

第 4 章 本プロジェクトのインパクト

4.1 インパクト調査

4.1.1 インパクト調査の背景と目的

2016年6月、本プロジェクトの効果を確認する事を目的として終了時評価が実施された。JICA とザンビア国農業省職員からなる合同評価チーム（以下、評価チーム）が現地にて聞き取り調査を実施し、『DAC 評価 5 項目』に基づき評価したところ、下表のような結論が得られた。その中で、本プロジェクトが複数のインパクトを発現させている可能性が指摘された。

表 4.1.1 5 項目評価基準に沿った終了時評価チームによる評価結果

Evaluation Criteria	Evaluation Results	Reasons/Remarks
Relevance	High	(+) Relevance with Zambian policies (+) Relevance with the needs of local communities to reduce poverty through irrigated agriculture (+) Relevance with Japan's aid strategy
Effectiveness	Relatively High	(+) Project Purpose has been reasonably achieved (-) Capacity of TSB officers in terms of permanent weirs construction(planning, design, construction and O&M) needs to be further enhanced
Efficiency	Relatively High	(+) Input by the Japanese side was reasonable (-) Input by the Zambia side was not made as planned (Capacity development of TSB officers on permanent weir construction has not been made as expected due to budget limitation of GRZ) (+) Output has been reasonably generated. More than 500 weirs were constructed during past 3 years. (-) Inconsistent implementation strategy of the Project: removal of activities related to simple weir irrigation scheme in the 1st half of the cooperation period
Impacts	Positive Impacts are observed	<ul style="list-style-type: none"> Overall Goals expected will be achieved as long as the current level of budget and human resources are maintained Various positive impacts are observed and no negative impacts observed so far
Sustainability	Relatively High	(+) High relevance with Zambian policies (-) More than 10 TSB officers are considered to have capacity to design permanent weirs (±) Concern about budget arrangement by the Zambian side to continue the smallholder irrigation schemes in the long term, particularly in terms of permanent weir construction

出典：JICA およびザンビア国農業省同評価チームによる終了時評価報告書（2016年6月）

この結果に基づき、評価チームはプロジェクトチームに対してインパクト調査の実施を提言し、本プロジェクトにより発現していると考えられるインパクト、特に受益農民の生活のうち、世帯の生計向上、食の多様性へのインパクト、栄養改善効果などにどのように貢献したかを定量的・定性的に明らかにすることを目的として、インパクト調査が実施された。

4.1.2 インパクト調査のコンセプト

インパクト調査のコンセプトは、図 4.1.1 に示す通りである。前述した通り、評価チームは本プロジェクトが複数のインパクトを発現させている可能性を指摘したが、インパクト調査では、インパクトの発現経路として「2 段階構造でインパクトが発現している」との仮説を立てて調査の構造を設計した。

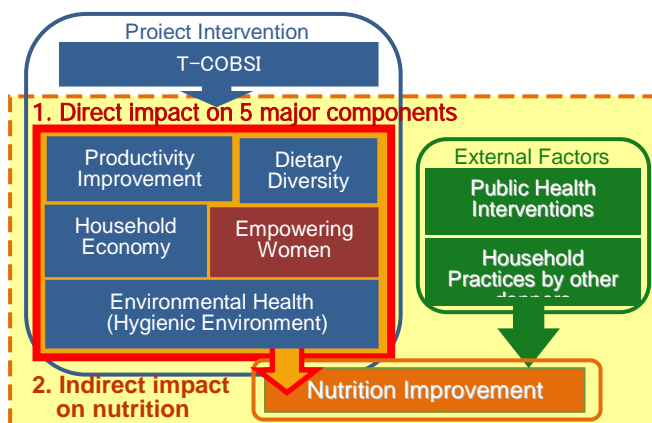


図 4.1.1 インパクト調査のコンセプト図

出典：JICA T-COBSI プロジェクトチーム（2017）

まず、本プロジェクトの活動が直接的に影響を与えた

ことにより発現する 5 つの直接的インパクトがあり、それらのインパクトを受け、間接的インパクトが発現する、という仮説である。また、国際機関やドナー、ザンビア国政府等による介入が行われている状況から、本インパクト調査は、それら外部からの介入を外的要因として考慮し、分析を行った。

4.1.3 インパクト調査の手法

インパクト調査の実施方法は下表の通りである。

表 4.1.2 インパクト調査の方法

Title	Contents	Detail/Remarks
Target area	3provinces	<ul style="list-style-type: none"> • Northern province, Muchinga province and Luapula province • 3 districts from each provinces
Condition	2conditions	<ul style="list-style-type: none"> • Condition 1. Non irrigated area • Condition 2. Irrigated area (both of target site from 2009 to2011 as COBSI and from 2013 to now as T-COBSI)
<u>1. 5major impacts</u> ①Productivity ②Dietary Diversity ③Household Economy ④Empowering Women ⑤Environmental Health	Interview with Questionnaire	<ul style="list-style-type: none"> • Index for productivity improvement Cultivated area, Yield etc. • Index for household economy , improvement Net income from agriculture, Expenditure for food etc. • Index for dietary diversity Food Consumption Score (FCS), Coping Strategies Index (CSI) etc. • Index for environmental health Time to access the safety water, Plague infected etc.
<u>2. Indirect impact</u>	Anthropometries' measurement	<ul style="list-style-type: none"> • Target: Children in farmers, 20-59 months after birth and breast feeding. • Measure height and weight (for calculating WAZ, HAZ and HWZ)
⑥Nutrition improvement	Observations	<ul style="list-style-type: none"> • Check "Under 5 years card" and copy writing by hand below • Date of birth • Ingest Vitamin

出典：JICA T-COBSI プロジェクトチーム（2017）

インパクト調査では、まず調査用に作成した質問票を用いて、聞き取り調査を行った。その際、食の多様化や食糧安全保障の度合い、栄養改善効果を測定するために、WFP や FAO 等の国際機関が開発した指標が複数存在しているため、それら指標の持つ特性を比較し、ザンビア国に適した指標を用いて調査表を作成した。

本調査は、3 段階で実施した。まず、コミュニティを対象に、地域の気候、社会的アクセスや他ドナーの介入の有無を聞き取った。次に、世帯に関する聞き取り調査を世帯別実施し、最後に、世帯の児童の身体測定を実施した（右写真参照）。

4.1.4 結果と考察

1) 結果

灌漑開発が農業分野に及ぼすインパクトとしては、農業生産性の向上が知られているところであるが、農家の食生活の多様化や、栄養状況の向上について示した報告は少ない。また、定量的・定性的な両面から便益を測定した研究あるいは調査結果も多くない。

このような背景から、本プロジェクトのインパクト調査では、統計学的手順を踏み、統計学的评价手法に基づいて調査を実施した。この手法で調査を行うことにより、プロジェクトで導入した灌漑施設が、対象地域の住民にどのような効果をもたらしたかを、可能な限り定量的に明らかにするよう試みた。



身長測定時、母親の目を見て静止する児童。

調査の結果、正のインパクトとして発現した効果は、農業生産性の向上、農家の生計向上、食の多様化、栄養改善効果であった。ただし、それらの効果は、地域特性や気象条件、社会経済サービスへのアクセスの善し悪しに強く依存していることが考えられた。

本調査を統計分析した結果を、次頁の表 4.1.3 に示すと共に、主要項目について下記にまとめる。

- 灌漑施設の導入による世帯当たり農業生産性の向上は、農地面積（生産面積）の拡大とそれに伴う農業産出額の増加により達成された。特に乾期の園芸作物栽培面積が増加しており、この効果は地域特性に関わらず発現した。灌漑農家の耕作面積と農業生産額は、非灌漑農家の耕作面積と農業生産額よりも、それぞれ 1.7 倍増と 2.2 倍増となった。
- 灌漑施設を導入することにより、農家の農業収入が増加し、生計向上が達成された。このインパクトの発現は、地域特性に左右されないこともわかった。数値的に見ると、非灌漑農家に比べ、灌漑を導入した農家の農業収入は 2.2 倍であった。また、農業収入は、気候変動に脆弱なエリアの乾期の食費支出額を向上させる傾向があることも示唆された。反対に、社会経済サービスアクセスに乏しい地域では、農業収入は乾期の食糧支出の増加を誘発しない可能性も考えられた。
- 乾期および雨期を通じて、灌漑施設の導入は、食の多様化を促していることが示唆された。特に、雨期における食の多様化は、地域特性に関係なく促進されている可能性が示された。また、気候変動に脆弱な地域ほど、乾期における食の多様化が促進されることも示唆された。社会経済サービスアクセスについては、進展エリアとリモートエリアで食の多様化が促進されていることが示された。この結果は、異なる地域特性における食の多様化の進展方法の違いを示すものであり、社会経済サービスアクセスの良い地域では食費支出の増加、つまり食糧購入による多様化で表され、アクセスの悪い地域では乾期農作物の自家消費による多様化で示されたと推察できる。
- 女性の労働時間は、灌漑導入によって著しく増加した。特に、社会経済サービスへのアクセスが制限されているリモートエリアにおいて、女性の労働時間の増加が顕著にみられた。
- 栄養改善に資するインパクトも確認された。地域特性別にみると、気候変動に脆弱な地域において影響が多くみられた。また、栄養改善効果は、社会経済サービスへのアクセスに乏しいエリアほど高いことも示唆された。この結果から、乾期の自家消費によって進められた食生活の多様化は、栄養改善に直結する可能性があると考えられる。
- 灌漑の導入は、成長阻害のような慢性的な栄養失調には効果がみられない一方で、短期的・中期的な栄養失調が原因である低体重や消耗症の場合には効果がみられた。慢性的な栄養不良状態は、ミネラル等の必須微量栄養素や、タンパク質の欠乏によるものであると考えられ、これらを改善するためには、食生活の抜本的な転換が必要となる。従い、灌漑の導入単独で栄養改善を試みるのではなく、栄養教育等の他分野からの支援と併せた長期的な介入が必要であると考えられる。

表 4.1.3 インパクト調査結果総覧

インパクトの項目	切り口 (数値指標)	要因： 灌漑導入 (I)		要因： 気候条件 (C)		要因： 社会経済サービスアクセス (SE)		外部要因： 保健プロジェクト介入 (PI)	
		効果	サイトの種類： 非灌漑、灌漑	交互作用	脆弱エリア、頑健エリア	交互作用	タイプ： リモート、中間、伸展	交互作用	タイプ： 介入あり、ナシ
① 農業生産性向上へのインパクト	農地面積：ha	○	5%水準で有意差あり 農地面積は灌漑は非灌漑の1.7倍	—	脆弱は頑健の1.1倍(10%水準)の農地面積	—	有意差なし、リモートにて最大値		
	農業産出額：ZMW	○	5%水準で有意差あり 灌漑は非灌漑の2.0倍の産出額	—	有意差なし、脆弱エリアで最大値	—	有意差なし、リモートにて最大値		
② 農家経済へのインパクト	農業所得：ZMW	○	5%水準で有意差あり 灌漑は非灌漑の2.2倍の産出額	—	有意差なし、頑健エリアで最大値	—	有意差なし、中間にて最大値		
	食費支出：ZMW	○	5%水準で有意差あり 乾期・雨期双方で灌漑の方が大きい値	○	エリア間の差なし 乾期食費支出に交互作用あり、脆弱エリアに灌漑導入することで乾期の食事支出が顕著に増加	—	乾期食費支出において5%水準で有意差あり リモートにて最小値		
③ 食の多様化・安全保障へのインパクト	多様化：FCS	○	乾期・雨期における灌漑に5%水準で有意差あり、灌漑による食の多様化を確認	○	エリア間の差なし 乾期のFCSに交互作用あり、脆弱なエリアほど灌漑導入の効果	○	エリア間の差なし 乾期のFCSに交互作用あり、リモートエリアと伸展エリアにおいて良い値		
	安全保障：CSI	○	5%水準で有意差あり 灌漑の方が良い値	○	エリア間の差なし CSIに交互作用あり、脆弱なエリアほど灌漑導入の効果	—	有意差なし、中間エリアと伸展エリアにおいて良い値		
④ 衛生環境へのインパクト	水源への距離：km	△	有意差なし、灌漑における水源への距離は短い傾向	—	有意差なし	—	有意差なし		
	下痢の回数：回/年	—	有意差なし	—	有意差なし	—	有意差なし、中間から伸展エリアにおいて少ない傾向あり		
⑤ 女性の活動へのインパクト	農地面積：ha	—	有意差なし	—	有意差なし	—	5%水準で有意差あり、伸展エリアの女性所有農地面積が大きい		
	労働時間：hr/日	—	乾期の灌漑サイトにて有意な差異あり 灌漑により女性の労働時間長い	—	雨期において脆弱エリアの女性の労働時間が長い(10%水準)	○	エリア間の差なし 乾期の労働時間に交互作用あり(10%)、灌漑によりリモートエリアにおける乾期の労働時間が長くなる傾向あり		
⑥ 栄養改善へのインパクト	HAZ(成長障害：慢性的低栄養状態)	—	有意差なし	—	有意差なし	—	有意差なし	—	有意差なし
	WAZ(低体重：短中期的栄養を受けた低栄養状態)	○	灌漑において5%水準で有意に高い値を示し、灌漑によるインパクトが確認できた	—	有意差なし	—	5%水準で有意差あり、多重比較で有意差なし、リモートエリアで最大値を示した	—	5%水準で有意差あり、プロジェクト介入ナシが介入ありより大きな値
	WHZ(消耗症：短期的影響を受けた低栄養状態)	○	灌漑において5%水準で有意に高い値を示し、灌漑によるインパクトが確認できた	—	有意差なし	○	5%水準で有意差あり、多重比較で有意差なし 交互作用あり、リモートエリア・中間で最大値	—	5%水準で有意差あり、プロジェクト介入ナシが介入ありより大きな値

