. Strengthening of Collaboration among Concerned Institutes

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Thank you for your attention !



ミャンマー国
中央乾燥地における節水農業技術開発プロジェクト

評価グリッド

項目	評価設問	判断基準・方法	必要なデータ	情報源	データ収集方法	備考	
1) 実施プロセス							
実施体制	プロジェクト活動はどのように実施されているのか？	プロジェクトの実施方法	関係者の役割分担を示す情報	プロジェクト専門家、ミャンマー実施機関	文献調査、インタビュー調査	—	
	プロジェクト実施機関の役割と責任は適切かつ明確であるか？	ミャンマー実施機関の役割分担の適性				—	
	ミャンマー実施機関は期待された責任を果たしているか？	ミャンマー実施機関の参加度	参加を示す情報			—	
	ミャンマー実施機関は相互に連携・協力しているか？	協力・連携の度合い	連携の事例			—	
	JCCはこれまで何回、開催され、主要な議題は何か？	頻度、主要課題	JCC 議事録	プロジェクト専門家		文献調査	—
	どのように意思決定をしてプロジェクトを進めているのか？	意思決定に関する問題の有無	問題があった事例	プロジェクト専門家ミャンマー実施機関		質問票、インタビュー調査	—
スケジュール	プロジェクトの実施スケジュールは適切だったか？	実施スケジュール計画と実績の比較	PO、活動実績	プロジェクト専門家	プロジェクト提供資料、インタビュー調査	—	
モニタリング	モニタリングの手段として、どのような手段が用いられたのか？	—	モニタリング・レポート	プロジェクト専門家		—	
	プロジェクトのモニタリングの実施に関して問題はあったか？	モニタリング実施における問題の有無		プロジェクト専門家、ミャンマー実施機関		—	
オーナーシップ	ミャンマー側の予算処置は適切か？	予算投入のタイミング、投入実績	予算額と執行時期	プロジェクト専門家、ミャンマー実施機関	質問票、インタビュー調査	—	
	ミャンマー実施機関はプロジェクト活動に積極的に参加しているか？ (C/P 配置を含む)	活動への参加度	参加を示す情報			—	
	日本側とミャンマー側でプロジェクトに対する考え方の違いはあるか？	プロジェクトの理解度への内容・主旨	プロジェクト活動の認知度			—	
広報	ミャンマー向けの広報として、どのような活動が実施されたのか？	—	—		インタビュー調査	—	
	日本向けの広報としてどのような活動が実施されたのか？	—	—			—	
コミュニケーション	日本側とミャンマー側でどのようなコミュニケーション手段を使用しているのか？	—	—		質問票、インタビュー調査	—	

	日本側研とミャンマー側のコミュニケーションに問題があるか？	コミュニケーションに関する問題の有無	問題があった事例			—
技術移転	C/P と TG にどのように技術移転が行われているのか？	C/P、TG の理解度	C/P、TG の理解度を示すデータ	C/P、TG、日本人専門家	プロジェクト提供資料、インタビュー調査	—
	技術移転の手法は効果的であったのか？					
その他の運営管理の問題	プロジェクト運営管理において、その他の問題や困難があったか？	運営管理の問題の有無	—	日本及びミャンマー関係者		—
2) 投入の実績						
日本側投入	日本側からどのような投入があったか？（量、質、時期）	—	人材	プロジェクト専門家、ミャンマー実施機関	プロジェクト提供資料、インタビュー調査 観察	—
		—	機材			—
		—	研修実績			—
		—	ローカルコスト			—
ミャンマー側投入	ミャンマー側からどのような投入があったか？（量、質、時期）	—	人材（C/P等）			—
		—	施設			—
		—	ローカルコスト			—
投入の問題	投入を行うにあたって問題はあったのか？	投入の問題の有無	—			—
3) 活動の実績						
活動の進捗	各活動は進捗しているのか？	—	それぞれの活動実績	プロジェクト専門家、ミャンマー実施機関	プロジェクト提供資料、インタビュー調査	—
阻害要因	活動を実施する阻害要因はあったのか？	—	要因の有無			—
促進要因	活動を実施する促進要因はあったのか？	—				—
成果品	活動の結果としてどのような成果品が作成されたのか？	—	成果品リスト			—
4) 成果の達成度						
成果の達成度	各成果は産出されているのか？	指標の達成度	指標の達成度と今後の予測値	プロジェクト専門家、ミャンマー実施機関	プロジェクト提供資料、インタビュー調査	—
阻害要因	成果を産出する阻害要因はあったのか？	—	要因の有無			—
促進要因	成果を産出する促進要因はあったのか？	—				—
5) プロジェクト目標の達成度						
プロジェクト目標の達成度	プロジェクト目標はどこまで達成されているのか？	指標の達成	指標の達成度と今後の予測値	プロジェクト専門家、ミャンマー実施機関	プロジェクト提供資料、インタビュー調査	—
阻害要因	プロジェクト目標を達成するための阻害要因はあるか？	—	要因の有無			—
促進要因	プロジェクト目標を達成するための促進要因はあるか？	—				—