出典：JICA T-COBSI プロジェクトチーム (2017)

2) 類似調査に向けた教訓

インパクト調査では、本プロジェクトにより発現した複数のインパクトを、統計学的手法を用いて明らかにした。現地のデータを基にして栄養改善効果を計測した経験は、今後実施されるプロジェクトや調査、特にザンビア国やその近隣国にとっても参考となる。その一方で、本調査では、調査方法や調査過程を試行錯誤しながら実施したため、改善の余地がある。従い、本調査手順および本調査結果が、将来的に実施されるプロジェクトや調査の基礎となるよう、下記に主要な教訓を取りまとめる。

表 4.1.4 類似調査に向けた教訓

項目	教訓
ベースライン調査の実施	本調査では、灌漑によるインパクトを、現時点の灌漑地域と非灌漑地域という「同じ時点における比較」で評価した。しかしながら、より正確に把握するには、灌漑導入前調査（ベースライン調査）と導入後調査（エンドライン調査）という、「時系列による比較」であることが好ましい。
簡易堰と恒久堰の比較	本調査では、灌漑施設の導入の有無でインパクトの違いを評価した。これは個別農家世帯に対する効果には違いが無いという仮定の基に行われたが、本プロジェクトでは、簡易堰と恒久堰の二種類の灌漑施設を導入しており、それぞれ係る費用に大きな差がある。灌漑施設の種類による世帯への影響に差異が無いとしても、費用対効果を明確にするために、簡易堰と恒久堰を区別して、分析・評価することが望ましい。
ネガティブな効果の評価	灌漑の導入により、対象地域に住む女性の労働時間は顕著に増加した。今後は、灌漑導入におけるポジティブな効果だけではなく、農家の生活におけるネガティブな効果の発現も調査することで、今後の介入策の検討等、将来に活用できる調査結果を残すことが可能となる。
保健関連プロジェクトとの相乗効果	本調査対象地域の一部は、他ドナーやザンビア国政府による栄養改善に関するプロジェクトが進行中のエリアと重複していた。しかしながら、そのようなエリアでも児童の低栄養状態が確認された。今後は、それらプロジェクトによる介入の種類を調査項目として設定（健康改善、公衆衛生整備、栄養改善等）することや、介入期間等で区分し、細かく整理した後に、外的要因として考慮すべきだと考えられる。
対象地域	本調査は、本プロジェクト対象地域の一部を対象として実施した。もし投入が十分に確保できるのであれば、プロジェクトから発現した効果をより明確に測定するために、プロジェクト対象地域の全体からサンプルを取る調査を実施することが望まれる。
健康関連施設の影響	ザンビア国の地方農村において、ヘルスポストとルーラルヘルスセンターは、重要な役割を担っている。それらで勤務しているワーカーの活動と、インパクト発現の関係性に着目して評価を行うのは有意義であると考えられる。特に栄養改善に資する介入を検討するためには、彼らの活動は重要な役割を果たすと考えられる。
マルチセクトラル・アプローチ	本調査の結果、灌漑導入という単体の介入だけでは、慢性的な栄養失調状態に影響を与えることは難しいということが示唆された。これは、栄養改善は長い期間が必要であることを示している。また、灌漑の導入により農家の所得が増えても、健康管理にかかる知識不足が原因で食生活が改善されなければ、栄養不良状態が続いてしまう。慢性的な栄養失調を解決するためには、灌漑導入のみならず、健康的な食事の考え方や、生活習慣の改善といった栄養管理を考えるプログラムが必要である。並行して、保健衛生や母子健康保健の知識普及等、他分野と連携したマルチセクトラル・アプローチが実施されて初めて実現可能となることが考えられる。

出典：JICA T-COBSI プロジェクトチーム (2017)

第 5 章 教訓と提言

5.1 効果的なプロジェクト実施のために講じた方策

本稿では、本プロジェクト実施期間を通じて、プロジェクト活動の改善のために講じた様々な方策について取りまとめる。

1) 研修内容に応じた研修参加者の選定

本プロジェクトでは、簡易堰灌漑開発や恒久堰灌漑開発、市場志向型農業など、様々な種類の技術パッケージの普及を行った。当初、この内のいくつかの研修項目、例えば灌漑開発計画概論等の一般項目については、農業普及員と TSB 職員の両グループに対して同時に研修を行った。しかしながら、そもそもの教育レベルやそれまでの経験が異なるため、特に、農業普及員にはやや難易度が高く、内容について行けないと訴える者もあった。このため、その次の研修からは、農業普及員と TSB 職員で異なる研修材料、研修内容を準備し、参加者のレベルに応じたものとなるよう務め、プロジェクト活動において、それぞれが異なる役割を果たすよう促した。

同様に、研修実施 2 年目（2015 年）からは、中間研修には郡 TSB 職員ではなく、郡マーケットオフィサーを招聘した。中間研修の主たる研修項目は市場志向型農業の実践研修であったものの、これは TSB 職員の主たる職務ではなく、マーケティングオフィサーの方が研修を受講するに相応しいと判断されたからである。また、農業省郡事務所にて、農業普及員の実際の活動を管理監督するのは、SAO と呼ばれる農業技官であったことから、プロジェクト活動に対する彼らの理解を促し、農業普及員が現場レベルで活動しやすくなるよう、時々の研修に SAO も招聘し、農業開発において役割の異なる様々なアクターを巻き込むよう努めた。

2) 連続性を考慮した研修やワークショップの実施

毎年の研修参加者が効率よく研修内容を身につけるため、段階を踏んで研修を実施した。これには 2 つの目的があり、1 つは研修受講者が 1 つ 1 つの項目を確実に理解していくため、もう 1 つは、研修を複数回に分けて実施することにより、季節を通じてプロジェクトへの参画意識を維持するためである。具体的には、キックオフ研修（灌漑開発と灌漑農業技術）、中間研修（市場志向型農業やジェンダー）、評価ワークショップ（モニタリング・評価）などで、それぞれ異なる目的を持って実施している。もちろん、研修参加者が多忙な状況に置かれるという難点もあったが、単年度型の研修プログラムとしては、それを補って余りある効果が得られたと考えられる。

3) 市場志向型農業研修の導入

本プロジェクトは、灌漑面積の拡大という目的を有していたことから、研修内容も簡易堰や恒久堰など水資源開発技術の習得に重きが置かれていた。しかしながら、灌漑は乾期農業の実践のためのツールであり、また、適正の高い地区においては、ビジネスチャンスの醸成にも用いられるものである。このことから、当初 RD の枠組みにはなかった中間研修を実施し、その中で、市場志向型農業技術（市場調査やそれに基づく作付計画の策定手法など）の研修を行った。

4) 既存農業普及システムを通じた技術普及

本プロジェクトでは、通常、灌漑技術者が単体プロジェクトとして実施している灌漑開発を、プログラムとして農業普及員に実践してもらうことを企図し、既存の農業普及システムの枠組みを用いて農業普及員でも実践可能な簡易灌漑開発技術の普及に努めた。そして、その活動を通じて

プロジェクト目標である灌漑面積の拡大を図った。プロジェクトのために新たな組織を、時限的に設立するのではなく、既存のしくみを活用することで、効率的に実施することができ、また、これにより、プロジェクト終了後にも技術や経験がその全体システムの中に残ることとなったといえる。

5) 農業普及員の稼働にかかる支援

本プロジェクトは技術協力プロジェクトであり、資金協力を是としたものではない。その一方で、3年間の実働期間において700haもの灌漑面積拡大という意欲的な目的も掲げていた。実のところ、ザンビア国政府は普及員の現場レベルでの活動予算について、追加的な支出を行うことは財政的に困難な状況にあったこともあり、各種研修への参加に伴う交通費と宿泊費、並びに、現場で小規模灌漑活動を推進するための燃料費を各人1シーズン分のみ支給することとした。こうした経費の支出は、持続性確保の観点から、常に問題となるものの、プロジェクト活動を進めるためにはある程度の支援はやむを得ないものと判断された。

6) 視覚普及資料の開発

本プロジェクトでは、灌漑開発技術に多くの経験を持たない普及員や、実際の建設作業を行う農民向けに、ポスターやリーフレット、マニュアルやガイドライン等、視聴覚教材を多用した様々な普及教材を作成した。特に農家向けには、Process Description (PD) マニュアルなどイラストを多用して一見して理解ができるものを中心に、一方、TSB職員のように、恒久堰の建設において細かい技術情報を何度も立ち返って確認する必要がある技術職員向けには、理論や設計基準を含む詳細なガイドラインを準備した。

7) PR 活動

ザンビア国では、本プロジェクトで採用したような小規模灌漑技術はまだ新しい技術であるため、特に政策決定者の理解を得ることが重要である。このため、様々な形態でのPR活動をプロジェクト当初から続けてきた。主なところでは、ニュースレターの発行、大臣、副大臣、局長、副局長など高官や日本国大使、メディア、大学教授などを含む様々な関係者の現地視察等である。この結果、開始当初に一度プロジェクトコンポーネントから削除された簡易堰灌漑技術が、2年後に再びプロジェクト骨子に組み入れられる結果となった。更に、この活動の他地域への更なる普及やプロジェクト終了後の継続的なドナーとの協調を目的として、普及セミナーも実施した。

8) 簡易技術の適用

既存の農業普及システムを活用して灌漑技術の普及を図ることを目的に、普及する技術を可能な限り簡易なものとした。特に、農業普及員は灌漑工学・農業土木の専門家ではないため、そうした普及員が技術普及の主たる担い手となるためには、彼らの技術レベルに適した内容にすること、すなわち、より簡易な技術にすることが必要であった。このことが、目標を超える灌漑面積の開発に寄与したことは疑いない。

9) アップグレード・アプローチの適用

プロジェクトの主要コンセプトとして、アップグレード・アプローチを採用した。これは、多額の投資を伴う恒久堰の建設場所を、簡易堰灌漑で実績を積み持続的に灌漑維持管理、灌漑農業が営まれているサイトから選ぶというものである。これにより、地形、水量、取水地点の傾斜等農業工学的な視点からだけでなく、農家グループの意欲、維持管理能力、組織力、営農経験など、社会的な側面についても確認することが可能となった。これにより必ず成功するとは限らないものの、こうしたアプローチを採ることで、成功の確率を上げるということに繋がる。

一方で、このアプローチでは、ポテンシャルの高いサイトを発見することをより困難にしている可能性もある。なぜならば、恒久堰の建設が全く適していないような条件においても、数多くの簡易堰灌漑サイトが建設されているからである。このため、このアプローチをより効果的に実践するためには、普及員による選定基準の十分な理解が肝要となる。

10) その他ドナーとの協調機会の模索

本プロジェクトで育成された灌漑技術者が、その能力を今後もザンビア国での灌漑開発に活かしていくことが求められる一方、ザンビア国政府の財務的基盤は必ずしもそれを容易なものとはしない。このため、他のドナーからの資金援助、特に S3P からのプロジェクト資金への投資が受けられるよう、TSB 職員が彼ら自身で恒久堰の設計図書を作成するための支援を追加的に実施した。具体的なサイトの設計図までが準備されていれば、ドナーは、新しくポテンシャルサイトを探索したり、設計したりする必要がなく、すぐに投資に結びつけることが可能である。事実、普及セミナー実施後、アフリカ開発銀行の担当者より、農業省の担当官に協議の申し入れがあった。

5.2 教訓

プロジェクト活動の実施を通じて、いくつかの教訓が得られた。重要と思われる教訓について、本項に取りまとめる。この内のいくつかは、カウンターパート職員から指摘されたものである。

1) 簡易堰灌漑開発アプローチの有効性

簡易堰を用いた灌漑開発のアプローチは、灌漑農業を開始するための費用対効果が高い有効なアプローチであるということが、プロジェクト期間を通じて多くの関係者に認識されるに至った。一般的な灌漑構造物と異なり、簡易堰は比較的平坦で軟弱な地盤においても建設することが可能なことから、農家が自分達の居住地の近傍で容易に灌漑農業を開始する手立てとなる。

2) 栄養状態にかかる灌漑開発の正のインパクト

非灌漑地区と灌漑地区を対象にした世帯調査や身体測定調査により、小規模灌漑は、幼児の栄養状態を改善させる効果があることが示唆された。灌漑プロジェクトの間接的なインパクトを探るためには、灌漑開発に付随する栄養状態の調査を実施することが望ましい。

3) 年度毎の成果の変動

プロジェクト実施実質 3 年間における簡易堰灌漑開発の各年毎の成果は、2014 年が 292ha、2015 年が 215ha、2016 年が 369ha とバラツキがみられた。この変動の原因は明確ではないが、最終評価ワークショップに参加した農業普及員や TSB 職員によると、大きく 3 つの要因が考えられる。すなわち、①キックオフ研修に参加した普及員のうち何名かが、通学などの理由で休職した、②ある年の降雨量が少なく、それにより河川流出量も減少した、③成果の低かった 2015 年では、特に「改善」地区に関して、そもそも目標値が低かった、の 3 点である。

2015 年に開発面積が伸びなかった理由は、「改善」地区の開発サイト数が少なかったことにその原因を求めることができる。「改善」地区開発においては、その定義からして、農業普及員は農家が何らかの原始的な灌漑を行っている既存地区を見いださなければならず、これは、実際にその地区にどれ程のそういった地区が存在するのか、そして、それを普及員がどれほど知っているのかということに負うところが大きい。このため、2015 年に招聘された普及員の管轄地区で、その条件があまり整っていなかったことが推察される。

実績の変動がどの様な要因によって引き起こされたかは明確ではないが、いずれにせよ、簡易堰

灌漑の開発は、農業普及員の熱意や政府予算の執行状況、雨量と河川流出量、通年河川の存在等々、様々な要素に依存していることから、各年の小規模灌漑開発の実績を事前に予見することは困難である。

4) 既存普及システムを通じた灌漑技術の普及

既存の農業技術普及システムを活用した灌漑技術の普及というアプローチは、こうした簡易な小規模灌漑開発を進めるにあたり有効であると、多くの参加政府職員（農業普及員や TSB 職員）から高い評価を得た。また、農業普及員などの政府職員の能力強化を通じて農家を育成する手法は、持続性を高めるものであるとも指摘されている。農業普及員の動員に対する政府予算の不足という課題はあるものの、このアプローチは、小規模農家が灌漑農業を即座に開始するための有効な手段であることが改めて確認された。

5) 農業普及員の作業負担

農家と同様、農業普及員にも年間を通じて行う様々な活動や任務がある。例えば、フィールドデーの実施や FISP（農業投入材支援プログラム：補助金付きでの肥料などの配布）の差配、FRA（Food Reserve Agency）によるトウモロコシ買取の支援、農業ショーの準備、作物収量予測のためのデータ収集などである。このため、そうした複数の任務を負った普及員にとって、小規模灌漑を普及していくことは容易ではなく、彼らに過剰な期待を寄せるべきではない。

6) 農家間普及

簡易堰を用いた小規模灌漑の普及については、同様のプロジェクトが隣国マラウイでも実施され、そこでは、農家間の技術伝搬を通じて簡易堰灌漑技術が飛躍的に普及した。本プロジェクトにおいても農家間普及が広範囲に行われるものと当初想定していたものの、そうしたケースはそれ程多く確認されていない。考えられる理由として、マラウイの 183 人/km²に対して 22 人/km²と著しく低い人口密度（全国）が挙げられる。農家もしくは村が散在しているために、そうした活動を目にする機会が少なく、これが農家間普及にあまり繋がらない結果になっていると推察される。

7) TSB 職員の経歴の違い

TSB 職員の経歴や学歴の違いが、各種研修の計画・実施を大変困難なものにした。TSB 職員は、農業普及員と同じく、2 年制大学（サーティフィケート）、3 年制大学（ディプロマ）、4 年制大学（グラジュエート）、そして、極めて希に大学院卒がおり、学歴とそれに伴う知識レベルに大きな差がある。例えば、農業系の 2 年制もしくは 3 年制大学の卒業生は、農業全般にかかる概論を学んでいるが、農業土木など専門的な知識はほとんど有していない。このように、農業土木にある程度の知識がある職員と全くそうした素養がない職員が、「TSB 職員」という名の下に一同に介して研修を実施するのは、非常に困難を伴うものであった。このため、特に恒久堰灌漑開発のように農業土木の素養を要する部門については、TSB 職員であっても、その学歴や経験に応じて参加者を限定する方が望ましい。

8) 恒久堰建設における長期間にわたる農家の参加

恒久堰を建設する際には、農家に対して、想定される労働投入量および支援を行う場合の条件などについて説明がなされ、それに同意する場合にのみ建設を行うこととしていた。そうしたプロセスを経てもなお、建設作業が続くにつれて農家の参加率は減少傾向にあった。建設が行われる乾期の始まりから終わりにかけては、それ以外の活動、例えば、チテメネ（焼畑農業）の準備や雨期トウモロコシ栽培の準備、そしてそれに伴う FISP への申し込み等、様々な行事があり、作業が競合してしまう。

このため、本プロジェクトのように農家の自助努力を基本に恒久堰の建設を計画する際には、建設期間後半に近づくにつれて徐々に農家の参加率が下がっていくことを念頭に施工計画を作成することが求められる。もしくは、食事の提供など、農家の参加意欲を維持するような策を講ずることも時には必要になるだろう。

9) 意識醸成・準備のための十分な準備期間の確保

簡易堰であっても恒久堰であっても、農家主導で灌漑施設の建設を行う場合には、彼らの意識醸成のための十分な時間を確保しておく必要がある。その村での事前の合意形成は、例えば建設される水路が個人所有の土地を通過し、かつ、その所有者が灌漑グループのメンバーではない場合などに土地所有権問題に発展することを防ぐためにも重要である。また、堰を恒久堰にアップグレードする際にも組織化の重要性は増してくる。なぜならば、恒久堰の建設においては、農家にはグループとして様々な義務が生じるためであり、農家の強い意志がなければ建設は順調に進まない恐れがある。

さらに、事前準備の重要性を物語る事例として、農業資材の適期準備が挙げられる。ある農家グループでは、市場調査に基づき、これまでとは異なる時期に園芸作物の栽培を始めようとして計画したものの、近隣の農業資材店には必要な資材がその時期には置いていなかったため、間に合わなかったとのことであった。同様に、簡易堰灌漑開発を行う場合、その活動は乾期の早い時期に開始し、同じ乾期の間にその便益を享受するよう努めるべきである。

10) カウンターパート予算の重要性

カウンターパート予算の執行にかかるザンビア国政府のコミットメントの低さが、プロジェクト活動を実行し、継続していく任にある農業普及員達のやる気を削いでいるとの指摘が多く挙げられた。本プロジェクトは、ザンビア国政府による灌漑開発並びに灌漑農業の推進を補完的に支援することが本来の建て付けである。しかしながら、プロジェクト期間中を通じて、期待される程のカウンターパート予算は執行されず、このことが農業普及員の活動・成果にマイナスに影響したと多くの普及員は訴えている。

11) 水路の補強

本プロジェクトの主たる目的は灌漑面積の拡大であり、そのためにできるだけ多くの灌漑地区を開発することが追求された。一方、灌漑施設の建設後、多くの農家グループが取水堰だけでなく水路からの漏水に苦しんでいることが判明した。本プロジェクトでは、農民の自助努力による灌漑開発を基軸としていたため、土水路が基本であった。しかしながら、係る状況を鑑みるに、将来的には、ライニングを含めた水路の強化策なども検討課題になるものと考えられる。

5.3 提言

ザンビア国において小規模灌漑開発を将来にわたり進めていくにあたり、上記に述べた教訓に基づき、提言として下記の通り7点にまとめる。

1) COBSI アプローチの灌漑開発施策への反映

河川流出量などある条件が満たされている場合の COBSI アプローチの有効性が本プロジェクトによって確認されたことから、簡易な技術で小規模灌漑開発を推進するというこのアプローチは政府の施策、具体的には、国家灌漑計画に反映されるべきである。国家灌漑計画は 2017 年の時点で更新手続き中であり、このタイミングでここに COBSI アプローチが反映されれば、小規模灌漑

開発に必要な活動、すなわち、普及員の更なる育成やその動員が施策に則ったものとして実施されやすくなり、ドナーもそこに投資できる素地が整うものとなる。

2) 普及活動支援にかかる政府のコミットメント

現地での普及活動に対する予算支出がなければ、どのような成果も期待できない。本プロジェクトが終了するにあたり、政府は、現場で活動する農業普及員の支援計画を明確にすべきである。特に、普及員の現場活動に必要な移動手段の確保は喫緊の課題であり、この点については、JICAが対象各郡に1台ずつのモーターバイクを供与することとした。ザンビア国政府は、このモーターバイクを活用してモニタリングを継続実施し、持続性確保のために尽力することが望まれる。

3) 恒久堰建設に向けた財務的措置

残念なことに、本プロジェクト期間中、ザンビア国政府は自身で目標として掲げた恒久堰の建設に対して予算措置をすることができなかった。この教訓から、将来計画を策定する際にも、恒久堰建設に対してはあまり意欲的な目標を掲げるべきではない。もし恒久堰建設を今後も進めるのであれば、各ドナーからの資金援助を求める方が現実的であると考えられる。そのためには、本プロジェクトを通じて設計図書までが準備された灌漑地区から建設を始めるのが効果的である。

4) 他のポテンシャル地域への展開

本プロジェクト対象地域と同じ農業生態系区分Ⅲに属する地域は他にもあり、西部州、北西部州、中央州等がそれに含まれる。それらのポテンシャル州の郡の中には、地形や河川流出量などにおいて小規模灌漑の展開に適した地区が存在するものと考えられることから、政府はそうした地区において更なる小規模灌漑の普及活動を進めるべきである。

5) 小規模灌漑技術の正規普及研修への取り込み

小規模灌漑技術の有効性が本プロジェクトを通じて確認されたことから、ザンビア国政府は、この技術パッケージを正規の普及研修に正式に取り込むべきである。灌漑開発にかかる知識を農業普及員が身につけることで、農業開発全般の進展余力は格段に向上されるはずである。補助的な施策として、多くの農業普及員が学習している農業大学のシラバスに小規模灌漑技術を導入する等も検討すべきである。

6) 農業省職員の研修機会としての恒久堰建設

簡易堰灌漑からそれ程多くの面積拡大が期待できるわけではないにも拘わらず、恒久堰の建設には150万円程の投資が必要であり、投資効率を考えると、このような数ヘクタール程度の小規模な灌漑開発に対して、それ程までの投資を行うことは合理的ではない。このため、もし、恒久堰建設を今後も行うのであれば、それを将来性のあるTSB職員の研修機会として活用することが望ましい。それにより、彼らが、灌漑計画、設計、現場監督にかかる経験を積み、将来、中規模灌漑開発に携わることになってその経験が活かされるものとなる。

7) 研修参加者の絞り込み

教訓の項で述べた通り、学歴や経歴の大きく異なる政府職員、すなわち、農業土木の素養がある者と無い者を、同じ内容で一時に研修するのは適切ではない。このため、研修に招聘するにあたっては、その候補者の職位だけでなく、農業土木の素養も含めた略歴を明確にし、その略歴に応じて適切な内容の研修を提供することが望ましい。このことは、特に農業土木系の専門的な研修を実施する際に重要となる。同様に、農業普及員を小規模灌漑研修に招聘するのであれば、灌漑ポテンシャルが高いと見込まれるキャンプからそうした普及員を招聘するべきである。

添 付 資 料

添付資料A	最新の PDM および PO
添付資料B	日本人専門家の要員計画
添付資料C	カウンターパート
添付資料D	調達機材
添付資料E	JCC 会議協議議事録
添付資料F	建設された恒久堰の概要
添付資料G	S3P および他ドナーによる支援に向けた恒久堰候補地区
添付資料H	TSB 職員による技能習得度自己評価結果

Project Design Matrix (PDM)

Version: 1 (Current Version)

Title of the Project: Technical Cooperation Project on Community-based Smallholder Irrigation (T-COBSI)

Project Period: From May 7 2013 to December 31 2016

Implementing Organization: Ministry of Agriculture and Livestock (MAL)

Target Areas: Districts where the pilot project was implemented under the Study for Capacity Building and Development for Community-based Smallholder Irrigation Schemes in Northern and Luapula Province in the Republic of Zambia in 2009 to 2011

Target Beneficiaries / Groups: Technical Staff from TSB, extension officers and smallholder farmers in the target areas

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal</p> <p>1. Irrigated agricultural production in the target areas is increased.</p>	<p>1. Production of crop by at least 700 farmer groups (Note 1) is increased in the target areas by March 2020.</p>	<p>* Annual reports of the districts</p>	<p>* Smallholder irrigation continues to be a focus area of the policies</p>
<p>Project Purpose</p> <p>To promote and increase irrigated land through the provision of irrigation infrastructure for smallholder farmers in the target areas.</p>	<p>1. More than 500 farmer groups (Note1) in the target areas are engaged in improved irrigated farming with community-based smallholder irrigation schemes.</p> <p>2. The community-based smallholder irrigation schemes cover 700 ha (70 ha by permanent weir and 630 ha by simple weir) or more (Note 2 & 3) in target areas.</p> <p>Apart from the above indicators, GRZ has set a target to construct 36 permanent weirs covering 180ha in the target areas. The GRZ target will be evaluated by the GRZ.</p>	<p>* Results of the Project's monitoring survey</p> <p>* Annual reports of the districts</p>	<p>* No drastic climate change to negatively affect the agricultural production takes place.</p> <p>* Prices of agricultural produce and agro-inputs do not change drastically.</p>
<p>Outputs</p> <p>1. Through hands-on experience, practical skills in design, construction, operation, and maintenance of simple and permanent irrigation facilities for smallholder irrigation schemes are transferred to Technical Staff from TSB.</p>	<p>1.1 Preparatory activities are conducted for at least 400 existing simple irrigation weirs which were developed in the previous study in 2009 to 2011 for upgrading to permanent weirs.</p> <p>1.2 At least 20 Technical Staff from TSB acquire training experience and skills through design and construction of 14 permanent irrigation weirs and 486 simple irrigation weirs.</p> <p>1.3 At least 15 Technical Staff from TSB acquire training experience and skills on permanent weir construction for 36 permanent weirs (Note 4) to be constructed by GRZ.</p>	<p>* Project's training reports</p> <p>* Annual reports of the districts</p>	<p>* There is no drastic incidence to negatively affect the conditions of the sources of water for smallholder irrigation in the target areas.</p> <p>* There is no serious conflict among the farmers in the target areas.</p>
<p>2. Through hands-on experience, practical skills in construction, operation, and maintenance of simple and permanent irrigation weirs for smallholder irrigation schemes are transferred to MAL extension officers.</p>	<p>2.1 More than 150 extension officers acquire training experience and skills in smallholder irrigation farming and on operation and maintenance of smallholder irrigation schemes.</p> <p>2.2 More than 90% of trained extension officers disseminate techniques in smallholder irrigation farming and operation and maintenance of smallholder irrigation schemes to farmer groups in their respective areas.</p>	<p>* Project's training reports</p> <p>* Annual reports of the districts</p>	<p>* Funds for upgrading of simple weirs to permanent weirs are provided.</p>
<p>3. Knowledge and skills of farmers in irrigated</p>	<p>3.1 More than 50% of farmer groups in the developed weirs apply at least one of</p>	<p>* Results of the Project's</p>	