6)「妥当性」の評価						
選定の妥当性	ターゲットグループのニーズに大きな変化はないか？	ニーズ変化の確認	受益者のニーズ	ベースライン調査、TG	インタビュー調査	－
	ミャンマー実施機関のニーズに大きなニーズの変化はないか？		実施機関のニーズ	プロジェクト専門家、ミャンマー実施機関	質問票、インタビュー調査	
	対象地域の選定は適切であったのか？	選定理由の変化	関係者の認識			
政策との整合性	ミャンマー政府の農業開発政策に大きな変化がないか？	農業開発政策の確認	農業開発計画	プロジェクト専門家、ミャンマー実施機関	文献調査 インタビュー調査	－
	日本の援助政策に大きな変化がないか？	援助政策の確認	援助政策	援助政策書	文献調査	－
手段としての適切性	プロジェクト実施は、ミャンマーの開発課題を解決する戦略やアプローチとして適切であるか？	重要性・優先度	農業開発計画	プロジェクト専門家、ミャンマー実施機関	文献調査 インタビュー調査	－
	対象地域の選択は戦略を達成するうえで適切か？	他地域との比較	優位性を示す情報		文献調査、インタビュー調査	－
	ターゲットグループの選定は戦略を達成するうえで適切か？	他ターゲットグループとの比較				－
	日本による支援の優位性はあるか？	日本による支援の優位性有無				－
その他	プロジェクト開始以降、プロジェクト活動の実施に影響する変化（政治、経済、社会など）はあるか？	変化の有無	認識の関係者		質問票、インタビュー調査	－
7)「有効性」の評価						
プロジェクト目標の達成度	プロジェクト目標は達成されるのか？（見込み）	実績の検証結果	指標達成見込み	プロジェクト関係者	プロジェクト提供資料	－
成果とプロジェクト目標との因果関係	成果とプロジェクト目標間の論理性が確保されているか？	論理性の有無	プロジェクト・デザインの文書	PDM など	文献調査、インタビュー調査	－
	成果からプロジェクト目標に至るまでの外部条件は満たされる可能性は高いか？	外部条件が満たされる可能性の有無	具体的事例と今後の予測	プロジェクト専門家、ミャンマー実施機関	インタビュー調査、観察	－
プロジェクト目標達成要件	プロジェクト目標の達成に必要とされる条件や要因はあるのか？	要件の有無	今後の予測		質問票、インタビュー調査	－
8)「効率性」の評価						
成果の産出	設定されたすべての成果は達成されるのか？（見込み）	実績の検証結果	指標達成見込み	プロジェクト関係者	プロジェクト提供資料	－
投入	投入は成果を達成するために十分だったか？（量や質）	不十分あるいは過剰な投入の有無	投入実績	プロジェクト専門家、ミャンマー実施機関	インタビュー調査、観察	－
	投入のタイミングは適切だったか？	不適切な投入タイミングの有無	不適切なタイミングの具体例			－
	投入された資機材等は十分に維持管理されているか？	機材の使用度、管理状況	管理台帳、責任者、管理方法など			－