farming and operation and maintenance of simple and upgraded permanent irrigation schemes are improved.	the irrigated farming technologies disseminated by the trained officers.	monitoring survey * Annual reports of the districts	
<p>Activities</p> <p>1.1 Conduct group training for Technical Staff from TSB on design, construction, operation, and maintenance (O&M) of smallholder irrigation schemes.</p> <p>1.2 Train farmers on basic O&M of smallholder irrigation schemes through the on-the-job training (OJT) for Technical Staff from TSB.</p>	<p><u>Zambian Side</u></p> <ul style="list-style-type: none"> - Assignment of Project personnel <ul style="list-style-type: none"> a. Project Director b. Project Manager c. Counterpart personnel - Assignment of supporting staff 	<p>Inputs</p> <p><u>Japanese Side</u></p> <ul style="list-style-type: none"> - Dispatch of experts in the relevant fields such as: <ol style="list-style-type: none"> 1) Team Leader/ Irrigation Planning and Management 2) Co-Team Leader/ Farming System/ Training Design 3) Irrigation Facility Design and Construction Control 4) Water Management/ Irrigation Facility Design and Construction Control (2) 5) Agricultural Marketing 6) Rural Society/ Farmers Organization/ Gender 7) Environmental and Social Considerations - Training of counterpart personnel in Japan and/or the 3rd country - Provision of machinery, equipment and materials for training activities - Supplemental operational cost as needs arise (as per rules and regulations of JICA's Technical Cooperation Projects) 	<p>* Trained officers continue their services in the target areas.</p>
<p>2.1 Conduct group training for extension officers on construction, O&M of smallholder irrigation schemes.</p>	<ul style="list-style-type: none"> - Provision of office spaces at DOA headquarters and in each province 		
<p>3.1 Conduct group training for extension officers on the on-farm water management.</p> <p>3.2 Disseminate knowledge and techniques of on-farm water management to the farmers in the target areas.</p> <p>3.3 Conduct group training for extension officers on techniques of irrigated crop production.</p> <p>3.4 Disseminate knowledge and techniques of irrigated crop production to the farmers in the target areas.</p>	<ul style="list-style-type: none"> - Provision of operational costs 		<p>Preconditions</p> <p>* Peace and order situation in the target areas is stable</p> <p>* Rural communities in the target areas are willing to take part in the project activities</p>

* Note 1: "Farmer groups" referred in the indicators are the groups of farmers in the targeted irrigation sites.

* Note 2: Coverage area of permanent irrigation weirs is derived from calculation based on the average acreage of upgraded permanent irrigation weirs by the Pilot Phase.

* Note 3: Coverage area of simple irrigation weirs is derived from calculation based on the data of Evaluation Workshop in 2014.

*Note 4: GRZ has budgeted resources for 2015 specifically for T-COBSI.

Plan of Operations (PO)

Version 1

Project Title: Technical Cooperation Project on Community-based Smallholder Irrigation (T-COBSI)

Overall Goal: Irrigated agricultural production in the target areas is increased.

Project Purpose: To promote and increase irrigated land through the provision of irrigation infrastructure for smallholder farmers in the target areas.

Project Period: Four (4) years from the date of the first dispatch of Japanese Expert(s)

Activities	JFY2013												JFY2014				JFY2015				JFY2016				JFY2017			Responsibility
	Q3		Q4		Q1		Q2		Q3		Q4		Q1		Q2		Q3		Q4		Q1	Q2	Q3					
Preparatory Activities																												
0-1 Set up the Project																								HQ TSB officers				
0-2-1 Conduct follow up monitoring of the pilot projects in the former Study on irrigation and agronomy, and revise the training materials, if necessities arise. The monitoring team will consist of Headquarter (HQ) TSB officers (C/P), provincial officers and JICA experts.																								HQ TSB officers, Provincial TSB offices				
0-2-2 Revise the training plan, if necessities arise.																								HQ TSB officers, Provincial TSB offices				
Output 1: Through hands-on experience, practical skills in design, construction, operation, and maintenance of simple and permanent irrigation facilities for smallholder irrigation schemes is transferred to TSB staff.																												
1-1 Conduct group training for TSB officers on design, construction, operation, and maintenance (O&M) of smallholder irrigation schemes.																												
1-1-2 Arrange and conduct kick-off training																												
1-1-3 Conduct refresh training																												
1-2 Train farmers on basic O&M of smallholder irrigation schemes through the on-the-job training (OJT) for TSB officers.																												
1-2-1 Conduct site identification, design, BOQ, Costing																								Provincial and district TSB officers				
1-2-2 Conduct up-front, procurement of foreign materials and tools.																												
1-2-3 Conduct construction supervision.																												
Output 2: Through hands-on experience, practical skills in construction, operation, and maintenance of simple and permanent irrigation facilities for smallholder irrigation schemes is transferred to MAL extension officers.																												
2-1 Conduct group training for extension officers on construction, O&M of smallholder irrigation schemes.																												
2-1-1 Arrange and conduct training of trainers (TOT) course																								BEOs/CEOs				
2-1-2 Arrange and conduct kick-off training																												
2-1-3 Arrange and conduct follow up training (monitoring the performance)																												
2-1-4 Conduct total follow up training (total monitoring of the performance)																												
2-1-5 Inspect and give advices for extension officers to supervise farmer groups.																												
Output 3: Knowledge and skills of farmers in irrigated farming and operation and maintenance of simple and upgraded permanent irrigation schemes and facilities are improved.																												
3-1 Conduct group training for extension officers on the on-farm water management.																												
3-1-1 Arrange and conduct training of trainers (TOT) course																								BEOs/CEOs				
3-1-2 Arrange and conduct kick-off training																												
3-1-3 Arrange and conduct follow up training (monitoring the performance)																												
3-1-4 Conduct total follow up training (total monitoring of the performance)																												
3-2 Disseminate knowledge and techniques of on-farm water management to the farmers in the target areas.																								BEOs/CEOs				

Attachment A-3

Assignments of Major Counterparts (Officially Assigned PIU members)

Institution	Name, Position	Area of Specialty	Assigned Period	Name of Expert in Charge	Employment Period in the Institution		Remarks: e.g. level of involvement in project
					From	To	
MOA	Kenneth Zulu, Senior Irrigation Engineer (N)	Irrigation engineering	May 2013 to Dec 2014	All the experts as assigned	N/A	Present	Member of the PIU in Northern
MOA	Sifaya Mufalali, Senior Farm Power Mechanization Officer (N)	Irrigation/ Farm power mechanization	May 2013 to Apr 2017	All the experts as assigned	N/A	Present	Member of the PIU in Northern
MOA	Ackson Mbewe, Senior Technical Officer (N)	Irrigation/ general agriculture	May 2013 to Apr 2017	All the experts as assigned	N/A	Present	Member of the PIU in Northern
MOA	Kelvin M. Simukoko, Senior Technical Officer (N)	Irrigation/ general agriculture	May 2013 to Apr 2017	All the experts as assigned	N/A	Present	Member of the PIU in Northern
MOA	Annie Bluaya Senior Technical Officer (N)	General agriculture	May 2013 to Apr 2017	All the experts as assigned	N/A	Present	Part time member of PIU in Northern
MOA	David M. Tembo (N)	Irrigation engineering	April 2015 to Apr 2017	All the experts as assigned	N/A	Present	Member of the PIU in Northern
MOA	Nelson Phiri, Technical Officer (M)	Irrigation/ general agriculture	May 2013 to Dec 2014	All the experts as assigned	N/A	Present	Member of the PIU in Muchinga
MOA	Stephen Syansingu (M)	General agriculture	May 2013 to Apr 2017	All the experts as assigned	N/A	Present	Member of the PIU in Muchinga
MOA	Mayson Saila, Acting Senior Irrigation Engineer (L)	Irrigation engineering	May 2013 to Apr 2017	All the experts as assigned	N/A	Present	Member of the PIU in Luapula
MOA	Obed Chanda, Acting Senior Land Husbandry Officer (L)	Irrigation/ general agriculture	May 2013 to Apr 2017	All the experts as assigned	N/A	Present	Member of the PIU in Luapula
MOA	Jonathan Sinkolongo, Principal Technical Officer (L)	General agriculture/ GIS	May 2013 to Apr 2017	All the experts as assigned	N/A	Present	Member of the PIU in Luapula

MOA: Ministry of Agriculture and Livestock/ PIU: Project Implementation Unit (established in each province)/ N: Northern Province, M: Muchinga Province, L: Luapula Province.

List of Equipment Procured under the Project and Handed over to the Counterpart Agency

No.	Asset	Spec	Currency	Cost	Date of purchase	User Dept
1	Mitsubishi Pajero	Pajero	ZMW	327,400.00		PACO's office, Northern province
2	Mitsubishi Pajero	Pajero	ZMW	327,400.00		PACO's office, Luapula Province
3	Copy machine	Canon IR 2520	ZMW	26,293.00	Sep 2013	TSB office, Northern province
4	Color printer	Canon i-SENSYS LBP7750CDN	ZMW	5,313.00	Sep 2013	TSB office, Northern province
5	Printer	Canon IR 1020	ZMW	5,171.00	Sep 2013	TSB office, Luapula province
6	Laptop computer	Toshiba Satellite L855	ZMW	5,397.00	Sep 2013	TSB office, Northern province
7	Laptop computer	Toshiba Satellite L855	ZMW	5,397.00	Sep 2013	TSB office, Northern province
8	Laptop computer	Toshiba Satellite L855	ZMW	5,397.00	Sep 2013	TSB office, Northern province
9	Laptop computer	HP Compaq 650	ZMW	5,397.00	Sep 2013	TSB office, Northern province
10	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Kasama district
11	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Mungwi ditrict
12	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Mporokoso ditrict
13	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Mbala ditrict
14	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Luwingu ditrict
15	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Nsama district
16	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Nakonde district
17	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Mpika district
18	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Isoka district
19	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Mafinga district
20	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Shiwang'andu district
21	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Mansa district
22	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Mwense district
23	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Kawambwa district
24	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Nchelenge district
25	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Milenge district
26	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Mwansa Bombwe district
27	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Chipili district
28	Auto level	STANLEY AL24	ZMW	8,146.56	Sep 2016	DACO's office, Chembe district
29	Generator	Jiang Dong S1100WP	ZMW	11,800.00	Dec 2014	TSB office, Northern province
30	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Kasama district
31	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Mungwi ditrict
32	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Mporokoso ditrict
33	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Mbala ditrict
34	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Luwingu ditrict
35	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Nsama district
36	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Nakonde district
37	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Mpika district
38	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Isoka district
39	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Mafinga district
40	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Shiwang'andu district
41	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Mansa district
42	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Mwense district
43	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Kawambwa district
44	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Nchelenge district
45	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Milenge district
46	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Mwansa Bombwe district
47	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Chipili district
48	Motorbike	YAMAHA AG200	ZMW	47,000.00	Apr 2017	DACO's office, Chembe district
49	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Northern province
50	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Northern province
51	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Northern province
52	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Northern province
53	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Northern province
54	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Northern province
55	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Northern province
56	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Luapula province
57	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Luapula province
58	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Luapula province
59	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Luapula province
60	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Luapula province
61	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	TSB office, Muchinga province
62	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	DACO's office, Kasama district
63	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	DACO's office, Mpika district
64	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	DACO's office, Nakonde district
65	GPS	GARMIN GPS Map 64	ZMW	4,890.00	Apr 2017	DACO's office, Kawambwa district
66	Laptop computer	HP Probook 450 G3	ZMW	8,300.00	Apr 2017	TSB office, Northern province
67	Laptop computer	HP Probook 450 G3	ZMW	8,300.00	Apr 2017	TSB office, Northern province
68	Laptop computer	HP Probook 450 G3	ZMW	8,300.00	Apr 2017	TSB office, Northern province
69	Laptop computer	HP Probook 450 G3	ZMW	8,300.00	Apr 2017	TSB office, Luapula province
70	Laptop computer	HP Probook 450 G3	ZMW	8,300.00	Apr 2017	TSB office, Luapula province
71	Laptop computer	HP Probook 450 G3	ZMW	8,300.00	Apr 2017	TSB office, Luapula province
72	Laptop computer	HP Probook 450 G3	ZMW	8,300.00	Apr 2017	TSB office, Luapula province
73	Laptop computer	HP Probook 450 G3	ZMW	8,300.00	Apr 2017	TSB office, Muchinga province
74	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	TSB office, Luapula province
75	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Kasama district
76	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Kasama district
77	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mungwi ditrict

No.	Asset	Spec	Currency	Cost	Date of purchase	User Dept
78	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mungwi ditrict
79	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mbala ditrict
80	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mbala ditrict
81	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mporokoso ditrict
82	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mporokoso ditrict
83	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mpika ditrict
84	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mpika ditrict
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97	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Nchelenge ditrict
98	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Nchelenge ditrict
99	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Luwingu ditrict
100	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Nsama ditrict
101	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mafinga ditrict
102	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Shiwang'andu ditrict
103	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Milenge ditrict
104	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Mwansa Bombwe ditrict
105	Desktop computer	HP Desktop 490 G3 MT	ZMW	10,257.40	Apr 2017	DACO's office, Chembe ditrict

**MINUTES OF
THE JOINT COORDINATION COMMITTEE MEETING OF JICA PROJECTS
HELD AT GRAND PALACE HOTEL
ON 7TH NOVEMBER 2013**

PRESENT

No	Name	Position
1	Mr. N.Chikwenya	Acting Director Policy & Planning Department
2.	Mr. Peter Lungu	Acting Director, Department of Agriculture
3	Mr. Timothy Tonga	M& E Officer, Policy and Planning Department
4	Mr. N Daka	Deputy Registrar, Department of Cooperatives
5	Mr. T Kato	2 nd secretary, Embassy of Japan
6	Mr. Charles Sondashi	Ag. Deputy Director – Advisory Service, Department of Agriculture HQ
7	Mr. Derrick Chimanga	Ag. Provincial Agricultural Coordinator-Lusaka
8	Mr. Andrew Banda	Provincial Agricultural Coordinator-Northern
9	Mr. Liyembeni Luhamba	Provincial Agricultural Coordinator-Western
10	Mr. Chate Godwin	Provincial Agricultural Coordinator-Luapula
11	Dr. Victor Mulopa	Provincial Agricultural Coordinator-Muchinga
12	Mr. Pascal Chipasha	Principal Agricultural Officer-Lusaka
13	Mr. Charles Kapalasha	Principal Agricultural Officer-Northern
14	Mr. Mwiya Mukungu	Principal Agricultural Officer-Western
15	Mr. Osbed Hamweete	Principal Agricultural Officer-Luapula
16	Mr. Fred Chikuta	Principal Agricultural Officer-Muchinga
17	Mr. Masayoshi Ono	Chief Advisor (RESCAP)
18	Mr. Goichi Sasakai	Extension Advisor (RESCAP)
19	Mr. Takahiro Miyoshi	M & E Advisor (RESCAP)
20	Mr. Peter K Lungu	Ag. Director, Department of Agriculture
21	Mr. Kenneth Zulu	Provincial Irrigation Engineer-Northern
22	Mr. Nelson Phiri	Provincial Irrigation Engineer-Muchinga
23	Mr. Obed Chanda	Provincial Irrigation Engineer-Luapuala
24	Mr. Chiba	Consultant T-COBSI
24	Dr Phiri	Deputy Director (ZARI)
25	Mr. Mwila	Chief Agriculture Research Officer-Chilanga
26	Mr. Henry Mgomba	Principal Farm Management Officer, Department of Agriculture, HQ
27	Mr. Malumo Nawa	Chief Crops Agronomist
28	Mr. Chitambi	Principal Agricultural Research Officer-Northern
29	Mr. Christantius Mutale	Agricultural Research Officer, Western
30	Mr. Mathias Ndlovu	Senior Agricultural Research Officer-Chilanga ZARI

31	Dr. Catherine Mungoma (Ms)	Director of SCCI
32	Mr. Yukinori Ito	Chief Advisor - FoDiS-R
33	Mr. Iino	JICA Expert – FoDIS-R
34	Mr. Yoshihide Teranishi	Chief Representative, JICA Zambia Office
35	Ms Mamiko Tanaka	Assistant Resident Representative, JICA Zambia Office
44	Mr. Patrick Chibbamulilo	Senior Programme Officer, JICA Zambia Office

The Joint Coordination meeting was held at the Grand Palace Hotel on the 7th November 2013. The meeting comprised of three JICA projects namely the Food Crop Diversification Support Project Focusing on Rice Production (FoDiS-R); the Technical Cooperation Project on Community Based Smallholder Irrigation (T-COBSI); and the Rural Extension Service Capacity Advancement Project (RESCAP).

The meeting commenced at 0830hrs and it was chaired by Mr. Nicholas Chikwenya, the Acting Director for Department of Policy and Planning. The Introductions were done starting with the Deputy Director Agriculture-Advisory Services Branch Mr. Charles M. Sondashi.

Welcoming Remarks

After the introductions were done, Mr. N. Chikwenya welcomed everyone to the joint JICA Projects Coordinating Committee meeting. In his welcoming remarks Mr. Chikwenya disclosed the purpose of the meeting:

- To receive progress reports, challenges and chart the way forward in all three areas of project implementation
- To re-focus to obtain the desired results

In addition to this, he announced that while projects had held separate coordinating meetings, they would now be done jointly hereon in order to reduce on costs. Further points mentioned included:

- That synergies would be brought-out as the projects were being implemented
- That the agenda was circulated and the members were free to comment. The agenda was proposed for adoption and was seconded by one of the members.

The JICA Chief Resident Representative Mr. Yoshihide Teranishi read the opening speech.

In his speech he welcomed all the people that were present and urged all the stakeholders to participate in the discussions for the fruitfulness of the meeting.

He said that he was pleased to be part of the landmark meeting which saw the three projects in the Cooperation in the Agriculture sector coming together under one roof. These Projects are namely the Food Crop Diversification Support Project Focusing on Rice Production (FoDiS-R); the Technical Cooperation Project on Community Based Smallholder Irrigation (T-COBSI); and the Rural Extension Service Capacity Advancement Project (RESCAP).

He mentioned that the purpose of the meeting was for fruitful discussions that would enhance mutual understanding to attain the objectives of each technical cooperation project successfully. He also pointed out that JICA has been training about 100 staff each year and as at 2013 the figures stood at 3,000

since 1968. He also said that there has been some Ministry staff who received training in Japan in the different sectors of Agricultural extension, Irrigation, Policy and statistics and Fisheries and Livestock to mention but just a few.

He also highlighted the fact that the Japanese Government has contributed the largest portion in grant form to the Agriculture sector compared to other Cooperating partners (based on the recent ODA study in Zambia).

Mr. Teranishi also mentioned that JICA has been cooperating in the area of agricultural mechanization by piloting some tractor scheme with the Ministry and hopes that the Ministry would continue to work diligently towards resolving difficulties encountered to ensure success. The JICA representative also mentioned that, at the time of the meeting, there were seven Japan Overseas Cooperation Volunteers that were working in the Agriculture Sector, based in Kafue, Kasama, Luwingu and Chinsali District. He further said these volunteers were complementing projects like RESCAP and FODIS-R.

He assured the meeting that JICA was committed to working with the Government of Zambia as Partners towards meeting the aspirations of the Zambian people. He looked forward to improved dialogue so that collaboration in areas of importance would be more effective.

He also stressed that JICA would remain open to discuss with the Ministry in order to align Projects to the changing environment, as long as changes are compatible with the JICA framework of Cooperation.

The JICA representative also recognized the efforts that had been put towards the organization of the meeting and thanked everyone for taking their time off their busy schedules to be a part of the meeting.

Presentation of Achievement and Planned Activities of the three (3) JICA Projects

The Presentations were done by each Project to highlight the activities being undertaken by each project. There was also a question and answer session after the presentation to seek clarifications make comments and also to make recommendations as follows:

Summary of Question and Answers on T-COBSI

1. Setting of Targets in advance; One of the participants wanted to know why the targets, as to how many farmers will benefit and how much area (Ha) will be developed, had not been set, since the project had already started.

The SIE (Senior Irrigation Engineer) in Northern Province indicated that the survey on the impact of the Pilot project of COBSI will determine which sites will qualify for upgrading to permanent structures. And based on the unit targets set, i.e. area (Ha) per site, number of beneficiaries per site, the overall target will be determined. Additionally, GRZ (Government of the Republic of Zambia) financial support will also influence the number of sites to be developed.

2. Sustainability of Irrigation Schemes Developed; The participants wanted to know what JICA is doing differently to ensure that there is sustainability of the irrigation schemes after donor (JICA) support has been withdrawn.

The Deputy Director of TSB (Ag. Director of Agriculture) reported that unlike past projects, JICA has done extensive training of both farmers and Officers. Additionally there is strong component of

community participation from inception and thus enhancing the sense of community ownership thereby guaranteeing sustainable maintenance of the schemes.

3 Training of Technical Officers and Camp Extension Officers; One participant wanted to know whether the trainings indicated by the presenter would include promotion of irrigation packages including agronomical, marketing, and farmers organizational aspects since putting up infrastructure without supporting those aspects usually leads to the infrastructure not fully utilized. The PIE (Provincial Irrigation Engineer) for Northern Province responded in the affirmative and added that exposure visits will be arranged for farmers where the infrastructure will be developed and this would be to schemes which have recorded success such as Chinenke irrigation scheme in Mbala district.

4. Training of TSB Officers from Other Provinces on COBSI; The PACO for Western Province wanted to know if it was possible to extend the training in COBSI approaches and techniques to other provinces to narrow the technological gap in TSB officers countrywide. He further added that this would enable the TSB officers implement the COBSI approach using GRZ funding in the other provinces not under the project.

The acting Director of Agriculture (Deputy Director of TSB) supported the idea and JICA indicated that the proposal can be considered for discussion considering that there was no budget line for the inclusion of other provinces. JICA indicated that there would be no problem if GRZ would sponsor staff from other provinces for training to the project areas. However, there would be need for discussions if experts were to be requested to move to other provinces to undertake the training because there is no budget for activities in non-target provinces.

5. Comments; The PACO for Northern commented that in some instances the weirs constructed for irrigation are also used as crossing points by communities, thereby adding extra load to the structure. He added that the thirty year period before maintenance may be required is rather too long unless the concrete works are done to the highest standards. He stated that what the province has done is to facilitate the formation of community based maintenance committees in the schemes.

The Assistant Director, Agri-business added that besides maintenance committees, there is need to incorporate the aspects of agri-business so that the targeted smallholder farmers may generate income. This idea was supported and district officers were encouraged to train CEOs implementing T-COBSI in issues of marketing activity.

Summary of Question and Answers on RESCAP

PACO Western Province enquired why Western Province is not given further allocation of funds for the expansion of PaViDIA Micro Projects. Mr. Mgomba, Principal Farm Management Officer of DoA HQ explained that the funding is different from the ones for Western Province (WFP/Japan Fund) and the one for North Western and Northern Provinces (KR2 Counterpart Fund). It was further explained that the progress of the implementation of the project in Western Province is rather slow and the funding from WFP/Japan is still being utilized with the implementation of the second and third sub-projects in the target Districts.

Summary of Question and Answers on FoDiS-R

1. **Q:** What is the adoption rate in the target areas where farmers are growing rice for the first time? For example in Kafue and Nyimba.
A: Indicative statistics are that the project has an adoption rate between 60 and 90 % though it is very difficult to measure adoption at the time the project is implementing- especially that this is only the second year of project implementation. The adoption rate of the project activities can be measured after the project has come to an end
2. **Q:** FISP is promoting and distributing rice in FoDiS-R none target areas. How is it operating to compliment the activities in its none target areas.
A: The Department of Agriculture (DoA) is the one responsible for the rice activities in FoDiS-R none target areas. The districts involved undertake demonstrations to spearhead the production of the crop. For the next year, DoA will try to include FoDiS-R target area into FISP program so that both activity can be corroborate well.
3. **Q:** In order to optimize adoption, FoDiS – R should target rice areas which are traditionally growing rice.
A: This point was taken and it was explained that the project is targeting both areas were rice is traditionally being grown and areas were rice is not grown. The major reason for growing rice in none traditional areas is that the areas have a very big potential due to the existence of continuous water sources and dambos.
4. **Q:** Who has been offering free rice shelling services and where?
A: The project offered free rice shelling services to farmers in Nyimba to encourage farmers on production. This was undertaken to make farmers realize that their quality of rice was as good as the rice that is sold in the shops

Concluding Remarks

The acting Director Policy and Planning thanked all that participated in the meeting being the first of its kind. Specifically he thanked all those that travelled from the provinces.

He also thanked JICA for the meeting to provide synergies.

He further said that he hopes to see more of such meetings in 2014 taking place. He also stressed that the Ministry was keen to see more of these Joint Coordinating/Steering meetings as this would help to cut down on the costs.

He was expectant that all the three JICA projects would include comments provided by the participants to refine their projects and improve the way activities were being conducted. He thanked all once again, and assured that these meetings will be held once a year and that JICA would advise when the next meeting would be held. The meeting ended at 12:48hrs.

MINUTES OF MEETING
ON
THE MID-TERM REVIEW
ON
TECHNICAL COOPERATION PROJECT ON
COMMUNITY-BASED SMALLHOLDER IRRIGATION
IN THE REPUBLIC OF ZAMBIA

Japan International Cooperation Agency (hereinafter referred to as "JICA") and Ministry of Agriculture and Livestock organized the Mid-term Review Team (hereinafter referred to as "the Team") from November 24 to December 10, 2014 in order to review the progress and achievements of the Technical Cooperation Project on Community-Based Smallholder Irrigation (hereinafter referred to as "the Project").

After the intensive study and analysis of the progress and achievements of the Project, the Team prepared a Joint Mid-term Review Report (hereinafter referred to as "the Report") attached and presented it to the Joint Coordinating Committee (hereinafter referred to as "the JCC") held in Lusaka on December 10, 2014.

At the JCC, persons concerned with the Project discussed the major issues of the Project stated in the Report and agreed on the matters attached hereto.

Lusaka, December 10, 2014



Mr. Hisanao NODA
Chief Representative
Japan International Cooperation Agency (JICA)
Zambia Office



Mr. Peter Lungu
Director, Department of Agriculture,
Ministry of Agriculture and Livestock
Republic of Zambia

Main points of discussions based on the Report at the Meeting are as follows.

1. Acceptance of the Report

After the intensive discussion, persons participated in the Meeting accepted the Report and agreed to take necessary actions to each recommendation.

2. Revision of Project Design Matrix (PDM)

The Team proposed the revised PDM (version 1) and JCC agreed and accepted it after the intensive discussion.