活動	活動は成果を達成するために十分だったか？ (必要十分条件を満たしているか)	不十分あるいは過剰な活動の有無	活動実績			—
	活動のタイミングは適切だったか？	不適切な投入タイミングの有無	不適切なタイミングの具体例			—
投入と成果の因果関係	投入と成果の論理性が確保されているか？	論理性の有無	PDM		文献調査、インタビュー調査	—
	活動から成果に至るまでの外部条件は満たされる可能性は高いか？	外部条件が満たされる可能性の有無	具体的事例と今後の予測			—
費用の効率性	プロジェクト目標、成果は投入に見合ったものだったか？	費用効率の高い代替案の有無	費用効率の高い代替案		インタビュー調査、観察	—
	同費用でより高い達成度を実現することはできなかったか？	達成度の高い方法の有無	達成度が高い案			—
9)「インパクト」の評価						
上位目標の達成見込み	上位目標は達成されるのか？(見込み)	検証結果の実績	指標達成見込み	プロジェクト専門家、ミャンマー実施機関	プロジェクト提供資料、質問票、インタビュー調査	—
	上位目標を達成するための取り組みが行われているか？	取り組みの有無	具体的な事例			
	上位目標の達成を阻害する要因はあるか？	要因の有無	今後の予測			—
インパクト	上位目標の達成により開発計画へのインパクトは見込めるか？	影響の有無	影響の具体例			
	受益者やミャンマー実施機関に対して(CF&TG)、直接的な影響や効果が見込めるか？	インパクトの有無	具体的な事例			—
	受益者やミャンマー実施機関に対して(CF&TG)、間接的な影響や効果が見込めるか？					—
プロジェクト目標と上位目標との因果関係	上位目標とプロジェクト目標は乖離していないか？	論理性の有無	プロジェクト・デザインの文書		文献調査、インタビュー調査	—
	プロジェクト目標から上位目標に至るまでの外部条件は満たされる可能性は高いか？	外部条件が満たされる可能性の有無	具体的事例と今後の予測			インタビュー調査、観察
波及効果	ミャンマー側への正の波及効果(上位目標以外のインパクト)はあるか？	波及効果の有無	正の波及効果の具体例		インタビュー調査、観察	—
	ミャンマー側への負の波及効果はあるか？(特にジェンダー、民族、文化、環境などについて)	波及効果の有無	負の波及効果の具体例			—

10)「持続性」の評価						
政策・制度的側面	プロジェクト終了後に、政策的支援の継続の見込みはあるか？	開発計画等の記述内容	開発計画・戦略	ミャンマー実施機関	文献調査、インタビュー調査	—
	必要な法制度や規制の整備の見込みはあるか？	必要な法や規則	法制度・規制			—
	プロジェクト終了後に、プロジェクト効果を継続していくための制度の整備の見込みはあるか？	必要な普及制度	人材配置、実施体制、コミットメント			—
組織・財政面	プロジェクト終了後に、プロジェクト効果を継続するための組織能力はあるか？（オーナーシップ）	必要な運営管理能力				—
	プロジェクト終了後に、プロジェクト効果を継続するために必要な予算確保の見通しはあるか？	必要予算の確保の見込み	コミットメント、予算書	プロジェクト専門家、ミャンマー実施機関	インタビュー調査	—
技術的側面	持続的な普及メカニズムはプロジェクト実施計画に取り込まれているか？	終了後の普及体制の自立度	具体的な事例			—
	ミャンマー実施機関、C/P、CF に移転された知識・技術は定着しているか？	技術の定着度	モニタリング結果	ミャンマー実施機関、TG、CF		—
	ミャンマー実施機関、C/P、CF に移転された知識・技術は普及されていくのか？	CF の数と技術レベル				
その他	プロジェクト効果の持続性に影響を与える阻害要因はあるか？	社会・文化・環境への影響の有無	関係者の認識	プロジェクト専門家、ミャンマー実施機関	質問票、インタビュー調査	—
総合的持続性	上記のような側面を総合的に勘案して、持続性は高いのか低いのか？	—	—	—	—	—