3. Extension of the Project

The Project activities have been progressing well and the outputs have been getting attained. However JICA noted the necessity of continuous activities on the monitoring and evaluation of the COBSI Approach in the target areas. It is, therefore, proposed that the Project period be extended for six (6) months, starting from December 31, 2016 to June 30, 2017.

After the intensive discussion, JCC approved the proposal, and JICA and GRZ agreed to take necessary actions to the extension of the Project period.

Attachment 1: List of Attendees

Attachment 2: Joint Mid-term Review Report



P.K.L

List of Attendees

Attachment 1

No	Name	Affiliation/Position	Station
Ministry of Agriculture and Livestock			
1	Mr. Peter K Lungu	Director of Department of Agriculture	Lusaka
2	Mr. David Mundia	Director of Department of Agribusiness and Marketing	Lusaka
3	Mr. Maketo Mubyana	Director of Department of Cooperatives	Lusaka
4	Mr. Sakara Emmanuel	Deputy Director of Technical Services Branch	Lusaka
5	Mr. Chate Godwin	Provincial Agricultural Coordinator, Luapula	Mansa
6	Dr. Victor Mulopa	Provincial Agricultural Coordinator, Muchinga	Chinsali
7	Mr. Andrew Banda	Provincial Agricultural Coordinator, Northern	Kasama
8	Mr. Osbed Hamweete	Principal Agricultural Officer, Luapula Province	Mansa
9	Mr. Fred Chikuta	Principal Agricultural Officer, Muchinga	Chinsali
10	Mr. Charles Kapalasha	Principal Agricultural Officer, Northern	Kasama
11	Mr. Saila Mayson	Provincial Irrigation Engineer, Luapula	Mansa
12	Mr. Syansingu Stephen	Provincial Irrigation Engineer, Muchinga	Chinsali
13	Mr. Sifaya Mufalali	Farm Power Mechanization Engineer, Northern	Kasama
14	Dr. Jiro Nozaka	JICA advisor	Lusaka
Mid-term Review Team			
15	Mr. Emmanuel Mabvuto Nyirenda	Principle Irrigation Engineer, Department of Agriculture	Lusaka
16	Ms. Harriet Matipa	Economist, Department of Policy & Planning	Lusaka
17	Mr. Shinjiro Amameishi	JICA headquarter	Tokyo
18	Mr. Takuya Oiwa	JICA headquarter	Tokyo
19	Mr. Atau Kishinami	Consultant	Tokyo
Embassy of Japan			
20	Hiroyasu KIRIOKA	Second Secretary, Embassy of Japan	Lusaka
JICA			
21	Mr. Hisanao Noda	JICA Chief Representative	Lusaka
22	Dr. Isaya Higa	ARR	Lusaka
23	Mr. Patrick Chibbamulilo	Senior Programme Officer	Lusaka
24	Mr. Tatsuya Ieizumi	JICA Expert, T-COBSI	Kasama
25	Mr. Hideaki Hiruta	JICA Expert, T-COBSI	Kasama
26	Ms. Makiko Yamamoto	JICA Expert, T-COBSI	Kasama
Others			
27	Mr. Tokutaro Iino	JICA Expert, FoDiS-R	Lusaka



P.K. Lungu

MINUTES OF THE JCC MEETING HELD ON 10TH DECEMBER, 2014.

Summary of the Discussion

1. Financial resources from GRZ needs to be released and on time to ensure consistency on implementation of activities
2. To minimize unnecessary disputes, farmer groups need to be established and legalized as cooperatives
3. Acquirement of water permits by farmer groups needs to be facilitated by MAL where applicable
4. Collaboration with other stakeholders and MAL departments should be considered and encouraged especially in training associated with agribusiness, marketing, linkages between producers and retailers
5. Indicators of the project purpose and outputs need to be quantified such as size of area brought under irrigation, for the easy assessment of the Project
6. Diversification need to be considered and encouraged; specifically fish farming where the demand is high
7. Pilot activities of the SHEP approach need to be tailored to the local conditions

Discussion

Crop Diversification

- There is a need to ensure that food insecurity is not created as farmers grow crops for selling. To promote food security, farmers must be encouraged to grow and sell horticulture crops as encouraged by the GRZ's policy on crop diversification and food security.
- It was reported that under T-COBSI, irrigation is encouraged and applied during the dry season for various horticulture crops which farmers can grow and sell. Therefore, staple foods such as maize and cassava are still produced during the rainy season hence food security is maintained.
- Further, irrigation enables farmers to have a wider choice of crops to produce. As a result of irrigation, farmers produce both during the dry season as well as the rainy season.

Budget Disbursement

- Low disbursement of the GRZ funds allocated to the T-COBSI project caused challenges to implement activities on time in 2014. The PACOs from the three provinces where the Project operates should continue to encourage MAL officers to work despite the low funds sent to the Provinces. However, in the 2015 budget, there is money allocated as counterpart funds for T-COBSI that will go towards the construction of 50 permanent weirs in the three Provinces. MAL will engage in discussions with the Ministry of Finance to ensure that these funds are released and on time.
- Given that financial resources have been released as counterpart funds for SIP and IDSP Projects to support irrigation in the some parts of the Country including the Southern Province, it is therefore envisaged that T-COBSI counterpart fund could also be released to support irrigation in the Northern Part of the country.

Simple and Permanent Weirs

- It was recommended that MAL TSB technical staff and representatives of farmer groups from Luapula, Northern and Muchinga Provinces should undertake a field visit to the irrigation facilities developed by SIP in Southern province in order to learn ideas from the farmers and scheme managers.
- Although focus is on the construction of permanent weirs under the T-COBSI project; simple weirs are still cost effective and are entry points to the construction of permanent weirs.. Construction of simple weirs has no major cost except for mobilization of labour among the communities. Simple weirs also help farmers learn how to operate and maintain irrigation sites before permanent weirs are constructed. Therefore, the use of simple weirs is one way of introducing the farmers to irrigated agriculture and for them to appreciate the impact before construction of permanent weirs.

PDM Indicators

- There were no targets set in the PDM on area to be irrigated. It was recommended that targets be set and developed up to 2016 so as to provide the base for review of the Project's performance; GRZ has a target to develop and irrigate a total of 17,500 ha under the Presidential Directives in the period of 5 years (2012 to 2016)

Terminology

- It was recommended that some terminology in the Evaluation report be changed. It was suggested that the word "Schemes" be replaced with the word "sites", "TSB staff" be replaced with the words "TSB Technical staff".

Value Addition and Marketing

- It was reported that the training conducted by T-COBSI should include officers from the Department of Agribusiness and Marketing. Value addition and marketing are key components in Agriculture. It is important for farmers to study and understand the market they operate in. for example, the fact that groundnuts at *Chanda Nakulu* are harvested earlier than in the other parts of the Northern Province, farmers are able to fetch more money from the commodity. In addition, processing of the agriculture produce enables a long life and adds value to the commodities.
- The PACO for Northern Province, Mr. Andrew Banda recently undertook a training in Japan and Kenya on (SHEP). He reported that he had formulated an action plan of SHEP approach that is going to be piloted in Mungwi District, Northern Province based on the lessons learnt from Kenya. SHEP will eventually be applied to the other provinces in the future.
- It was also reported that the Department of Agribusiness had produced a marketing manual.

Capacity Development

- Competency of engineers at provincial and district level is a challenge and inadequate: For instance, in Northern Province, there are only two officers who have technical background in irrigation engineering. Most of the TSB technical officers are junior officers who have educational background in general agriculture, but are still trainable.
- Further, external assistance in training of extension officers on simple weir technologies is still needed especially for new officers.

Institutional Development

- It was recommended that formation and strengthening of farmer groups or irrigation committees should be encouraged and it is necessary for the effective Operation and Maintenance (O&M) of irrigation sites. Therefore, there is need for farmer groups to form maintenance committees to ensure that there is sustainability.
- In addition, farmer groups need to be formalized and legalized as cooperatives.
- Group work is essential for harnessing best practices, sharing effective water and farm management as planned activities and coping with seepages. Simple weir irrigation is an entry point to learn how to work together.
- An example of a successful farmer group was shared. Buleya Malima Irrigation Cooperative in Southern province, is a farmer group that started small and is now one of the biggest groups using irrigation. By using contributions made by members of the cooperative, they are able to effectively manage the irrigation facility without Government involvement. The Cooperative bought a truck and tractor for the scheme. It was reported that Buleya Malima Cooperative has a system that should be encouraged and extended to other farmer groups.
- *Sefula* irrigation scheme has some challenges in water management; strong institution is the key for the water management.
- The number of water user associations needs to be clarified.

Water Permit

- Application for water permits need to be encouraged by MAL to avoid conflicts among the farmers sharing the same stream due to limitations in water resources as the number of farmers using irrigation increases.
- However, it was reported that application for water permit is applicable only to the sites with a minimum water intake of 500 m³/day.

Impact of the Climate Change

- It was raised that the Impact of climate change needs to be considered when constructing irrigation facilities. As the demand for irrigated land increases, deforestation and environmental degradation may also increase. Deforestation leads to the reduction of the catchment area, and thus resulting into the reduction of river discharge.
- One solution shared to reduce deforestation was the use of rosewood in the construction of simple weirs. The use of rosewood can minimize deforestation as it can germinate a root system from the timber put on the ground when used in the construction of simple weir.
- In relation to the reduction in deforestation, it was reported that the main structure of the simple weirs usually remains even after the rainy season based on the follow-up survey conducted for the simple weir sites which were constructed during the COBSI Study.
- Further, during training farmers are advised not to use trees near the river and the trees more than a certain size in diameter may not be cut during construction of weirs.

MINUTES OF MEETING
ON
THE TERMINAL EVALUATION
ON
TECHNICAL COOPERATION PROJECT ON
COMMUNITY-BASED SMALLHOLDER IRRIGATION
IN THE REPUBLIC OF ZAMBIA

Japan International Cooperation Agency (hereinafter referred to as “JICA”) and Ministry of Agriculture organized the Terminal Evaluation Team (hereinafter referred to as “the Team”) from June 1 to June 24, 2016 in order to review the progress and achievements of the Technical Cooperation Project on Community-Based Smallholder Irrigation (hereinafter referred to as “the Project”).

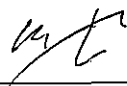
After the intensive study and analysis of the progress and achievements of the Project, the Team prepared a Joint Terminal Evaluation Report (hereinafter referred to as “the Report”) as attached and presented it to the Joint Coordinating Committee (hereinafter referred to as “the JCC”) held in Lusaka on June 22, 2016.

At the JCC, persons concerned with the Project discussed the major issues of the Project as stated in the Report and agreed on the matters attached hereto.

Lusaka, June 22, 2016



Mr. Hisanao NODA
Chief Representative
Japan International Cooperation Agency,
Zambia Office, Japan



Mr. Peter K Lungu
Director, Department of Agriculture,
Ministry of Agriculture,
Republic of Zambia

Main points of discussions based on the Report at the Meeting are as follows.

1. Acceptance of the Report

After the intensive discussion, persons participated in the Meeting accepted the Report and agreed to take necessary actions to each recommendation.

2. Termination of the Project

The Project activities have been progressing well and the outputs have been getting attained. The Project agreed on termination of the Project as scheduled on June 2017.

ANNEX 1: List of persons participated in the Meeting

ANNEX 2: Joint Terminal Evaluation Report



List of Attendees

No	Name	Affiliation/Position	Station
Ministry of Agriculture			
1	Mr. Peter K Lungu	Director of Department of Agriculture	Lusaka
2	Mr. Kaputa Chongo	Deputy Director of Department of Agriculture	Lusaka
3	Mr. Mulenga Chisakuta	Deputy Director of Technical Services Branch	Lusaka
4	Mr. Dominic Namanyungu	Provincial Agricultural Coordinator, Luapula Province	Mansa
5	Dr. Victor Mulopa	Provincial Agricultural Coordinator, Muchinga Province	Chinsali
6	Mr. Andrew Banda	Provincial Agricultural Coordinator, Northern Province	Kasama
7	Mr. Obed Chanda	Principal Agricultural Officer, Luapula Province	Mansa
8	Mr. Fred Chikuta	Principal Agricultural Officer, Muchinga Province	Chinsali
9	Mr. Charles Kapalasha	Principal Agricultural Officer, Northern Province	Kasama
10	Mr. Salla Mayson	Provincial Irrigation Engineer, Luapula Province	Mansa
11	Mr. Syansingu Stephen	Provincial Irrigation Engineer, Muchinga Province	Chinsali
12	Mr. Sifaya Mufalali	Provincial Irrigation Engineer, Northern Province	Kasama
13	Dr. Yusuke Haneishi	JICA advisor	Lusaka
Embassy of Japan			
14	Hiroyasu KIRIOKA	Second Secretary, Embassy of Japan	Lusaka
JICA			
15	Mr. Hisanao Noda	JICA Chief Representative	Lusaka
16	Dr. Isaya Higa	ARR	Lusaka
17	Mr. Patrick Chibbamulilo	Senior Programme Officer	Lusaka
18	Mr. Tatsuya Ieizumi	JICA Expert, T-COBSI	Kasama
19	Mr. Hideaki Hiruta	JICA Expert, T-COBSI	Kasama
20	Mr. Nobuaki Chiba	JICA Expert, T-COBSI	Kasama
21	Mr. Yoshihiro Sagawa	JICA Expert, T-COBSI	Kasama
Evaluation Team			
22	Mr. Sitali Cornelius Mulako	Principle Irrigation Engineer, Department of Agriculture	Lusaka
23	Ms. Harriet Matipa	Economist, Department of Policy & Planning	Lusaka
24	Mr. Shunichi Nakada	JICA headquarters	Tokyo
25	Mr. Takuma Noguchi	JICA headquarters	Tokyo
26	Dr. Hideaki Higashino	Consultant	Tokyo

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MINUTES OF MEETING
ON
DRAFT FINAL REPORT
ON
TECHNICAL COOPERATION PROJECT ON
COMMUNITY-BASED SMALLHOLDER IRRIGATION
IN THE REPUBLIC OF ZAMBIA

The Ministry of Agriculture (MoA) and Japan International Cooperation Agency (JICA) has been implementing the Technical Cooperation Project on Community-Based Smallholder Irrigation (“the Project” or “T-COBSI”) from May 2013 to June 2017.

As the Project is coming to end, the Project Implementation Unit (PIU), comprising of Japanese experts and Zambian counterpart officers, made a presentation to the Joint Coordinating Committee (JCC) on the project outline, achievement, lessons learned and way forward as the main contents of the draft final report.

At the JCC meeting held on April 4, 2017, persons concerned with the Project discussed the major issues of the Project as to be stated in the draft final report and agreed on the matters attached hereto.

Lusaka, April 4, 2017



Handwritten signature of Mr. Peter K Lungu in black ink.

Mr. Peter K Lungu
Director, Department of Agriculture,
Ministry of Agriculture,
Republic of Zambia

Handwritten signature of Mr. Tatsuya Ieizumi in black ink.

Mr. Tatsuya Ieizumi
Team Leader
JICA Project Team for T-COBSI
Japan

The Final Joint Coordination Committee (JCC) meeting was held at the Taj Pamodzi Hotel on the 4th April 2017. The meeting included the project provinces and the proposed three provinces (Central, Copperbelt and Northwestern provinces) to be included in Phase II.

The meeting was called to order at 10:00hrs and it was chaired by Mr. Peter K. Lungu, the Director for Department of Agriculture in the Ministry of Agriculture. The members present started by introducing themselves by name, designation and station of operation as per attached attendance list. The chairperson read the agenda and the Deputy Director TSB proposed for adoption and the PACO Muchinga Province seconded for adoption

WELCOMING REMARKS

After the introductions were done, the chairperson welcomed everyone present to the final JCC meeting. In his welcoming remarks Mr. Peter K. Lungu disclosed the purpose of the meeting:

- To receive draft final report presentation on the T-COBSI project achievement
- To discuss the way forward on the proposed T-COBSI Phase II

In addition to this, he emphasized that irrigation is a key area in agricultural development and that T-COBSI scored in capacity building in farmers and MoA staff in the project area in irrigation skill development and that the knowledge acquired should be passed on to other farmers and staff in the ministry.

He also informed the house that 5,600 ha of irrigation land in addition to the 900 ha developed by T-COBSI had been put under irrigation beating the 5,000 ha set target. This contribution is attributed to the cooperation of JICA and Government of the Republic of Zambia.

The ministry is seeking treasury authority for funds to establish a database to collect inventory on smallholder irrigation and document sites under irrigation.

He informed the house of other projects and funders that are contributing irrigated agriculture through development of irrigation schemes such as IDSP, ADB, and APMEP. He also informed that it is planned a team be dispatched to the area for finding appropriate sites for upgrading.

On behalf of MOA, the director thanked JICA for the contribution to irrigation development.

PRESENTATION

Mr. Sifaya Mufalali a member of the Project Implementation Unit made a presentation on the achievement of the project throughout the project period and reported that the project purpose has been achieved, main indicators of which include the following:

- Number of Technical Service Branch (TSB) staff trained: net 47 and gross 388 officers
- Number of extension officers trained: net 185 and gross 506 officers

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- Number of farmer groups applied at least one of the technologies introduced: 88%
- Number of farmer groups engaged in improved irrigation farming: 788 groups
- Area under irrigation: 948.2 ha

DISCUSSION

Responses to Recommendation from the Terminal Evaluation Team

The chairperson guided the respective implementing teams to respond on what was achieved in regard to the recommendations made by the terminal evaluation team.

To the Project Team

1. To clarify changes and effects on beneficiary farmers from economic and social aspect
Mr. H. Hiruta responded that from the survey carried out in the project and non-project areas, income levels per year in the project area were 2.3 times higher than the non-project area.
2. Technical Support on Application Procedure for S3P Project as to enable potential beneficiaries to access the fund for community level irrigation
Mr. N. Chiba responded that 15 sites in the S3P project area had been surveyed and Bill of Quantities (BOQs) and designs were ready and some applications had already been submitted to S3P. He also informed the house that another 9 sites in non S3P operational area had been prepared.
3. Compilation of the project data for facilitate budget request as to support budget application process
Mr. H. Hiruta responded that resources and budgetary allocation was facilitated and that \$350 was required to train each office. Also, 65 liters/ha and 87 liter/site were required that are less than US\$100.
4. Implement wrap-up training for TSB
Mr. Y Sagawa informed the participants that in March 2017 a TSB wrap up training was conducted
5. Review on the Training Materials
Mr. Ieizumi responded that the materials were reviewed and cited an example of the posters and flayers that were distributed during the dissemination workshop and JCC meeting.

To the Zambian Side

1. To improve communication with cooperation partners to share Information on Agriculture Sectors
The PACOs from the three project areas (Luapula, Muchinga and Northern provinces) responded that quarterly meetings were being held where DACOs shared the information with other departments.
2. Utilization of Trained CPs as to implement the training programs of T-COBSI, and examine the feasible way for further expansion.
The director indicated that the ministry has plans to use the trained CPs in orientation programmes for newly employed staff.
3. Budget Allocation as to cover both training implementation and weir construction
The Director indicated that government is committed to fulfil the counterpart funding
4. To arrange field visit for MoA Officers by the end of August 2016 as to show the impact of the project to the stakeholders including core officers on Irrigation Policy Development in MoA
The Deputy Director TSB visited the project site in 2018.

5. To conduct dissemination seminar as to share the output of the project and discuss possible ways to expand COBSI approach

The Director alluded that the workshop was held successfully on the 3rd of April 2017.

To the Japanese Side

1. Cooperation to the Site Visit to T-COBS Sites and Dissemination Seminar

Mr. Hiruta responded that JICA supported the planning, preparation of the dissemination workshop, and thanked Dr. Haneishi for the effort and time towards the successful implementation of these activities.

2. Additional Resource Allocation for Impact Assessment

Mr. Hiruta informed the house that JICA had dispatched two expats to the project sites for two months to carry out the impact assessment and nutritional impact.

ANY OTHER BUSINESS

Transport Challenge

The Director responded to the concern from the PAO Copperbelt province that the ministry had reached advanced stage in the procurement of motor bikes and vehicles which will be distributed to the most affected camps and provinces. Mr. Hiruta acknowledged the fact that even from the project side it was difficult for MoA staff to monitor the project activities and thus the Project was in the process of acquiring 19 motorbikes to be distributed to the 19 project districts to be used by the TSB staff.

Sustainability Measures

Dr. Haneishi the advisor to MoA reminded the house to start putting up measures of sustaining the activities that were being implemented by T-COBSI especially if phase II of the project was not to be approved. Mr. Moffat Gondwe, a SIE from the Copperbelt province encouraged the house especially his fellow TSB members to continue with implementation of the project activities and to take ownership of the activities.

Irrigation inventory and human resource

The Director responded to the concern from the SIE from Northwestern province on the understaffing of the TSB section that in those lines the section is being considered to be full-flagged Department and the proposal has been submitted to cabinet awaiting approval. The director further emphasized the need for in-service trainings to be a continuous process in the ministry.

The Director responded to the follow-up regarding the handover of equipment procured by the project that he was positive and in agreement with the proposal submitted by the project team regarding the retention of the equipment to the project area.

CLOSING REMARKS

Dr. Fujiie's, the Chief Resident Representative of JICA Zambia office presented closing remarks. In his speech he welcomed all the people that were present and thanked all the stakeholders who participated in the discussions for the fruitfulness of the meeting.

He said that he was pleased to be part of the occasion to share the observations on the progress of the project as it comes to the end. He further said that he was confident that meeting provided good lessons drawn from

the project and hoped members can use these lessons for implementation of similar projects on irrigation in the future.

He highlighted from the discussion of the dissemination workshop a lot of issues regarding role of irrigation in agriculture and the progress of this project. We also had the opportunity to listen to presentations by the Project Team, evaluators from the University of Zambia and from the beneficiary farmers. There was a consensus in the presentations that the project had positive impacts that were observed among the staff in the Ministry of Agriculture and at the farm level.

He encouraged the ministry the following issues to be considered to enhance irrigation development in the country:

- Allocation and release of the budget by the Ministry of Agriculture towards the implementation of the future project activities. This will enable officers to implement various project activities like farmer training, monitoring and evaluation, among others;
- Allocation of resources to upgrade priority simple weirs to permanent ones; in the last project there were limited resources to undertake this activity
- Allocation of more resources to strengthen farmer groups organization at community level. This can entail strengthened arrangements for Operations and Maintenance (O&M), as well as to ensure that water is more equitably shared among the community beneficiaries
- Enhanced linkages with other stakeholders like training institutions and Ministries that are related to the project (water resources, environment and natural resources, among others)
- Inclusion of the experiences learnt from the Project into the Irrigation Policy being developed so that the good practices from the project can be scaled up to reach out to more beneficiaries

The JICA representative paid tribute to the people who had contributed to the success of seminar. Thanked the ministry of agriculture for their coordination to bring the members together for such a dialogue. Last but not the least, he thank the team of organizers (comprising the team from T-COBSI and their counterparts in MoA) for worked tirelessly to ensure that the logistics were in place.

Concluding Remarks

The Director of the Department of Agriculture thanked all that participated in the meeting and for the positive contributions to the deliberations. Specifically he thanked all those that travelled from the provinces. He also thanked JICA for the meeting and the contribution towards irrigation development. He thanked all once again, and wished all those travelling a safe trip. The meeting ended at 12:48hrs.

Attachment 1: List of persons participated in the Meeting

No	Name	Affiliation/Position	Station
Ministry of Agriculture			
1.	Mr. Peter K Lungu	Director of Department of Agriculture	Lusaka
2.	Mr. Stanslous Chisakuta	Deputy Director of Technical Services Branch	Lusaka
3.	Mr. Chate Godwin	Provincial Agricultural Coordinator, Luapula	Mansa
4.	Dr. Victor Mulopa	Provincial Agricultural Coordinator, Muchinga	Chinsali
5.	Mr. Andrew Banda	Provincial Agricultural Coordinator, Northern	Kasama
6.	Mr. Fred Chikuta	Principal Agricultural Officer, Muchinga	Chinsali
7.	Mr. Charles Kapalasha	Principal Agricultural Officer, Northern	Kasama
8.	Mr. Saila Mayson	Provincial Irrigation Engineer, Luapula	Mansa
9.	Mr. Syansingu Stephen	Provincial Irrigation Engineer, Muchinga	Chinsali
10.	Mr. Sifaya Mufalali	Senior Irrigation Engineer, Northern	Kasama
11.	Mr. Kelvin Simukoko	Assistant Technical Officer	Kasama
12.	Mr. Acson Mbewe	Assistant Technical Officer	Kasama
13.	Dr. Yusuke Haneishi	JICA advisor	Lusaka
Other Provinces			
14.	Mr. Derrick Simukanzye	Provincial Agricultural Coordinator, Northwestern	Solwezi
15.	Dr. Obvious Kabinda	Provincial Agricultural Coordinator, Copperbelt	Ndola
16.	Dr. Adreen Nansungwe	Provincial Agricultural Coordinator, Central	Kabwe
17.	Mr. Mubambwe Simbarashe	Provincial Agricultural Officer, Northwestern	Solwezi
18.	Ms. Janie C Monga	Provincial Agricultural Officer, Copperbelt	Ndola
19.	Ms. Elizabeth Chuma	Provincial Agricultural Officer, Central	Kabwe
20.	Mr. J M Bwalya	Senior Irrigation Officer, Northwestern	Solwezi
21.	Mr. Moffat Goma	Senior Irrigation Officer, Copperbelt	Ndola
22.	Mr. Adamson Tembo	Senior Irrigation Officer, Central	Kabwe
23.	Mr. John Hikanyemu	Senior Irrigation Engineer, Lusaka	Lusaka
Embassy of Japan			
24.	Mr. Shingo Matai	Second Secretary, Embassy of Japan	Lusaka
JICA			
25.	Dr. Hitoshi Fujiie	JICA Chief Representative	Lusaka
26.	Dr. Isaya Higa	Assistant Resident Representative	Lusaka
27.	Mr. Patrick Chibbamulilo	Senior Programme Officer	Lusaka
28.	Mr. Tatsuya Ieizumi	JICA Expert, T-COBSI	Kasama
29.	Mr. Hideaki Hiruta	JICA Expert, T-COBSI	Kasama
30.	Mr. Nobuaki Chiba	JICA Expert, T-COBSI	Kasama
31.	Mr. Yoshihiro Sagawa	JICA Expert, T-COBSI	Kasama

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Outline of the Sites for Permanent Weir Construction (2014) (1)

No.				
Name of scheme	Mpela	Kawama	Mufili Chibwale	Musanza
Province	Northern	Northern	Northern	Muchinga
District	Mporokoso	Mbala	Luwingu	Nakonde
No. of members	23	55	39	30
Present irrigated area (ha)	4.0	10.0	5.0	4.0
Scheme area (ha)	16.0	23.0	79.0	25.0
Type of weir	Fixed type stone masonry with stop log.	Fixed type stone masonry with stop log.	Fixed type stone masonry with stop log.	Fixed type with stop log. Stone masonry and embankment combined.
Total length of weir	35.0m	25.0m	17.0m	120m
Height of weir	1.7m	2.4m	2.2m	2.6m
Spillway	W=4.0m Design flow depth: 0.6m Stop log: W = 0.8m x 1	W=5.0m Design flow depth: 1.0m Stop log: W = 0.8m x 2	W=6.0m Design flow depth: 1.1m Stop log: W = 0.8m x 2	W=4.0m Design flow depth: 1.2m Stop log: W = 0.8m x 2
Top Elevation*1	EL. 6.7m	EL.5.0m	EL.7.3 m	EL.7.6m
Over flow crest elevation*1	EL. 5.5 m	EL.3.4m	EL.5.4 m	EL.5.8m
Intake	Right side Trapezoid Bottom width: 0.6m Bottom elevation : EL.5.2m	Right side Trapezoid Bottom width: 1.0m Bottom elevation : EL.3.1m	Left side Trapezoid Bottom width: 1.0m Bottom elevation : EL.5.0m	Right side Trapezoid Bottom width: 0.6m Bottom elevation : EL.5.5m
Design discharge (lit/s)*2	127	216	344	127
Maximum irrigable area (ha)*3	11.0	23.7	29.1	9.2
Estimated potential irrigable area (ha)	6.0	15.0	7.0	8.0

*relative elevation, *2 design discharge > actual river flow, *3 design capacity

Outline of the Sites for Permanent Weir Construction (2014) (2)

No.			
Name of scheme	Lubanga	Buyantanshi	Munsa
Province	Muchinga	Luapula	Luapula
District	Mpika	Mwense	Nchelenge
No. of members	36	40	120
Present irrigated area (ha)	5.0	8.0	11.0
Scheme area (ha)	65.0	16.0	30.0
Type of weir	Fixed type with stop log. Stone masonry and embankment combined.	Fixed type with stop log. Stone masonry and embankment combined.	Fixed type with stop log. Stone masonry and embankment combined.
Total length of weir	40.0m	52.0m	23.0 m
Height of weir	1.75m	1.7m	1.9m
Spillway	W=4.0m Design flow depth: 0.5m Stop log: W = 0.8m x 1	W=8.0m Design flow depth: 0.5m Stop log: W = 0.8m x 2	W=8.0m Design flow depth: 0.5m Stop log: W = 0.8m x 2
Top Elevation*1	EL. 5.15m	EL.6.0m	EL. 4.0 m
Over flow crest elevation*1	EL. 4.05 m	EL.4.9m	EL. 2.9 m
Intake	Both side Trapezoid Bottom width: 0.6m Bottom elevation : EL.3.75m	Right side Trapezoid Bottom width: 0.6m Bottom elevation : EL.4.6m	Both side Trapezoid Bottom width: 0.6m Bottom elevation : EL.2.6m
Design discharge (lit/s)*2	127 x 2	127	127 x 2
Maximum irrigable area (ha)*3	17.3	12.7	32.4
Estimated potential irrigable area (ha)	8.0	10.0	13.0

*relative elevation, *2 design discharge > actual river flow, *3 design capacity

Outline of the Sites for Permanent Weir Construction (2015)

No.				
Name of scheme	Munyele	Lualizi	Kalila	Chansamalamba
Province	Northern	Muchinga	Luapula	Luapula
District	Nsama	Isoka	Mansa	Kwambwa
No. of members	150	36	42	37
Present irrigated area (ha)	2.25	2.5	2.6	2.25
Scheme area (ha)	30	10.0	7.8	7.75
Type of weir	Fixed type stone masonry with stop log.	Fixed type stone masonry with stop log.	Fixed type with stop log. Stone masonry and embankment combined.	Fixed type with stop log. Stone masonry and embankment combined.
Total length of weir	31.6m	15.0m	46m	50m
Height of weir	4.1m	2.2m	2.5m	2.5m
Spillway	W=8.0m Design flow depth: 1.3m Stop log: W = 0.8m x 1	W=8.0m Design flow depth: 1.0m Stop log: W = 0.8m x 1	W=11.0m Design flow depth: 1.4m Stop log: W = 0.8m x 2	W=12.0m Design flow depth: 1.1m Stop log: W = 0.8m x 2
Top Elevation*1	EL. 4.8m	EL.5.2m	EL.6.0 m	EL.5.5m
Over flow crest elevation*1	EL. 2.9 m	EL.3.6m	EL.4.0 m	EL.3.8m
Intake	Left side Trapezoid Bottom width: 0.6m Bottom elevation : EL.2.5m	Right side Trapezoid Bottom width: 1.0m Bottom elevation : EL.3.2m	Left side Trapezoid Bottom width: 0.6m Bottom elevation : EL.3.7m	Right side Trapezoid Bottom width: 1.0m Bottom elevation : EL.3.5m
Design discharge (lit/s)*2	205	344	127	216
Maximum irrigable area (ha)*3	16.8	25.5	9.0	15.6
Estimated potential irrigable area (ha)	5.0	6.0	7.8	7.8

*relative elevation, *2 design discharge > actual river flow, *3 design capacity

Outline of the Sites for Permanent Weir Construction (2016)

No.			
Name of scheme	Musanda	Twikatane	Fitungulu
Province	Northern	Northern	Luapula
District	Kasama	Mungwi	Chipili
No. of members (HH)	85	25	27
Present irrigated area (ha)	4.5	2.5	2.5
Scheme area (ha)	8.0	8.25	7.0
Type of weir	Fixed type stone masonry with stop log.	Fixed type stone masonry with stop log.	Fixed type stone masonry with stop log.
Total length of weir	20.3m	24.5m	19.4 m
Height of weir	2.3m	2.5m	2.1m
Spillway	W=4.0m Design flow depth: 0.8m Stop log: W = 0.8m x 1	W=10.0m Design flow depth: 0.9m Stop log: W = 0.8m x 2	W=6.0m Design flow depth: 1.0m Stop log: W = 0.8m x 1
Top Elevation*1	EL. 4.1m	EL.3.2m	EL. 2.7 m
Over flow crest elevation*1	EL. 2.7 m	EL.1.7m	EL. 1.1 m
Intake	Left side Trapezoid Bottom width: 1.0m Bottom elevation : EL.2.3m	Left side Trapezoid Bottom width: 0.6m Bottom elevation : EL.1.3m	Right side Trapezoid Bottom width: 1.0m Bottom elevation : EL.0.7m
Design discharge (lit/s)*2	344	200	344
Maximum irrigable area (ha)*3	25.5	15	25.5
Estimated potential irrigable area (ha)	7.0	15	12

*relative elevation, *2 design discharge > actual river flow, *3 design capacity

S3P Candidate Sites

Province		District	Camp	Site name	Beneficiary (HH)	Irrigated Area (lima)	Total Project Cost (ZMK)	Farmers' Contribution (ZMK)	Remarks
Northern	1	Mbala	Chindo (S3P)	Musankwa	130	20	246,730	80,231	
	2		Senga (S3P)	Mpwani	50	36	266,031	74,241	
	3	Luwingu	Tungati (S3P)	Chilinda	75	6	257,429	65,661	
	4		Mufili (S3P)	Ipandula	35	12	196,449	49,112	
	5	Mporokoso	Shibwalya kapita (S3P)	Kalashi	40	11	289,479	100,576	
	6	Kasama	Lukulu North (S3P)	Chilemba	40	13	244,238	63,616	
	7	Nsama	Kasonsa (S3P)	Mukotwe	100	15	256,510	64,128	
	8	Mungwi	Malole North (S3P)	Bwambi stream	327	12	237,399	61,729	
Muchinga	1	Nakonde	Mwenzu (S3P)	Musesengoma	20	16	341,759	90,224	
	2	Isoka	Kantensha (S3P)	Namota	90	82	440,902	113,370	
	3		Lualizi (S3P)	Mumbwe	120	21.25	298,623	76,240	
	4		Nansala (S3P)	Nansala	150	22	170,728	42,880	
	5	Mpika	Kaburamwiko (S3P)	Chiseke	100	29	343,738	86,323	
	6		Mukungulu (S3P)	Chikumbi	63	13	267,191	68,516	
	7	Mafinga	Chitapo (S3P)	Mundebe	37	29	264,092	67,960	
Total	15				1377	337.25	4,121,298	1,104,807	

Candidate Sites for Other Donors

		District	Camp	Site name	Beneficiary (HH)	Irrigated Area (lima)	Total Project Cost (ZMK)	Farmers' Contribution (ZMK)	Degrees of priority and Remarks
Northern	1	Mporokoso	Kapumo	Kapumo	57	24	265,996	98,073	
	2	Kasama	Chikosho	Ituna	10	5	197,291	49,472	The scheme intends to include downstream area and increase number of beneficiary and irrigated area
	3		Milungu West	Mwika	40	12	276,454	90,634	
Muchinga	1	Shiwangandu	Mukungwa	Mwango	41	8.4	205,599	48,813	
	2		Philip	Musowa	30	3	387,890	97,350	
Luapula	1	Mwense	Mubende	Kasengu	21	1	220,625	66,638	
	2	Nchelenge	Mulwe	Chipili	23	8	208,286	60,771	
	3	Chipili	Kalundu	Milayi	15	6	157,096	45,455	
	4	Mwansa Bombwe	Chipunka	Mununshi	43	10.5	300,403	83,936	
Total	9				280	77.9	2,219,640	641,142	

Result of Self-Evaluation of TSB Officers on their Capacity in Permanent Scheme Development

Evaluation Items	Average	1	2	3	4	5
(1) Survey	3.98					
Able to survey elevation with dumpy level and to calculate elevation.	4.18	1	1	4	13	15
Able to make a drawing of cross section according to survey data.	3.53	2	6	7	10	9
Able to measure and calculate water flow quantity of a stream	3.76	1	3	8	13	9
Able to carry out survey of socio-economic condition	4.45	0	2	2	8	21
(2) Irrigation water requirement	3.75					
Able to carry out survey of farming and cultivation condition	4.33	0	0	1	20	12
Able to make a cropping calendar	4.30	0	0	6	11	16
Able to calculate irrigation efficiency	3.62	1	5	10	8	10
Able to calculate irrigation water requirement of the scheme	3.65	0	5	11	9	9
Understood design discharge capacity of intake	3.39	0	8	9	8	6
Able to calculate maximum irrigable area	3.61	0	6	7	11	7
Able to operate CROPWAT	3.59	1	7	7	9	10
Able to prepare report of irrigation water requirement by "Word"	3.53	0	6	9	14	5
(3) Design of Permanent weir	3.40					
Understood procedure of implementation	3.82	1	7	2	11	13
Able to calculate flood water flow area	3.32	3	6	7	13	5
Able to determine design high water level (Calculation of spillway flow area)	3.28	3	5	10	8	6
Able to determine various elevation	3.39	2	6	9	9	7
Understood determination of various dimensions (intake)	3.21	3	8	8	7	7
Able to prepare design report by "Word"	3.34	3	5	11	4	9
(4) Drawing	3.14					
Able to make a drawing of Plan	3.15	5	6	9	5	8
Able to make a drawing of Longitudinal section	3.15	4	8	7	7	7
Able to make a drawing of various cross sections	3.13	5	7	6	7	7
(5) BOQ	3.24					
Able to calculate the quantity of stone masonry	3.26	3	8	8	7	8
Able to calculate the quantity of excavation	3.24	4	8	5	8	8
Able to calculate the quantity of rubble stone	3.21	6	5	7	8	8
understood how to calculate the quantity of Mortar	3.21	4	7	8	8	7
Understood how to calculate the quantity of sand	3.29	5	7	5	7	10
Understood how to calculate the quantity of cement	3.44	4	4	10	5	11
Able to prepare BOQ with "Excel"	3.00	4	9	10	5	6
(6) Work plan	3.58					
Able to calculate required manpower	3.47	1	8	7	10	8
Able to calculate required work period	3.55	1	7	5	13	7
Able to make work schedule	3.74	1	6	5	11	11
(7) Cost estimation	3.68					
Able to calculate material cost	3.59	1	7	7	9	10
Able to calculate labor cost	3.59	1	7	7	9	10
Able to calculate transportation cost	3.76	1	4	8	10	11
Able to calculate supervision cost	3.79	1	4	7	11	11
(8) Supervisor	4.12					
Understood procedure of implementation and schedule	4.03	1	1	6	13	12
Able to install pegs at major points according to the drawing	3.88	1	4	6	9	13
Able to instruct the farmers on excavation of river diversion and construction of coffer dam	4.12	1	3	4	9	17
Able to instruct the farmers area and depth of excavation according to the drawing	4.06	2	2	4	9	16
Able to indicate the various elevation at the site according to the drawing	3.88	1	4	9	4	16
Understood mortar mix proportion, mortar mixing and placing	4.29	1	1	5	7	20
Able to instruct the farmers on stone masonry work	4.24	1	3	4	5	21
Able to instruct farmers on O&M of permanent weir and furrow.	4.48	0	2	3	5	23

Present your degree of IMPLEMENTATION	Average	1	2	3	4	5
(1) SURVEY by YOURSELF.	4.10	2	0	2	14	11
(2) IRRIGATION WATER REQUIREMENT by YOURSELF.	3.65	2	2	10	8	9
(3) DESIGN OF PERMANENT WEIR by YOURSELF.	3.29	1	8	10	5	7
(4) DRAWING by YOURSELF.	3.17	3	8	8	3	8
(5) BOQ by YOURSELF.	3.50	2	5	8	6	9
(6) WORK PLAN by YOURSELF.	3.84	1	3	7	9	11
(7) COST ESTIMATION by YOURSELF.	3.65	3	2	8	8	10
(8) SUPERVISOR by YOURSELF.	4.39	0	0	4	11	16

- 1: Not able, not understood
- 2: A little able, understood
- 3: Partially able, understood
- 4: Almost able, understood
- 5: Fully able, understood